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**Modelling music: a theoretical approach to the
classification of notated Western art music**

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Declaration

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Abstract

The classification of notated Western art music is a perennial issue. This thesis analyses and models the knowledge organization of notated Western art music in order to elucidate a theoretical understanding of these classification issues and to offer new ways of viewing music classification in the future. This thesis also considers how music classification contributes to developments in general knowledge organization and compares the classification of Western art music across the library and information science (LIS) and music domains. The research is conducted using a number of analytical techniques, including examining music knowledge organization discourse, analysing examples of LIS classification schemes, unpicking discussions of classification in the music domain and analysing composer worklists in the music domain. After ascertaining how music classification fits into theories of faceted classification, three important facets of music are identified: medium, form and genre, and a quasi-facet of function. These three facets are explored in detail over five chapters: the binary vocal/instrumental categorisation; classifying numbers of instruments or voices, accompaniment, arrangements and “extreme” mediums; classifying musical instruments; classifying musical forms and genres; and the quasi-facet of function.

Five resulting models of music classification are presented. Model 1 demonstrates the complexities of classifying musical medium, including the interlinked relationships between different parts of musical medium. Model 2 offers a solution to LIS classification’s largely binary view of vocal and instrumental categorisation by suggesting a novel new category: “vocinstrumental”. Model 3 illuminates the entrenched dependencies between facets of music, highlighting one of the structural issues with LIS classifications of music. Model 4 offers an original structure of music classification, proposing a simultaneous faceted and genre-based system. Model 5 compares classification in the music and LIS domains, offering a novel way of considering domain-based classification by codifying various types of relationships between the LIS and domain classifications. This thesis also contributes to the theory and practice of knowledge organization in general through the development of novel frameworks and methodologies to analyse classification schemes: the multiplane approach, reception-infused analysis, webs of Wirkungs (connections) between classification schemes and stress-testing.

List of classification scheme and other abbreviations and initialisms

Abbreviation	Details of scheme	Author-date reference
Ayer	Ayer's article "Shelf classification of music"	Ayer 1902
BCM	<i>British Catalogue of Music</i> classification	Coates 1968a
Bliss1	<i>Bliss Classification</i> , 1 st edition	Coates 1953
Colon6	<i>Colon Classification</i> , 6 th edition, revised version	Ranganathan 1963
Colon7	<i>Colon Classification</i> , 7 th edition	Ranganathan, Gopinath 1987
Cuttter1902	Cutter's article "Shelf classification of music"	Cutter 1902
DDC13	<i>Dewey Decimal Classification</i> , 13 th edition	Dewey, Fellows & Getchell 1932
DDC19	<i>Dewey Decimal Classification</i> , 19 th edition	Dewey, Custer 1979
DDC22	<i>Dewey Decimal Classification</i> , 22 nd edition	Dewey et al. 2003
Dickinson	<i>Classification of musical compositions: a decimal-symbol system</i> , published in 1938, thesis uses the 1968 reproduction which maintains the original pagination	Dickinson 1938
Expansive	<i>Cutter's Expansion Classification</i> , original edition	Cutter 1891-1904
Flexible	<i>Pethes' Flexible classification system of music and literature on music</i> , produced as a pre-print in 1967	Pethes 1967
Haroon	Haroon's revised music schedules for the <i>Colon Classification</i>	Haroon 2010
H/S	Hornbostel and Sachs' <i>Classification of musical instruments</i> , initially published in 1914, thesis uses the 1992 reproduction of the English translation of the scheme, which does not maintain the pagination of the original	Hornbostel, Sachs 1992
LCC2015	<i>Library of Congress Classification</i> , schedules for M, music, online version and downloaded in 2015	Library of Congress 2015

McColvin and Reeves	McColvin and Reeves' revisions of the <i>Dewey Decimal Classification</i> , as reproduced in a textbook, new version edited by Dove	McColvin, Reeves & Dove 1965
Olding	Olding's article "A system for classification of music and related materials"	Olding 1954
Ott	Ott's paper "The role of music in public libraries"	Ott 1961
Subject	Duff Brown's <i>Subject Classification</i>	Brown 1914
UDC	<i>Universal Decimal Classification</i> , 3 rd edition, standard edition	British Standards Institution 2006

Note that in addition, some common abbreviations from Library and Information Science are used in the thesis:

- LIS (Library and Information Science)
- KO (Knowledge Organization, the sub-domain of LIS)
- DDC (*Dewey Decimal Classification*, when referring to the scheme generally or to an edition not mentioned in the above table)
- LCC (*Library of Congress Classification*, when referring to the scheme generally or to an edition not mentioned in the above table)

These standard abbreviations are used in the conventional manner, and re-introduced the first time they appear in any particular chapter.

Also, throughout this thesis, the abbreviation "Grove" is used to refer to the standard reference source in music currently called *Grove Music Online* (Grove music online 2016), whose print predecessors were known under a variety of names including *The Grove Dictionary of Music and Musicians*. This thesis uses "Grove" when referring to the most recent edition, and specifies the title in full when referring to a specific, older edition. Individual articles from Grove music online (2016) are referenced in the thesis with the author(s) and update or access dates for the particular article, and bibliographic details for the individual articles can be found in the "References" section.

Chapter 1: Introduction

1. Introduction to Chapter 1

Music classification has both inspired and irritated those seeking to classify music for the best part of a century. The voluminous discourse about music classification and the dozens of published classification schemes for music – notwithstanding all the adaptations, slight “enhancements” and other efforts which never make it into published form – are indications of a subject which is difficult to classify. Yet, the first fully faceted classification scheme in the U.K. was for music and the faceted music schedules occupy pride-of-faceted-place within the *Dewey Decimal Classification* (DDC) from 1990 onwards. Solutions suggested by irritation, perhaps; inspired in their construction, definitely.

On further consideration, while classification usually concerns some form of “about-ness”, the question must be asked, what *is* the subject of a piece of music. Its message, its topic and its rhythm might be useful ways of classifying the latest BBC Radio 1 chart-topper, but what about the subject of Beethoven’s Symphony No. 5? What is Beethoven’s Symphony No. 5 about, and how do we classify it? However, this symphony was treated by critics contemporaneous to Beethoven such as E.T.A. Hoffmann (Hoffmann 1981, p. 38) as the apotheosis of sublime infinite-ness, celebrated precisely for its lack of depiction of finite emotions (Dahlhaus 1989b, p. 18). In other words, the symphony’s lack of defined “programme” – a tangible “subject” – helps to elevate the symphony to the sublime (at least, to the philosophers and critics of the day) but a subject-less piece of music will not prosper in a classification system based upon subject and about-ness. (In addition, what constitutes a subject to some music would not be useful for other music.) The solution taken by traditional library classification schemes is to focus on what music is, rather than what it is about – a duality labelled as “the about-ness vs. the is-ness” in, for example, McKnight (2012, p. 288) – circumnavigating the issue of music’s subject. Yet, even with classifying what music is, and the solutions offered by DDC and the plethora of other schemes being used to organize music today, we do not appear to have gained a theoretical understanding of what it is about music that makes it problematic in the first place. Our collective knowledge – gained through the journals of librarianship and music libraries, and the trail laid down by the numerous schemes and experimental faceted treatment – indicates that music classification is a

problem, but we have few indications as to why. Thus, even over a century after the first (extant) scheme for classifying music was published, music classification is (still) clearly interesting, complex and mysterious. This thesis aims to analyse and explore music classification in a theoretical plane, illuminating its mechanisms and elucidating its mysteries.

2. The “music” in “music classification”

The first considerations concern the term “music” and what is meant by this term in the realm of this thesis. This is not a straightforward question. The answers embrace types of information, the medium through which that information is delivered, the theoretical concept of works and the categorization of music into types.

2.1. The various types of music information

An initial question concerns the type of information covered by the term “music” within the context of “music classification”, evoking questions about what exactly is meant by music *information*. On one hand, “music classification” is dealing with the communicative and aesthetic entities known as pieces of music or musical works and other such labels; on the other hand, the “music” in “music classification” is the product of the study of music in all its appearances, commonly called “music literature”. While the content of “music literature” is broadly anything *about* music, it can take many formats – for instance, books, encyclopaedias, journals, e-books, and so on. Moreover, as well as representing the products of music scholarship, the classification of “music literature” within a research environment also represents a classification of the scholarship itself.

However, this thesis is focused on one particular type of music information: the music itself. In particular, explorations of the classification of music literature are forgone, only referenced where crossing the direct path of classifying music itself. The primary reason for this is pragmatic: there is so much research to be done concerning classifying the actual music, there simply is not space to also talk about classifying music literature, which would be a separate study in its own right. So the “music” in “music classification” for this thesis is simply the “music itself”.

2.2. Music as sound and notation

Alas, defining “music itself” is far from straightforward. Nettl (2014), author of the entry on music in the seminal music encyclopaedia *Grove music online* (2016; abbreviated to “Grove” from this point onwards), notes that there are many variations in how musical dictionaries and encyclopaedias define music, while some avoid defining music at all. For example, *The Harvard Dictionary of Music* (Apel 1970b) gives a historical account of the term when defining “music”, considering how early theorists and philosophers have divided up and defined different types of music; yet he neglects to actually define music. The Grove entry for music (Nettl 2014) suggests that different cultures would define music in different ways: for Western cultures – different types of music are discussed in Section 2.4 – the common definitions say music has aesthetics and communications functions and is essentially about sounds (Nettl 2014). For instance, the *Penguin New Dictionary of Music* describes music as “The art or science of arranging sounds in notes and rhythms to give a desired pattern or effect” (Jacobs 1973). This emphasises the essentialism of music-as-sound.

However, does this mean music *only* exists as sound? This question is particularly pertinent for this thesis, as the object of classification is notated music. At this juncture, the meaning of the phrase “notated music” should be briefly explored. While the term “notated music” does not appear in sources such as Grove, the definition of “notation” in Grove is useful: “a visual analogue of musical sound, either as a record of sound heard or imagined, or a set of visual instructions for performers” (Bent et al. 2014). If notated music is defined as the version of music which is in notation (as opposed to sound), then utilizing Bent et al. (2014) positions “notated music” as the visual “version” of music, acting as the visualization of musical sound and/or the visual instructions needed to play or sing that music. The eminent music philosopher Dahlhaus seems to think that notation is an important element of what constitutes music: when talking about what makes up a “musical fact”, notation joins sound as being two parts of the “musical fact” with the third part described as intention (Dahlhaus 1982, p. 12). While Dahlhaus *doesn't* say that music can be expressed only as text, he thinks only counting the “audible” as music is problematic (Dahlhaus 1982, p. 13). Thus, Dahlhaus, as one example of a theorist discussing the ontological aspects of music, outlines the importance of the notated aspects of music.

The main reason that notated music is the focus of this thesis rather than, say, sound recordings, concerns the artefacts and types of knowledge which created the practical problems that germinated this thesis. The world which cannot find a suitable way to organize the music in its libraries, is largely discussing the physical organization of notated music (and when it is discussing music-as-sound, it is discussing physical objects containing sound, such as records and CDs). So, while this thesis discusses the classification of music in the abstract and concentrates on building a theoretical understanding of the issues at hand, the context of the conceptual probing is taken from a very real set of problems contained by time and place. This context – for instance, mid-20th century public libraries, early music libraries in university music departments in the 1920s, the first catalogue of printed music in the United Kingdom in the 1950s, and so on – is bathed in notated music, thus notated music is the most relevant “music” for this thesis. (Not choosing to extend the remit so as to also cover sound recordings or any type of music-as-sound is caused by the limitations of time imposed by a doctoral study.)

So, in this thesis, “music” is taken to be the music itself, and in its notated form. Where broader conceptions of music are needed for comparison, “music-as-text” (notated music) and “music-as-sound” will be used to distinguish the two (artificial) divisions of realisations of music. It must be made clear that while notated music is the base that is being discussed, notated music does not exist in a vacuum: being realised through notation does not strip the music of its potential for sound. As Dahlhaus puts this succinctly: “... with [texts of] music ... silent reading always represents an inner hearing, translating signs into sound” (Dahlhaus 1982, p. 12). Thus the “music” of this thesis may be textual and in notated form, and sounds themselves may not be the object of classification, but this (notated) music is not *silent*.

2.3. The musical work

Considering classifying the “music itself” in its notated form unearths key constructs in both the music and library and information science (LIS) domains. In musicology, part of the music domain, the idea of a musical work has received currency in musicological thought for a number of years. For example, Dahlhaus (1982, p. 10) suggests that since the early 19th century, there has been much discussion about the idea that music “is exemplified in works”. Goehr’s (1994) seminal monograph about musical works discusses the problematic nature of the musical work: the musical work does not exist in

a “concrete” way, and a musical work is not synonymous with a performance (Goehr 1994, pp. 2-3). Furthermore, a Beethoven symphony exists outside of all the scores that contain that symphony (Goehr 1994, pp. 2-3). While Goehr’s work is primarily interested in the musicological-sociological implications of the “work concept”, the results of her forays into the ontology of the musical work bear much similarity to discussions about “the work” in LIS discourse.

“The work” as a general construct has received attention in LIS discourse, by authors such as Yee (for example, Yee 1994a, 1994b, 1995a, 1995b, 2000) and Smiraglia (for example, Smiraglia 2001, 2007). Ultimately, general bibliographic discussion about “the work” is concerned with “the work” as a way of separating out the intellectual content from its physical manifestation. Smiraglia (2001, p. 121) summarises that at the most basic level, a “work” in the bibliographic sense is “the set of ideas created by an author or other artist, set into the document using text, with the intention of being communicated to the receiver (probably a reader or listener ...)”, and that one work can spawn multiple texts. Although receiving much interest in the last 20 or so years, the idea of “the work” in bibliographic circles is not new: for example, Lubetzky’s influential writings about works were first devised in the 1950s (Yee 1994a, pp. 13-14). The idea of a *musical work* receives specific attention in bibliographic literature. For instance, Vellucci’s (1997) monograph concerning bibliographic relationships for music expands knowledge and discussion about musical works; Pietras and Robinson (2012) explore the “musical work” from three standpoints, including bibliographic control, arguing that there is seemingly no singular concept of a “musical work” (Pietras, Robinson 2012, pp. 553-554).

The advent of the Functional Requirements for Bibliographic Records (FRBR) models in the 1990s, followed by the embodiment of these models into the cataloguing guidelines of RDA, has encouraged much discussion about FRBR models and music, and more generally about the nature of musical works within the bibliographic sphere (for example, Boeuf 2005, Vellucci 2007, Iseminger 2012b, Schmidt 2012, Holden 2013, Kishimoto, Snyder 2016).¹ FRBR appears to be well suited to music in that the otherwise somewhat problematic idea of “expressions” – an intermediary layer between works

¹ FRBR will be superseded by a new model which incorporates the original FRBR models and many of the models which evolved from FRBR. As this new model (FRBR-LRM) was only published in draft form in February 2016 (Riva, Boeuf & Žumer 2016) and is at the time of writing being revised and renamed (IFLA-LRM), it is not discussed in this thesis. Furthermore, consulting the draft of FRBR-LRM reveals that the relevant points concerning the treatment of music discussed in this introduction are unaltered.

and their manifestations – is already familiar to those cataloguing music (Vellucci 2007, p. 141). While in FRBR “works” are considered the artistic creation, “expressions” describe the channelling of that work via a particular mode of delivery or version. The expression layer in FRBR is used for different types of information about music itself, such as whether it is a score or recording, whether it is an arrangement or transcription, or delineating one particular performance from another (Holden 2013).² So, FRBR can help to unpick exactly what is being studied in this thesis, which is led by the idea of music as encapsulated in LIS classification schemes. Usually classification schemes are concerned with works rather than manifestations; for instance, Beethoven’s 5th Symphony is classified rather than a particular publication of that symphony by the publishers Breitkopf & Härtel in 1996. However, elements of expressions are also sometimes important to classification schemes; for example, classifying transcriptions and arrangements, to be discussed in detail in this thesis in Chapter 6, is part of the expression entity rather than the work entity, and similarly the format of the notated music is an expression rather than a manifestation according to FRBR.

Thus, using the ideas of general and musical works from the music and LIS domains and combining Lubetsky, Goehr, Smiraglia and others, this thesis could be described as classifying musical works, rather than their instantiation in any particular publication of that work. Furthermore, in FRBR terms, the music being classified in this thesis could be described as *works and expressions* (in contrast to FRBR’s entities of manifestations or items). However, this thesis will generally use the more popular term “musical works” to describe the unit of classification used in this thesis, instead of the arguably more precise “musical works and expressions”. The reasons for this are partly to avoid straying into a complex discussion about FRBR, and partly so as to have a suitable term which can be used – if sometimes incompletely – across the spheres of classification, the music domain and the bibliographic control of music.³

² However, Holden (2013, pp. 49-50), who discusses and categorizes expressions as part of his work on FRBR and music, argues that actually there is too much in the expression layer for music, saying that the FRBR model does not provide enough ways to distinguish all the types of expression which take place for music. In addition, FRBR applied to sound recordings has produced some discussion (see for example, Snyder, Kishimoto 2014, Schmidt 2012, Holden 2014) not least as FRBR’s composer-led idea of musical works rests uneasily with sound recordings of certain types of music. However, these are out of the scope of this thesis and will not be discussed further.

³ Another simplification adopted in this thesis relating to musical works is that collections of works are not explicitly discussed. Collections of works could include all the works of a specific composer (sometimes called “collected editions”) or groups of works sharing the same medium, form, time period (sometimes called “monuments” or “monumental editions”), and so on. While LIS classification schemes might separate out collections from single works, this division is not discussed

2.4. Types of music

There are many “musics”, and not every type of music is considered in this thesis. The decision to include only notated music in this thesis automatically includes and precludes certain types of music. First, some musical traditions are oral and some are written (Kartomi 1990), thus including notated music means that culturally, only those musical traditions which transmit their music in a written manner *could* be included. Second, notated music is intrinsically linked with some types of music within a culture, whereas sound-based conceptions of music are linked with others. For instance, a song by The Beatles will most likely be codified by the recording of that song, whereas a song by Shostakovich will be codified by the publication of the musical score. (Note that there are also temporal constraints: for instance, codification by sound was impossible in the 18th century). Thus, while the type of music is a different phenomenon from the medium in which music is presented (notated versus sound), they are dependent.

This thesis focuses on “Western art music”, so it is useful to unpick what this term means. “Art music” is not an ideal term; however, it is perhaps the best we have. “Art music” is often defined by what it is not: “popular music” or “folk music” – see for example, the definitions in *Oxford English Dictionary* (“Art, n. 1” 2008, III, C [compounds] 1, d. (b)) and *Webster Merriam Dictionary* (“Art music” 2016). In addition, this use of “art” as an adjective is defined as “designed primarily to produce an aesthetic or artistic effect” (“Art, n. 1” 2008, III, C [compounds] 1, d.); the *Webster Merriam Dictionary* definition for art music says that art music’s creator is a “trained musician” (“Art music” 2016). Thus, art music’s distinction from popular and folk music lies in its mode of production, its creators and its intention. Art music’s creators are not “the populace”, but instead a small, specifically skilled subset thereof.

In addition, art music is also known as “classical music” – not to be confused with the stylistic period of “Classical”, which ran through the second half the 18th century, or thereabouts – and sometimes even as “highbrow music”. For example, *The Harvard Dictionary of Music’s* (Apel 1970a) discussions on classicism outlines a duality between art music or highbrow music on one hand, and popular music or music for entertainment on the other hand. *The Harvard Dictionary of Music* definition (Apel 1970a) neatly encapsulates why “classical” is not an ideal term: its confusion with an

in this thesis. The reason for this is that the distinction between individual and collected works relates to work information and is associated with ideas from resource description, rather than being purely about music classification. Conversely, the classification of the *contents* or *subject* of that musical work or collection of works is of interest to this thesis.

aesthetical movement of classicism and its similarity to the stylistic period. “Highbrow music” is even more problematic: the term “highbrow” focuses the divisions of types of music entirely on to the audience, rather than the creators, making an already value-laden distinction more pronounced. Thus, the term “art music” is seen as the most appropriate and is used in this thesis.

“Western” is used to distinguish the geographic origins of this art music, for art music can be found in numerous cultures. The term “Western art music” in this thesis is taken to mean the art music of a traditional music history, thus focusing primarily on Europe, with the addition of North America from, say, the 1800s onwards and including other countries where the music fits into this Europe-centric tradition. “Western” is used to denote a particular tradition, rather than conforming entirely to a geographic area. While the term “Western art music” is not explicitly defined by Nettl (2014) in his definition of music in Grove, he used the expression “Western art music”, helping legitimise its use in this thesis.

So, “Western art music” is used to mean a particular tradition of music, where the music’s creation and intention in some way fulfils an artistic or expert creation process. It is worth briefly addressing why this particular choice of music is used in this thesis. First, as mentioned above, the choice of notated music automatically limited the choice of music. Second, like the choice of notated music, the decision was centred on the types of material that original classifications were designed to classify. Rightly or wrongly, many of the classification schemes discussed in this thesis were at least originally designed to be used for a collection which consisted primarily of Western art music. However, there are schemes discussed in this thesis which include extensive coverage of folk music; for example, the *Flexible Classification* (Pethes 1967) has extensive coverage of ideas relevant to Hungarian folk music. In these rare cases the extensive and almost equal treatment to the classification of Western art music sours the argument that the coverage of LIS classification schemes is the guiding hand to coverage of “music” in this thesis. (However, there is also reason two-and-a-half: not everything could be covered in a doctoral-length project, so the priority was given to musics covered in the majority of schemes.)

Third, commentators on music classification note the poor coverage of non-art music and non-Western music in classification schemes; for example, Nero (2006) discusses the problems in classifying recordings of Trinidad and Tobago popular music using the

European, art-music centric DDC. Indeed, poor treatment of so-called “other” musics – where “other” is anything which is not Western art music – is one of the main themes of the LIS classification literature, and is discussed in the Literature Review chapter. LIS theorists such as Abrahamsen (2003) and Weissenberger (2015) point out how their particular non-art “other” musics – popular music and folk music, respectively – require special attention or have been neglected in the past, and rightly so, but it can be asserted that within this narrative of all-music-classification-focusing-on-Western-art-music, the “Western art music” has actually been passed over in terms of critical attention and theoretical analysis. Ergo, there is a distinct lack of understanding concerning the classification of the “non-other” music: Western art music. Therefore, the third reason that this thesis is concerned with the classification of notated Western art music, is that despite its position as the “established” type of music, Western art music has hitherto received very little attention on a conceptual level within LIS classification discourse, thus a thesis concerning the classification of Western art music will make an important contribution to LIS.

3. The “classification” in “music classification”

The second consideration is concerned with the term “classification”. As well as disambiguating the term from “knowledge organization”, it is also important to consider the type and products of classification at play in this thesis.

3.1. Classification and knowledge organization

“Classification” at its most basic level involves organizing *something*. The essence of that *something* is usually considered to be knowledge or information; for example, Tennis differentiates knowledge organization as “the process of ordering and representing documents” (Tennis 2008, p. 102) whereas organizing information involves documents but also other types of information (Tennis 2008, p. 102). As this thesis is centred on notated music, which could be considered a document, classification could be considered to be the process and theory of organization knowledge. The boundaries of the activities covered by classification must also be explored. In this thesis, subject indexing is not covered. So, activities such as tagging and subject indexing – whether using “professional” tools such as thesauri or taxonomies, or user-generated structures such as folksonomies – will not be discussed. The organization of individual works/expression is the focus of this thesis, and for the purposes of this thesis, this will

be called “classification”. So, classification is taken to be a subset of knowledge organization, where knowledge organization is Tennis’ (Tennis 2008, p. 102) “ordering and representing documents”.

“Knowledge organization” is also the name of the sub-discipline of LIS. (In this thesis no distinction is made in nomenclature between the process of knowledge organization and the sub-discipline of LIS known as knowledge organization; so, after first usage in each chapter and for the rest of this chapter, the initialism “KO” will be used to indicate either the process, sub-discipline or both.) It is useful to consider where this thesis is positioned within the sub-discipline of KO. KO discourse includes attempts at delineating the different strands and activities of KO, which are useful for understanding how this thesis fits within KO. For example, Hjørland (2008c) suggests there are six groups of approaches used within the discipline of KO, which include what he terms traditional approaches, facets, information retrieval and domain analysis. This thesis does not fit easily into any one of Hjørland’s (2008c) categories as arguably it utilizes the products of traditional approaches (in particular in the form of general classification schemes such as DDC), focuses on facets in relation to music (discussed in detail below) and takes parts of the ideas of domain theories. Hjørland’s (2008c) categorization is also useful to show what this thesis is definitely not covering, such as information retrieval. So, while classification is taken to be primarily (but not exclusively) as having retrieval at its goal, it is important to note that this thesis is not directly concerned with retrieval, only the classification itself.

Tennis (2008) attempts to make a framework of the sub-discipline of KO. Again, this thesis does not fall easily into one category or another, but the framework is still very useful for articulating the approach taken. Out of six main facets, Tennis’ (2008) system has three directly related to what he calls information organization frameworks, which could be crudely said to include classification schemes. The three categories relating to information organization frameworks are “design”, “analyse” and “critique” (Tennis 2008). This thesis is very much concerned with analysing the existing frameworks and in some cases providing critique. (However, from Tennis’ (2008) description, it is not easy to unpick the exact boundary between analysis and critique, so it is assumed that there are places where this thesis does both.) Again, Tennis’ model is useful to determine what this thesis is *not* going to do: design a classification scheme. The models produced at the end of the thesis show the existing frameworks and propose new theoretical

structures to understand music classification, but crucially, do not suggest new ways to classify music. So, Tennis' framework helps to understand where this thesis fits within a map of KO as a sub-discipline – about analysis and possibly critique of schemes – and more crucially, what it is not.

3.2. Taking a theoretical approach

This thesis takes a theoretical and conceptual approach to music classification. Using Hjørland (2008c) and Tennis' (2008) appellations, it is neither about "information retrieval" in that it does not discuss the retrieval of music information (Hjørland 2008c) nor is it about "design" as it does not produce a practical solution in the shape of a new classification system. This is not an apology or a failing of the thesis; instead, it can be argued that the theoretical and conceptual approach is part of the originality of the thesis. For example, Hjørland (2008c, p. 87) discussing Miksa's seminal text from 1998 about DDC and universal classification, says that in the past KO has been primarily concerned with making practical solutions; this will be confirmed in the literature review (Chapter 2) which shows how few writings in music classification are concerned with generalisations or theory, and are more likely to discuss practices and particular issues.⁴ So the objective of this thesis is to *understand* what is happening inside music classification and to model it, and this breaks away from the traditional route of taking a practical and solutions-orientated approach to classification.

3.3. The importance of facets

One of the most important ideas which permeates KO literature concerns facets and faceting. For example, Hjørland (2008c) lists faceting as one his six theoretical frameworks, and details the development of faceting and analytical-synthetic techniques. From the proto-faceted conceptual developments by Otlet (see for example the early editions of UDC) and Kaiser (Dousa 2010, pp. 19-20, Dousa 2013, p. 403), Ranganathan's systematic development of a faceted classification scheme (Ranganathan 1933) and theory (Ranganathan 1937), the work of the Classification Research Group and Bliss (1953) through to the evolving developments and interest in faceting classification found in current KO research (see for example, the programme and papers from the 2014 International ISKO conference (Babik 2014)), faceting is clearly a linchpin

⁴ It is assumed that Hjørland's (2008c) "past" does not include the last 15-20 years or so. For example, a quick glance through ISKO's journal, *Knowledge Organization*, and the past international conferences, show much research concerning abstractions and conceptual approaches rather than providing practical solutions.

of KO discourse. Coupled with this, there is also a visible link between music classification and faceting. This can be seen, for instance, in the presence of significant facet milestones which happen to involve music, such as the first British fully faceted scheme using music as its subject or one of the first fully faceted sections of DDC being devoted to music. Thus, to discuss the classification of music in this thesis, it is vital to embrace faceting.

3.4. Introducing classification schemes

Discussing the classification of a subject such as notated Western art music may involve considering classification in the abstract, but is likely to also rely upon pre-written systems of classification, collectively called knowledge organization systems (KOSs). A KOS is at essence a list of subjects, which has a structured and systematic organization; for example, the *Art and Architecture Thesaurus* (AAT) is a vocabulary containing subjects relating to art and architecture, which is organized to show the relationships between those subjects, such as broader or narrower subjects. For some types of KOS, the KOS is also a set of instructions as to how to use the system and even how to classify the document/item at hand. For example, the DDC includes rules as to how to add geographic place to subjects, or rules about what to do when there are two or more subjects.

There are many types of KOSs, and the boundaries between them are not always clear. For example, Pieterse and Kourie (2014) attempt to categorize and disambiguate various types of KOS, including taxonomies, lattices and ontologies. In this thesis, a particular type of KOS will be used: the classification scheme.⁵ For the purposes of this thesis, classification schemes are taken as to be a structured list of subjects, which are organized by grouping together like subjects, usually hierarchically. The classification scheme is taken to be a system of organizing documents (where the subset of documents being considered in this case is notated music) and it is distinguished from most other KOSs by having the ultimate aim of placing the documents in a single physical or conceptual position.

The literature review (Chapter 2) demonstrates how general and conceptual discussions of notated Western art music are rare; thus, eliciting LIS ideas about the classification of music will come from dissecting ideas of classification represented by music

⁵ Note that classification schemes are not included in Pieterse and Kourie's (2014) disambiguation of types of KOS.

classification schemes. So, much classification scheme analysis will be involved. (Note how in Tennis' (2008) categorization of KO, this translates to "analysis" and some "critique".) However, accounts of *how* to analyse a classification scheme are sporadic. While critiquing the notation of a classification scheme has various labels and metrics, such as "expressive" and "hospitality" – see for example, a clear account in Batley (2005) – and levels of faceted-ness in schemes is a matter discussed by classification theorists such as Ranganathan (La Barre 2010, p. 248) there are large gaps in our understanding about how to analysis and critique classification schemes. This thesis, as well as advancing our knowledge of the classification of the specific subject of music, also tackles the issue of analysing classification schemes. First, it provides a deep analysis of particular parts of classification schemes, which is an uncommon approach in KO discourse. Second, it creates novel and original ways of analysing and thinking about classification schemes, including "stress-testing", "reception-infused analysis", "Wirkung" (in other words, studying the effect of one classification scheme on another) and "multiplane approach" analysis. So, the contribution of this thesis resonates within KO as a whole, and is not limited to the classification of music.

3.5. Focus on music information as part of music classification

As an aside, note that music-as-information is used as a conduit for other types of scholarship outside of music classification: music information behaviour and music information seeking. For example, Lam (2011) develops an organizational system for musicianship, in order to understand the information practices associated with music instructional videos (Lam 2011). Furthermore, music-as-information is also considered as part of work concerning music information seeking. For instance, Lavranos et al. (2015) combine general models of information seeking with models of musical creativity, part of a general consideration of music-as-information. However, there are two main reasons these types of studies are out of the scope of this thesis. First, although retrieval and classification share close bonds (see Section 3.1), this thesis is primarily concerned with the classification of music rather than how it is sought and retrieved. Second, Lam's (2011) model and discourse is concerned with music as an *act* – in whatever form this act takes, be it listening or performing – whereas this thesis is concerned with music as a *document*. Therefore, music information seeking and music information behaviour, including the aforementioned papers and others of their ilk, are outside the scope of this thesis and these non-classification-focused models of music information will not be considered further.

4. Non-LIS classification

So far the discussion of classification and classification schemes has been limited to one perspective only, classification as it is perceived within LIS. Yet, considering the classifications inherent within domains themselves is seen as significant within LIS discourse. For instance, despite strong differences between Beghtol and Hjørland/Nicolaisen (Beghtol 2003, Hjørland, Nicolaisen 2004, Beghtol 2004, Nicolaisen, Hjørland 2004) about the nature of and terminology of non-LIS classification systems – discussed in more detail below – the *need* to study non-LIS classifications is keenly stated by all these authors. Furthermore, the desire to study and utilize non-LIS classifications was discussed in the early parts of the 1900s (Hjørland 2008c, p. 97); for example, Bliss (1933) writes about what he calls “library classification” and how it interacts with organizing knowledge itself, imploring readers to make library classification “conform to the scientific and educational organization of knowledge” (Bliss 1933, p. 36). Even before Bliss’ seminal work on classification, authors such as Cushing Richardson (1901, pp. 67-69) were comparing what he termed “theoretical” and “book” classifications. Bliss’ (1933) rallying cry about book classification following knowledge classification in the 1930s is transfigured in the intervening years into studies of domain-based classifications.

4.1. Terminological issues

To consider the idea of non-LIS classifications, it is necessary to unpick the terminological entanglements involved with the concepts. Beghtol (2003) articulates two types of classification, using the terms “naïve” and “professional” to differentiate the classifications produced by those working in the domain itself (“naïve”) and within LIS practice or theory (“professional”). The term “naïve” attracted particular dissent from Hjørland and Nicolaisen (Hjørland, Nicolaisen 2004, Nicolaisen, Hjørland 2004), as they perceived it as attaching a lesser value to those classifications produced within the domain.⁶ These are not the only terms which are proposed: for example, both Hjørland (2008a) and Mai (2004) use the terms “scientific” and “bibliographic”. However, to complicate matters, there are multiple types of “non-LIS” classifications, of which “scientific” is only one. For example, Mai (2004) distinguishes between scientific and philosophical classifications, both of which refer to a wider brief than LIS; in addition,

⁶ Beghtol (2004) makes it clear in her reply to Hjørland and Nicolaisen that she is referring to “naïve indexing”, in other words, the indexing performed by those whose background is not in the theory of indexing.

Hull (1998) suggests that there are “structural” and “historical” classifications, when discussing classification as a philosophical concept. So, to avoid the negativity of Beghtol’s “naïve” in the naïve/professional duality, and to avoid the duplicitous meaning of “scientific” as an alternative, two other terms have been selected for this thesis. “LIS classification” will be used to discuss the classifications imposed by those working theoretically or practically within LIS, so including schemes such as DDC and *Library of Congress Classification* (LCC). The term “domain classification” will be used to describe a scheme created within a domain, usually by a domain-based researcher using classification to organize and advance knowledge.

4.2. Comparing LIS and non-LIS classifications

As well as looking at the domain classifications themselves, there is also interest within KO discourse in considering the comparison of LIS and domain classifications. This effects questions about the *type* of relationship which exists between LIS and domain classifications, and this is not always codified or agreed upon within KO literature. For example, Hjørland and Nicolaisen (2004, p. 59) imply that LIS classification should always be based on domain classification, and later Hjørland (2011) describes how ideas of classification start within a domain before spreading to other types of classification. However, this is not the only view about the relationship between classifications. For instance, Mai (2011, pp. 714-715) describes an example of a “cyclical relationship” (Mai 2011, p. 714) between an LIS classification (in this case DDC) and domain classifications (within anthropology and sociological scholarship, amongst others) of race. In Mai’s example the relationship was one of LIS classification reflecting on changes in the scholarly world, and DDC ends up making a “social and political” statement (Mai 2011, p. 714). In the process, Mai illuminates how the relationship between LIS and domain classifications might be more nuanced and complex than just a direct, one-way influence. Despite the interest in domain classifications from KO discourse, detailed attempts at unpicking the *types* of relationships between LIS and domain classification are not forthcoming. So, this thesis, in the course of exploring the specific connections between the LIS and music domains’ classifications of notated Western art music, will also attempt to ascertain the types of relationship between classifications in both domains.

Existing discourse about domain classifications usually falls into three categories: directly concerned with a particular domain classification scheme (for example, Hjørland

(2008b, 2011) and Scerri (2011) on the *Periodic Table* as a classification system, and Hjørland (2008a) on the *Diagnostic and Statistical Manual for Mental Disorders*), directly concerned with classification within a particular domain (for instance, Ørom (2003) writing about the art domain, and Blake (2011) writing about biology) or concerned with the theory of domain classification, usually also including examples drawn from specific domains (for instance, Beghtol 2003, Hjørland, Nicolaisen 2004, Beghtol 2004, Nicolaisen, Hjørland 2004, Jacob 2010, Mai 2004, Mai 2011). This thesis will generally both utilize and add to discourse in the second of these categories of domain classification discourse, as discussion about classification within the music domain is at the heart of the thesis. However, there will also be some discussion of specific domain-based classifications, in particular the *Hornbostel and Sachs Classification* of musical instruments which will be compared with the classification of instruments in the LIS classification schemes. The models and conclusions of this thesis show that while discussing the theory of domain classification may not be within the subject area of the thesis, the discussions about music classification which take place also add to our knowledge about this third type of discourse.

4.3. Domain classifications for music

Finally, it is useful to consider the state of existing (LIS) research which considers domain classifications related to Western art music. While scholars such as Hjørland, Nicolaisen, Beghtol and Mai (Beghtol 2003, Hjørland, Nicolaisen 2004, Mai 2004) all advocate the consideration of domain classification, this has not manifested itself in many exemplars for music. Gnoli comes the closest in his consideration of the *Hornbostel and Sachs Classification* of musical instruments – to be discussed in detail in Chapter 7 – as a domain classification, both when specifically addressing musical instrument classification (Ghirardini, Gnoli 2005) and as one example in his work on phylogenetic classification (Gnoli 2006). Thus, Gnoli's works are built upon in this thesis when considering musical instrument classification. (In addition, Beghtol (2003, p. 68) uses instruments as one example in her initial article about professional/naïve classifications, and while not useful for this thesis, it perhaps shows how out of all music, it is instruments which are considered most suitable for this domain-based approach.) Abrahamsen (2003) presents a domain analysis approach to music classification which includes some analysis of music-domain classifications. (Note this article is discussed in more detail in the Literature Review, Chapter 2.) However, as Abrahamsen's (2003) article is primarily focused on both popular music and on the classification of the study

of music rather than music itself, it does not help address the central topic of this thesis. So, academic researchers have argued that studying the classification of a domain is central to understanding LIS classification; yet, so far, Western art music has not received a detailed and expansive analysis of classifications present within the music domain – leaving aside the isolated examples of important work considering musical instrument classification systems from an LIS perspective. Thus, this thesis contributes a vital service in understanding music classification, and in KO discourse more generally, by positioning the understanding of music classification within the domain of music as a central tenet of this thesis.

5. Research questions

So, the objective of this thesis is to explore and model the classification of notated, Western art music. In order to achieve this, the following five research questions are posed:

1. How is notated Western art music organized in LIS?
2. How can knowledge organization theories from LIS, such as faceted classification, be used to understand the knowledge organization of notated Western art music?
3. How does the classification of notated Western art music interact with and enhance our understanding of general classification?
4. What classification structures are inherent in the music domain's classification of Western art music?
5. What are the accords and discords between the classification of notated Western art music in the LIS and music domains, and how does its classification in the music domain influence the classification of notated Western art music in the LIS domain?

A number of important points need to be noted from these questions. The type of music is specified in all the research questions: notated Western art music. The meaning of this term and the reasons for the selection of this type of music were discussed in Section 2. The inclusion of “faceted” as a likely line of enquiry reflects both the importance of faceting within KO and the particular interest paid to faceting within music – as discussed in Section 3.3. Furthermore, the presence of such significant general faceted classification milestones within the development of music classification,

coupled with the need to create novel methods to analyse classification schemes which have value even outside of music classification, suggest that the thesis should consider the general classification/music classification transversal in *both* directions; this explains the need for research question 3. Another important point concerns the term “classification structures” in research question 4. This is an inclusive term used to make sure all relevant types of classification within the music domain are captured, not just those which fulfil the criteria laid down within LIS to be considered classification schemes.

The research questions are in some respects a tale of two halves. The first three questions are concerned with classification within the LIS domain only, while the last two also consider music classification as a domain classification – this reflects the importance of considering domain classifications, as discussed in Section 4. In relation to the domain classification, note how research question 5 encompasses more than just direct, one-directional influence between classification found in the music domain and the classification of music within the LIS domain. (Note that in the rest of the thesis, the research questions will be abbreviated to RQ1, RQ2, and so on.)

6. Outline of the thesis

The thesis starts with a review of the existing literature (Chapter 2), exploring how music classification has been discussed within KO and beyond. The literature review demonstrates that despite receiving much attention, there are few theoretical discussions of music classification, especially those that involve notated Western art music. Therefore, this thesis and its concentration on theoretical and conceptual understanding of music classification will fill a significant gap within LIS discourse. Music classification literature within the music domain is also discussed, and the review shows how the different availability and approaches to music classification within the music domain necessitate a different approach to eliciting information from that used within LIS.

Four main methodologies are explored in this thesis (Chapter 3): literature and conceptual analysis within LIS, classification scheme analysis, analysis of music classification within the music domain and synthesis of all the analytical approaches. Each methodology is described alongside discussions as to how it has been appropriated for this particular study. Another important discussion in the methodology involves the

selection of example classification schemes and classification samples from the music domain, and the sampling is discussed in detail in this chapter.

Six research chapters follow. After an initial chapter which introduces the ideas of faceting for music classification, the remaining five chapters dissect the classification of a different aspect of a musical work. Each chapter discusses both the LIS and music domains' classification of the phenomenon under review, showing how in each case the issues affecting KO contemplations of classification relate to those seen in the music domain.

The first research chapter (Chapter 4) explores how the idea of facets interacts with the classification of notated Western art music. The core of this chapter lies in analysis and discussion about what facets mean in the context of notated Western art music, ascertaining the most important facets for music using a range of LIS literature and classification schemes. This is coupled with an exploration of the essential constituent parts of Western art music viewed from the perspective of the music domain. The results of these discussions drive the rest of the thesis: the most significant facets are identified as medium, form/genre and a nebulous facet associated with function, purpose and character. The chapter concludes by considering how faceting manifests itself in two example music classification schemes; in addition to new knowledge about music classification, this exploration contributes a specially devised and novel analysis technique called the multiplane technique, as well as offering some ideas about music's importance to the general development of faceting.

The next three chapters explore one of the most critical facets in classifying notated Western art music: musical medium. Chapter 5 considers the fundamental division between instrumental and vocal music, exploring this basic categorization in both LIS and music's conceptions of music classification. A detailed example of the complications and consequences of this categorization is offered in an investigation of choral symphonies, which teases out one of the major issues uncovered in this thesis: dependence between supposedly independent facets. Chapter 6 explores other aspects of the medium facet: the notoriously problematic issue of multiple instruments and/or voices, issues concerning classifying arrangements and the classificatory meaning of "accompaniment". A novel classification analysis technique is introduced, stress-testing, which uses examples of musical works for extremely large numbers of players and singers in order to deliberately "break" classification schemes and to see how the

classification of medium really works. Chapter 7 explores the classification of musical instruments as part of notated Western art music, both within LIS and organology (the area of music devoted to the study of musical instruments). The chapter includes explorations of the broad categorization of instruments within LIS classification schemes and the categorization of instruments within organological schemes such as *Hornbostel and Sachs*, positing a bifurcation between the organological and LIS conceptions of the basic categories of instruments. There is also discussion about classifying specific instruments, such as the saxophone and whistling, which illuminate various trends within instrument classification. Through the discussions about particularly important organological schemes to arrange instruments, this chapter introduces and utilizes original methods of understanding classification schemes: reception-infused analysis and plotting the relationships between classification schemes (“Wirkungs”).

Form, genre and function are the topics of chapters 8 and 9. Chapter 8 considers form/genre as a classificatory device, including outlining how a facet of musical form/genre would behave. Specific examples of opera, string quartets and symphonies are used to explore issues relating to classifying form/genre. The chapter is brought to a close by drawing together various threads relating to form/genre into a discussion about dependency of the form/genre facet on other facets, exploring the lack of orthogonality of music’s facets. Chapter 9 explores the nebulous concept of function, purpose and character, considering how the idea of function and its various acolytes works as a classificatory principle. Various matrices are considered, such as dramatic/non-dramatic, secular/sacred, which add to the complexities, and help to paint a more detailed view of the interaction between the “quasi-facet” of function and the form/genre and medium facets.

The thesis culminates in five models of music classification (Chapter 10). Model 1 illustrates the classification of musical medium showing how the different aspects of musical medium fit together and how musical medium works as information and as classification. Model 2 is an extension of Model 1, proposing an extra category associated with vocal/instrumental categorization. Model 3 posits musical classification as a model of dependency between facets, both visualizing and exploring the culmination of these dependencies. Model 4 proposes a new way of understanding music classification, as a simultaneously faceted and genre-based system. Model 5 directly considers the relationship between the classification of Western art music in the

LIS and music domains, categorizing the types of relationships between the classifications.

There are many possible beneficiaries of this research project. First, the results of this research will help those who organize music materials as part of their work, such as music librarians and librarians working with music materials. They might benefit from directly engaging with the research and the opportunity to more fully understand how Western art music behaves when being classified, or from subsequent developments in tools and classification schemes resulting from this doctoral research. Second, anyone developing a classification system for notated music could also benefit from this research, by using the results of the analysis and the models as the broad structure for creating a classification scheme. The benefits are not just limited to those working with printed music: the structures and ideas explored in this thesis would also be very useful to those designing systems to organize digital libraries of notated music. Third, those researching or designing systems to organize and retrieve music-as-sound, such as those within the computer science sub-discipline of music information retrieval, could employ ideas from this thesis, especially when working with Western art music. Fourth, those in the research area of knowledge organization within library and information science will benefit from this research in a number of ways: through gaining new insights into a specific area of knowledge organization (the classification of music), through procuring new methodologies to analyse classification schemes, and from the resulting new concepts and ideas in the realm of faceted classification.

Through the course of discussion and the proposed models, this thesis demonstrates the full extent of complexities underpinning the classification of notated Western art music. However, this thesis' contribution is not just in showing that music classification is complicated, it also shows *why* music is so complex to classify and *how* these complexities are manifested. The longstanding literature about music classification and numerous specially written schemes written over the 20th (and 21st) centuries, as well as music's selection for various general classification milestones involving faceting, are all signs that music is interesting to classify. This thesis' (main) contribution to LIS is that for the first time, the nature of why music is interesting to classify can be fully understood: through deep theoretical and conceptual analysis culminating in the models posited at the end of this thesis, notated Western art music finally yields its classification secrets.

Chapter 2: Literature review

1. Introduction to Chapter 2

This literature review describes and analyses the literature on the knowledge organization (KO) of notated Western art music, relating to the research questions identified in Chapter 1. The review is centred upon the two main themes of the research questions: library and information science (LIS) LIS conceptions of music classification and music domain ideas about music classification – although the review will show that deciding the domain-perspective is not always straightforward. For a number of reasons which will be described more fully within the review, this literature review will devote significantly more space to an analysis of the first of these areas rather than the second, due to the respective quantities of literature and the position of this research as a doctoral study within the domain of LIS rather than music. As one of the main methods utilized in the research study is literature and conceptual analysis – see Methodology, Chapter 3 – much of the analysis of literature will take place within the body of the thesis (Chapters 4-9). Hence, this literature review will focus on identification and trawl of the literature, and reviewing the broad discourse about music KO.

It is important to define the boundaries of music classification for the purposes of this review. Generally, “music classification” is taken to cover the same core focus as the thesis as a whole, but there are ways that the literature review takes a wider approach. The “music” of this review is music-as-text rather than music-as-sound. This means that literature from the sub-discipline of music information retrieval will generally not be discussed. An exception is made for music-as-sound as found as physical sound recordings in libraries, which is briefly overviewed in Section 2.5.1. The reason for this is that some of the ideas being discussed about sound recordings also pertain to notated music. Similarly, this literature review is focused on classifying music itself rather than music literature, but where discussions take place concerning music generally, these will be mentioned. The notated music being discussed in the review is primarily Western art music; yet, the dominance of this type of music is one of the themes of music classification discourse, so the classification of “other” musics is discussed in Section 2.3. Another clarification is needed as to what sort of KO is discussed. While the thesis generally covers classification, this is reflected in the literature review. However, there

is a small overview of key developments and literature in subject indexing and subject headings (Section 2.5.2), to provide context to the discussions on music classification.

There are a variety of different literature review methodologies; this review is centred on providing a descriptive summary of a selection of sources which have not been chosen in a “systematic” fashion in the manner of methodologies such as the “systematic qualitative review” (Bawden 2012, p. 152). Instead, the review focuses on a small proportion of the available sources, and uses those deemed to be most important in providing an overview of the state of literature in the areas covered. (Please note that an earlier version of part of this review was given as a conference paper at ISKO UK in 2011, and was later published in the proceedings – see Lee (2012), reproduced in Appendix B1.) So, the review starts by considering music classification literature in the LIS domain, including its quantity and history, identifying key methodological approaches, major themes, and finishing with two areas outside of the strict confines of “classification” and “music-as-text”. This is followed by a consideration of music classification in the music domain. The final section considers the literature which is concerned with comparing classification in the two domains, as well as literature which discusses LIS classification of music but either uses non-strictly-LIS documents or is interested in modelling music as information or musical knowledge rather than classifying musical works.⁷

2. Music classification literature: LIS domain

Historically, music classification has received much attention by those writing about KO; therefore, this literature review seeks to outline the history of this discourse, discuss in more detail the key players within this discourse, produce a typology of methodologies used in the literature and identify main themes or trends. As well as providing background and context for the thesis, the review will also demonstrate that though there is much written about music classification from the LIS perspective, this thesis also fills a sizeable and significant gap in the discourse.

2.1. History and quantity of literature

The organization of music in libraries is not a recent phenomenon; Smiraglia claims that “... systematic efforts to develop and organize music collections in libraries are known to

⁷ The difference between the two conceptual constructs of music-as-information and musical works is outside the scope of this thesis.

have been made for nearly 600 years” (Smiraglia, Young 2006, p. 1).⁸ However, most of the documentation of these intellectual efforts has not survived (Smiraglia, Young 2006, p. 1). Duff Brown produced one of the first significant and extant documents on music classification in the form of a letter to *The Library* in 1897 (Brown 1897).⁹ This letter discusses the subject arrangement of music in the context of a classified catalogue, including a scheme for the arrangement of musical works in the subject catalogue (Brown 1897). Smiraglia claims that this letter “... illustrated the beginning of the professionalization of the bibliographic control of music materials in libraries” (Smiraglia, Young 2006, p. 6) and uses the letter as the temporal starting point – 1897 – for his monumental bibliography on the bibliographic organization of music (Smiraglia, Young 2006).¹⁰ McKnight (2002, p. 5) conjectures why the late 19th century witnessed the birth of literature about music classification: this epoch’s genesis of music librarianship more generally. The existence of music libraries and music librarianship generate a need to organize those libraries. McKnight (2002, p. 5) then identifies two main drivers for the establishment of music libraries in the United States during this time; as public libraries in the United States became more established they started to contain lending music collections and music also became accepted as a university subject during this period.¹¹ Therefore, the topic of music classification is a historic one, and this has a bearing on the age – and as a possible corollary, perhaps even the formats – of the literature that will be consulted throughout this thesis.

The next question to consider is which issues drove the music classification discourse. Smiraglia (2006) gives a detailed account of the major issues in the bibliographic organization of music, and how their fortunes fared over the 20th century. While it is not useful to repeat Smiraglia’s work here, it is useful to highlight the issues which are directly relevant and interesting to music classification. For example, Smiraglia (2006, p. 8) suggests that the mid-20th century saw a rapid increase in literature which he terms “institution-based professional practice” documents, which sees librarians describe their

⁸ Note that although both Smiraglia and Young are listed as authors of this work, Young has a secondary role as evidenced by their “with” status and lack of name on the Preface. Therefore, in the text, the author will be referred to as Smiraglia only, but the reference refers to both authors.

⁹ To confuse matters, this letter has two names in the literature, “Cataloguing of music” and “Classification scheme for music libraries” (Bradley 1973, p. 143).

¹⁰ It is interesting to note that Smiraglia (2006, p. 15) considers this letter to be about cataloguing; this is inferred from his statement that “descriptive cataloguing” first appeared in 1897 (i.e. the Cutter 1897 source) while classification was not written about until five years later.

¹¹ This is closely related to the “birth” of the discipline of musicology. However, the structure and history of the music domain is outside of the scope of this thesis.

experiences and solutions to music-arranging problems. The 1950s and 1960s marked a significant point in the history of music classification literature, as manuals started to be published about general music librarianship and the bibliographic control of music more specifically (Smiraglia, Young 2006, p. 10); Smiraglia (2006, p. 10) highlights Redfern's tomes on organizing music in libraries, with one volume specifically about music classification, which was first published in 1966. Reading the music classification literature confirms Smiraglia's comment about the wide use and importance of Redfern's tome, so it will be discussed in more detail in Section 2.4. From 1970, Smiraglia (2006, p. 11) suggests that the topics covered in the bibliographic organization of music significantly expanded; of interest to this study is Smiraglia's inclusion of non-Western musics and the proposed revision of the *Dewey Decimal Classification* (DDC), which are both discussed in later sections of this literature review. He (Smiraglia, Young 2006, p. 12) concludes that the last two decades of the 20th century did not see such an increase in topics, but instead witnessed an increasing maturity in the discussions as well as a change in format from technical reports to journal articles. These highlights from Smiraglia's (2006) account suggest that the literature review and literature analysis throughout the thesis will need at least some reference to resources from the early and mid-20th century, in addition to any relevant later resources.

The quantity of literature about music classification can be seen through various bibliographies. Smiraglia's book (2006) is itself a bibliography – albeit one which includes all forms of information organization for music, not just music classification – which provides some evidence of the quantity of published literature on this topic. Furthermore, an annotated bibliography produced as a master's thesis by Elmer in 1946 (Smiraglia, Young 2006, p. 9) is noted as being evidence of how much literature was produced about music classification even by the 1940s. There are also other examples of substantial bibliographies about music classification, such as Nettl (1960) and a specific chapter in Bradley's bibliography of music librarianship (2005). The bibliographies are clearly a reflection of the popularity of the topic of music classification, which asks important questions about this thesis: does the presence of so much existing literature mean that there are readymade answers to the research questions laid out in the introduction, and what meaning can be ascribed to the quantity of literature about music classification? In order to answer these questions, the LIS music literature now needs to be unpicked.

2.2. Specific types of approaches to LIS music classification discourse

Reading LIS music classification discourse identifies a number of distinct approaches and methodologies. The key topics discussed will be presented in later sections; instead, these approaches identify *how* knowledge about music classification is elicited. The four approaches could be seen as having an order: while the first two are based entirely within LIS, the third utilizes resources from the music domain to discuss LIS music classification, while the fourth uses an analysis technique from the music domain and applies it to LIS music classification.

2.2.1. Classification scheme approach

The “classification scheme approach” is a discussion where music classification is discussed primarily through the prism of one or more exemplified scheme. Sometimes they are in tripartite form: highlights of the history of the scheme, description of the scheme, then a discussion about issues with the scheme which may be accompanied by suggested improvements – see for instance, Bradley (1972) discussing *Dickinson Classification*, and Philp (1982) discussing the proposed revisions to DDC. Often, the tripartite approach is taken repeatedly: a chapter or article consists of multiple miniature tripartite forms, each discussing a different scheme (for example, Bryant, Marco 1985, Redfern 1978). These are particularly interesting as they show how discussions about music classification *are* the discussions of music classification schemes. At other times discussions about music classification include a proposal for a new music classification scheme – see for example, Olding (1954) and Ott (1961), proposing schemes within journal articles. (The popularity of constructing new classification schemes for music will be discussed further in Section 2.4.) So, music classification discourse is frequently mediated through music classification schemes.

2.2.2. Project approach

The “project approach” focuses on classification practices in a specific library, and frequently takes a narrative approach: examination of the problem, discussion about why existing schemes/practices are not suitable, description of the process of finding a solution, implementation and then a reflective evaluation. Marsh (2002) describes the adaptation of the *Alpha-Numeric System for Classification of Recordings* (ANSCR) at the Leeds College of Music, showing a project which adapts an existing scheme; Krohn (1970) describes a project to classify sheet music at the library of Washington University

in St. Louis, where the author develops their own system of classification. In both examples, the issue of classification is discussed through the lens of a practical problem, which involves the arrangement of real-life items. The “classification scheme approach” (discussed in Section 2.2.1) and “project approach” both involve real-life schemes and/or real-life libraries. This demonstrates that music classification is a live and practical issue, even though this thesis is going to take a more theoretical approach.

2.2.3. Music domain approach

The other two methodologies are conceptual and used less frequently. Some LIS classification literature uses resources from the music domain to discuss music classification from an LIS perspective. A number of authors use a “book-based classification” methodology as the basis of their discussion of music classification. Sources used by authors include the structure of bibliographies (see for example Goldthwaite (1948), discussed in more detail in Section 4.3.), structure of textbooks (see for example Abrahamsen (2003), discussed in more detail in Section 4.1.), and structural diagrams within textbooks (see for example Line (1963)). Authors such as Abrahamsen (2003) not only use resources from the music domain, but discuss music classification from the (LIS-based) domain analysis approach, including comparing the organization of music in both the LIS and music domains. Abrahamsen’s (2003) article, alongside the few other exemplars of this approach, is important to this thesis, as discussing the comparison in classification between the LIS and music domains is part of this thesis’ research objectives. So, these articles will be discussed in detail in Section 4, which considers comparative and non-exclusively LIS works. It is noteworthy that these articles exist which look outside of the LIS domain, especially considering that Goldthwaite (1948) and Line (1962) are writing decades before domain analysis is formulated by Hjørland and Albrechtsen (1995) and adopted by the LIS community.

2.2.4. Utilizing music domain technique for LIS analysis

The final methodology presented is somewhat of a rarity but sets up a fascinating coalescing of domains. Elliker (1994) uses a technique of analysis taken from the music domain – “Schenkarian Analysis”, which is usually used to analyse musical works – and applies it to LIS classification schemes.¹² In the previous methodology (Section 2.2.3), resources from the music domain were used as documents, such as text books of music

¹² Schenkarian analysis – a ubiquitous 20th-century music analysis method of great significance – separates musical works into foreground, middle ground and background, demonstrating the overall structure of a work across a sea of musical notes.

history and bibliographies; whereas Elliker (1994) is borrowing the analytical method instead, using a *technique* from the music domain rather than a series of documents. This is one level removed from using an LIS method such as domain analysis to study the relationship between the “target” domain and LIS. It is truly a dyadic approach. (Elliker (1994) is also important for other reasons, which will be discussed later in the literature review.)

2.3. Major music classification themes

The literature trawl revealed a number of prevalent themes within the LIS music classification literature. The themes discussed are scores versus literature, faceted classification and music, “other” musics, classification and retrieval, and music classification schemes.¹³

2.3.1. Theme 1: scores and literature

LIS music classification discourse sees the potential division of music-related materials into literature (works about music) and scores (for all intents and purposes, notated music) as a significant issue. For instance, Jones (1979, p. 95) describes separating literature and scores as a “basic distinction”; Benton (1976, pp. 55-56) describes literature and scores as “principal categories”. Furthermore, a classification scheme’s treatment of this issue is used to assess a music classification scheme’s worth; for instance, the perceived lack of division between literature and scores in older versions of DDC is cited by commentators as one of its fundamental flaws (see for example, Wursten 1990a, p. 4). Often, the discussions will draw upon the treatment of other artworks and their corresponding literature, such as art (for example, Mullally (1976, p. 60) compares the issue to the visual arts). The separation between scores and literatures could be considered as relating to format; so, this issue is discussed in detail in Chapter 4, Section 3.4, which discusses format’s position as a facet.

2.3.2. Theme 2: faceted classification and music

Faceted classification is a key theme in music classification literature, whether it is mentioned directly using the terms “facet” or “faceted” or not. One of the ways in

¹³ It is interesting to note Smiraglia’s (2006, pp. 6-7) identification of themes, to see any overlap with the themes that have been selected in this literature review. However, it is important to note that Smiraglia’s base is wider as the documents he uses refers to cataloguing and subject indexing, in addition to classification. His themes concern the concept of a musical “work”, the subject of a musical work, and browsing and retrieval (Smiraglia 2006, pp. 6-7). Though some of Smiraglia’s discussions about these themes have been useful to this literature review, the differences in coverage and emphasis between Smiraglia’s (2006) overview of the literature and this literature review means it was not advisable to adopt Smiraglia’s themes *verbatim*.

which the discussion of faceted classification surfaces is within discussions about the *British Catalogue of Music Classification* (BCM), which was the first published fully faceted scheme in Great Britain (Redfern 1978, p. 24) and also formed the basis of the DDC *Phoenix Schedule* (Sweeney 1976, p. 4). Due to the revolutionary nature of both schemes, they are discussed in LIS discourse and thus faceted classification of music receives attention within the context of these discussions. As well as mentioning facets in many writings, commenters also state which facets they consider to be most important – this is discussed in detail in Chapter 4, Section 3, which considers the LIS discourse concerning music’s facets. It is worth noting that while many important references to faceted classification within music occur around the 1960s (for example, BCM) through to the later 1970s and 1980s (for example, the *Phoenix Schedule* of DDC), faceted classification of music is still a current topic; for instance, Madalli, Balaji and Sarangi (2015) utilize facets of music in order to create an example of a faceted ontology, showing how facets of music are still an important topic, even when repurposed for the ontology/computer age. (This paper, and the earlier paper by Madalli, Balaji and Sarangi (2014) are discussed in more detail in Chapter 4, when discussing the facets of music.) So, faceted classification of music is an important topic within LIS music classification discourse, and is explored as part of Chapter 4, which is devoted to faceted classification and music.

2.3.3. Theme 3: “other” musics

The treatment of subjects outside the realm of Western art music is an important issue to music classification authors, with the treatment of folk music, jazz and pop music cited by authors as being particularly problematic. Authors suggest reasons why this is the case (for example, Nero 2006, p. 122), and how the problems pervade not just the contents of classification schemes but the structures of schemes (for example, Inskip, MacFarlane & Rafferty 2008, p. 690). Commentators also describe some of the consequential effects of problems with classifying these “other” musics on libraries, most notably the impact upon retrieval. For instance, Langridge (1967, p. 4) cites a case where the failure to recognize the importance of the performer in the arrangement of jazz materials has resulted in unwanted separations of materials which naturally belong together. As this thesis focuses on notated Western art music, further research into how jazz, folk music, popular music, and so on, are treated in LIS classification schemes is outside the scope of the thesis. However, it is also important to note that the type of music being considered in this thesis has primacy within most of the music LIS

classification schemes being considered. While the reasons why certain types of music are the focus of LIS classification schemes is not within the scope of this thesis, one outcome is that the LIS schemes considered in this thesis are primarily designed for the type of music being considered in this thesis (according to the arguments by Langridge, Nero, and others).

2.3.4. Theme 4: classification and retrieval

Retrieval is a major purpose of classification (Batley 2005, p. 3) and the organization of knowledge is described by Rowley and Hartley (2008, p. 4) as the “other face of information retrieval”. Thus it is unsurprising to find that retrieval is discussed in LIS music classification discourse. Smiraglia (2006) describes retrieval-based classification as one of the key themes of 20th-century literature in the bibliographic control of music. Amongst other questions, the retrieval/classification combination asks whether music would be better found using certain facets over others (Cazeaux 1966, p. 35). One sub-theme of the retrieval discussions within music classification concerns the different information needs of different types of users; for instance, as expressed by Inskip, Macfarlane and Rafferty (2008, p. 689). Commentators discuss these differences by categorizing the needs of different types of music library users; for example listeners versus (what is more succinctly called) performers (McColvin, Reeves & Dove, p. 48), scholars versus so-called “browsers” (Buth 1974, p. 441) and performers versus scholars (Line 1952, p. 362). However, it can be seen that commentators don't necessarily agree on these divisions, or the best classification for each group. In addition, the categorization of users is itself a questionable activity: not only can one individual person fall into different categories even within the same library visit, but boundaries between activities such as performing and research are distinctly blurred. Some authors also link their categorizations of users to the use of specific facets (for instance, Line (1963, p. 353), writing in more detail about his scheme). Retrieval is not the focus of this thesis, so will not be discussed further. However, it will be seen in the thesis that some classification schemes – for example, *Dickinson Classification* (Dickinson) – directly link the workings of their classification scheme to the organizations in which the scheme will be used, meaning that even theoretical discussions of music classification will be impinged upon by matters of usage, and by natural extension, retrieval.

2.3.5. Theme 5: music classification schemes

One of the most prolific topics in the LIS music classification discourse is the discussion of LIS music classification schemes; however, interestingly, classification schemes could

be considered an approach and a topic. “Music classification schemes” will be used to denote both the music schedules of general classification schemes and special classification schemes for music. What is immediately apparent from perusing the music classification literature is the sheer volume of special and home-grown classification schemes for music. Some of the most prevalent special schemes in discussions include BCM, Dickinson and McColvin and Reeves classifications; however, the literature reveals dozens more. (BCM and Dickinson will be discussed in detail later in the thesis; McColvin and Reeves was a scheme designed as an alternative to DDC music schedules (Elmer 1973, p. 149).) This occurrence of multiple special and home-grown schemes for music is of great significance to this thesis, as it potentially raises two interlinked and potent issues: first, the number of schemes could be an indication that music is fundamentally difficult to classify; second, existing schemes are inadequate, which is also indicated by authors such as Clews (1975, p. 7) and Olding (1954, p. 13). The link between finding all existing schemes inadequate and creating your own is logical, but existing KO research does not appear to conceptualize this relationship; an article written separately to this thesis, but inspired by some of the questions music classification asks, positions this relationship through a reception studies framework, where “criticism” leads to a new scheme, which can be considered part of the “Wirkung” of an existing scheme – see Lee 2015, Lee 2014, reproduced in Appendices B2 and B3.

As well as being a source of complaint, general classification schemes also feature in LIS classification literature in other ways. For example, McKnight’s (2002) textbook *Music classification systems* is mostly a discussion of *Library of Congress Classification* (LCC) and DDC (as well as an example of a classification for sound recordings, which will be discussed in section 2.5.1). This could be seen to signify that music classification practices in the United States in the early 2000s conformed to using regular, general schemes as opposed to using the variety of special (and specially devised) schemes exemplified in older music classification literature.

By far the most prolific music classification scheme discussed in the music classification discourse is one of these general schemes: DDC. However, the LIS music classification has a particular concentration around a particular epoch and related series of events within DDC’s history: the inadequacies of pre-DDC20 editions of DDC, the publication of the DDC *Phoenix Schedule* and the eventual incorporation of the *Phoenix Schedule* into

the 20th edition of DDC (DDC20). *Phoenix Schedules* are where a part of a classification scheme is rewritten to such an extent that every class number within that part of the schedule has been reassigned (Prytherch 1987, p. 600). In 1973, music was designated an area needing work within DDC (Sweeney 1976, p. 4) and a project team was formed to create a new schedule. The reasons given for the need to rewrite the schedules included the lack of separation between scores/literature and the lack of treatment of music such as African-American music and jazz (Sweeney 1976, p. 4), both issues covered above as being highly prolific within music classification discourse.¹⁴ While unsurprising, this enforces the idea that DDC's revision is caused by common tropes of music's problematic classification, rather than being specific to DDC. In this reading, DDC is *reflecting* music classification issues.

The new schedule was completed in 1975 (Humphry 1980, p. viii) and after discussion at various meetings, was published as a separate monograph in 1980 (Dewey et al. 1980). During this gestation period, Sweeney and Clews, the main authors of the revised schedule, engaged the library community with their scheme – see for example, Sweeney (1976), Clews (1975). The publication of the *Phoenix Schedule* was specifically designed to enable librarians to comment on the schedules before it was fully integrated into the main DDC schedules (Humphry 1980, p. viii), and so the dissemination of the *Phoenix Schedule* generated comment, analysis and further dissemination of the revised scheme (see for example, Cotton 1978, Hassell 1982). The integration of the *Phoenix Schedule* – with some major changes – into DDC20 also generated more discussion and analysis such as Redfern (1991), and a monograph in “celebration” of the schedules (Wursten 1990b). Therefore, it can be seen that DDC, including its narrative of “bad-to-good-scheme” plays an important role in music classification, and this needs to be considered during the thesis.

Another trope within LIS classification scheme discourse concerns the idea of a universal scheme for classifying music. The lack of standardization in music classification is commented upon by authors such as Elmer (1973, p. 149). Various constructive moves were made to develop such a system. The IAML conference in 1966 identified an urgent issue with music classification (Pethes 1968, p. 83) and originated an initiative to create

¹⁴ Of course, it should be remembered that part of the discourse analysed in themes 1-4 was that associated with DDC, as the themes are not mutually exclusive. However, while some sources will have been covered in multiple themes, resources discussing themes 1-4 *and* DDC only make up a minority of all the literature, so it still stands that the DDC “complaints” reflect the trends seen in themes 1-4.

a universal scheme for classifying music (Pethes 1967, p. 1); Pethes' *A Flexible Classification System of music and literature on music* (Flexible) was the response to that initiative (Pethes 1967). However, the literature reveals that this is not the only universal scheme which was planned. Chailley (1988) writes independently about the need for a classified scheme for music.¹⁵ Her ideas about universality have a slightly different focus to the IAML/Pethes campaign: her chief concerns are that the scheme should apply to all libraries and be hospitable to all formats of music materials both now and in the future (Chailley 1988, p. 244). However, from the context of Chailley's (1988) article, it appears that "universal" has a different meaning for her than in Pethes' sense: all music materials rather than worldwide music collections, as she only refers to French libraries in her article rather than any form of international universality. Chailley's (1988) contribution thus raises some interesting points. First, there is no one goal of creating a universal system of classifying music and second, the quest for universality occurs in multiple environments and is not limited to a specific campaign in the 1960s by Pethes and company. Therefore, the idea of creating a universal system for classifying music is a small but important part of discourse concerning music classification schemes. So, ideas about universality are explored further in the thesis, during discussions about universal facets in Chapter 4, Section 3.3.5.

2.4. Seminal texts in LIS music classification

Another interesting question concerns whether there are seminal texts in the music classification discourse, and to discuss any which are identified. Unsurprisingly, the importance of various texts is closely related to the research questions being asked. The following three texts appear to be particularly important, for varying reasons: Abrahamsen's (2003) domain analysis account of music classification, Elliker's (1994) systematic analysis of music classification schemes and Redfern's textbook-cum-theoretical-text about music classification (1966, and 2nd edition in 1978, which is the edition discussed in this thesis).¹⁶ Abrahamsen (2003) is important due to its citation

¹⁵ Though she writes a considerable length of time after the Pethes scheme was published and the assumed discussions within IAML about a universal classification scheme, there is no evidence that Chailley was aware of the previous work of Pethes or IAML concerning a universal classification for music.

¹⁶ Please note that there was not space in this thesis to include bibliometric analysis concerning these three texts, therefore all comments about the texts' citations are based on approximations from literature trawl and review. While Smiraglia (2006) does carry out some bibliometric analysis, Abrahamsen's (2003) article is outside of the timespan covered in Smiraglia (2006), and Elliker does not make an impression numerically. Conversely, Redfern (1978) does feature in Smiraglia (2006), albeit briefly. First, the first edition of Redfern's monographs concerning organizing music (which includes a volume devoted to classifying music) are mentioned as one of the "significant manuals" and "landmark texts"

within KO and outside of LIS through the conduit of music information retrieval. (Note that it is not the purpose of this study to produce a bibliometric account of music classification texts, so one or two comments about whether the three texts have been used is deemed sufficient.) This text is discussed in detail in section 3.2.1. Elliker's (1994) work does not appear to have been as widely quoted as the other two texts, but provides a significant, systematic analysis of multiple music classification schemes. As discussed in Section 2.2.4., the method is novel, but actually this is not the most important aspect for this thesis. To perform the analysis Elliker (1994) adopts a series of facets, and the process and decision to adopt these facets is very useful for considerations about facets in this thesis – see Chapter 4, Section 3.3.3; furthermore, Elliker's (1994) findings, especially their quantitative nature, help to define the most important facets for music and to this end are used to shape this thesis – see Chapter 4, Section 3.2. Finally, Redfern's (1978) book concerning music classification is seminal in a number of ways. It appears to be referenced often in the literature which succeeds it, and furthermore, Smiraglia (2006, p. 17) finds that Redfern is an especially prolific author about music classification. Redfern (1978) includes a general and theoretical discussion about music classification, and like Elliker (1994), this discussion proves useful for pursuing general facets of music – see Chapter 4, Section 3.3.2. What is perhaps the most interesting point about all three texts is not their contents, but their existence. While the field of music classification writings is voluminous, there is a scarcity of theoretical and conceptual discussions about music classification and so these three examples are rarities.¹⁷ This significant limitation of the existing music classification discourse is the springboard for this thesis.

2.5. Casting a wider net: two broader, music classification topics

2.5.1. Classification of sound recordings in libraries

While music-as-sound is generally outside the scope of this thesis, it is worth pausing to mention briefly one particular subsection of music-as-sound: the classification of sound recordings, especially within libraries. This discussion will focus on physical manifestations of recordings; later ways of providing music-as-sound to library users

(Smiraglia 2006, p. 10) and Redfern is included as one of the most statistically prolific authors about the bibliographic control of music (Smiraglia 2006, p. 17).

¹⁷ This helps to explain why the three seminal texts are decades old: for instance, there does not appear to be a 2010s version of Redfern's monograph. There are likely to be external factors as to why this is the case, such as changing trends in KO, but a discussion of these is outside the scope of this thesis.

such as through digital streaming are not easily separable from music information retrieval discourse, which is mainly outside the scope of LIS.

A broad overview of the literature of sound recording classification within the LIS discipline revealed a number of main themes and trends. First, the subject has received much attention over the years since libraries started to collect sound recordings: for instance, Smiraglia (2006) states that sound recording arrangement was written about as early as 1933, and by 1963 there was already an entire book devoted to managing collections of sound recordings, which included discussions on their arrangement. The lack of good organization for these resources has been noted by commentators (for example, Davidson 1989). Second, one of the main issues discussed is whether collections of sound recordings need to be classified or not, with arguments for and against non-classified arrangements; accession number is discussed as an alternative organizing system (not necessarily a positive one) by some writers (Stevenson 1973, pp. 276-277, Howes 1970, p. 94). Third, the nature of the sound recording format and changes in formats are an important feature of discussions on sound recording arrangement (for example, Stevenson 1973, p. 274). Fourth, one classification scheme for sound recordings is frequently discussed: the ANSCR scheme. For instance, McKnight's (2002) textbook about music classification contains chapters on three specific schemes he perceives as being the most frequently used in the United States: ANSCR joins LCC and DDC as one of these chosen three (McKnight 2002, p. 1). Therefore, it can be seen that there the issues relating to sound recordings do not have much overlap with those identified as major themes for classifying notated music. This is interesting as, using FRBR terminology, music-as-sound and music-as-text are merely different expressions of the same works (International Federation of Library Associations and Institutions 2009); one interpretation is that issues relating to classification are bound up with the expression layer, generating this separation in classification issues for text versus sound. Regardless, the classification of sound recordings will not be explored further in this thesis, as it seems their focus lies in different places from notated music.

2.5.2. Subject indexing and subject headings for music

The final issue to be considered within LIS music classification concerns a type of KO not considered in this thesis: subject indexing. The exact boundaries of subject indexing as opposed to classification are difficult to define but for this thesis are taken to be by outcome. Subject indexing is concerned with providing subject access, while

classification has an addition task, which is to place – physically or conceptually – the resource as a whole within an organization of knowledge. Again, music-as-sound is not the focus of this study, but will be included when referring to physical library materials.

The issues concerning music subject indexing are longstanding. For example, Hemmasi and Young's (2000) important article about LCSH for music dates back to 2000, while Colby (1998) writes about the issues concerning providing LCSH for notated music and sound recordings of 20th-century music at around the same time. Problems with LCSH and music are clearly not (that) new. Part of the problems concern, what McKnight (2012) neatly labels, separating "is-ness" from "about-ness"; traditionally, in LCSH the only way to indicate that through its subject that a book was about opera rather than being an opera score, was through omitting the "s" from "operas". Although out of the scope of this thesis, the principles are very similar to the discussions in Chapter 4, Section 2.3.1: adequately classifying the format of music materials. This shows that format-related issues have wider resonance than just in classification schemes.

Tied up with subject indexing are the schemata used to contain the subject terms; one exemplar is the music thesaurus. Hemmasi (1994) writes about the idea of creating a (universal) music thesaurus, and work on a music thesaurus started in 1995 (Smiraglia 2006, p. 12). The thesaurus issue has metamorphosed into a recent significant development in music subject indexing: the extension of the *Library of Congress Form/Genre Terms* to include musical works and the development of the *Library of Congress Medium of Performance Thesaurus for Music* (LCMPT). The project to develop a thesaurus of forms and genres for music was part of a wider, ongoing project to create separate terms for forms and genres, as opposed to topical headings (Library of Congress 2013, entry: 2 July 2010). However, while the music form/genre project was being planned, it became clear that the form/genre headings were linked to the medium of performance, and thus it was agreed that a thesaurus for mediums of performances would be developed alongside the form/genre terms (Iseminger 2012a, p. 65). The LCMPT launched on 24th February 2014 (Library of Congress 2014) and is available as a separate vocabulary through the *Library of Congress' Linked Data Service* (Library of Congress 2016b) among other sources. The form/genre terms for musical works were officially approved in March 2015 (Library of Congress 2014) and are one part of the form/genre thesaurus which is available through the *Library of Congress Linked Data Service* (Library of Congress 2016a) and other sources. (The projects are described by

Iseminger (2012a), Blough and Jurgemeyer (2015) among others.) It is fascinating to see how medium was soon found to be a critical part of classifying form/genre development – indeed, its necessity meant that the medium thesaurus was completed before the form/genre one – and this is discussed further in the context of classification throughout the thesis but in particular in Chapter 8. The thesauri themselves are of limited use to this thesis: notwithstanding the different theoretical constructs proposed by subject indexing, as opposed to classification, the thesauri contain very little hierarchy and are in many places more like typologies. As identified in the research questions, this thesis is especially concerned with faceted classification and thus by extension, hierarchy, making the presence of these KOSs is interesting for the thesis, but their contents not directly relevant.

Finally, there have been other recent classification tools for categorizing notated music, outside of classification schemes. For example, Carroll, Grimshaw and Koehne (2014) describe a “Universal instrumentation code” which codifies the instruments and voices associated with a work in notated music form – in other words, coverage similar to the LCTMP – primarily from the perspective and for the use of music publishing, to be used for the digital exchange of information; while outside the scope of this thesis in terms of its overall purpose, it is interesting to note that some of the system’s structures echo significant issues within music classification, such as broad categories of instruments and multiple instruments. Therefore, while subject indexing and the specific, library-community-based subject headings are out of the scope of this thesis and will not generally be discussed further, it is fascinating to note that recent years have seen new projects and knowledge organization systems (KOSs) for categorizing notated (and mostly Western, art) music. In addition, some of the features and issues identified for these types of KO become some of the fundamental issues within music classification explored in this thesis.

3. Music classification literature: music domain

Up to this point, literature has been discussed concerning the classification of music within the LIS domain. Two of the research questions are specifically concerned with the music domain’s conceptions of music classification, so it is important to consider the contextual landscape of classification literature from the music domain. A search for literature on classification within the music domain reveals that the quantity and type of literature explicitly devoted to classification is dependent on the sub-discipline of music.

For example, ethnomusicology (the study of music from its socio-cultural perspective and historically associated with the study of music from non-Western cultures) and organology (the study of musical instruments) both generate explicit references to music classification. (There are reasons why organology and ethnomusicology seem to have classification as a fundamental activity, but discussion of the mechanisms of these sub-disciplines compared to other sub-disciplines would be outside the scope of this thesis.) For example, in 1990, there were two monographs published specifically concerning taxonomy of musical instruments (Kartomi 1990, DeVale 1990a), and organology yields “universal” taxonomies such as those by Hornbostel and Sachs, Mahillon, and so on.

Music classification appears to occupy a different position within other sub-disciplines of music. A literature search on *Répertoire International de Littérature Musicale* (RILM) revealed very few results outside of ethnomusicology and organology when searching for terms such as “classification” and “organization”, suggesting that even if classification does feature, it uses different terminology.¹⁸ Even a significant reference sources such as Grove does not contain a general article concerning the classification or organization of music – although note that there is an article dedicated specifically to the classification of musical instruments. Examples of the areas of the music domain covered by the relatively few search results in RILM include medieval classification systems (see Dyer (2007), who attempts to fit music into medieval classification systems), a criticism of an existing music classification system (see Kenton (1952) who writes a detailed criticism of Apel’s classification system for music) and classifying types of musical quotation (see Burkholder (1995), who discusses and categorizes Ives’ use of musical quotation and paraphrase). These examples demonstrate that for certain, very specific research questions, classification and its ilk are considered explicitly.

This broad description of the state of literature concerning music classification identifies a number of directions, as well as methodological challenges, concerning the enquiry into the music domain’s conception of music classification. To start, different chapters will involve different types of engagement with the music domain. For example, when discussing musical instruments, organology provides a rich background of discussions and classification systems to draw upon; however, this rich seam of classificatory discussion cannot be drawn upon for other aspects of music classification under

¹⁸ “Arrangement” is a problematic search term in music, as it has a very specific and different meaning in music.

discussion in this thesis. (Ethnomusicological classification, another explicit provider of discourse directly discussing classification, will mostly be out of the scope of this thesis, as it has traditionally dealt with non-art music and is often based around music-as-sound. However, note that it is not always easy to draw a line between organology and ethnomusicology, so ethnomusicological classification might feature peripherally.) In other chapters, the music domain will be consulted for examples of discussions about music classification, but will not be able to utilize the same broad classification discourse as found for instruments. So, a different methodology will be used, which is discussed in Chapter 2, Section 4.3.

As a postlude, the question must be asked as to whether the music domain makes reference to music classification in the LIS domain. Largely, the answer is no. One notable exception is discussion concerning a specific classification scheme in organology, *Hornbostel and Sachs*, which sometimes mentions that the notation comes from a bibliographic classification (an early edition of DDC): for example, DDC gets a passing reference in Kartomi's seminal tome on music instrument classification from the organology perspective, albeit with a warning not to consider *Hornbostel and Sachs* as being comparable to DDC (Kartomi 1990, p. 168). The relationships between *Hornbostel and Sachs* and DDC will be explored in detail in Chapter 7, Section 5.4. There are other exceptions. For example, Rehding (2006) frames a music theory discussion about the "listener" and contemporary music, with his concerns and wonder about a particular music library's way of classifying music theory texts – though it is notable that the discussion does not engage with LIS classification theory or seek to understand why a library might be arranged in this way; rather, he limits the discussion to the music-theory "message" of the classification. However, as a whole, the music domain's conceptions of music classification stay within their domain, a point worth remembering when discussing any accords and discords between the two domains. If there is any flow of ideas between the two domains, on first appearance, it appears to go in one direction only.

4. The comparative perspective and other perspectives on classifying music

4.1. Comparing music classification in the LIS and music domains

The LIS KO discourse includes a few examples where a direct comparison has been made between music classification in the LIS and music domains. An article by Abrahamsen (2003) in the journal *KO* is particularly important, largely because as mentioned above, it is referred to in much subsequent literature about music classification. This article focuses on music as a discipline rather than musical works themselves, usually referring to “musicology” rather than “music”. Abrahamsen’s (2003) article is particularly concerned with the position of “popular” music, arguing that there is a strong divide between the treatment of popular music as opposed to classical music; furthermore, he argues that that musicology’s classical-music focus, has led directly to a classical-music focus within LIS classification schemes. The article (Abrahamsen 2003) is also concerned with genre, and discusses the philosophical basis of genre theory. In terms of music genres specifically, he concludes that much knowledge about genres in popular music comes from people outside of “music institutions” (Abrahamsen 2003, p. 163), arguing that so-called “professional listeners” who reside outside of formal institutions (Abrahamsen 2003, p. 163) have much unwritten and informal knowledge of music genres. Perhaps of most relevance for this thesis is his discussion about two Danish music textbooks (Abrahamsen 2003, pp. 149-151), where Abrahamsen considers whether the different paradigms feeding the textbooks make a difference to how they are organized. The act of taking sources from the music domain and using them to answer music classification questions from an LIS perspective is an activity which will be used in this thesis – even though Abrahamsen’s question and particular approach are not relevant for this thesis. Thus, most of Abrahamsen’s (2003) article is out of the scope of this thesis as it focuses on popular music genres, the classification of the discipline of music and the broad divisions into classical/popular music. (Some individual topics are briefly useful, such as general ideas about music genres and mentioning function as an organizing device for music, and these will be referred to in

the relevant chapters.) However, the article at least in places is comparing music classification from the LIS and music domains, showing the interest in this endeavour.¹⁹

There are other examples of direct comparison between music classification in the music and LIS domains, which focus on one aspect of music; classifications of musical instruments have generated some good examples, which is unsurprising considering the apparent fondness within organology for direct discussions about classification and classification schemes. For instance, Gnoli (2006) uses musical instruments as one of his examples when discussing evolutionary principles within classification, which combines discussion of LIS classification principles with “scientific” or “domain-based” classifications (see Chapter 1, Section 4.1 for discussion of these terms). Ghirardini and Gnoli (2005) discuss the classification of musical instruments from the perspective of comparing the classification of the object (musical instrument) with the subject (say, books about musical instruments); inevitably, this involves comparing domain-classification with LIS classification. Furthermore, Ghirardini and Gnoli (2005) is unusual in being co-authored by, what could be crudely classified as, representatives of the LIS and music domains, thus furthering the LIS/music domain mashup. These examples are exciting as they show a new aspect to domain comparison and the potential dividends of exploring musical instrument classification, which is the focus of Chapter 7.

4.2. Classifying music as information and knowledge

The classification of music is not limited to those approaching the topic from a pure KO perspective: those interested in defining and refining our understanding of music-as-information and musical knowledge, appear to consider music classification as part of this overall goal. For example, Lam (2011) produces a model that classifies music-as-knowledge, focused on music as pedagogical activity. This model (Lam 2011, pp. 204-206) categorizes knowledge about music, rather than categorizing musical works, and the layers of the model are based on education-based divisions rather than aspects of musical works. However, a few familiar ideas from classifying works are mentioned in the model such as musical forms, timbre and rhythm (Lam 2011, p. 204) – although they are mentioned within the context of knowledge and understanding rather than as parts of the model’s layers in their own rights. Therefore, although an interesting model and paper, especially as it introduces a new dimension into the music domain in the form of

¹⁹ Inskip, MacFarlane and Rafferty (2010) also use a domain-analysis approach, drawing upon Hjørland, Albrechtsen and Abrahamsen when discussing the classification of film music. However, the target of the analysis is outside the scope of this thesis as it does not cover music-as-text.

music education, Lam (2011) will not be considered further as it is asking very different questions from this thesis and is not based around classifying musical works.

Similarly, Weissenberger (2015) discusses music classification, but largely from the perspective of information retrieval, drawing upon ideas from information theory. The article (Weissenberger 2015) introduces the idea of a “Music Information Object (MIO)” and produces a series of three classes which cover all types of representations of music with a few subclasses for each class. Again, the paper focuses on creating a system which is inclusive of all types of music, “traditional music” in particular. However, while the discussions about music-as-information provide interesting context to defining music for the purposes of this thesis – as already discussed in Chapter 1, Section 2 – Weissenberger’s (2015) classification and classes do not help answer the questions posed by this thesis: Weissenberger classifies the different representations of music (so for instance, this thesis’ music-as-text falls into one of Weissenberger’s classes) rather than a universe of musical works.

4.3. Classifying music using non-LIS documents

Other authors use documents from outside of the LIS domain to understand the classification of music, without comparison between the LIS and music domains as the primary focus. For example, Goldthwaite (1948) considers how music bibliographies are organized and classified. The article (Goldthwaite 1948) discusses classification, but does not relate the analysis to classification within LIS or any formal classification policies. The subject that is being classified within Goldthwaite (1948) is music literature rather than music, so this article is out of the scope of this thesis. However, the technique of analysing the classification of a domain by studying the classification of its bibliographies is noteworthy, especially as it is written decades earlier than formal developments of analysing the domain and domain classifications espoused by theorists such as Hjørland and Albrechtsen (1995). Whether Goldthwaite’s work (1948) is from the perspective of LIS looking into musicological debate while asking questions pertinent to LIS without directly addressing LIS classification theory, or is a musicological work happened to be published in *The Library Journal* is not clear, or perhaps not even too important. The resulting article (Goldthwaite 1948) is another demonstration of the documents of the music domain being used to understand that domain’s classification, even if this was not the precise intention of the author. So, while analysing bibliographies would not be a useful technique for this thesis, as it helps to understand

the classification of the literature not the musical works, it provides a useful example of “domain classification” applied to music.

Krummel (1984) writes about music classification through the lens of music catalogues and music bibliographies from pre-1850, building in part on Goldthwaite’s work. Krummel (1984) constructs a general historical account of music classification, detailing principles of the classification of musical works (by definition of their source, notated Western art music) and works about music, using the classifications found in early bibliographies about music and publishers’ music catalogues. The results of this study have some overlap with the purpose of this thesis, as he (Krummel 1984) discusses specific categories of music which are important to LIS such as medium, genre, function, and so on. As well as a new angle on discussing non-LIS conceptions of music classification – we can loosely attribute the music bibliographies to music theory and the precursors of musicologists, while the publishers’ catalogues represent the commercial aims of music publishers who intertwine but do not represent LIS – Krummel (1984, p. 181) gives examples where his findings about the classification used in these sources match the categories found in one particular LIS system, the IAML facets. (The IAML facets are discussed in Chapter 4, Section 3.3.1.) Therefore, while his (Krummel 1984) analysis is part of LIS in its questioning, but arguably not in the sources it utilizes, Krummel’s findings will be discussed alongside their pertaining topic within the thesis.

5. Conclusion to Chapter 2

Reviewing the LIS music classification literature revealed a number of critical insights. The broad topic of music classification has been discussed in LIS discourse since the last few years of the 19th century, and has received much attention since. One interpretation of the popularity of discussing music classification is that there is something interesting or difficult about music classification, a view enhanced when combined with the numerous LIS classification schemes that exist for music. The review identified that there were a number of dominant methodologies used in discussions of LIS music classification; notably, the two which appear to be the most common, the classification scheme and project-based approaches, discuss music through the conduit of a vehicle such as a classification scheme or a practical problem rather than music classification in the abstract. A number of themes also emerged: format issues, faceted classification, “other” musics, classification and retrieval, and music classification schemes. Two of these are outside of the scope of this thesis (“other” musics and

retrieval), but the other three will be analysed in later chapters. (The theme relating to facets is particularly interesting. However, its presence as a key trend cannot be considered wholesomely a “result” of the literature review, as “facets” was identified as part of the research questions of this thesis a priori to the review – see Chapter 1, Section 5.) The literature review illuminates the numerous classification schemes for music; again, an inference can be made about how this could be an indication of music’s difficult-to-classify qualities. A brief summary of how music classification is considered within the music domain reveals that it is dependent on the particular sub-discipline of music, and for many sub-disciplines, music classification receives little explicit interest. This will have ramifications on the methodologies and discussions which take place in this thesis. Finally, some interesting discussion about music classification takes place outside of the focus of this thesis, which will not be explored further; for instance, LIS conceptions of music as sound recordings and an interesting examination of domain comparison (Abrahamsen, 2003) which largely focuses on “popular” music.

This literature review has identified some important gaps in the literature on music classification, which this thesis aims to move towards filling. For instance, the review showed that methodologically, there is little within the voluminous field of LIS music classification which considers the theory of music classification outside of a scheme or specific scenario, and no in-depth study on the scale of a doctoral project; this thesis is interested in understanding and modelling the theoretical classification of (notated, Western, art) music, so will help to fill this gap. In addition, the review showed the paucity of discussion which compares the classification of notated Western art music within the LIS and music domains, whereas this comparison between domain and LIS classifications is considered by Hjørland, Beghtol and others to be a significant part of modern KO; arguably the most significant article which compares music classification across domains, by Abrahamsen (2003), concerns the treatment of popular music and is therefore not insightful for Western art music. (Conversely, Gnoli and Ghiardini’s work comparing instrument classification in the two domains is relevant and will be consulted and integrated into the research.) Again, this thesis will tackle this gap in the literature.

The literature review has also revealed appropriate methodologies for the thesis and methodological considerations. First, the prevalence of existing music classification discourse which uses the classification scheme as the prism through which music classification is discussed, indicates that classification schemes – both direct analysis and

through analysing the literature the scheme generates – will feature as an important methodology, with details to be discussed in Chapter 3. Second, this literature review has also demonstrated that the music and LIS domains will require very different approaches to literature analysis. An examination of the music domain literature revealed that most topics considered in this thesis are not accompanied by numerous explicit references to classification or obvious KOSs; thus, for these topics, more implicit literature will be sought and used, and creative alternatives explored for finding “classifications”. Authors such as Goldthwaite (1948), Abrahamsen (2003) and Krummel (1984) have shown how a variety of different documents can be used as “surrogate” classification schemes, which will be useful when devising this thesis’ methodology for examining classification in the music domain. Organology, or the study of instruments, provides the main exception; the plethora of discussions and presence of published classification schemes means that this section of the thesis will need a different methodology – see Chapter 3, Section 4.2.

In conclusion, this literature review has shown how music’s classification is inherently interesting, while the specific and theoretical study of the classification of notated Western art music has been neglected within LIS, despite the quantity of literature generically categorized as about “music classification”. The review has illuminated the importance of schemes of music classification, leading a path to the methodology needed to explore the theoretical foundations and to model the classification of notated Western art music.

Chapter 3. Methodology

1. Introduction to Chapter 3

The general methodological approach selected for this thesis is theoretical and conceptual, with “analysis” the key method employed. Literature and conceptual analyses are key members of the artillery of methodologies employed in this thesis. These are joined by another type of analysis which is not normally considered as a methodology in its own right although it often forms part of knowledge organization (KO) research: classification scheme analysis. This thesis not only makes use of deep analyses of specific classification schemes but also offers new perspectives and novel ways of using classification schemes to enrich classification research. Thus, some of the *methods* used in this thesis also form part of the *results*.

Four broad methodologies are utilized in this thesis. The first two focus on library and information science (LIS) conceptions of music classification. Methodology 1 discusses how literature and conceptual analysis are the bedrock of this thesis, and positions these discussions as a type of qualitative content analysis. Methodology 2 considers the analysis of LIS classification schemes, showing how analysing the manifestation of classification theories through a realised classification structure can fill in the gaps left when only analysing literature and concepts. The selection of three main example schemes and a wider set of classification schemes are also discussed, including how this classification scheme selection can be viewed in relation to case study methodologies. Methodology 3 is based on classification ideas in the music domain: while somewhat diluted and smaller-scale methods employed in methodologies 1 and 2 were preferred for the music domain, in reality, the unavailability of explicit discussions and classifications of music led to slightly different methods being used. Methodology 4 is concerned with synthesis, and this discussion considers how the findings of the other three methodologies were synthesised to produce the discussion and results in this thesis. The methodology concludes with a short outline of the main ethical considerations of this research.

2. Methodology 1: Literature and conceptual analysis

2.1. Use of literature and conceptual analysis methodologies

Analysing the literature and concepts involved in music KO is one of the major techniques used in this study. There are a number of reasons why literature and conceptual analysis are considered the most appropriate research method for this thesis. First, as the literature review revealed (see Chapter 2), there has been little in-depth analysis of the LIS music classification literature. Second, in order to model music classification – one of the stated objectives of the thesis – it is imperative to survey the existing knowledge and theories.

There are different types of literature analysis; for instance, Bawden (2012, p. 151) references Grant and Booth, who identify 14 different types of literature review. Bawden (2012, p. 156) states that a philosophical and conceptual analysis endeavours to “analyse, clarify and explain concepts” and gives examples where this type of analysis has been successfully performed on an individual term. In this thesis, this technique was used in a number of places, for example when outlining Ranganathan’s PMEST formula in Chapter 4, Section 2.4, where an overall understanding of the theory was needed. Another example occurs in the same chapter, when the principles of facet analysis needed elucidation (Chapter 4, Section 2.1); here, analysing and synthesising various definitions and discussions which define this concept were a critical initial step in ascertaining the faceted nature of music. Bawden (2012, p. 156) also differentiates between “do novo” conceptual analysis and analysis carried out through examination of the literature; this thesis largely uses the latter. The concepts analysed – such as facet analysis – have already received a lot of consideration and careful analysis by theorists, so it would not have been beneficial for this thesis to ignore the existing literature and philosophical debate.

2.2. Re-purposing literature analysis as a form of content analysis

It is useful to consider how the literature analysis of LIS music classification can be considered through the lens of the methodology of “content analysis”. For example, Krippendorff (2004, p. 87) gives an overview of the main features of quantitative and qualitative content analysis (in an attempt to illustrate the common ground between both types of content analysis):

“... [both types of content analysis] sample text, in the sense of selecting what is relevant; unitize text, in the sense of distinguishing words or propositions and using quotes or examples; contextualize what they are reading in light of what they know about the circumstances surrounding the texts; and have specific research questions in mind” (Krippendorff 2004, p. 87).

The literature analysis in this thesis is certainly working towards answering the research questions of the thesis and only using the music classification literature which is relevant rather than all available literature; for example, literature concerned with issues limited to a single library was largely dropped. Examples from the literature are used throughout the thesis, and attempts are made to contextualize the examples, for instance in placing the literature within the context of its country, time period and purpose underpinning the text. Therefore, in the broadest way, the literature analysis of LIS music classification is loosely using the methodology of content analysis.

Though traditionally thought of as a quantitative method, content analysis is also qualitative (White, Marsh 2006, p. 23), and the literature analysis methodology employed in this thesis shares certain traits with qualitative content analysis. One significant difference between qualitative and quantitative content analysis is that in qualitative analysis, some ideas are found in the text that were not sought nor originally considered (White, Marsh 2006, p. 34). This occurred multiple times in the course of the thesis; for instance, the importance of formats within music classification literature was not originally considered to be a main topic, but the literature revealed its importance and thus it is considered in a separate section in Chapter 4.

Inevitably, qualitative content analysis uses only a small number of texts, as the reading of the texts is very close and texts may be read multiple times (White, Marsh 2006, p. 36); this was borne out by the literature used in this thesis. While the initial reading in music KO was reasonably wide, there was much closer analysis of a number of key, theory-based texts, such as Redfern (1978) and Elliker (1994).

However, there are a number of significant variations in the literature analysis in this thesis and the formal content analysis methodologies as described in Krippendorff (2004). For instance, in this thesis the specific parts of texts for close reading were identified freely using criteria assigned during the literature analysis process, rather than following a pre-ordained pattern. No formal use was made of “memos”, an essential

step in content analysis methods; rather, new ideas and changes of focus were built into the research plan during the analysis without necessarily noting on a memo the development of the theory at every temporal signpost. Therefore, though the literature analysis method employed in this thesis benefits from being examined using the content analysis standpoint, the methodology utilized is best described as a “quasi-qualitative content analysis” or “loose qualitative content analysis”.

2.3. Techniques of literature search, trawl and sampling

The methodology of the literature search and trawl is an important part of literature analysis. Three main methods of literature searching were utilized for this part of the literature analysis: searching of abstracting tools and bibliographies, citation pearl growing and serendipity. The abstracting site *Library and Information Science Abstracts* (LISA) was used as the initial tool for trawling the literature, which yielded approximately 200 to 300 results when searching for variations of “music” and synonyms of “classification”. A purposive sample of around 70 citations was used to inform the initial, broad reading; these sources were needed to identify the trends and key topics in order to focus the analysis and to search other tools. The criteria for selection of this sample were as follows: first, the citations which suggested theoretical articles and general articles were prioritized. Then, convenience sampling was used to identify those articles in English, French and Italian, due to the language competencies of the author.

As well as LISA, another review was undertaken, using Smiraglia’s bibliography of music cataloguing and classification (Smiraglia, Young 2006). Approximately 270 classification references were reviewed and cross-referenced against the existing reference list (drawn from LISA). References not on the existing list were selectively added; again, convenience sampling was used, so citations in languages such Chinese and Hungarian were omitted. In addition, as by this stage certain boundaries had been set – for instance, it had been decided to exclude sound recording classification from the study – citations which were out of scope were also excluded. Formats such as book reviews were also deemed to be of limited value and were rejected, though reviews of classification schemes were included as these were useful for understanding the reception of classification schemes and in-depth “scholarly” reviews such as those appearing in *Knowledge Organization* were also included. Bibliographies from a small number of citations were also analysed in a similar way where they added value in an underused area. For instance, Netti’s (1960) master’s dissertation on music

classification schemes was particularly rich in references from the first half of the 20th century, an era not well served by abstracting sites such as LISA; the section of Bradley's (2005) bibliography of music librarianship devoted to music cataloguing and classification was useful to both confirm no important sources had been missed through other methods, and also provided a few extra references.

Other methods were also employed which utilized citations. First, a form of citation pearl growing (Rowley, Hartley 2008, p. 116) was used to identify new sources, being particularly fruitful for gaining citations for sources outside the traditional KO and LIS paradigms. Second, citation analysis was used to crudely identify the most cited and respected sources by authors, which would be employed for identifying the sources which would be closely read (for instance, as discussed in identifying major sources in the literature review, see Chapter 2).

The third searching method employed was "shelf browsing", which was utilized specifically to target monographs. It was apparent that a number of general texts on music librarianship and music libraries contained information about classification. However, as these texts were usually published too early to be covered at chapter-level by abstracting services, and the music classification information not normally significant enough to be included as a subject term in the catalogue record, these texts were sought by a serendipitous method. The shelves of University College London Science Library (specifically the music librarianship section within the librarianship collections) and Senate House Library (specifically the music librarianship section within the music collections) were scanned and a number of useful sources found which had not been identified by the other two methods.

As the final stage, the results from LISA were triangulated with the results from abstracting sites with different coverage. *Web of Science* was used to seek out references not covered in LISA using a title/abstract search, which yielded a few extra citations. *Library and Information Science and Technology Abstracts* (LISTA), which has similar but not identical coverage to LISA, was also consulted. While the initial search for literature was carried out in the first year of doctoral research (2010-2011), any relevant references published in the intervening years were added during the course of the research, and a final search of LISTA was completed in July 2016 to ensure that no new references had been accidentally omitted. The initial sample of 70 sources from LISA enhanced with extra references found through other means, were all read broadly.

However, detailed analysis of this many references was not practical, therefore “key texts” were identified using purposive sampling, and these sources were analysed in detail – focusing on a few key resources is a key feature of the content analysis methodology, as mentioned in Section 2.2.

The literature trawl and search used triangulation in a number of ways, which helped to validate the literature analysis research. Using different abstracting tools – LISA, RILM, *Web of Science*, Smiraglia’s bibliography (Smiraglia, Young 2006), and so on – is a useful type of triangulation, namely data triangulation, as this triangulation helps to reduce the number of omissions (Wildemuth 2009, p. 55). The combination of different methods of literature searching – searching abstracting tools, citation pearl growing, citation analysis and shelf browsing – is a form of methodological triangulation, and this not only reduces the risk of significant omissions but also counterbalances any natural biases present in any one of these four methods of literature search (Wildemuth 2009, p. 55).

3. Methodology 2: Classification scheme analysis

The literature review (Chapter 2) and literature analysis which took place during the course of this thesis (above, Section 2) revealed a number of interesting ideas, which influenced subsequent methodologies employed. First, classification schemes were clearly a central tenet of music KO literature. Second, the literature revealed the existence of a multitude of different music classification schemes suggesting an interesting phenomenon at play which was worth exploring in its own right. Third, the literature analysis carried out during this thesis suggested that a classification scheme was the physical realisation of theorists’ views on classification or a commentator’s starting point when discussing music classification; therefore, these schemes needed to be explored in order to better understand the theory of music classification. For all these reasons, analysing music classification schemes was a major methodology in this thesis.

3.1. Outline of classification scheme sampling

The size of the population of music classification schemes or general schemes with music schedules is unknown and even the known number of music classification schemes is large.²⁰ Therefore, only a sample of music classification schemes were used

²⁰ As a rough idea of scale, three major surveys of special schemes for music – Redfern (1978), Elliker (1994) and Nettle (1960) – analyse a total of 11 unique special schemes, and a few more published, special

in this thesis as the purpose of sampling is to improve efficiency by not needing to look at the whole population (Wildemuth 2009, p. 116) – useful, if the total population is unknown. While the initial plan was to work from a deep analysis of a very small number of classification schemes, as the thesis progressed, it became clear that having a second set – a “backing group” as it were – would be useful for various different questions posed by the research. Therefore, two samples were selected. A few “example schemes” and a “broader set”, with one or both sets of schemes employed at various junctures in the thesis.

3.2. Selecting three example classification schemes

Selecting the example schemes started with non-probability sampling. This was chosen as the total population of schemes was unknown, and even the known part of the population was not always easily available. Wildemuth (2009, pp. 120-121) lists four types of non-probability sampling. From these, purposive sampling was the method selected, as this relies on the judgement of the researcher and this was felt to be an important consideration due to the uniqueness of each potential classification scheme. In addition, convenience sampling was also used as a screening device (Wildemuth 2009, p. 121), as only schemes which could be obtained without issue were considered for the sample. Pickard (2007, p. 64) suggests that purposive sampling can be divided into two types, a priori and snowballing. Pickard’s description of a priori sampling best describes the method by which the three classification schemes were selected: developing criteria from theory then outlining what is needed from the members of the sample to fulfil these criteria, usually using a grid system (Pickard 2007, p. 64).

The criteria for selecting the schemes were as follows. First, only special schemes were considered, in other words, those classification schemes which only cover music. The reason for this was that in general schemes, it can be difficult to unpick where a feature has been designed to accommodate music and where it has been inserted for consistency with the rest of the classification scheme. In addition, general schemes introduce the complexities of editions, which significantly complicate the classification scheme analysis. (Some of these complications can be seen when selecting the broader set of schemes.) While two of the eventually-selected schemes do in fact exist in

schemes have been encountered in the course of the doctoral research. Furthermore, there are schemes published as part of journal articles on music classification and schemes such as “McColvin and Reeves” which sit on the boundary of the general/special divide as they are special schemes written as a reaction to music’s treatment in a general scheme. Therefore, a sensible description of the scale of the *special* music classification scheme population would be “dozens”.

multiple versions – which could be viewed as an inevitable consequence of any scheme’s perpetually transient existence over time (Tennis 2010, p. 223) – the “versioning” (Tennis 2010) of these two special schemes is still notably simpler than the “big” general schemes such as *Library of Congress Classification* (LCC) and *Dewey Decimal Classification* (DDC). Second, classification schemes were only considered where they either did have or intended to have a wider impact than just affecting one library collection. Out of the special schemes which fulfilled these criteria, three aspects were selected where different values were sought for each: background of author, geographic location and purposes. So, the following three schemes were selected: Coates’ *British Catalogue of Music Classification* (Coates 1960a, abbreviated to BCM), Pethes’ *Flexible classification system of music and literature on music* (Pethes 1967, abbreviated to Flexible) and Dickinson’s *Classification of musical compositions: a decimal-symbol system* (Dickinson 1938, abbreviated to Dickinson). Their fulfilment of different values for the three criteria can be seen in Figure 1.

	BCM	Flexible	Dickinson
Author’s background	Classification theorist	Music librarian	Musicologist/ music librarian
Geographic location	UK	Hungary	USA
Original purpose	Arrangement of a classified catalogue	Theoretical scheme for potential adoption by international community	Use for a specific collection in specific library

Figure 1. Three selected schemes showing different values for certain criteria

However, purposive sampling was also used in the selection of these three schemes, to not only fulfil the criteria but also ensure that each of the schemes was significant in some regard. In brief, some of their important criteria are as follows: being the so-called first fully faceted scheme in the United Kingdom and authored by a classification theorist (BCM); being in one respect a (common) home-grown scheme, yet published and used in multiple libraries in the United States (Dickinson); intending to be a worldwide scheme for music (Flexible). Dickinson exists in multiple versions, with the so-called “Vassar-Columbia” edition updating and enhancing the original Dickinson scheme (Bradley 2003, p. 471); however, the original version is used in this thesis as it provides an example of a relatively early classification scheme and the single-author

aspect of the original version simplifies the analysis. While no updates to BCM were published, an annotated version was used until the scheme was discontinued – for more details, see Chapter 4.3.1. However, for similar reasons of date and simplification of having a single author, in most cases, only the original, published scheme is used in this thesis.

3.3. Using the case study methodological framework for classification schemes analysis

The case study is an established methodology in LIS (Wildemuth 2009, p. 51) so it is useful to consider whether the analysis of three specific music classification schemes could be viewed as a type of case study research.²¹ Yin defines a case study as exploring a “... contemporary phenomenon in depth and within its real-life context ...” (Yin 2009, p. 18). The three example schemes under exploration in this doctoral study fail this list of criteria in three ways: the schemes are not contemporary and the issues they raise are not exclusively new; it is difficult to argue that a classification scheme is a “phenomenon”, as schemes lack the event or sensual qualities associated with phenomena (“Phenomenon” 2008); the investigation in this thesis focuses on the schemes as *documents* rather than focusing on their *use*.

Nevertheless, this thesis does share the aims and general theoretical approach of the case study methodology. For instance, Pickard (2007, p. 85) suggests that the aim of a case study is to consider the particular as well as looking at something with a specific purpose in mind – both aims shared by the use of three example schemes in this thesis. So, while the use of these three schemes is not directly a case study methodology, it can be useful to use some of the models from case studies in order to unearth more information about how the three example schemes are working as a methodology.

The first consideration is the type of case study. Pickard (2007, p. 86) identifies three types: intrinsic, instrumental and collective. The three examples of classification scheme were generally used in order to analyse and understand music classification generally and therefore could be considered to be instrumental (Pickard 2007, p. 86); knowledge and information about the schemes themselves were not deemed valuable in their own

²¹ There is some debate over how the term “case study” is used. Both Burns (2000, p. 459) and Pickard (2007, p. 85) describe the use of “case study” in methodological literature as a catch-all term. In addition, a case study can be either the writing produced as an output of a study or the research process itself; researchers discussing methodology for LIS such as Pickard (2007, p. 85) or Wildemuth (2009, p. 51) both use the term “case study” to mean the latter, thus this section uses the term in the same way.

right most of the time, even when knowledge about the specific schemes was enhanced as a by-product of the research – for example discussions about the multiplane approach (Chapter 4, Section 5) and the connection of schemes to an organological scheme (Chapter 7, Section 5). However, the schemes were all used in a collective way, as three schemes rather than one constituted the “case study”. A second consideration which is useful for thinking how the schemes are used within the doctoral study involves replication, and what Wildemuth (2009, p. 54) describes as either “theoretical” or “literal” replication. For this study, theoretical replication was utilized, as there was no intention to get the same results from each scheme; in fact, the difference in analysis between the three example schemes provided much richness to the study.

3.4. Selecting a broad set of 15 classification schemes

While in some parts of the thesis, the three classification schemes described in Sections 3.1 to 3.3 answered the theoretical questions about LIS music classification, in other parts of the thesis it became clear that a wider set of example schemes needed consultation. Therefore, in addition to the three example schemes, a broader set of 15 LIS classification schemes was also selected to add further breadth to the analysis of LIS music classification schemes.

As discussed in Section 3.1 and in the Literature review (Chapter 2), there are many LIS classification schemes which cover music, so some sampling was needed in order to provide a workable set of music LIS schemes. Again, purposive sampling was deployed to narrow the field, and the following minimum criteria were used: include a music schedule within a general classification or to be a special classification for music; cover Western art music; cover all Western art music, rather than a specific subset only; be published. (Note that unlike the three example schemes, in this group, general schemes were also included.) In addition, interoperability of terms in different languages would add extra complications to the analysis and would create unnecessary additional work, therefore only schemes which included English were considered – thus, using convenience sampling to narrow the field further.

Even with these criteria, there are more schemes than would be practical to include in this thesis, so more purposive sampling was used. The chosen 15 schemes were selected in order to provide a wide coverage and give a “popular” account of issues within music classification, so obscurity was not considered an advantage to the analysis. The coverage of LIS schemes in key texts was considered the basis of the

selection; 12 out of 15 schemes appear in Elliker (1994) and seven appear in Redfern (1978).²² Other factors were considered important, such as ensuring the inclusion of modern and historic schemes, widely-discussed or widely-used general schemes, and including some of the earliest special schemes for music. So, the following schemes were selected:

- Ayer's 1902 article outlining a classification scheme for music (Ayer 1902)²³
- *Bliss Classification*, 1st edition (Bliss 1953)
- *Colon Classification*, 6th edition (Ranganathan 1963)
- *Colon Classification*, 7th edition (Ranganathan, Gopinath 1987)
- Cutter's 1902 article about classifying music (Cutter 1902)
- *Dewey Decimal Classification*, 19th edition (Dewey, Custer 1979)
- *Dewey Decimal Classification*, 22nd edition (Dewey et al. 2003)
- Cutter's *Expansive Classification* original edition (Cutter 1891-1904)
- Haroon's revised music schedules for the *Colon Classification* (Haroon 2010)
- *Library of Congress Classification*, current edition (Library of Congress 2015)
- McColvin and Reeves' adaptation of *Dewey Decimal Classification's* music schedules, appearing in their textbook of music classification, which was later edited by Dove (McColvin, Reeves & Dove 1965)
- Olding's outline of a classification scheme (Olding 1954)
- Ott's outline of a classification scheme (Ott 1961)
- Duff Brown's *Subject Classification* (Brown 1914)
- *Universal Decimal Classification*, 3rd edition, standard edition (British Standards Institution 2006).

Nine of these are general schemes, with the other six being either specially created special schemes for music or music-related spin-offs from general schemes. For simplification, these particular versions of classification schemes will be referred to by their abbreviated titles from this point onwards: Ayer, Bliss1, Colon6, Colon7, Cutter1902, DDC19, DDC22, Expansive, Haroon, LCC2015, McColvin and Reeves, Olding,

²² Of the three schemes which do not appear in Elliker (1994), one was published a number of years after Elliker's article was written and two appear in multiple versions in this thesis but in only one version in Elliker (1994).

²³ The Ayer scheme is taken from an article by Ayer about music classification and his scheme for the Harvard University library. In some sources this is referred to as the *Harvard Classification* but will be referred to by its author in this thesis.

Ott, Subject, UDC.²⁴ (Note that the specific editions listed above will be referred to by these specially-formulated abbreviations; however, when referring generally to a family of classification schemes – for instance *Dewey Decimal Classification* or *Library of Congress Classification* – the full italicised title will be used or a standard and stated abbreviation, such as DDC or LCC.)

Editions and versions of LIS classification schemes (see, for instance, Tennis (2010)) proved to be a significant issue when sampling schemes, as most of the chosen schemes exist in multiple editions, and many of these live within a complex system of editions and versions. So, a mixture of purposive and convenience sampling was used to select the editions used in the above list. Generally, the latest version of the scheme was selected – albeit when the latest version was easily available in London and no major changes were known between the latest version and that easily-available version. Sometimes the latest version changed during the course of the doctoral study. For this reason, DDC22 is used rather than the 23rd edition of DDC, which was published during the course of the thesis; while the online, free publication of LCC in 2015 meant an easy transfer to the latest version of LCC; by 2016 this 2015 version is no longer quite the latest. For purely pragmatic reasons, the latest version of UDC was not consulted as a slightly earlier edition was more easily available. At the time of writing, the second edition of *Bliss Classification* has not been published; however, a draft of a revised version of the *Bliss Classification* music schedules was produced in 1972 to 1973 and was extended in 2002 (Bliss, Lane 2002). As this draft largely copies BCM, with a few additions, it was not considered necessary to include the draft of the new edition of *Bliss Classification* in this thesis. Yet, the original scheme of *Bliss Classification* (Bliss1) was important to the development of faceted classification, so the older edition is included instead.

However, sometimes one edition of a classification scheme was not considered to be sufficient, as the schemes might have undertaken considerable change in the music schedules between editions. Satija (1997, p. 20) lists the editions and dates of Ranganathan's *Colon Classification*, suggesting that while Ranganathan was alive the scheme was predominately the work of one man, Ranganathan (Satija 1997). Therefore, it makes sense to utilize one of the “pure” Ranganathan editions of *Colon Classification*: the revised version of the 6th edition of *Colon Classification*, published in 1963. This

²⁴ While the abbreviation “Subject” will be used where possible, on some occasions it will prove necessary to give the full name of this classification scheme in order to avoid confusion.

particular edition has been selected as it is the last edition written while Ranganathan was alive, and is also considered to be the most popular edition (Satija, Singh 2013, p. 266). However, the 7th edition is also selected: not only is it the first edition which appeared after Ranganathan's death (Satija, Singh 2013, p. 266), thus demonstrating different authorship, but is also profoundly changed from Colon6 (Satija, Singh 2013, p. 266) including significant changes in the music schedules. Thus, both editions make an appearance in the classification scheme "backing group". DDC is one of the most significant examples of this phenomenon. The music schedules undertook radical changes between editions 19 and 20, through the conduit of a *Phoenix Schedule*; this radical new schedule for music was developed in 1974 to 1975, revised during 1975-1979, and then published in 1980 (Humphry 1980, p. viii). Therefore, including a representation of the pre-DDC20 and the post-DDC20 schedules was imperative. For the "before", the last pre-DDC20 edition, in the shape of DDC19 schedule was included, but selecting one or more post-DDC20 editions was more complex. As the *Phoenix Schedule* was not used in its published state, it was considered more useful to include a published schedule, and as the main structure of the revised music schedules did not change drastically between DDC20 and DDC22, only DDC22 is included in the list.

3.5. Using the broad set of 15 classification schemes

The broad set of schemes is used in a number of ways in the thesis. In some places the set is used as an overall way of gauging an issue – such as the most popular terminology used for a musical term within LIS classification or the groupings and order of specific music-related concepts in LIS classification schemes. At other times, the 15 schemes provide a pool to draw upon when giving examples of phenomena found within music classification. In these places, the whole set of 15 schemes are not mentioned, but the example schemes are generally drawn from their ranks.

However, it should be noted though that while the 15 schemes are the bedrock of the broader set of schemes, in every chapter, there are slight changes to the line-up to best fit the analysis. For example, sometimes adding earlier or later editions of schemes already being used are useful for discussion. In Chapters 5 and 6, the 13th edition of DDC (abbreviated to DDC13 when used alongside the other 15 schemes) is added to the broader set of schemes; more pre-20th editions of DDC are used, for instance, to trace the development of the classification of saxophones and electronic instruments in Chapter 7, while the 1904 and 1917 music schedules of LCC and unpublished

annotations to BCM are used in discussions of unusual instruments. Conversely, some schemes are not relevant for certain sections or chapters. In Chapter 7, only schemes which list many specific instruments are useful, so some of the early 20th-century schemes are temporarily abandoned; in Chapter 8, the non-Western nature of Haroon means it is of little use for discussions about form/genre and is dropped.

4. Methodology 3: Music domain analysis

The third methodology utilized in this doctoral study concerns considering the music domain. The introduction (Chapter 1) outlined the importance of examining how a concept was classified from the perspective of its domain, through for example, writings on particular domain classifications by Hjørland, Scerri, Dupré and others (Hjørland 2008b, Scerri 2011, Dupré 2011) and for instance the debates between Beghtol, Hjørland and Nicolaisen (Beghtol 2003, Hjørland, Nicolaisen 2004, Beghtol 2004, Nicolaisen, Hjørland 2004) concerning so-called professional and naïve classification. So, the consideration of domain-based ideas of classification is the third methodology. At a broad level, the methodologies used to analyse the music domain are very similar to those used for the LIS domain – as discussed under Methodology 1 and Methodology 2. However, there are some differences, so the music-domain equivalents of literature and conceptual analysis, classification scheme analysis and analysing a specific set of example classifications are now discussed.

4.1. Literature and conceptual analysis

Literature and conceptual analysis is an important methodology in determining how music is classified within the music domain. However, while the methodologies employed follow a similar pattern as those used for LIS classification – for instance, using an abstracting site and citation pearl growing – the general importance attached to the *concept of* classification within the music domain as compared to the LIS domain, resulted in taking a somewhat different direction. Furthermore, as this thesis is based within the LIS paradigm rather than music, a broad investigation of music classification within the music domain would suffice.

General ideas of classification were sought as a starting point using a key abstracting site used in music: *Répertoire Internationale de Littérature Musique* (RILM). However, the results were very different from the equivalent searches in LIS sources such as LISA. In RILM, general accounts of classification or classifying were not found, and once results

based in LIS and computer science (through music information retrieval) were discounted, the valid results tended to focus on particular areas of the music domain – such as ethnomusicology and organology (the study of instruments). For each music classification phenomenon, such as medium, form/genre, function, and so on, RILM was searched for equivalent results within the music domain, in addition to searching the seminal encyclopaedia for music (Grove). With the notable exception of musical instruments (Chapter 4), these searches did not yield many results.

As an alternative, the literature and conceptual analysis which appears in the thesis was mostly found using citation pearl growing, often from a single source. These “pearls” were usually found through general musicological reading or from a reference directly from the LIS literature, rather than direct results from RILM. So, the process of finding discussions about music classification from the music domain suggested a number of somewhat interlinked conclusions. First, the music domain is less concerned with how music is classified than LIS. Second, the so-called lack of literature sometimes represents a lack of *explicit* discussion about classification; in other words, sometimes discussions about music are talking about classification, but not acknowledging that they are doing so. Third, sometimes the level of detail was an issue; for instance, discussions and taxonomies of chords or individual paraphrases for a particular composer existed in the music domain, but this was too detailed to be comparable to LIS. Whatever the reasons for the dearth of equivalent literature about music classification in the music domain, the following methodologies were adopted: some general discussions about music classification using only a few sources (for example, the discussions in Chapter 4, Section 4) and some analysis of classificatory ideas in the music domain which might have at their source some musicological discussions which do not directly discuss classification at all (see for example, discussions in Chapter 5, Section 4).

A notable exception to the lack of direct discussion about music classification is found in Chapter 7, devoted to the classification of musical instruments. Organology, the area of study concerned with musical instruments, appears to put classification at its centre, which meant a rich seam of literature which directly discusses classification. As well as results from abstracting tools such as RILM, the analysis of organological classification literature also made good use of citation pearl growing, with Kartomi’s (1990) monograph about the classification of musical instruments proving to be an excellent “pearl”.

Finally, a short note is needed about the use of Grove in this thesis. Music-based research would be in most cases expected to consult more detailed resources than an encyclopaedia such as Grove. However, this thesis makes much use of Grove in a number of ways and for a number of reasons. First, when discussing musicological concepts such as a particular instrument, form, and so on, the purpose is to get a sense of the standard, most common ways those in the music domain consider the term in order to understand these ideas within LIS classification, so Grove is an ideal source. Second, the thesis is frequently concerned with definition, thus Grove articles are very useful for this task. Third, as Grove is a seminal resource within the music domain, the inclusion or exclusion in Grove for a particular term – for example, choral symphonies – helps to ascertain useful information from the classification perspective. Fourth, as this is not a musicology thesis, a simple overview from Grove was often adequate for the purpose of providing a brief explanation for a concept within a LIS thesis. Fifth, sometimes Grove itself was used as a primary resource, for example the Grove composer lists discussed in Section 4.3.

4.2. Classification scheme analysis

The original intention was to use a similar methodology in analysing music-domain classification schemes similar to that utilized in Methodology 2. However, outside of organology (Chapter 7), few schemes relevant to the topics discussed in Chapters 4 to 6 and Chapters 8 to 9 were revealed in literature searching and there were no suitable leads given in the literature and conceptual analysis. So, some alternative approaches were attempted. The first attempt was to consider the organization of music textbooks as a representation of the music domain's music classification, in a manner similar to Abrahamsen's (2003) discussion of the arrangement of two music textbooks. So, the contents of the multipart monographs *The Oxford History of Music* and the newer series of monographs *The Cambridge History of Music* were scrutinized. However, this did not provide appropriate findings as it seemed analysing music textbooks is insightful for considering the classification of music literature – effectively, Abrahamsen's (2003) motivation – but less so for representing the organization of musical works.²⁵

²⁵ The original objective of this thesis was to consider the classification of music literature, which was an initial reason why this method was tested at all.

The second method attempted was thus to consider resources which list musical works: classified lists of composers' works. These appear in a number of different guises but one proved particularly useful: the lists of composers' works found under the entries of individual composers in Grove. Grove offers guaranteed coverage for all composers of a certain level of importance, with some levels of consistency between composers even if the basic categorization and order of categories differs. More details about this methodology are discussed at length in Section 4.3, which also explains how the individual composers were chosen. An additional type of source was also explored with the idea of enhancing the Grove analysis: thematic catalogues. The thematic catalogue is a scholarly resource which lists every work by a composer, often with incipits of the first notes of the musical composition. A pilot study was attempted but the results suggested that this would not be a beneficial line of enquiry to explore further: many of the catalogues were arranged chronologically rather than in a classified fashion, and the availability of thematic catalogues varies widely between different composers causing issues when attempting to create a good set of examples.

In some chapters, classifications covering areas of music were sought. For instance, classification schemes pertaining to examples of forms and genres were sought for Chapter 8, such as taxonomies of opera or classifications of orchestral forms/genres. However, these were generally not forthcoming and so a different approach was used instead, which again focused on indirect discussions of the classification of forms/genres in musicological discourse, rather than analysis of music-domain classification schemes.

Conversely, classification schemes for musical instruments were found to be abundant and therefore could be utilized in the study. The most dominant classification scheme, *Hornbostel and Sachs*, was used directly, while secondary literature from organology was used to discuss other classification schemes. This was partly due to the detailed accounts of the history of organological classificatory thought provided by Kartomi (1990), DeVale (1990), and others, meaning that overall trends in categorization could sometimes be used as a shortcut to obtaining the same information from direct analysis.

4.3. Grove composer worklists

The Grove composer worklists formed the main set of classification schemes from the music domain and were analysed at a few different points in the thesis. Grove includes a list of works for every entry about a composer, and the organization of these worklists – which for some composers can contain thousands of musical works – can be

considered to be a type of classification structure. In the online version of Grove, the worklists appear at the end of the article on a particular composer, usually as a separate tab.²⁶ From here onwards, these will be shortened to “Grove worklists”. However, there are some ways in which composers’ worklists are not ideal as a methodology for this thesis. Generally, lists of composers’ works do not emulate the coverage of classification systems found within LIS schemes – LIS classification schemes cover multiple composers, as they are attempting to cover the universe of musical works, rather than the oeuvre of a particular composer. In addition, the Grove worklists only use one, or occasionally two, levels of hierarchy as they are in essence a broad categorization scheme. Again, this limits their usefulness for comparing classification between the LIS and music domains. Nevertheless, due to the lack of general music domain classifications as described in Section 4.2, the Grove worklists were the most suitable tool at the disposal of this research project, and they provided some useful results.

It would have been impractical to select every composer featured within Grove, and thus sampling was needed. A pragmatic figure of around 25 was selected in the first instance as a good size for the sample. In a similar vein to the selection of classification schemes, obscurity was not considered of particular value for a number of reasons: more mainstream composers will be more comparable with LIS classification schemes, which are largely designed around mainstream works; the desire for large worklists where possible, as these will need more detailed classification, which are more likely to occur when a composer is reasonably well known. Time period was another important factor: in order to cover the biggest range of Western art music as possible, composers from a range of time periods were desired in the selected worklist. So, purposive sampling was needed to ensure that all the composers met the criteria of being “not obscure” and from a range of time-periods. To achieve these criteria, a list of composers found in the “Subject guides and research resources” section of Grove (Oxford music online 2016) was utilized as the basis of the sampling. The composers were divided into stylistic periods: Medieval, Renaissance, Classical, Romanticism, twentieth century and

²⁶ The specific composer worklists have been referenced. It has been assumed that unless a specific set of authors is stated for the worklist, that the authors responsible for the whole article also wrote the worklist. Dates of articles in Grove are generally problematic and there are various practices within musicology. In this thesis, where an update date for the whole article, the worklist or the bibliography has been provided, this has been used as the publication date. However, where no update date is given, the publication date has been assumed as the date of retrieval. So, in the case of the Grove worklists, the retrieval date occurred in 2014 when this part of the research was carried out.

opera. The latter (opera) was ignored, as it would not have helped to reach the goal of wider time periods and presented potential duplication.

However, using all the composers featured in the subject guides would still have been much more than 25. So, more sampling was used. The composers were grouped into their stylistic periods, and even though there were different numbers in each of the periods, four composers from each category were selected. As an arbitrary measure, the composers in each period were placed into alphabetical order and divided into four groups, with the first of each group selected.²⁷ Where the lists did not divide neatly into four, the final group was bigger and contained “the remainders”. This method was selected rather than an alternative of dividing remainders between some of the groups, as it produced a more useful list containing Handel, Mozart and Beethoven, all significant composers with long lists of musical works – this illustrates purposive sampling at work, and how some decisions were made a posteriori. However, composers which would have been selected using this “alternative” method were used as a list of “reserves” when extra composers were needed. Thus, a set of 24 composers was produced.

However, a few changes were needed to the list. First, due to the diversity of music produced in the first half of the 20th century, it was considered problematic that the final 24 did not include composers who primarily wrote during this time-period – again, purposive sampling at work, manipulating the results of the sampling to ensure coverage which helps to answer the research questions. So, two composers were added from the 20th century group, with a decision to add two extra composers rather than replace two existing composers, as the 20th century group had been the biggest in the first instance. Two composers from the “reserve” were selected who added national styles not already featured in the set of worklist. Second, two composers from earlier periods had no classified worklists – one (Fruolfus of Michelsberg) being considered more of a theorist rather than a composer and the other (Cavalieri) having too few extant works for their worklist to be classified. While a replacement from the Baroque list was selected from the “reserves” for Cavalieri, due to the dearth of composers in the Medieval list in the first instance and the few Medieval composers who had classified worklists, an alternative was not taken for Fruolfus of Michelsberg.

²⁷ Note that two composers (Monteverdi and Beethoven) appeared in two different categories. However, as this did not interfere with the selection methods, this was ignored.

So, the Grove worklists of the following 25 composers were used as a set of example classification systems in this thesis:

- Adam de la Halle (Falck 2014)
- Jacopo de la Bologna (Fischer, D'Agostina 2009)
- Guillaume de Machaut (Arlt 2014)
- Gilles de Bins Binchois (Fallows 2014)
- Guillaume Du Fay (Planchart 2014)
- Pierre de la Rue (Meconi 2009)
- Giovanni Pierluigi da Palestrina (Lockwood, O'Regan & Owens 2014)
- Tomaso Giovanni Albinoni (Talbot 2014)
- Francesco Cavalli (Walker, Alm 2014)
- George Frideric Handel (Hicks 2014)
- Alessandro Scarlatti (Boyd 2014)
- Carl Philipp Emanuel Bach (shortened to C.P.E. Bach) (Wolff 2014)
- Ludwig van Beethoven (Burnham, Johnson 2014)
- Christoph Willibald Ritter von Gluck (Brown 2014)
- Wolfgang Amadeus Mozart (Eisen, Sadie 2014)
- Daniel-François-Esprit Auber (Schneider 2014)
- Franz Liszt (Eckhardt, Mueller 2014)
- Luigi Cherubini (Fend 2014)
- Robert Schumann (Daverio, Sams 2014)
- John Adams (Cahill 2008)
- Pierre Boulez (Hopkins, Griffiths 2011)
- Philip Glass (Strickland 2002)
- Wolfgang Rihm (Häusler 2005)
- Leoš Janáček (Tyrrell 2014)
- Dmitry Shostakovich (Fay 2014).²⁸

²⁸ Note that generally only the surname of the composer will be referred to in the thesis. However, initials or first names will be used when either musicological convention is to refer to the whole name which is especially pertinent for Medieval composers, or there is a possibility of confusion with another, equally or more famous composer from the same family (such as C.P.E. Bach).

5. Methodology 4. Synthesis of different analyses

The final methodology to be discussed is that of synthesis. Synthesis is a useful methodology as it often provides new ideas from concepts which show no obvious signs of association (Hart 2001, p. 2). For each chapter, which covers a separate element of music classification, both the literature analysis and the classification scheme analysis have been synthesised. For example, Chapter 7 is a synthesis of the literature analysis of bibliographic KO concerning musical instrument analysis and the results of analysing the three example schemes with the 15 broader examples. Furthermore, another aspect of the thesis could be considered as synthesis: the comparison of classification phenomena found in the LIS and music domains. For instance, Chapter 7 sees the cross-fertilization of ideas between classifying instruments in the music and LIS domains, and conceiving of a model which compares both the domains could be considered in terms of synthesis. In addition, the ideas within each of the domains have already been synthesised – for instance, Chapter 7 contains synthesis of literature analysis and classification scheme analysis within LIS, then it is synthesised with the findings from music-domain literature analysis. So, this “double synthesis” methodology could be termed “meta-synthesis”.²⁹

Synthesizing the results of the literature analysis and classification scheme analysis within each of the domains could also be considered as a form of triangulation – more precisely, “methodological triangulation” (Wildemuth 2009, p. 55). Analysing the theoretical schemata complements the analysis of the realizations of those theories as demonstrated through classification schemes. Triangulation has two purposes which are both exemplified by this use of multiple methodologies: corroboration of the same phenomena and flattening out any strengths and biases of two different methodological systems (Pickard 2007, p. 86). (This is why triangulation is a useful way of considering the synthesis of methodologies within one of the domains, but not useful as a way of considering comparison between domains, as both accords and discords were sought.) For instance, Chapter 4 shows how the example LIS music classification schemes selected use medium and form/genre as the main facets which corroborate the findings from the LIS literature analysis. An example of how triangulation helps to balance out strengths and weakness of two methods can be seen when considering the classification of accompaniment (Chapter 6): the literature analysis proved unhelpful for this detailed

²⁹ It must be noted that in some chapters, there is less synthesis between the music and LIS domains than others – for instance, Chapter 6 is almost entirely focused on LIS classification, using a few ideas from the music domain to enhance the LIS classification analysis.

query into the mechanics of music classification, but the classification scheme analysis was insightful. Yet, the opposite situation can be seen when exploring the general development of LIS music classification.

6. Ethical considerations

Ethical considerations have been taken into account in constructing this research study. The work was carried out in accordance with the research ethics policy of City, University of London.

One area of consideration is the copyright of classification schemes. The schemes selected were mostly published, and copyright has been obeyed in the same manner as all published resources. One unpublished annotated scheme is briefly discussed in this work: the British Library's annotated copy of BCM, where copyright resides with the manuscript owner. No direct images are used from this scheme and the same consideration in quoting accurately and attribution are used as for other resources.

A few informal conversations with experts outside of my supervision team enriched the study, in particular a conversation with an organologist. Where their ideas are useful for the thesis, these conversations have been attributed in the same manner as a conventional communication with a scholar.

7. Conclusion to Chapter 3

Four main methodologies were employed in this thesis, although each methodology actually shares the same broad methodological approach: analysis. The analysis within the LIS domain was centred on analysing literature, concepts and classification schemes. This chapter showed that considering the relationship between the analyses used in this thesis and more established LIS methodologies, such as content analysis and case studies, can be insightful even if literature, conceptual and classification scheme analysis cannot be completely understood in terms of these more conventional LIS methodologies. In fact, future research – it is outside the scope of this thesis to consider this here – might consider how classification schemes function as “content” within the framework of content analysis, a possible methodological exploration which continues on from some of the findings in this thesis about redrawing and redefining what we think of as “the classification scheme”. As literature trawling and searching revealed more LIS music classification literature and schemes than were pragmatic for close

analysis, a major part of the methodological work involved sampling. Purposive and convenience sampling techniques proved the most useful, and as well as narrowing down the literature to be analysed, this produced a set of three example classification schemes coupled with a broader set of 15 schemes to be used when wider results are needed.

In some regards, the third methodology, devoted to music domain analysis of music classification is not a separate methodology at all. For at heart it uses the same methods deployed as methodologies 1 and 2. However, it is discussed as a separate methodology, as closer examination of the methods used to analyse music classification in the music domain revealed many differences in the outcomes of using these methodologies, even when the techniques were similar. For example, explicit literature about music classification was more difficult to find than in LIS, so alternative searching methods were employed; in addition, a dearth of easily available music-domain music classification schemes meant certain comparisons between the LIS and music domains could not be made in the way that was initially desired. However, one usable realisation of music-domain music classification was found in the organization of lists of composers' works in Grove, and again, the sampling used to select which composers would feature was largely purposive. Another interesting aspect of the third methodology was the differentiation between suitable resources or classification schemes in different areas of the music domain; the classification of musical instruments typically provided classification-focused literature and classification schemes, likely to be caused by a need within the subdomain to classify actual objects, whereas the classification of accompaniment, forms/genres or function, and so on, were classifying knowledge rather than objects and no such explicit classification-focused literature or schemes existed.

Methodology 4, by its essence, drew the others together: a "meta-synthesis" which synthesised both the literature/conceptual analysis with the analysis from the schemes, and in some places, also synthesised findings about classification from the LIS and music domains. In conclusion, analysis is the overall methodology of this thesis, and this analysis is fed into a system of meta-synthesis, which in turn is used to model the classification of notated Western art music.

Chapter 4: The facets of music

1. Introduction to Chapter 4

In order to begin looking at the knowledge organization (KO) of music, it is important to consider the most fundamental question of all: what are the classification principles at play when considering music KO. This thesis chooses to consider music KO through a classification framework known as faceted classification – or as will be seen in later sections, a number of variants on these terms. While faceted classification has excellent coverage in KO literature, though as will be shown there are some significant gaps in basic tasks, its relationship to music and more fundamentally, *how* music can be considered in a faceted framework, are not popular topics of consideration. Hence, this chapter will discuss the classification of music through the lens of faceted classification.

Faceted classification is the single most important set of theories within KO; from the antecedents of faceted ideas by Otlet, La Fontaine, Bliss, Kaiser and others at the beginning of the 20th century (Broughton 2004, p. 259, Dousa 2013, p. 403) their official codification by Ranganathan in his *Colon Classification* (1933) and *The Prolegomena to Library Classification* (1937) then the extension and adaptation of faceted classification theories by the Classification Research Group (McIlwaine, Broughton 2000) and many others, it is clear that faceted classification, both itself and reactions to it, are fundamental to KO. Therefore, it is only appropriate that a thesis about music KO must tackle questions about how music and faceted classification fit together. However, it is not predetermined how facets and the system of facet analysis associated with faceted classification apply to music. Therefore, this chapter first needs to spend considerable time exploring this concept.

So, the chapter starts by a brief outline of some of the concepts of faceted classification which are needed in the PhD, including defining “faceted” and “faceted classification”. A substantial section follows which considers how facets might work for music, including the ideas of facets of music as realised in classification schemes for music (taken from some primary and secondary analysis of music special schemes), as well as the determination of the music facets from secondary music classification literature. It also discusses the idea of universal facets for music, and asks how music facets fit into general ideas about fundamental categories and citation orders. The discussion then

moves towards ideas of facets found – directly and indirectly – in the music domain. The final section looks at the special relationship between faceted classification and music, using BCM and Dickinson as its guide and introducing the “multiplane approach” to analyse knowledge about classification schemes. Therefore, this chapter shows how abstract ideas of faceted classification can be applied to the notoriously difficult subject of music, and identifies which facets might be expected to be important players.

2. General theories of faceted classification

Faceted classification theory is an expansive area of KO. This section will first seek to define the borders of facet-ness and its related terms. This is followed by a discussion of a small selection of key ideas within faceted classification which are particularly pertinent to the interaction of faceted classification and music. (Please note that this section is designed to introduce the parts of faceted classification which are particularly important for music, and thus many key parts of faceted classification have been omitted. Also note that while most of the ideas discussed in Section 2 are applied in this chapter, some are visited in subsequent chapters.)

2.1. “Faceted-ness”, facet analysis and faceted classification

This thesis is going to make much use of theories related to facets and faceted classification. Therefore, in order to employ these techniques as analytical tools for music, it is vital to address the terms and terminology of “faceted-ness”. At first glance, there appear to be multiple ideas and terms being used: for instance, “facet analysis”, “faceted classification”, “analytico-synthetic classification”. Therefore, the first task is to investigate whether these terms are synonyms, and if not, which terms are most useful for this thesis.

In her seminal analytical overview of research in facet analysis, La Barre (2010, p. 244 and p. 247) states clearly that there is a fundamental difference between facet analysis and faceted classification: the former is a method and the latter is a structure. Commentators often describe one in terms of the other, for instance, defining faceted classification as a scheme which uses facet analysis (La Barre 2010, p. 249, heavily based on writings by Vickery) or more precisely a scheme which uses only facet analysis (Broughton 2004, p. 258). Broughton (2004, p. 257) goes further and suggests a symbiosis between the relationship between facet analysis and faceted classification by defining facet analysis entirely in terms of faceted classification: facet analysis is the

"methodology of faceted classification". For the purposes of this thesis, La Barre's distinction will be adopted between "facet analysis" as method and "faceted classification" as structure of classification schemes.³⁰

However, what does facet analysis mean, and what conditions need to be met in order for any sort of faceted label to be applied? It is not possible to work from a singly agreed definition of facet analysis/faceted classification as commentators do not agree on how these terms should be defined (La Barre 2010, p. 245). Working through a sample of definitions, a couple of trends emerge. First, that facet analysis, or a general expression of faceted-ness, is described loosely as a breaking of complex subjects into their most fundamental or elemental concepts (for instance, Broughton 2004, Langridge 1992, La Barre 2010). To some commentators (for instance, Coates 1960a, p. ix), another aspect of facet analysis is critical: a prescribed order to build up these elemental subjects is an important part of faceted classification, what would be technically termed the "citation order". This is not universal, however, as this idea of order does not feature in some commentators' definitions; for example, Keenan and Johnston (2000) in their definition of a faceted classification scheme in a dictionary of library and information science (LIS) omit any mention of ordering the facets.³¹ Therefore, something will be accepted as facet analysis even if there is no designation of order.

2.2. Defining a faceted classification scheme

One of the main ways that "faceted-ness" is manifested is through its use in classification schemes. This could be considered to have two parts: determining whether faceting is part of the scheme's design, and if so, determining boundaries as to whether the whole scheme is a faceted classification scheme or not. There are a number of different interpretations of the binary categorization of faceted classification scheme/not a faceted classification given in KO literature, and it is useful to combine a number of ideas. Ranganathan (summarised by La Barre 2010, p. 248) suggests there is a sliding scale between "enumerative" and "analytico-synthetic" systems, ranging from one to five. Using Broughton's (2004) definition of a faceted classification scheme which

³⁰ However, there are still many other related terms to consider. For instance, La Barre (2010, p. 270) suggests that Ranganathan intended a separate meaning for "analytico-synthetic classification" from the terms "facet analysis" and "faceted classification"; however, other commentators such as Langridge (1992, p. 37) treat "analytico-synthetic" and "faceted" interchangeably. As the term "analytico-synthetic" has been defined less frequently than the "facet"/"faceted" terms, it is difficult to compare its various assigned meanings. Therefore, for the purposes of this discussion, the term "analytico-synthetic" will be considered a synonym for "facet" or "faceted".

³¹ Note that while they do not talk about the order of the facets, Keen and Johnston (2000) do mention order of concepts within the facets, but this is a separate idea – see Section 2.4.

requires the whole scheme and every part of it to use facet analysis, we can combine this with Ranganathan’s levels – see Figure 2.³² This can also be visualized as a sliding scale, which can be seen in Figure 3. The difference between the 4th and 5th levels appears to be determined by the presence, or not, of a “rigid” facet formula (La Barre 2010, p. 248, quoting Ranganathan). The advantage of combining both parts is that Ranganathan’s scale has the ability to answer the question “how faceted?”, or more precisely, “how much facet analysis?” for schemes which are not fully faceted, while Broughton’s answers the original question of is a scheme a faceted classification. The combination gives an extra level of precision to the analyses of classification schemes, which could be useful for this thesis.

Ranganathan level	Facet analysis?	Faceted classification?
Enumerative	N	N
Almost enumerative	Y	N
Almost faceted	Y	N
Rigidly faceted	Y	Y
Freely faceted	Y	Y

Figure 2. Ranganathan’s five levels combined with Broughton’s definition of a “faceted classification”

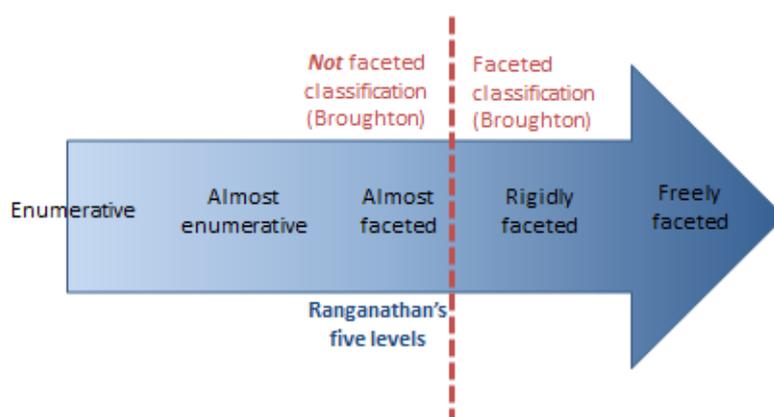


Figure 3. Sliding scale of faceted-ness

³² This combined approach aims to strike a mediating line across various theorists’ definitions and this methodology has not been seen by the author in other works about facet analysis and faceted classification.

Yet, there is an issue with answering the *first* question about faceted classification schemes: the presence (or not) of any facet analysis. If examining the scheme itself, it is not possible to see facet analysis itself, as facet analysis is the process used to create the scheme in the first place. Generally, we are interested in the ontological aspects of the scheme, rather than their creative births; in other words, we are interested in what a scheme *is* rather than the processes used to create it. So, we will be assessing whether facet analysis took place by the evidence it leaves behind: faceting. Therefore, in this thesis, the presence of facet analysis will be taken if the schemes consist, at least in part, of elementary subjects that are designed to be combined with other elementary subjects into complex subjects, with some attention paid to whether the facets are meant to be applied in an assigned order.

2.3. Ideas of order: citation order and order within arrays

“Order” is a complex and involved topic within faceted classification. Two types of order are considered especially important (Langridge 1976, p. 19), and both play important roles in this thesis. First, there is the order of elements within a compound subject, known as a “citation order”.³³ For instance, a citation order would govern whether the time period should be represented before the literary genre in a classification system for literature. Second, there is the order of the (simple) subjects within the schedules, which could be termed the “order of array” (Langridge 1976, p. 20). (An array is a group of simple subjects (subclasses) which are created when a facet is divided into different types of information (my definition, based on Broughton (2004, p. 294)). The difference between an array and a facet is discussed in Section 3.6.) For instance, an order of array would rule over whether “plays” come before “poems” within a facet for literary genres. (Note that “plays” and “poems” would be considered to be “foci” – the single of which in faceted classification terminology is focus – in faceted classification terms, the term used for specific phenomena within an array.) A third type of order, the order of the main classes (for example, whether science comes before arts, or whether physics comes before chemistry) will not be discussed as this thesis is only interested in one of the main classes: music.

Much has been written about citation orders. Ranganathan’s standardisation of citation orders across different subjects is represented by the PMEST formula – see Section 2.4; for instance, time is always the last facet to be applied, and personality is the first. So,

³³ However, Langridge (1976, p. 18) draws attention to questions about compound subjects created from two ideas within the same facet which would not be a citation order.

when discussing how music facets fit into PMEST categories (see Section 3.5), it is important to consider how citation orders fit into the order prescribed by the PMEST order of facets.

Orders within an array can take on various forms, and one general rule appears to be attempting to create a “helpful order” (Vickery 1975, p. 26). While the exact order depends on the terms (Vickery 1975, p. 26) there are some general orders which apply across multiple subjects. For example, Vickery (1975, p. 26) gives a list of orders within an array, originally written by Richardson, and extended by Berwick Sayers: logical, geometrical, chronological, genetic, historical, evolutionary, dynamic, alphabetical, mathematical, decreasing extension, increasing concreteness. Vickery (1975, p. 27) also cautions against following orders so obsessively, suggesting that literary warrant should ultimately lead. So, when discussing “order” in this thesis, it is important that a distinction is made between “order of array” and “citation order”.

2.4. Fundamental facets and PMEST

One discussion by Ranganathan and other theorists concerns whether the facets used for different subjects – such as history, physics, cooking, music, and so on – can be generalised, and have a generalizable order. Ranganathan developed a theory of fundamental facets, which are at the heart of his *Colon Classification* (Ranganathan 1933, and various later editions) and articulated in a number of his writings including *Elements of Library Classification* (Ranganathan 1962). The theory of fundamental facets is concerned with finding the commonality between different facets, and Ranganathan reduces the facets in the whole universe of knowledge to just five: personality, matter, energy, time and space (PMEST) (Ranganathan 1962, p. 82). Frické (2012, p. 189) summaries PMEST as follows: personality is the aspect which distinguishes the discipline, matter is the material, energy refers to process, space is the geographic location, and time describes the temporal element. However, subsequent theories have demonstrated the flaws with having five categories and these particular five, as well as the conceptual arguments surrounding reducing knowledge to five types of facet in the first place. Some of these issues are now discussed.

The most obvious criticism of having five categories could be seen in the extension to the number of categories by the Classification Research Group (CRG). The CRG expanded the list to 13: object, kind, part, property, material, process, operation, agent, patient, product, by-product, space, time (Broughton 2013, p. 739). Slight amendments

were made by Vickery in the 1950s (Broughton 2013, p. 739). Like Ranganathan's PMEST formula, it is possible to see the categories in action in a classification scheme, by looking at the second edition of the *Bliss Classification* (BC2) (Broughton 2013, p. 739).

There are also various issues with the nature and contents of Ranganathan's categories. One common complaint is the lack of definition of the categories; for example, Raghavan (2013, p. 858) lists this as a common complaint, though attempts to refute it. Broughton (2013, p. 738) gives a nuanced argument regarding the way that Ranganathan defines his categories: Ranganathan merely provides examples of the concepts which are in each of the PMEST categories, a technique Broughton (2013, p. 738) refers to as "ostensive definition" and she suggests it is particularly useful when trying to define something abstract. The categories get more difficult to define as you move from "time" to "personality" (Broughton 2013, p. 738). So, "personality" is particularly tricky: Broughton (2013, p. 738), Mazzocchini and Gnoli (2010, pp. 137-138), amongst others describe how "personality" can only be defined by what it is not. So, P is defined as not being MEST. Another complaint is that though there are only five categories in the theory, the actualisation of this theory in the form of the *Colon Classification* sees some of these categories divided into two, three, and so on – see for instance, Broughton (2013, p. 738) and Frické (2012, p. 189).

The idea of having a set of fixed elements is seen as being problematic; for example, Hjørland (2013, p. 554) questions this principle (generally within facet analysis rather than specifically for PMEST), as it makes an assumption that elements have the same roles for every concept, which is not always true. Broughton (2013, p. 740) describes how BC2 does allow for elements to move from one category to another, depending on the subject. This will prove to be important for music, especially when dealing with format issues such as music scores versus resources about music. Vickery (1959, p. 23) is concerned with the validity of all "a priori" categories, seeing as new knowledge and relationships between knowledge are constantly being discovered. However, it is important to note that Vickery's comments are specifically in reference to indexing in science, and perhaps will not apply equally to music.

Therefore, though Ranganathan proposes five fundamental categories, and demonstrates proof-of-concept to some degree by their (continual) use in his *Colon Classification*, it is clear that there are issues with the idea of fundamental categories. However, due to the imperiousness of the concept of fundamental categories it is still

important to consider how the subject of music fits into the idea of fundamental categories. So, for instance, questions can be asked about what would be the “personality” of a music score. In order to simplify the procedure, just for the initial set of categories, PMEST will be used, rather than later alternatives created by CRG and others. It is important to ask these questions, to see how easily music fits into the fundamental categories of the universe of knowledge and to help gauge music’s relationship with KO, and vice versa.

2.5. Independence of facets

The idea of independence of facets is very important within faceted classification, and how this impacts upon the classification of music needs to be considered in this thesis. (Frické (2012, p. 209) implies that the terms “independent” and “orthogonal” are synonymous in this context.) Frické describes orthogonal facets as follows:

“This [orthogonal or independent facets] means that, when constructing a synthesized value, the choice of a focus from one facet has no repercussions whatsoever for combination with a focus from another facet.” (Frické 2012, p. 209).

In other words, Frické’s statement and ensuing examples are stating that within a faceted classification, using a term (a focus) from one facet should not lead to, or restrict, your combination of this term (focus) with another term (focus) in another facet.

The inevitability of independence of facets can be witnessed in a number of places. For instance, Frické (2012, p. 209) leaves no room for manoeuvre about how faceted classification and the independence of the facets within faceted classification fit together: “Facets are going to be orthogonal or independent”. Satija (1992, p. 87) suggests that the ideal is for any isolate from one facet to be combined with an isolate from another. (For the purpose of this thesis, an “isolate” can be taken to be a synonym for a focus.) Furthermore, the concept of independent facets makes sense when considering the context and spirit of faceted classification: independent elements are those that are completely free of ties to any other element, thus honouring the principle of truly breaking down subjects into their smallest parts. However, while an independent and orthogonal facet might be epitomical in the theoretical realm, it seems that this is not borne out in the reality of organizing knowledge.

Vickery (1959, p. 37) gives examples from agriculture where independence is not achieved in a faceted system: the choice of term in one facet (product) dictates which list of terms in another facet (operations) can be used. In fact, this situation is common enough to have its own term: differential facets. This phenomenon is not limited to Vickery's writings: it penetrates the heart of faceted classification theory by being present in Ranganathan's *Colon Classification*. For example, while writing about the desirability of orthogonality in facets, Satija (1984, pp. 74-78) devotes a chapter of his manual of *Colon Classification* to differential facets and their presence in the *Colon Classification*. He (Satija 1984, pp. 75-77) gives examples with varying degrees of "differential-ness"; one example from chemistry has a range of values in one facet (P2) which can only be used with certain values of the (P1) facet, and another shows how every different value of one facet (E) has a different set of values in a subsequent facet (2P).

The reasons for using differential facets and alternative solutions are also discussed by theorists. For instance, Satija (1984, p. 77) lists some advantages of differential facets, such as brevity of notation and increased hospitality. Vickery (1959, p. 37) gives some alternatives to using differential facets. When different foci in facet A mean different sets of foci are needed in facet B, Vickery says there are two options: make facet B include all the foci corresponding to all the foci in facet A, even when a number of them will be invalid for particular foci in facet A; or, create separate facet Bs, such as facet B1, B2, B3, and so on, where each of these facet Bs covers a different corresponding value in facet A (based on Vickery 1975, p. 37, expanded by the author).

Therefore, there is a quandary about the status of orthogonality and faceted classification, which is important for this thesis. On one hand, orthogonality is an essential part of faceted classification; on the other hand, so-called faceted schemes such as *Colon Classification* are not always orthogonal and have some differential facets. The existence of differential facets in *Colon Classification* leads to two alternative conclusions. First, orthogonality of facets is critical, thus *Colon Classification* cannot be considered a faceted scheme; as well as being a drastic and counterintuitive reading, as *Colon Classification* is known as the *first* faceted classification scheme (see for example, Hunter 2009, p. 35), it also means that by extension, any other classification scheme which has differential facets would not be considered to be purely faceted. The second alternative is that orthogonality may be desired, but faceted classification and facets can

exist without it with no loss of faceted status. This second, less drastic reading of independence will be adopted for this thesis. In addition, as differential facets are usually considered unideal by most theorists – with Satija (1984) a notable exception – spotlighting occurrences of differential facets occur could also help unpick music classification’s inner mechanisms. For, as it will become very clear in the next chapters, independence of facets is a major issue for the classification of music.

3. Finding the facets of music

This section considers how LIS and the bibliographic practitioner community have approached the ideas of faceting for notated music. The answers to the following questions are sought: if faceted-ness and facets can be taken to be a breaking-down of subjects into its constituent parts, what are these facets, and what order are they applied (a citation order)? This section uses a variety of sources to attempt to answer these questions. First, LIS classification schemes are analysed to unpick how music has been broken down and the order of these elements. Note that the intensions of the authors of the schemes and strict ideas of faceting are put aside; only a basic idea of the breaking-down of music into loose “facets” and the order of these “facets” are of interest in this analysis. The second part looks at how LIS theorists discuss music’s facets in the abstract, and whether this matches the evidence seen in the actual classification schemes. The third part considers the “meta-facets” of music: theorists’ attempts to produce a set of universal facets for music. This will consider the context of these decisions, and how the concept of “music meta-facets” fits into the general zeitgeist of universality in classification schemes at the time that the meta-facets were created. The fourth section focuses on issues concerning a particular facet: format. With the main facets now established, the fifth section considers how the facets of music fit into general KO ideas of fundamental categories, seeing how music interacts with Ranganathan’s universal PMEST categories and ideas of order. Finally, a question is asked about whether the facets of music are facets at all, or whether they could be considered to be sub-facets or arrays. This investigation of music facets and music faceting from the LIS perspective will bring us closer to understanding how KO theories can be used to understand the classification of music.

3.1. Facets in music classification schemes

This section considers which facets are used for music within LIS classification schemes, and the orders of these facets. Three example schemes are used: BCM, Dickinson and Flexible. (Only three schemes are discussed at this juncture for reasons of space and time: ascertaining the facets (or facet-like elements) at play in a classification scheme, let alone establishing an approximate sense of the order of importance of those facets can be a very involved and complex task, as will be demonstrated by the three example schemes.)

3.1.1. BCM

Ascertaining the facets of BCM is helped by the statement of citation orders in the scheme's introduction. BCM has different citation orders for scores and literature, with the literature citation order being the most complex.³⁴ BCM's citation order for scores is as follows: executant → form of composition → character of composition (Coates 1960a, p. ix). Translated to more common terms, the facets for music according to BCM are medium (in other words, who is playing and/or singing), form and character. It is also interesting to note the facets which do not appear, such as composer, space and time. The omission of composer is interesting. It suggests an emphasis on what the composition is (the instruments/singers which perform it, formal qualities, and so), rather than its creative process (its author, the composer). In terms of order, BCM considers the medium/executant to be the most important, followed by form.

3.1.2. Dickinson

Dickinson has "combinations" which state the order of the elements, and acts as a useful way of analysing the facets used by Dickinson and their relative order. These "combinations" share many similarities with citation orders – the relationship between Dickinson and faceted classification is discussed in detail in Section 5.3 – so the standard faceted classification term of "citation order" will be used for this section, and the elements listed in these citation orders will be assumed to be facets. Dickinson is very unusual in having multiple citation orders. The different citation orders refer to different types of library; once a library selects a citation order, each individual musical score within that library will be classified using that same citation order. So, while Dickinson's citation orders are easy to identify as stated clearly in the introduction to the

³⁴ While the classification of music literature is outside the scope of this thesis, it is interesting to note that even the first characteristic of division is different for music literature – composer, rather than executant – meaning that conceptually, notated music and music literature would not interfile in BCM.

scheme, the presence of multiple citation orders makes generalisations more difficult. The various citation orders can be seen in Figure 4. Note that some of the elements have been given more standardised names for the purposes of this table.

Combination/citation order	Order of facets
Combination 1 (Loan and performance libraries)	Medium → form → accompaniment → type of voice → number of musicians/parts → tessitura → arrangement → composer → title → editor
Combination 2 (Reference and musicological libraries)	Medium → form → accompaniment → arrangement → composer → type of voice → number of musicians/parts → title → editor → tessitura
Combination 2a (Reference and musicological libraries)	Medium → form → composer → accompaniment → type of voice → number of musicians/parts → title → arrangement → editor → tessitura
Combination 2b (Reference and musicological libraries)	Broad medium → composer → detailed medium → form → accompaniment → type of voice → number of musicians/parts → title → arrangement → editor → tessitura
Combination 3 (General or small libraries)	Medium → type of voice → number of musicians/parts → arrangement → composer → title
Combination 4 (General or small libraries)	Medium → number of musicians/parts → composer → title

Figure 4. The combination/citation orders of Dickinson

Establishing the facets used in Dickinson and their citation order are not just complicated by the multiple citation orders, but also by another significant factor. What was considered to be “medium” in BCM – in other words, the voices and/or instruments needed to perform the notated music – is divided up in Dickinson. For instance, accompaniment, number of musicians/parts, arrangement, all appear as separate elements in Dickinson, yet could all be considered to be part of an overall idea of who/what is playing/singing. In addition, although much easier to resolve, the citation orders also include information relating to the musical work, such as the title and editor, which the scheme itself suggests are to do with shelf-marking – called “title mark” and “edition mark” in the scheme (Dickinson 1938, p. 34).³⁵ These perform a similar function to the suffixes and Cutter numbers found in numerous general classification schemes such as *Library of Congress Classification* (LCC), and are out of the scope of this thesis. So, the citation orders can be rewritten in order to elicit some generalisations about facets. If “medium” is used to replace all aspects which have separate titles, but are

³⁵ “Composer” also appears in the same section, but it will be assumed that as the composer generally appears in the middle of the citation order, “composer” will be treated as a regular subject-based facet rather than part of an identifying suffix.

related to medium, and the title and edition elements are ignored, then the various citation orders can be simplified – see Figure 5.

Combination/citation order	Order of facets
Combination 1 (Loan and performance libraries)	Medium → form → medium → composer
Combination 2 (Reference and musicological libraries)	Medium → form → medium → composer → medium
Combination 2a (Reference and musicological libraries)	Medium → form → composer → medium
Combination 2b (Reference and musicological libraries)	Broad medium → composer → detailed medium → form → medium
Combination 3 (General or small libraries)	Medium → composer
Combination 4 (General or small libraries)	Medium → composer

Figure 5. Simplified combination/citation orders of Dickinson

A number of interesting ideas emerge from these simplified citation orders. First, that the main facets are medium, form and composer – however, it is acknowledged that this is somewhat an *a priori* outcome in the case of medium. While the orders vary, medium always comes first, indicating the importance of medium in classifying music. Form usually comes before composer, when form is included in the citation order. However, while Figure 5 shows how various types of information can be simplified to being just part of “medium”, it also showed how medium is not a facet in Dickinson, as it is scattered throughout the citation order.

While complicating the citation orders, the appearance of many aspects of medium as facets is very insightful about music classification. First, it indicates that there is not uniformity in the boundaries between facet and sub-facets (or arrays), as what was part of medium in BCM is a separate facet in Dickinson. While in some respects this is just a matter of terminology, there are ramifications for whether an aspect is a facet or sub-facet: as independent facets, aspects such as accompaniment and voice type can move independently, which is not possible if they are all part of one medium facet. So, the idea of facets versus sub-facets will be considered in Section 3.6. Second, it shows the multitudinous nature of medium, suggesting that medium is many separate ideas; these various aspects such as accompaniment, arrangement, number of musicians/parts, and so on, and their interrelationships, need investigating further.

3.1.3. Flexible

It is more difficult to determine the facets used in Flexible, as the citation orders are not stated. Instead, information about the facets at play and the citation order of these facets can be deduced from the schedules themselves and in the “logographs” found in the lengthy introduction to the scheme. As an extra complication, Flexible’s creation as an alternative, but also an update (Pethes 1967, p. 4) to UDC means that it is indebted to UDC’s ideas of facets and citation orders.

Flexible has three main parts: “special auxiliary subdivisions” (includes musical periods, forms, transcriptions, education, formats, etc.), “main tables: musicology, music literature” and “main tables: compositions” (includes musical medium) (Pethes 1967, p. 6). For music scores, the main tables devoted to musicology and music literature can be ignored. Within each of the parts of the schedules, multiple types of information are represented; for instance, “special auxiliary subdivisions” includes forms of musical works, time periods and formats. Therefore, while analysing the facets of Flexible, the divisions between the various parts of the schemes will be ignored to some extent.

For musical compositions, Flexible classification has two overarching facets (where facets are taken to mean broad categories): medium and form. Within medium, there are many sub-categories, such as voices versus instruments, number of musicians/parts, accompaniment, and so on, which have also been seen in BCM and Dickinson. At first glance, Flexible’s introduction implies that there is a straightforward citation order for building classmarks for musical compositions (Pethes 1967, p. 8): medium → form. He enforces this citation order later in the introduction, when discussing how “elements must never be mixed” (Pethes 1967, p. 9) suggesting that compositions should have a citation order approximating to medium → form → format (Pethes 1967, p. 10).

However, Pethes goes on to discuss “relation” (Pethes 1967, p. 8) as part of UDC’s general ideas of expressing the relationship between subjects. This allows for different facets to be emphasised: for instance, Flexible gives examples where there is clearly a citation order of basic medium → form → medium, and, basic medium → form → medium → format. Pethes’ discussions of relations and use of different citation orders is revealing for a number of reasons. First, it confirms the importance of medium and form as facets, but also suggests that format needs to be considered too – see Section 3.4. Note too, how a basic idea of medium can be the most important, even if medium itself is lower down the list. Second, it shows that the medium → form hegemony is not

as stable as could be first thought. Third, Pethes' reasons for introducing this alternative are determined by the contents and usage of the collections "... it [the alternative 'citation order'] is especially important in collections where research in the catalogue is directed, say, on the genre of compositions" (Pethes 1967, p. 8). This is similar to Dickinson's ideas of fluid citation orders, though implemented in a different way as Dickinson's alternatives are made at library level whereas it seems Pethes is advocating a decision about citation order for each item classified. While Pethes' (and Dickinson's) conception of having alternative citation orders is unusual (Elliker 1994), the presence of such alternatives gives credence to ideas that music may demand such flexibility in citation orders.

3.1.4. Conclusions concerning BCM, Dickinson and Flexible's facets

BCM, Dickinson and Flexible demonstrate that medium and form are important facets for music. In terms of order, medium is usually considered the primary facet, but Dickinson and Flexible show on occasion how full medium information might be superseded by form or composer. Interestingly, "composer" is either not considered a facet or is of lesser importance for musical scores (while it is important for music literature, which is out of the scope of this thesis). This suggests that while musicological discourse might be work-led and authorial-based, this is not often echoed in the universe of musical works. Composers are useful to identify musical works and useful for shelf-marking, as seen in Dickinson, but composers do not appear to lead the classification of notated music. So, the composer facet will not be considered in detail in this thesis. Flexible discusses format as a facet, so this will be considered separately in Section 3.4, which will include some analysis of Elliker's (1994) discussions about this facet. "Character" is part of the citation order in BCM, albeit the last of the facets, so suggesting further consideration. The analysis of schemes has also shown how medium appears to be made up of many ideas, some of which act like facets in their own right – see, for instance, Dickinson. This can also be seen when schemes have a "basic medium" first, followed by the full medium information later in the citation order, for instance as seen in the relations in Flexible. Therefore, the makeup of the medium facet and the resulting facets versus sub-facets decisions need to be discussed further.

3.2. Music facets in LIS music classification discourse

Music classification discourse is another useful source for establishing the facets of music, especially establishing what commentators consider to be the *critical* facets. One

of the most important studies for ascertaining the facets of music is Elliker's (1994) study of the classification of music scores in 24 classification schemes. This is an invaluable monument in the literature of music classification for a number of reasons, including the systematic nature of the study – see Chapter 2, Section 2.4. Elliker (1994) is particularly useful for answering our question about the building blocks of music, as Elliker's (1994) study asks similar questions, although should be used with some caveats.³⁶ Elliker (1994) is useful in two main ways. First, it establishes seven elements for music, taken from combining writings in the LIS and music domains, and uses these to analyse the 24 schemes. These could be considered “meta-facets”, as these are created to be somewhat universal rather than used within the structure of a particular classification scheme, and will be discussed in detail in Section 3.3.3. Second, Elliker's (1994) analysis, using his seven elements, establishes some useful generalisations about the most popular and important facets and ideas about citation order.

Elliker (1994, p. 1317) finds that medium is the most commonly used element for “background”; translated to faceted classification, this suggests that medium is most commonly found first in the citation order. Form/genre is the most commonly found element in the “middle ground” (Elliker 1994, p. 1318). This does not equate precisely to form/genre coming second in a citation order, as it is possible to have multiple elements in one level (Elliker's system has seven facets, and is using a system of analysis which has three levels). Elliker (1994, p. 1319) finds that character is the most commonly found element in the “foreground”; in other words, character is important enough to be in the structure of the scheme, but comes at least third in a citation order. (“Background”, “middle ground” and “foreground” are technical terms from Schenkarian analysis. Their musicological meaning is not important in this instance, as we are only interested in how they have been equated with classification ideas such as faceting.) Generally, space and

³⁶ There are a few important points to note about the boundaries and methodology of Elliker's (1994) study before considering or even adopting his findings. First, Elliker's (1994) only includes 24 schemes for music, rather than every scheme (which would be an impossible task). However, while not “complete” this sample is extremely wide geographically, for instance covering schemes from China, Russia, Germany, among others; it also covers both general and special schemes. Furthermore, the study was written in 1994, meaning more modern versions of some schemes will not be included. Second, Elliker's (1994, p. 1320) main aims are to identify the “basic elements in scores that lend themselves to classificatory ordering”, which is very similar to our question concerning facets. However, the way that Elliker chooses to proceed with answering this question is through an adaptation of an analytical method from the music domain, Schenkarian analysis. Schenkarian analysis breaks down music into its three levels, known as background, middleground and foreground (Elliker 1994, p. 1271), and is concerned with the flow between them (p. 1273); Elliker (1994) uses these levels to place the elements of the scheme. So, while asking a similar question to that posed by this thesis concerning facets, the methodology, domain background and goals do not exactly match between Elliker's research question and the question being asked in this thesis – see Section 3.5 for more discussion about Elliker (1994).

time are rarely used in any of the levels; over all three levels and 29 iterations of the 24 schemes, place is used five times, and time is used only four times (Elliker 1994, p. 1319). So, we can see that medium, form/genre and character are the most important facets for music, according to Elliker's (1994) analysis of each of the 24 classification schemes.

In terms of order, Elliker (1994, p. 1319) concludes that the most common structure for scores is as follows: medium + form/genre + character, which would translate to a citation order of medium → form/genre → character. It is important to note that while the order medium → form/genre is more common, Elliker (1994) found that the order form/genre → medium was used in some schemes. Elliker (1994) believes that order medium → form/genre will become even more ubiquitous in the future, and is gradually crowding out arrangement primarily by form/genre.

Elliker's (1994) findings are significant for this thesis as they suggest that medium, form/genre and character are the most important facets for music. Furthermore, Elliker's (1994) results could be read as a good reason to explore medium in depth, due to its elevated position in so many scheme's citation orders. Elliker (1994) also discusses how some of these elements – what could be considered as facets – are divided; in particular, he says how medium is the most important element as the first categorization of music is between vocal and instrumental music. This suggests that this categorization would be worth exploring further. Elliker (1994) includes a scheme by Maurice Line in his analysis. Line's scheme was designed specifically to negate what Line perceived to be a failing of existing classification schemes: "the primary division by medium" (Line 1963, p. 352). However, Elliker (1994, p. 1306) suggests that despite Line's intentions, the scheme produced by Line also puts medium centre stage by making its first division into vocal and instrumental music. Thus, Line's non-medium-arranged scheme is in fact a medium-arranged scheme. This not only emphasises the importance of medium as a facet, but also is suggestive of the strength of vocal/instrumental categorization. Again, this emphasises the need to explore such a categorization further.

"Medium" and "form/genre" are the most commonly used facets for arranging scores according to other commentators too; for instance, Line (1952, p. 362) states that "medium" is the primary characteristic in most classification schemes, while Bryant (Bryant, Marco 1985, p. 208) states that when "medium" is the primary characteristic

then form is usually the secondary one. Elliker (1994) also uses existing literature to create the structure of this analysis, which is insightful in its own right. His initial discussion about the arrangement of scores is taken from an essay about the arrangement of music bibliographies by Krummel (Elliker 1994, p. 1269) – Krummel’s essay is broadly discussed in the Literature review, Chapter 2, Section 4.3 – from which Elliker (1994 p. 1270) concludes that there are two basic arrangements of musical works: forms/genres then instrumentation, or instrumentation then forms/genres.³⁷ (Note that in this instance, instrumentation could be said to represent the more general term of “medium”. However, the choice of this term is interesting in that it suggests instruments rather than voices, and also shows how names for facets are not standardized in the literature.) Finally, Krummel (1984) is also worth considering in its own right as a source of information about music facets. This article discusses the order of music publishers’ catalogues (rather than library catalogues) and focuses on the years before 1850, and offers some insights into important organizing principles of music. Five categories were considered key in these catalogues – date, place, medium, genre and function – with their resemblance to the facets identified in library classifications of music acknowledged (Krummel 1984, p. 181). Krummel (1984, p. 190) also provides some detail about the most significant facets; while earlier catalogues see genre as the most important category, medium is the most important category in later catalogues. Thus, Krummel’s (1984) work on publishers’ catalogues also endorses a medium and form/genre-centric model of music classification – albeit with the twist that the comparative importance of medium and form/genre changed over time.

The music KO discourse is also a valuable source for opinions and ideas about *why* “medium” and “form/genre” are the most prevalent facets. Nettle (1960, p. 12) suggests that “medium” is the simplest facet to manage: the classifier does not need much musical expertise to decipher that the music is for one instrument or another – though this thesis will later argue that music medium is in fact a very complex idea and unsuitable for a musical novice to classify. Line (1962, p. 352) suggests that different mediums are easier to distinguish from each other than different forms. Smiraglia (2006, p. 7) takes a more conceptual approach when discussing the representation of music scores in a subject catalogue: “form” and “medium” have to be used to *arrange* music as “form” and “medium” *are* music. Though discussing music in subject

³⁷ As stated above, after his analysis of 24 classification schemes, Elliker (1994) concludes that both orders are possible, but medium → form/genre is the more common amongst music classification schemes.

catalogues, Smiraglia's argument is equally applicable to classification. Elliker (1994, p. 1317) gives different reasons for the popularity of medium-followed-by-form/genre in classification schemes, which he labels "traditional": following on from Krummel, Elliker (1994, p. 1319) suggests this is the way that music publisher catalogues and music bibliographies are arranged, and this dates back to the 16th century. Elliker (1994, p. 1320) argues that other facets and orders have been tried, but are not as successful.

Therefore, we can conclude that in music classification discourse, medium and form/genre are considered to be the most important facets, usually having the citation order of medium *then* form/genre. So, it is imperative to consider music medium and form/genre, as these are considered to be the most important facets for music by multiple commentators, albeit for different reasons. However, Elliker's (1994) analysis also shows another common facet called character, which also covers ideas such as function, purpose, occasion, and so on. This facet appears to have received far less attention in music KO discourse and is also worthy of further discussion (see Chapter 9). It is also important to note what Elliker's (1994) analysis suggested was unimportant: for example, composer, space and time, do not appear to be as important as medium, form/genre and character/function in the classification of music. Furthermore, from the music KO literature it seems that "medium" and "form/genre" are considered to be the existential qualities of music, leaving aspects such as composer, space and time, on the periphery of the classification of notated music.

3.3. Meta-facets of music

Another perspective in considering music classification is to look at those works which attempt to create a universal set of facets or elements for music, which in this thesis will be termed "meta-facets". The presence of multiple universal systems of music facets is revealing: it strengthens arguments about the importance of facets to music – if all the systems discussed can loosely be considered to be facets – and they each reveal a belief that all (notated, Western, art) music can be broken down in the same way. Three important works in the quest for "meta-facets" for music will be discussed: a project by the International Association for Music Libraries, Archives and Documentation Centres (IAML) Sub-commission for Classification in the 1970s to produce a comprehensive set of facets for music; a demonstration of the creation of music facets by facet analysis of music-related works by Redfern in the 1980s as part of his textbook on music classification; an attempt by Elliker to draw together the facets from the IAML Sub-

commission and Redfern to create a “meta-taxonomy” of music facets in order to analyse music classification systems (the conclusions to this analysis were discussed in Section 3.2.)

3.3.1. IAML facets

The IAML Sub-commission for Classification met at the Jerusalem IAML conference in 1974, and the discussions and summary of their meeting appears in *Fontes Artis Musicae* for the next year. One result of their discussions was the iteration of five facets (“fünf Facetten”) (Dorf Müller 1975, p. 48): Besetzung; Zeit (Entstehungszeit der Werke); Form-Gattungen; Zweck, Anlaß, Inhalt; Raum (Entstehungsraum der Werke). These literally translate as follows (using the Collins German dictionary): cast; time (birth date of the work); form-genre; purpose, occasion, intention; space (birth place of the work).³⁸ Transfigured to a music setting, we could understand the five facets to be as follows: medium; time period; form-genre; purpose, occasion, effect/intension; geographic place. Dorf Müller (1975, pp. 48-49) notes how agreement has been reached about medium and time period, but that form/genre and purpose/occasion/effect/intension were discussed. While it is not directly mentioned whether the facets are only for musical works or also include works about music, the choice of facets and other information in the article suggest that it is the latter (Dorf Müller 1975). For instance, some of the detailed discussions about purpose, occasion, effect/intension, include a sub-facet of “subject relation” (Dorf Müller 1975, p. 49) which would not be useful for musical works. The IAML facets do not appear to specify an idea of order of importance or citation order.

The IAML facets are interesting as the list is relatively brief. Other notable features include the opaque facet of “purpose, occasion, effect/intension”, which gathers up some of the more abstract ideas of music. The difficulties of this facet can be seen by the need for the sub-commission to create a thesaurus covering this facet (Dorf Müller 1975, p. 48), useful or important enough to warrant an extended second edition (Schneider 1994). It is also interesting to note what is lacking – as discussed by Elliker (1994, pp. 1270-1271) in his precis of the IAML and Redfern schemes – such as any differentiation between works about music and music itself, and any idea of composers.

³⁸ Interestingly, Krummel (1984, p. 181) directly mentions the IAML facets and suggests that the title “function” would be an adequate title for the facet entitled “Zweck, Anlaß, Inhalt”.

3.3.2. Redfern facets

Redfern's (1978) facets are stipulated as a result of facet analysis. Unlike the IAML facets which are just stated, Redfern (1978) demonstrates how his facets are decided; in fact, Redfern's implication is that no decision is made at all, and instead the facets are revealed once the musical titles are analysed. This is a significant conceptual difference between both sets of facets, which is very telling about the faceted nature of music. The IAML facets are "discovered", by years of debate and analysis involving multi-national committees; the doubt and debate can be seen by the process, the presence of separate thesauri, the unaccepted nature of some of the facets, and so on. This suggests that music is considered to have multitudinous possibilities of facets, and IAML is attempting to mould a best solution and to *create* a universal system of facets. Conversely, Redfern (1978) is implying that universal facets of music exist, and only await discovery. For example, Redfern (1978) analyses 20 or so musical works or books about music, and takes the reader through how considering the foci of these particular resources will reveal the facets of music. Redfern (1978) does not explain how he chose these 20 resources, and whether they are a representative sample of the universe of works about music and musical works. The casualness (and smallness) of the sample could be read as Redfern's (1978) belief that whichever resources you analyse, the facets of music will reveal themselves. Therefore, Redfern (1978) is suggesting, even if subconsciously, that there is a "single truth" of facets of music: as long as enough works are chosen, these singular facets will – more or less – reveal themselves through facet analysis.

Elliker suggests that it is important to remember that Redfern was influenced by the IAML facets (Elliker 1994, p. 1270); the corollary is the IAML and Redfern facets cannot be considered as independent "solutions" to the same problem (namely, how to classify music). For scores, Redfern (1978, p. 22) concludes that there are four facets: composers, instruments, forms, size of ensemble. In addition, he gives three other facets which are possible: character, space, time. (It is interesting to note that Redfern (1978, p. 22) gives extra facets for music literature compared to scores. These include all three "possible" (score) facets as certainties and an extra group of five facets which do not appear for scores at all.)

The choice of facets by Redfern illuminates a number of issues with classifying music. A significant feature of Redfern's (1982, p. 22) facets is his choice to have separate facets for instruments and size of ensemble – which differs from the IAML (1975) facets' choice of a single medium facet (Section 3.3.1), but to some degree matches what was seen in

Dickinson (Section 3.1.2). From the perspective of types of information, a number-of-thing and a type of instrument are different. This suggests that “number in ensemble” and “instrument” should be explored in detail in this thesis. Another interesting point to note is the title of Redfern’s facet “instruments”, which omits any mention of voices. Redfern (1978) actually includes foci which are voices – singular and massed – in his analysis, so this is a question of terminology of the facets rather than their contents. This chimes with Elliker’s (1994, pp. 1269-1270) use of the term “instrumentation” in his initial investigation into the ordering used in music bibliographies (see Section 3.2 above). Another feature of Redfern’s (1978, p. 22) facets is the presence of a composer facet; as discussed in Section 3.2, while seen in some schemes – for instance, in Dickinson – music classification discourse did not find it as important as other facets (see Section 3.2.).

Redfern (1978) also makes some pertinent points about the nature of individual facets. For instance, he comments on the facet he calls character for scores (Redfern 1978, p. 18); he suggests that there are difficulties in grouping the foci within this facet and problems in assigning a unifying title for the facet. His solution (Redfern 1978, p. 18) is to borrow BCM’s “character”, which is important to note if considering BCM and Redfern separately. While folk music is outside the scope of this thesis, it is of interest that Redfern designs his universal facets to apply to both art and folk music, see for instance, the example works which are used to “create” the facets (Redfern 1978, p. 15), yet considers one facet (space) to be mostly used for folk music and little use for art music. This shows a tear in the fabric of Redfern’s intended universality.

The order of facets is discussed by Redfern (1978, p. 19) explicitly for music literature, but more obliquely for music scores. If his statement that “The same principles will apply here as in the arrangement of literature” (Redfern 1978, p. 21) are interpreted as referring to the order of facets, then this is particularly interesting. For music literature, Redfern (1978, p. 19) believes that the special facets – in other words, those referring specifically to music rather than general principles – do not have a fixed order. The type of library and the readers’ needs determine the citation order within a library, and it could be read that Redfern is assuming the same arguments for the citation order of notated music. While understandable on a practical level, this has interesting ramifications on a conceptual plane: Redfern (1978) is arguing that the facets for music are so fixed that a small amount of facet analysis will reveal them, yet also stating that a

federalised order for these facets would be anathema to effective retrieval. So, Redfern is suggesting that music has universal facets but localised orders.

3.3.3. Elliker's facets

Elliker (1994) created a set of seven elements, which could be considered facets, in order to analyse music classification schemes. (While the results of his analysis of music classification schemes have been discussed in Section 3.2, this section is interested in the facets he develops to analyse the schemes.) So, Elliker's facets were created with a different purpose from those by IAML and Redfern. His aim was to develop a unified set of facets – he calls this a “metataxonmy” (Elliker 1994, p. 1271) – to transcend the problems of the different language, terminology and synonyms present in 24 classification schemes. The facets were developed as an analysis tool; nevertheless, his seven facets are also an invaluable insight into music classification and illuminate issues with creating universal music facets.³⁹ Elliker's (1994) system of meta-facets is as follows: medium, form/genre, character, time, place, composer and format. No discussion of an a priori citation order of the meta-facets occurs, as Elliker did not need one to analyse the 24 classification schemes.

Elliker's system of facets explicitly and deliberately utilizes the IAML and Redfern systems; he merges the two existing systems (Elliker 1994, p. 1270), as well as adding a facet of his own (Elliker 1994, p. 1271). The connections between the three systems of meta-facets are visualized in Figure 6. (Note that influences other than between these three sets of meta-facets, such as BCM's influence on Redfern's character facet, are not represented.)⁴⁰ So, a comparison between the meta-facets used for classifying notated music in Elliker, Redfern and IAML is shown in Figure 7. This uses the English versions of IAML's meta-facet names and Redfern's “possible” facets are shown in italics. This table (Figure 7) highlights the similarities and differences between the schemes.

³⁹ Unlike IAML and Redfern, Elliker only developed a set of facets for music scores, as the purpose of his meta-facets was to analyse schemes for notated music, rather than music literature.

⁴⁰ The idea of plotting connections between classification systems has not received much attention in existing KO discourse. Relationships between classification systems is an important part of the discussions about musical instrument classification in Chapter 7, and is discussed in more detail there, as well as in Lee (2014) and Lee (2015) which are reproduced in Appendices B2 and B3.

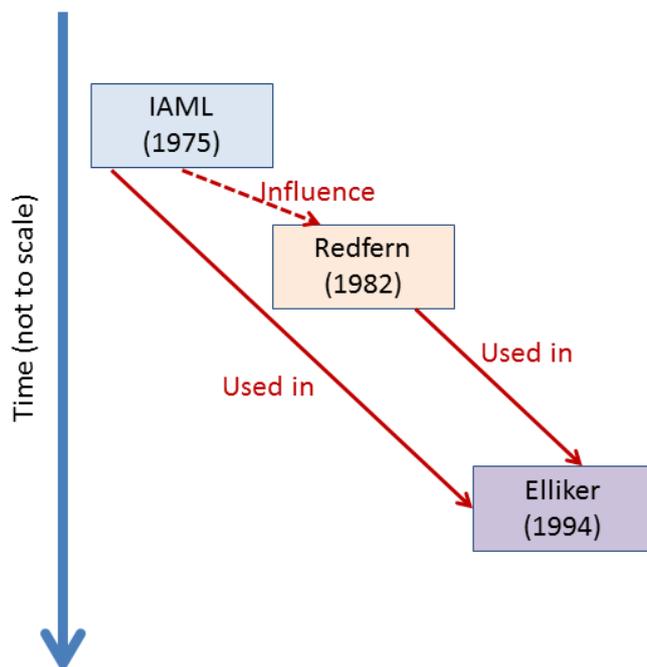


Figure 6. Connections between the IAML, Redfern and Elliker sets of meta-facets

IAML	Redfern	Elliker
Medium	Instruments AND Size of ensemble	Medium
Form-genre	Forms	Form/genre
Purpose, occasion, effect/intention	Character	Character
Time period	Time	Time
Geographic place	Space	Place
N/A	Composers	Composers
N/A	N/A	Format

Figure 7. Concordance between meta-facets used in IAML, Redfern and Elliker

The biggest differences between all three schemes (Elliker, Redfern and IAML) can be summarised as follows: Redfern’s splitting of the medium facet into type-of-thing and number-of-thing, the non-appearance of composers in the IAML system, and the format facet making its only appearance in Elliker. Alas, Elliker’s choices for actions such as forgoing Redfern’s medium split are not discussed, so we are left primarily with Elliker’s decisions rather than his reasoning. So, Elliker offers seven meta-facets for music, which to some extent draw together the other two meta-facets systems.

3.3.4. Other ideas of meta-facets

Other ideas of meta-facets of music can appear outside of direct discussions about classifying notated music or classification schemes. For instance, recent research into faceted-ontologies has used music as an example (Madalli, Balaji & Sarangi 2015, Madalli, Balaji & Sarangi 2014).⁴¹ While meta-facets were not the primary purpose of these papers, it is useful to briefly consider the main categories of music which were identified as part of this project. Note that the coverage of music in this project is different from this thesis: for instance, Madalli, Balaji and Sarangi (2015) mention organizing systems for audio-visual music such as *AllMusic* and *YouTube*, and the discussion and examples in the categories suggest that their ontology covers notated music, music literature, music-as-sound, and perhaps more. Certainly, all music is considered, rather than this thesis' subset of Western art music.

The main categories identified and utilized in the Madalli, Balaji and Sarangi ontology (2015, p. 18) are as follows: theory, persons, instruments, kinds, forms and works. (Note that the reasons why these particular categories were selected to represent music are not explained in Madalli, Balaji & Sarangi 2015.) However, these titles are not always intuitive to the foci that might be considered part of the facet: "works" appears to be musical forms/genres such as "symphony" and "first movement"; "kinds" includes time periods *and* genres; "forms" refers to what Redfern (1978) would describe as "minor forms", such as "fugues" or "sonata-form". So translating the Madalli, Balaji and Sarangi categories into the category systems used by the three sets of meta-facets would give the following list: theory (associated with literature not notated music, so has not been discussed), composers (but also including all other types of people such as performers, which are not needed for notated music), medium, genre/character/function, forms (major) and forms (minor).

First, it is interesting to note that medium makes an appearance in this system, as medium's importance as a facet has been a running thread during discussions about the facets of music. Perhaps the most major (relevant) difference between Madalli, Balaji and Sarangi's facets and those of Redfern, Elliker and IAML is that form/genre is considered as three different broad categories; while major versus minor forms appears in Redfern (1978), teasing out genre from form, and form's close relationship to ideas about style is a notable divergence from the three systems of meta-facets. To conclude,

⁴¹ Both papers cover the same project, so for this section, the later iteration of the research in 2015 will be used.

while the difference in coverage between Madalli, Balaji and Sarangi's (2015) universe of music, and the specific type of music used in this thesis mean that their categories are not appropriate to be adopted in this thesis, considering their choices has been insightful. First, it shows another circumstance where music is considered to have universal broad categories; furthermore, these are offered as established phenomena rather than with explanation for their provenance, suggesting again that music is considered by theorists to have innate, universal categories. Second, it could be useful to note the differences between the Madalli, Balaji and Sarangi categories and the three systems of meta-facets which do pertain to relevant to Western art music, revolving around form and genre, suggesting that a form/genre facet may not be as straightforward as first presented.

3.3.5. Visions of universality

The discussion about meta-facets is entwined with an important endeavour: the quest for universality. This section offers an exegesis on how the three systems of meta-facets embrace and represent a desire for universality, in the form of universal facets for music. Questions are asked about what such an endeavour represents for music classification, and how it fits into broader discussions about universality within KO. In this section the Elliker facets are not considered, as Elliker's aims were a pragmatic tool for use in one analytical situation rather than intertwined with a desire for universality.

Creating or uncovering universal facets can be seen within current trends in KO, for example as part of the golden quest(s) for universal classification schemes. This desire for universal classification schemes was summarised succinctly by Jens-Erik Mai at a workshop in 2015 concerning global versus local classification, including Miksa's narrative of KO history as a search for a single and best classification scheme (Mai 2015). Therefore, the search for meta-facets for music could be viewed as one strand of the historical desire to consider there to be, and to seek, a single "best" system of classification. Another perspective on music's meta-facets and universality comes from a wider context than KO: the general scientific desire for universality, for example quantum mechanics, general relativity and the quest for so-called theories of everything.

So, how do the two meta-facets systems fit within a context of universality? The IAML facets' creation by a IAML sub-commission suggests an intention of universality, as IAML is not only international, but also represents different information sectors such as

libraries, archives and documentation centres (International Association of Music Libraries, Archives and Documentation Centres 2016). The chair of IAML's sub-commission for classification which produced the 1975 IAML facets (Dorf Müller 1975), Dorf Müller, worked in Germany, but other members of the commission were active at institutions in a number of different geographic locations – for instance, the United States (Brook) and Sweden (Cnattingius). Furthermore, while the IAML facets do not give details about their intended purpose, it is called “... einer umfassenden Klassifikation ...” (Dorf Müller 1975) which can be loosely translated as “a comprehensive classification”.⁴²

IAML as an organization and the particular authors of this sub-commission are connected to musicology – for example, see Dorf Müller's writings in musicology journals and monographs as listed in *Répertoire Internationale de Littérature Musicque* (RILM) – which suggests another dimension to the universality of the IAML facets.⁴³ This also means that the IAML facets have close links to the music domain, showing how an “LIS” classification system is itself steeped within the music domain, which is insightful for the domain-focus to this thesis. This also could be used to argue that the IAML facets have a different validity from the other systems, due to their music-domain godparents.

Another way in which the IAML facets are linked to ideas about universality is through Flexible, which aimed to be a “universal” classification. Pethes (1967, p. 1) created his scheme (Flexible) to be a basis for discussion within IAML (and the International Federation of Documentation), showing how through IAML, Flexible's ambitions of universality are (at least) tangentially linked to IAML's meta-facets.⁴⁴ Further research on the links between Pethes, Flexible and IAML are outside the scope of this thesis, but would provide an interesting future research question. However, at the least, considering IAML's facets alongside Flexible shows an appetite for universality in music classification, amongst those working with music materials.

⁴² Comprehensive could be taken as a comment on its coverage within music, or perhaps could be understood as an indication of its intended coverage across schemes/practices.

⁴³ There are a number of ways that these links manifest themselves; for instance, the history of IAML (Wagstaff 2011, private communication) or the joint conferences with the IMS are two examples of the close connections between IAML and the academic music community.

⁴⁴ It is, however, an interesting conundrum as to why IAML was commissioning a universal classification scheme in the 1960s, yet a decade or so later the same organization decided there was a need for meta-facets for music.

Redfern's facets take a different approach to universality. As mentioned above, his facets are "found" rather than proposed and discussed, and Redfern (1978) demonstrates that these universal facets can be found using just 26 examples. Furthermore, Redfern's message suggests that the universal facets are so easy to spot and extract that when you, reader, do the task set by Redfern, you will also discover them. (While giving the impression of the randomness of this selection, naturally the examples that Redfern chooses neatly highlight all of his universal facets and do not include any problematic situations.) So while IAML and Redfern agree on the existence of universal facets, there is a subtle difference in the approach to universality: Redfern is implying that the universal facets are omnipresent and easily spotted, while IAML implies that they are expertly (and committee) determined. Both provide a set of different "universal" facets for music, but their varying approaches to universality of those facets also provides contrasting visions of music's essential, classificatory nature.

3.4. Format facet, or, quasi-facet

Some of the classification schemes and Elliker's meta-facets include a facet of "format", and so this facet needs further consideration. "Format" covers a variety of interrelated theoretical issues and practical problems. First, there is a fundamental division between *types of information* when dealing with "music": notated music, text and music-as-sound are the most significant.⁴⁵ While this thesis is only considering notated music, briefly considering how notated music interacts with other "formats" of music is beneficial. "Format" is the conduit for discussions about this demarcation. Second, within notated music, there are various formats. Full score, vocal score, miniature score, choir score, part, are just some of the possibilities. Hence, "format" has a role to play even when only classifying notated music.

3.4.1. The great scores versus literature debate

The potential division of music library materials into notated music and works about music (abbreviated to "literature") is a key topic in music classification discourse. While the issue of how to treat artworks and works which discuss those artworks is not confined to music – see for instance Nettle (1960) and Mullally (1976), who compare music's format issue with non-music artforms – it is particularly pertinent for music, as it could be argued that scores are book-like, yet not book-like enough. (Note that

⁴⁵ These "types of information" correlate to FRBR's expression entity (International Federation of Library Associations and Institutions 2009) and could be considered loosely aligned to three different types of "form of expression" (International Federation of Library Associations and Institutions 2009, p. 36).

although the term “notated music” is preferred in this thesis as the more technical category for entities including musical scores, much of the music classification discourse uses the more common music domain terms of “scores”. Therefore, in this particular section, “scores” will be used as a synonym for “notated music”, where appropriate.) The magnitude of the scores/literature division can be seen in the language used by commenters. For instance, Jones (1979, p. 95) describes separating literature and scores as a “basic distinction”; Benton (1976, p. 55) describes literature and scores as “principal categories”. The perceived lack of division between literature and scores in older versions of *Dewey Decimal Classification* (DDC) is cited by commentators as one of its fundamental flaws (see for example, Wursten 1990a, p. 8). Furthermore, as well as being highly significant, some commentators also state that the separation between music literature and scores must also be the first separation (Nettl 1960, p. 12).⁴⁶

Whilst being of vital practical concern, conceptual ideas about classifying music can also be embedded within practical discussions about where to place scores in relation to literature (and vice versa). Sometimes, dividing music and literature can place practical considerations in direct opposition to conceptual ones. For instance, Redfern (1978, p. 17) argues that literature should be shelved alongside scores; however, for practical purposes, separating scores and literature by format is preferable.

On a purely theoretical plane, there are a number of ways of viewing the scores versus literature debates. One way is to consider a scores/literature division as embodying the separation of format from contents, a tension which resonates wider than music classification – for instance, separating content from carrier is a major aim in the cataloguing guidelines *Resource Description and Access*. Pethes (1968, p. 3) provides a particularly illuminating visual representation of the separation of format from contents concept, suggesting that “outward appearance” adds a third dimension to the two-dimensional instrumentation/form representation of music classification.⁴⁷ This would translate as facets for medium, form/genre and format. There is a corollary to accepting any division based on format: the fabric of one-ness of music materials is irrevocably disrupted.

46 The discourse also focuses on the two different ways to enact score/literature division as well as the various advantages and disadvantages of both these methods – details about both of these discussions are outside the scope of this thesis. Furthermore, it is not always easy to make the distinction between literature and scores: there are certain hybrid items which could potentially live amongst both sequences. Examples include critical editions, study editions and critical series.

47 It is not clear whether Pethes (1968) is specifically describing the scores/literature debate or a more general set of all music materials. Nevertheless, the principle is the same.

Another iteration of the debate can be seen in McKnight's (2012) designation of "is-ness" versus "aboutness"; "is-ness" describes the musical works existing in music notation, while "about-ness" describes the literature which discusses those musical works. While this model was born in the music thesaurus and music genre debates, it can be easily borrowed to describe the scores/literature issue in music classification. We could view the scores/literature division through the prism of an existing, general theoretical debate: mentefacts and artefacts, a Classification Research Group division between works of art which exist in a physical plane and knowledge which has no physical realisation of its own (see for example Beghtol (2003), who discusses mentefact/artefact division in light of the modern information age and information retrieval). Scores could be considered artefacts while music literature acts as mentefacts. However, this relies on an assumption that musical works exist in a physical format; such a statement implies that the musical notation contained within the score is enough to "be" the musical work, without any involvement or potential involvement of sound. Further discussion of music-as-text is outside the scope of this thesis, though it is interesting to note that discussions about the formats of music classification lead directly to discussions about what music is.

3.4.2. Formats of notated music

The importance of dividing types of musical representations is clear. For instance, Krummel (1984, p. 181) suggests that the issue of the vehicle of the musical contents is omnipresent, and this is an old issue. However, surprisingly, the issue of different formats of notated music receives far less attention in music classification discourse than other discussions relating to format, such as the scores/literature divide described above. Therefore, considering music classification schemes and the meta-facets is a good starting point for a discussion about the classification of different formats of notated music. The discussion is complicated by the fact that in some cases, the formats of scores demarcation is intertwined with the scores/literature division.

Analysis of the three main schemes revealed that format (of scores) did not feature within the main citation order of BCM or Dickinson, but was present as a facet within Flexible. Flexible's contemplation of format as a theoretical third dimension of music – see Section 3.4.1. – is also a positive sign for format's significance and presence as a facet within this scheme, albeit if taken to include format of scores within this dimension. Even BCM, while not explicitly having a format facet, does feature formats within the scheme; discussions later in this thesis (Chapter 8) will show how BCM

merges forms/genres of dramatic vocal works with formats. A similar mixed message can be distilled from considering the position of format within the meta-facet analysis. The format of scores does not feature in Redfern's summary list of facets (Redfern 1978, p. 22), his schemata for music classification; yet, he (Redfern 1978, p. 17) discusses different formats of scores, and suggests that scores should be separated by type as their first division (after first being separated from the literature). So, within this one source, format is both a facet and it isn't. IAML and Elliker both make more definitive decisions about format's meta-facet status. Format does not appear in the IAML list, while it is explicitly one of Elliker's meta-facets. In fact, Elliker (1994, p. 1271) deliberately adds it to his merged Redfern/IAML lists, considering format to be an extra facet which is not addressed in other systems.⁴⁸

It is imperative to dissect what is meant by organizing by format, and what "format" actually represents. Examples of two different formats of musical notation are a "full score" and a "vocal score". On the surface, the differences between the two are external properties relating to presentation and physical properties. For instance, a full score contains all the parts of the music, and is typically used by conductors; it is differentiated from other formats which contain all the parts (such as the miniature score) due to its large(r) physical size, a virtue of its potential purpose to be used by the conductor when rehearsing with the instrumental group/orchestra (and singers). Conversely, a vocal score contains all the parts relating to the voices, but the instrumental parts (usually originally for orchestra) are arranged for piano; it is designed for singers to practise, rehearse and use in concerts (whenever they are permitted to use the music). So, there are physical differences between the two formats. However, there are also implied differences between a "full" and "vocal" score relating to medium. A vocal score contains an implied arrangement, for the piano part is (normally) an arrangement of the orchestral original; "accompaniment" is used to define the format of "vocal score", yet accompaniment is firmly entrenched within the medium facet. In addition, a "vocal" score will only be used when there are voices, another division relating to the medium facet. Therefore, it is clear that in certain situations, the idea of "format" is conjoined to other facets, such as medium.

⁴⁸ Elliker (1994, p. 1271) considers Redfern, like IAML, only to have addressed the "contents" suggesting that Elliker is viewing Redfern as not including a format facet – as discussed above, this is a valid interpretation of Redfern's position.

Thus, the idea of formats is clearly an important one within music classification, and asks interesting conceptual questions about music classification. The importance of the divide between music scores and literature in music classification discourse is noted, and analysing how it fits within more general theoretical frameworks provides useful contextual information; however, it is not of further interest to a thesis focusing on notated music. “Format” relating to scores is of interest. This section has shown a number of different guises to format: a super-facet which comes into operation before the main facets are laid out (for example, Redfern’s discussion), one of the main facets of music (Elliker), a quasi-facet which is half included within music classification (a comparison of Redfern’s introduction with his list of facets), a quality which is tied to another facet (medium), and so on. Thus, format appears to be a quasi-facet. So, much like its nebulous status as a facet, format will be discussed at germane moments in the thesis, but it does not necessitate a discrete chapter or section.

3.5. Fundamental categories, PMEST and music

Now the facets of music have been deciphered and discussed, it is fruitful to see how the facets of music fit into Ranganathan’s fundamental categories and PMEST order. This will enrich our understanding of the varying importance of the music facets and to see how music classification fits into the classification of the whole universe of knowledge (at least, Ranganathan’s version thereof).

3.5.1. Personality, Matter and Energy of music

As noted in Section 2.4., qualities such as “personality” are not intuitive, due to their abstract nature and the lack of definitions by Ranganathan and his acolytes. So, one workaround in the first instance is to utilize the *realisation* of PMEST: Ranganathan’s *Colon Classification*. The sixth edition of the *Colon Classification*, first published in 1960, is used for this task in its revised version of 1963 – abbreviated to *Colon6*. This was the last version of the *Colon Classification* published before Ranganathan’s death in 1972. (See Satija (1997) for an account of the authorial and editorial history of the *Colon Classification* including a list of editions of *Colon*.) The PMEST categories for music are as follows and the following order:⁴⁹

[P] = Style; [P2] = Style; [P3] = Music; [M] = Instrument; [E] = Technique; [2P] =
Technique

⁴⁹ In order to simplify the discussions of *Colon Classification*, instructions about the separating elements between facets has been ignored.

(Ranganathan 1963, p. 1.97).

Alas, this formula and the listed foci in Colon6 offer the barest of guidelines as to how facets of music might map on to fundamental categories. The only facets which have any foci listed at all are P3 “music” and M “instrument”. However, Elliker’s (1994) neat summary and analysis of Colon6, which draws upon external literature about Colon6, can be used to help where necessary.

The formula and scheme show that the abstract idea of “personality” is broken down into two types of things: style and “music”. No meaning or examples of “style” are offered, but secondary literature about the *Colon Classification* (Elliker 1994, p. 1295, discussing work by Khanna and Satija) suggests that P1 and P2 refer to geography and time respectively, and together make up the idea of musical style. P3, “music” does not have a revealing name but this facet does have some foci. The foci listed in P3 include types of music (“dramatic music”, “orchestral music”) and difficult-to-categorize elements such as “Word”, “Notation”, “Keeping time” (Ranganathan 1963, p. 2.93). Satija (1984, p. 173) gives P3 the label “kind of music”, and Elliker’s (1994, p. 1295) Schenkarian analysis of Colon6 suggests that he believes P3 to be a combination of “character” and “form/genre”. While the “character” part is perhaps explicit, this means that Elliker would be receiving ideas such as “orchestral music” as form/genre, which is a less obvious interpretation. Furthermore, the six foci offered might be brief but the presence of foci such as “notation” suggests that this facet would be intended, at least in part, for music literature.⁵⁰ The name and foci under “instrument” – for which we can assume a general idea of musical medium – show that in the *Colon Classification*, the fundamental category of “matter” equates to musical medium.⁵¹ “Technique” appears as two further facets; however, from this term’s use in other music classification systems, it mostly likely refers to concepts only needed by music literature. The idea of “Technique” is unexplained, leading Elliker (1994, p. 1295) to conclude that this part of the schedule is unfinished. So, if the above analysis is put together, PMEST for music would be read as follows:

⁵⁰ In fact, Elliker (1994, p. 1294 and 1296) says it is unclear whether Colon6 is intended for use for scores at all. If Colon6 is not intended to be used for scores, then the discussions in this section are less relevant though still of interest.

⁵¹ Satija (1984, p. 173) offers an explanation of why musical instruments are considered to be matter: it relates to ideas from music theory that music is actually a constant presence in the universe and instruments are therefore only vessels through which music becomes sound.

Personality = stylistic place, stylistic time, character/function/form/genre; Matter = medium; Energy = technique; Space; Time

This suggests that medium comes after character/function/form/genre in the citation order, which is very different from the findings in Sections 3.1, 3.2 and 3.3.⁵² (The difference in treatment of medium is particularly striking when looking at Elliker's (1994, p. 1319) concluding tables, which shows how *Colon Classification* – in this case, the 6th edition – is the only scheme out of the 24 surveyed which has medium as its “foreground”, roughly equivalent to a low position in the citation order.) Also, there is no separate facet for form/genre and character/function, instead having a mixture of all these ideas. Therefore, we can see a disjuncture between Ranganathan's general ideas of fundamental categories, and the more typical ways of classifying notated music.

3.5.2. Musical space and time in PMEST, and beyond

“Space” and “Time” form the last two categories in PMEST; yet, as seen in Section 3.5.1., place and time are also considered as part of musical style in *Colon Classification*. This means that space and time bookend the citation order for music. While generally not discussing music literature in this thesis, this section is going to use examples of the classification of music literature as they illuminate issues with PMEST which could also affect music scores. Facets representing space and time do not seem to be fixed outside of the *Colon Classification*. For example, Flexible offers a variable position of the time facet: there are alternative citation orders where form can appear before or after time period in the citation order, depending on the type of music. Translating this to PMEST, this suggests that stylistic time [P1] sometimes appears before form/genre [P3], and sometimes the other way around. More significantly, Flexible also “disobeys” PMEST by offering the history of music as organized by space *or* by time. This contravenes a primary part of PMEST: “Time” as the final facet, and “Space” as the penultimate one.

Therefore, it can be concluded that while PMEST is an interesting conceptual idea for music, the realisation of PMEST through the *Colon Classification* shows an order of music which does not fit into the rest of the music classification landscape. Considering time and space in music show that even the basic tenets of PMEST – the general facets of space followed by time – are not always followed when it comes to music. Thus, while attempting to map PMEST on to music classification illustrates some of the specific

⁵² However, as an aside, it is interesting to note that medium is considered a “personality” in *Colon7*, perhaps demonstrating how music's elements are not entirely fixed.

failings of *Colon Classification* such as needing external resources in order to utilize *Colon Classification*, it could also be read as another example of music's general trickiness in conforming to faceted expectations.

3.6. Facets versus arrays and sub-facets for music

One of the ideas that has emerged from the discussions about LIS conceptions of facets is the variations between whether elements are treated as facets in their own right, or instead, as part of a bigger facet. For example, BCM has a facet of medium (albeit with a different name), which contains elements such as the number in an ensemble and the type of instrument; Redfern's meta-facets have the types of instrument and numbers of things as facets in their own right. The difference between these is visualized in Figure 8, where Redfern's titles and the standardised "medium" have been adopted to aid the comparison. Having multiple elements at work within one facet is not only possible but in fact, according to Vickery (1959, p. 36) common, and these constituent parts of the facet are known as sub-facets or arrays. Arrays are "... defined by some specific property or attribute" (Broughton 2004, p. 266-267), and the order of the arrays within the facet is based on their most useful order for creating compound subjects (Broughton 2004, p. 270).

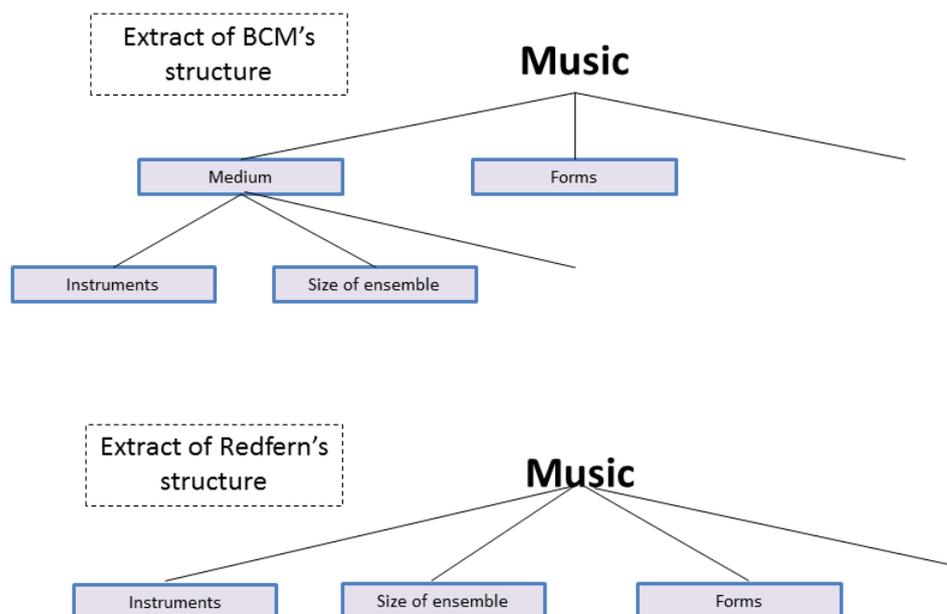


Figure 8. Facets versus arrays in BCM and Redfern

Hence, it is possible to have, say, medium as one super-facet or as separate facets but we need to consider if there are any consequences to the different possibilities. Ranganathan calls the placement of multiple categories into one facet “telescoped” (Vickery 1975, p. 33). He (Vickery 1975, p. 33) suggests that there are only issues if you need to have one of these categories interspersed with something in another facet altogether; in other words, once the arrays have been placed within a facet, if the facet moves, all the arrays move, as though in a three-legged race. Visualising this for music, we can start to see how a multi-array and multi-facet medium could differ: for example, supposing you wanted to have instrument next to form/genre, but arrangement next to format, perhaps to demonstrate the close connections between arrangement and vocal scores. If medium is a single facet, it would not be possible to have instrument next to form/genre, as well as accompaniment next to format. Since whichever facet one array of medium wishes to cleave, the other arrays would be dragged behind. However, if instrument and accompaniment were considered to be separate facets rather than just separate arrays, it would be possible to have a citation order which expressed both the neighbourliness of instrument and form/genre, in addition to the clinging of accompaniment to format. The two possibilities are illustrated in Figure 9. (Note that Elliker’s labels for facets have been adopted in this example, where there is an appropriate Elliker term.) Hence, while the facets-versus-arrays-issue is very important when describing the structure of music classification, it appears to make little practical difference apart from when two arrays would like different neighbouring facets. While IAML and Elliker’s idea of a single medium will be adopted for this thesis, for the sake of simplicity, it is clear that the various elements that constitute medium are significant and need further investigation; however, whether type of instrument or number of instrument is an array or facet will not be the focus of that discussion.

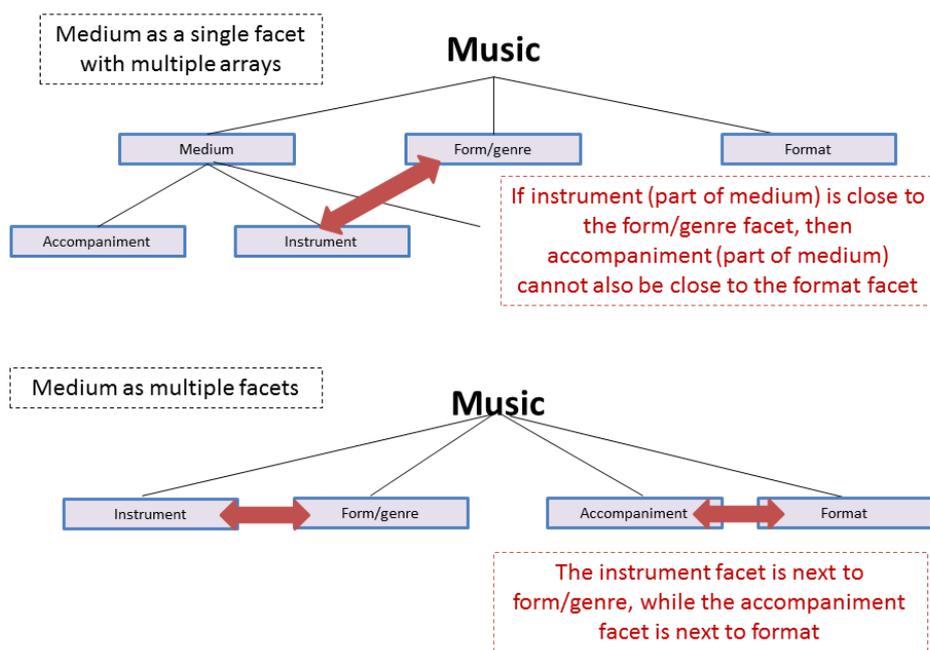


Figure 9. Impact of facets versus arrays in the classification of music

3.7. What are the facets of music from an LIS perspective?

The discussions in this section demonstrated that the question “What are the facets of music?” has a number of different answers. Even the three meta-facets of music could not agree on the same list of facets or even the same number of facets. Elliker has seven, IAML has five while Redfern divides his list of facets for scores between four (with one division, for major and minor forms) absolute facets, three which are possible and another five which are unlikely. In fact, this section has shown that even asking the question about what are the major facets of music could be considered a loaded one; why *should* there be a single set of facets for (notated, Western, art) music? In terms of the differences between the LIS ideas of facets, this section has identified certain flashpoints and areas of contention. For example, while most of the schemes and meta-facets suggested there should be some facet centred upon character/function, this appeared to be a somewhat nebulous facet, with possible inclusions of character, purpose, occasion, intention, and function, to start. To add to the murkiness of the character/function facet, there is an interesting juxtaposition between the LIS music classification discourse which rarely mentions character (or similar ideas), and how some elements of character/function appear in almost all the schemes and meta-facets discussed. Another difference occurred in the levels of concepts, distinguishing facets from sub-facets/arrays; for example, medium is a single facet in some schemes, yet

ideas such as “type of instrument” and “number in ensemble” are considered facets in their own right in others. The existence of a format facet is also tentative: it was shown in Section 3.4 that its varying treatment means “format” could be described as a “quasi-facet”, reflecting the uncertainty over whether format is part of music classification or not.

On the other hand, an ensuing question about which are the most important facets for notated music, yields a more definitive answer. The close analysis of three classification schemes (BCM, Dickinson, Flexible) as well as a survey of the music classification literature demonstrated that medium and form/genre were important. Elliker’s (1994) analysis of 24 schemes demonstrated that the most common order of importance for scores – equivalent to citation order – is medium, form/genre and character/function. The facet of composers has a mixed showing for notated music, either not being considered at all or often further down citation orders than medium, form/genre and character/function. While it might have been expected that space and time would be significant for music, they did not fare well in Elliker’s (1994) score analysis, or the other analyses of literature or schemes. (The PMEST analysis was interesting, but it is not clear whether the *Colon Classification* example was exclusively for literature or also included scores.) Therefore, we can conclude that from an LIS perspective, there does not seem to be a definitive list of *the* facets of music; instead, there is some loose agreement on the most important. For music scores, this list is medium, form/genre and the nebulous facet of function, character, and so on.

4. The music domain’s perspective on music’s elemental properties

So far, this chapter has considered facets through the LIS domain’s schemes and discussions; now attention is turned to ideas about facets in the music domain. This is significant for a number of reasons. In order to get a more rounded view about music facets it is important to consider the issue from the domain (music) itself. Furthermore, this section will demonstrate that a music-philosophy approach to determining the elements of music reveals important questions about defining exactly what is being classified when classifying music. It also reveals the ontological meaning of the elements of music represented in the LIS music facets. So, considering the music domain’s approach answers questions that are usually not asked by the LIS domain.

It would be unexpected to find musicologists discussing facets, as faceted classification is part of LIS theory development. Instead, musicological discourse is considered which, however loosely, discusses how music can be broken down into a series of attributes and any discussions concerning the perimeters of those attributes. Those labouring over such questions are within a specific section of the music domain: musicology, or more specifically, music philosophy. Only an overview of a few important resources is presented, as detailed analysis of music philosophy discourse is out of the scope of this thesis. A few key texts have been considered, both historical and near-contemporary: Busoni's essays, and two key entries in the *Encyclopaedia of Music Philosophy*.⁵³

4.1. The idea of breaking music up into elements and facets

The first consideration concerns how dividing music into its elements fits into music philosophy discussion. Busoni (1957, p. 1) states that music is usually broken down into elements, but that he doesn't agree with this – at least, not with what he considers are the conventional elements attached to music; instead, Busoni (1957) advocates for a “one-ness” of music. Busoni's position is noteworthy because it suggests that breaking down music into elements is a conventional part of musicological discourse (while disagreeing with this process). Matheson and Caplan (2011) are interested in a related issue, which has a potential impact on music classification: attempting to categorize the essence of a musical work, which leads to discussion about how one musical work is related to another. Questions about what properties of a work distinguish it from another work, could be perceived as a parallelism to breaking down musical works into elements – the source of Busoni's complaint, and the fundamental idea of LIS faceted classification. Certainly, both discussions involve stripping the musical work bare and dividing it into constituent parts, albeit for different reasons. So, breaking down musical works into constituent parts, a key tenet of faceted classification, appears to be part of musicological discussion, for reasons including comparison between musical works (Matheson, Caplan 2011).

While discussing music's elements, general questions are asked about the boundaries of musical works. For instance, Matheson and Caplan (2011, p. 46) separate out the properties relating to a work from those relating to performances of that work, using

⁵³ The methodological limitations of investigating music philosophy ideas of medium are acknowledged. However, retrieving and analysing more musicological texts for this short overview would have been too time-consuming for this thesis, in part due to the lack of explicit statements about classification in musicological discourse.

critical reception as an example to illuminate this separation.⁵⁴ Thus, Matheson and Caplan's (2011) discussion demonstrates how the elemental properties of music-as-text and music-as-sound are different from a music domain's perspective, which will have ramifications for classifying music. As this thesis is considering notated music only – music-as-text, rather than music-as-sound – the corollary is that only one set of Matheson and Caplan's properties are applicable for the "music" being discussed in this thesis. So, musicologists breaking down music into elements are interested in the concept of the musical work. However, they appear to be interested in the philosophical concept of *a musical work* and its properties, rather than how the *universe* of musical works can be broken down into elements. This is a subtle, but vital difference from LIS: music philosophy appears concerned with the elements (facets) of *the* musical work, whereas faceted classification within LIS attempts to find the elements (facets) relating to *all* musical works. How this difference colours discussions and the findings will need to be seen.

4.2. What are the elements and facets of music according to musicologists?

Busoni (1957) provides some detail about which elements he considers to constitute music. He (Busoni 1957, p. 1) expresses what he considers to be the traditional way that music is divided up, and also offers his suggestion for a better way of considering music:

"The time has come to recognise the whole phenomenon of music as 'oneness' and no longer to split it up according to its purpose, form, and sound-medium. It should be recognised from two premises exclusively, that of its content and that of its quality."
(Busoni 1957, p. 1).

The phrase "no longer" suggests that Busoni considers purpose, form and sound-medium to be the status quo. A table containing the examples Busoni uses and number in the "facets" can be seen in Figure 10. As part of his discussion, Busoni (1957) states that there are subdivisions for some elements/facets and he also gives a few examples (foci) of each element (facet). More detailed discussion of the elements takes place in Section 4.3 and in Chapter 9. Busoni's triumvirate of purpose, form and sound-medium could be relabelled using LIS terminology: this makes Busoni's elements of music a very

⁵⁴ However, a counterargument can be offered for new Western, art works. For instance, concert reviews of new works will often judge both criteria simultaneously, seldom differentiating between the critic's rating for the work and for the performance.

familiar, medium, form/genre and character/function. (Note that although purpose, character and function are different as elements, the LIS discussion showed that there was no single way of describing this facet or its content, so a simplified character/function is used for this comparison.) They match the findings from Section 3, which concluded (Section 3.7) that medium, form/genre and character/function were the most important facets of music. So, Busoni's (1957) music-domain writings identify a traditional way of splitting up music which is structurally similar to the most important facets of music identified in the LIS domain.

Element/Facet	Subdivisions	Examples
"Purpose"	Opera, Church, Concert	
"Form"		song, dance, fugue and sonata
"Sound-medium"	Human voices, Instruments	orchestra, quartet and pianoforte

Figure 10. Busoni's elements /facets of music

This convergence of the two domains is very important. However, it also asks a crucial question: do the LIS classification schemes use music philosophy's structure of music because they are directly following the classification within their domain; or, do both philosophers of music and music classificationists – scheme creators and theorists – break down music into its constituent elements and get the same result? Put another way, is this "one truth" about music something created in one domain then followed by those charged with organizing the documents in that domain or is there just "one truth" about the most important elements of music, which can be verified by being "discovered" independently in both domains? The lack of explicit mention of Busoni in the LIS sources suggests that there is not a trail from Busoni to classificationist/classification scheme author, but lack of evidence does not in itself negate the hypothesis; influence is a notoriously difficult essence to prove. (The idea of influence between classifications in the LIS and music domains is discussed in more detail in Chapter 10, Section 6.2.)

Finally, the three elements are mentioned by Busoni (1957) to express his unhappiness with them. So, what of Busoni's proposed improvements? He (Busoni 1957) suggests content (a mixture of invention and atmosphere) and quality (form and shape). As these are somewhat subjective, and do not relate to the facets seen in Section 3, they will not be discussed further.

4.3. Medium

Music philosophy is insightful about the potential facet "medium".⁵⁵ "Medium" has been shown in the analysis in Section 3 to be a significant part of music classification within LIS, so understanding what is meant by medium from the music domain's perspective is insightful to understanding music classification. In its simplest form, Davies (2011, p. 48) defines music medium as "... something that serves as a means, or instrument, whereby some content is transmitted from a source to a receiver". The music domain literature reveals that medium as a concept exists within musicology – although Davies (2011, p. 50) suggests that it has not received as much attention as it should – and that the term "medium" is used to describe this phenomenon. For instance, there is a whole chapter in *The Routledge Companion to Philosophy and Music* (Gracyk, Kania 2011) dedicated to medium; Busoni (1957) also uses the term "sound-medium", when discussing the elemental properties of music. It is important to note that medium is a general category and is used for a variety of artforms in addition to music (Davies 2011); therefore, this could be used to explain why Busoni's term "sound-medium" may not be as tautological as first seems, as medium is used as a term in other arts to transmit entities aside from sound. Three key ideas from music philosophy writings about musical medium will be briefly outlined: the two types of medium, medium's relationship to historical context and the sonicism and instrumentalism frameworks of music.

Music philosophy ideas of medium are bisected into "artistic vehicle" and "artistic medium". Davies' (2011) discussion of medium provides a useful account of the division, and is an important comparison to the conception of medium within LIS music classification. "Artistic vehicle" refers to the physical (Davies 2011, p. 49), and furthermore, in arts other than music, the artistic vehicle is often described as the

⁵⁵ Of Busoni's three facets, only medium is discussed at this juncture for a number of reasons. First, as there are three chapters in this thesis concerning music medium, but one each on form/genre and function, music domain ideas about form/genre and function can more easily be explored in their appropriate chapter. Second, the ideas about music medium are couched in the music philosophy explorations seen in ideas about elements of music (in Sections 4.1 and 4.2).

physical part of the medium. While at a superficial level, the vehicle for music could be considered to mean sound (Davies 2011, p. 49), this soon becomes disingenuousness as within traditional Western art music, composers do not manipulate the sound itself. Conversely, “Artistic medium” is described as the link between an artistic vehicle and the expression of artistic content (Davies 2011, p. 49). Therefore, it is important to note that “medium” is a catch-all for two distinct concepts, although these do not appear to coincide with medium’s super-facet status as discussed in Section 3.

Another important idea about music philosophy’s concept of medium is that it includes ideas which are beyond medium’s remit in LIS; for instance, Davies (2011, p. 56) discusses context, in particular the art-historical context, such as the culture that the musician is writing in or taking into account the musical works which already exist. In LIS classifications of music, these types of ideas would not be considered to be part of medium. The presence of a historical element within medium is noteworthy, as it borrows ideas from other LIS facets, such as time, highlighting that the music philosophy idea of medium is not a “pure” facet. Hence, care must be taken when considering LIS classification when using music philosophy terms: the elemental idea of medium belies some fundamentally different contents depending on whether within the music or LIS domain.

Music philosophy discussions about music medium involve considerations concerning sound, and there are varying philosophical positions: sonicism and instrumentalism. The sonicism viewpoint considers music by how it sounds, rather than how the sound is made (Matheson, Caplan 2011, p. 41). There is a division within sonicism, which sees it divided into pure and timbral sonicism (Davies 2011, pp. 54-55). A pure sonicist is only concerned with the notes, not the sounds used to make them, so the same sequence of notes played on a violin and flute would satisfy a pure sonicist as being the same work; conversely, a timbral sonicist would not consider both of these sequences to be the same, as they care about the exact sounds of the work including the resonances and characters of the particular instruments or voices (Davies 2011, pp. 54-55).

Instrumentalism (Davies 2011, p. 55) is interested in the particular qualities of the instruments (or voices) who play (or sing) them, but in a stage further than the timbral sonicist, also requires that the actions causing the sound happen as the composer intends, even if the resulting sound is identical – so a synthesised violin and acoustic violin’s performance of the same work would be considered different works by the

instrumentalist. (From a classificationist viewpoint, the pure sonicist does not categorize by sound, the timbral sonicist categorizes by sound and the instrumental categorizes by the method of sound production. However, note that all three viewpoints care about the “notes” – in other words, form, genre, character, function, and so on.) As discussed above, this thesis is distinctly *not* taking a purely sonicist view of music, as Section 3 showed that distinguishing between what instruments/voices are needed for a musical work is an important part of LIS classification. Distinguishing between the instrumentalist and timbral sonicist view is mostly not of interest as the differences between these two particular perspectives are related to sound rather than text – notwithstanding potential ramifications for classifying arrangements of musical works, which are discussed in more detail in Chapter 6, Section 4. However, composer intentions are arguably an implicit part of medium and this does have an impact on music-as-text; in other words, whether the composer intended the work to be played on the acoustic violin or a synthesised violin, regardless of whether they sound the same, would be considered to be different mediums in the instrumentalist viewpoint. This thesis, as well as LIS classification of notated music generally, falls within the instrumentalist’s mantra of aligning with the composer’s wishes for how the sound is produced. So, in this thesis “medium” will be considered to be that defined by music philosophy’s *instrumentalist* view.⁵⁶

We can conclude that there is a musicological concept of “medium”, and that it is appropriate to use this term. However, this brief foray into music philosophy has shown that this thesis (and LIS) is not using the term “medium” in its precise music philosophical way. This thesis will not concern itself with the difference between artistic vehicle and artistic medium as the two subdivisions of medium; however, it is going to take a more “artistic vehicle” notion of medium, as this fits in with ideas of medium – albeit sometimes with very different labels – found in LIS ideas of music classification. So, medium will be considered to be a property belonging purely to the work itself, without regard for how it fits into any art-historical context. The composer’s specifications for the musical work are enshrined into this thesis’ approach to medium, thus taking what music philosophers would call a somewhat “instrumentalist” view to medium. So, investigating the music domain’s ideas about music medium helps to refine exactly what is covered by, and is intended by, this significant LIS facet of music.

⁵⁶ This is not a complete instrumentalist view: it could be argued that as the concept of sound is not a *possibility* (as only classifying notated music) sound is not mindfully discarded, thus the true validity of selecting instrumentalism over sonicism dissipates.

5. Facets and music, music and facets: using the multiplane approach to explore the symbiotic relationship between faceted classification and music

This chapter has so far demonstrated how faceted classification can be used to analyse music; however, this section looks at the symbiotic relationship between music and facets, exploring how music classification also increases our knowledge of faceted classification. The exploration centres on the faceting in two LIS classification schemes for music: BCM and Dickinson.⁵⁷ The purposes of this endeavour are manifold. First, this analysis will illuminate the actual and perceived importance of faceting to music classification. Second, dissecting a scheme's faceted credentials will illuminate the parts of music which stubbornly refuse to fall into facet analysis line, and thus provide examples for examination in the later chapters of this thesis. Third, examining whole schemes will help to answer the question about the ease in which a music classification scheme can be truly faceted. Fourth, this analysis also explores the symbiotic relationship between faceting and music, by also considering how music is important to the general development of faceted classification. To perform this analysis, a novel scheme-analysis methodology is instigated, the "multiplane approach", which is now introduced.

5.1. Introducing the multiplane approach

In order to fully study the faceting in the classification schemes, it is important to consider all perspectives on faceting. To this end, a new method and model of analysing classification schemes has been created for this thesis – the author is not aware of other studies which use a similar method or any related discussions – called the "multiplane approach". This approach is discussed in detail by the author in a paper given at the COLIS 2016 conference, and is in the process of being published in *Information Research* (Lee 2016), and a copy of the paper is given in Appendix B4. So, what follows is a summary of the approach as adapted from Lee (2016), followed by its application to BCM and Dickinson.⁵⁸ In addition, Lee (2016) uses the Dickinson analysis to illustrate the theory. However, while the same main points are covered in this thesis, the focus of Lee

⁵⁷ Though usually in this thesis three example schemes will be used – the two mentioned plus the addition of Flexible – for this particular task, BCM and Dickinson highlight the crucial issues, without adding the complications wrought by Flexible's dependence on UDC.

⁵⁸ For simplicity, the original version of BCM (without its later annotations) and the original published version of Dickinson (so, not in its "Vassar-Columbia" form or the revised version in Bradley (1968)) will be used, with no reference to their later versions.

(2016) – to present an original theory about analysing classification schemes in general – is different from the music-classification-focus of this thesis.

The “multiplane approach” is focused not only on separating out different types of knowledge about classification schemes in order to deepen the knowledge we have in each of these planes, but also to consider the important knowledge which appears when the types of knowledge are compared. Taking *The Oxford English Dictionary’s* definition of “multiplane” as its lead (“... involving or occupying several distinct planes, layers, or levels ...”, (2003) the “planes” of knowledge are considered to be, for instance, knowledge gained from the scheme itself, or knowledge gained from reading a review of the scheme, and so on. The model supposes that there are four planes of knowledge, and certainly these planes are sufficient for the analysis of BCM and Dickinson.

Plane 1 is concerned with the classification scheme itself, considering what information can be obtained by analysing the scheme’s schedules, and if necessary, any technical information presented in the introduction. This ontological analysis deliberately ignores any contextual information. While there are potential issues with the objectivity of the analyser (in this case, myself), this will not be discussed further for the analysis of BCM and Dickinson, as issues of subjectivity when discussing KO are outside the scope of this thesis. Plane 2 considers what the author(s) of the scheme say and write about their classification schemes; typical sources include introductions to classification schemes and articles about the schemes written by that scheme’s authors. (While this plane could in theory unearth interesting questions about authorship and authorial intention, for the schemes under consideration in this thesis, this is not a particular issue.) Plane 3 considers the external criticism and third-party analysis of the schemes, and this plane is theoretically dependent on ideas about scheme criticism which I discuss in detail as part of my work on reception studies of classification schemes (Lee 2015, and text appearing in Appendix B3). This plane and plane 2 reveal issues with scheme-as-document, as knowledge gained from the introduction to the scheme (other than direct instructions on the mechanics of using the scheme) could appear in planes 2 or 3 (depending on whether it is by the author(s) or a third-party) yet can be physically attached to the scheme itself (plane 1). Plane 4 covers the author’s background and the context for the scheme’s creation, such as date of creation and experience of the author.

The four planes can be put together, as shown in Figure 11. While this visualisation is useful to show the relative distance of each of the planes from the scheme (which is

somewhat debated) and the internal/external divide, actually in some respects the order of planes does not matter. The planes can be viewed in any order, and the model allows for interactions between any combinations of planes. The full paper (Lee 2016, and Appendix B4) shows that it is the space between the planes which provides the most invaluable knowledge, so this will be presented and explored for BCM and Dickinson. So, the four planes will be articulated for both BCM and Dickinson. This will be followed by exploring the space between each of the planes, highlighting the knowledge gained about music classification and faceting using the “multiplane approach”. The importance of the relationships between planes, rather than the information found in the planes themselves, can be visualized as a tetrahedron, with each node of the tetrahedron representing a plane of knowledge – see Figure 12. (See Lee (2016) and Appendix B4 for more discussion about the visualisations.) Examining the music schemes through all these perspectives will enable a multi-dimensional picture of the schemes’ position in the faceted universe to emerge, and will be insightful for the study of the symbiotic relationship between faceted classification and music.

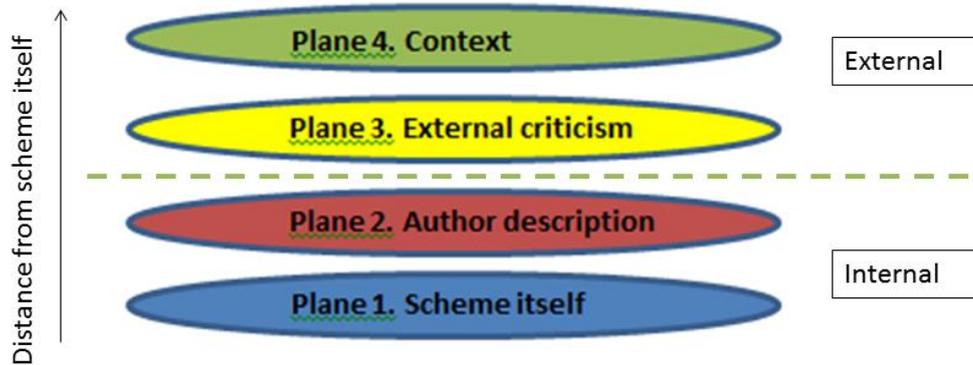


Figure 11. The four planes of the “multiplane approach” to analysing classification schemes

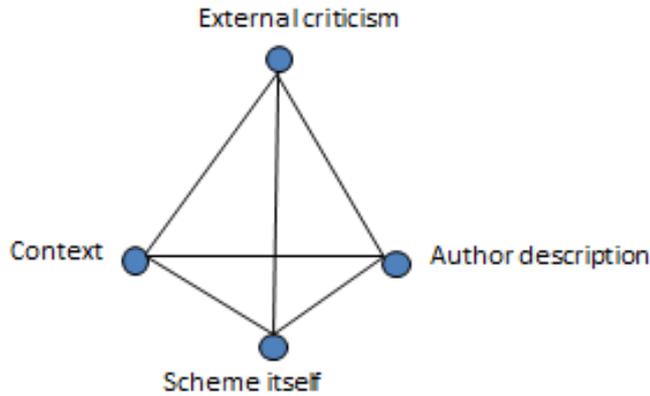


Figure 12. Visualizing the four planes of knowledge as a tetrahedron

5.2. BCM's faceted-ness

5.2.1. Plane 1: the classification scheme itself

Examining the BCM schedules as well as rules for using the scheme shows a commitment to facet analysis: most concepts are written in their simplest forms and classmarks for complex subjects are created by combining classmarks for simple concepts. This fulfils the basic prerequisite of facet analysis as described in Section 2.1. A citation order for notated music is presented although not using the term "citation order", with two subsequent orders for the "executant" facet (in other words, musical medium); while the citation orders are not vital for being considered a faceted classification scheme, they are a good indicator of facet analysis (see Section 2.1).

However, when examining the scheme in detail, it seems there are numerous ways that the scheme is not *entirely* faceted. BCM contains a number of sections where it could be argued that complex topics are pre-coordinated and are not listed in their simplest forms.⁵⁹ For example, dramatic vocal music contains concepts which are a combination of form/genre and facet which belies the simple concepts found required by a faceted classification: CC to CP (Coates 1960a, p. 25) lists various forms/genres of opera all with the format of vocal scores while the same forms/genres with a different format are listed in CQC to CQN (Coates 1960a, p. 25). There are also places where complex concepts are listed which are pre-coordinated, and do not match the classmark which would be created by combining the classes for the single concepts. For example, the class of NUR is assigned for "Flute, string & keyboard ensembles" (Coates 1960a, p. 10); however, "flute", "strings" and "keyboard" are listed elsewhere in the schedule as VR,

⁵⁹ Note that this section does not list *all* the non-faceted elements of BCM, only one example of the more prominent issues. Therefore this section should not be taken to be exhaustive.

RW and PW respectively.⁶⁰ It is clear that though mnemonically related to their individual components, the complex classes listed in BCM are not pure additions of simple concepts. (This also suggests that chamber music might be a fruitful area to consider in the thesis, and elements of chamber music are discussed in Chapter 6, Section 2.)

So, how faceted is BCM? In Ranganathan's scale (see Section 2.2), BCM would be placed at level three, indicating the scheme is mostly faceted but not a complete faceted classification. However, Coates' (1960a) own definition of faceted classification does not explicitly say that the scheme has to be entirely faceted to be considered a faceted classification scheme – indeed, this would be a very difficult requirement for any scheme to meet in practice – so in his own terms, Coates' scheme qualifies as a faceted classification.⁶¹ Therefore, examination of BCM itself reveals that it is mostly, but not fully, faceted. How you categorize the scheme depends on whose criteria the answer is based upon; in Coates' framework, BCM would be considered a fully faceted scheme, but according to Ranganathan's framework, BCM is a highly faceted scheme but fails to be considered a purely and totally faceted classification scheme.

5.2.2. Plane 2: authorial description and analysis

The printed schedules of BCM include an introduction written by the author (Coates 1960a). This introduction reveals the author's faceted intentions in a number of ways: types of terms are described as "facets", a definition of faceted classification is offered and Ranganathan's highly faceted Colon classification scheme is described as BCM's "immediate forebear" (Coates 1960a, p. ix). Overall, the author's faceted intentions are unequivocal.

5.2.3. Plane 3: external criticism and analysis

External criticism of the scheme – both contemporary and post-facto – emphasises the faceted nature of the scheme. BCM is received as a faceted scheme (see for instance, Bryant (1985, p. 242), Jones (1979, p. 97) and Elliker (1994, p. 1279); in other words, its

⁶⁰ We see that at one level NUR is built from the following classmarks: chamber music for wind/string/keyboard ensemble (NU) and flute (R). However, even if we make the leap that in order to add "flute" from the classmark for flute already in the schedules, the "V" from "VR" needs to be omitted, we run into problems when we consider other chamber music classmarks; for instance, the brass ensemble classmarks (NUXP to NUXV) are created by dropping the "W" (from W to WY, the section for individual instruments) and changing it into an "X". Not only is there no instruction to do this, but it is hardly a neat, faceted solution.

⁶¹ In Coates' terms (1960a, p. ix), a faceted classification is "a classification system consisting of schedules of elementary terms capable of combination in a prescribed manner".

perception by those who have not written the scheme is that it is faceted. Moreover, it is not just any faceted scheme, but described as the “first *printed* fully faceted scheme published in Great Britain” (Redfern 1978, p. 24, emphasis in original). So, this also suggests a relationship between general KO and music classification. External knowledge about the scheme could be considered to be part of its impact on other schemes, what is described by Lee (2014, 2015, and text appearing in Appendices B2 and B3) as its *Wirkung*. For example, BCM has been used as the basis for a number of later schemes which are also faceted or somewhat faceted, such as the *Phoenix Schedule* of DDC and the revised music schedules of *Bliss Classification*. In the case of DDC, music goes to the heart of the “facetization” of this general classification scheme, showing how music can act as a champion for faceting.

Interestingly, BCM also has a preface, written by an unspecified third party. This preface also promotes the faceted intentions: the term “facets” is introduced (Coates 1960a, p. vii) and used by the author to describe the chain-indexing approach adopted by Coates, and the author makes a comparison between *Colon Classification* and BCM (Coates 1960a, p. ix). However, there is a methodological question about where the preface fits in terms of planes as it is both analysis of BCM and also, to some extent, part of the “original” scheme.

5.2.4. Plane 4: context and author background

The background of Coates, the author of BCM, is extremely important to discovering BCM’s faceted nature: Coates was heavily involved with developments in faceted classification as a member of the Classification Research Group (McIlwaine, Broughton 2000, p. 195), the group of United Kingdom classification theorists who were at the cutting edge of classification theory during the post-War years and beyond. External information also reveals that Coates was specifically familiar with Ranganathan’s work, such as references to Ranganathan in Coates’ classification monograph *Subject Catalogues* (Coates 1960b). Therefore, this plane indicates knowingness to the faceted nature of BCM.

5.2.5. Multiplane approach to faceting in BCM

Putting all the planes together for BCM reveals some interesting information, not seen from traditional analysis of the scheme. While examining BCM (plane 1) suggests that it is unquestionably based on the theories of facet analysis, a closer look reveals some kinks in the facet analysis; so BCM is a scheme based on facet analysis, but is not a

purely faceted classification scheme in Ranganathan's framework. In itself, this information is not especially insightful, and typical for classification schemes and other forms of knowledge organization system (KOS) such as taxonomies (Bawden 2015, private communication). However, when the author's description (plane 2) and background (plane 4) are taken into account, it becomes more interesting. Coates designed and perceived his scheme to be faceted, and he had a background steeped in faceted classification; yet, scrutinizing his scheme reveals that it is not entirely faceted. One interpretation of this concerns music itself: it cannot be simple to break down into effective facets.⁶² If a scheme is designed to be faceted with faceted values at its heart, but is not fully faceted in reality, then this reveals something very interesting about music classification. The gaps between the intentions and expressions of faceted-ness in this scheme, which are revealed using the multiplane approach, could be viewed as evidence that faceting and music are not a good match.

Another useful point concerns the criticism of BCM as a faceted scheme and its use in flagship faceting milestones (plane 3). As discussed in Section 5.2.3, this is a revealing indication of a symbiotic relationship between general KO and music. However, it is particularly pertinent when contrasted with plane 1, which suggests that the scheme is not fully faceted after all and that there is a dichotomy between BCM's reception as a faceted scheme and the realities of the scheme. Thus, the multiplane approach reveals the contrast between BCM being feted as a fully faceted scheme and the more prosaic reality of being *almost* faceted, falling foul to music's occasionally impeachable structures. BCM is revealing about music classification, but also unearths some ways in which music impacts upon general KO.

5.3. Dickinson's faceted-ness

5.3.1. Plane 1: the classification scheme itself

Analysing *Dickinson Classification* reveals that it has the basic tenets of facet analysis: the schedules consist of simple subjects which are added together to form complex subjects. The scheme also includes the orders that subjects should be added together:

⁶² There are other interpretations. First, it could be considered that the analyser (me) is incorrect in their assessment of the scheme. It is worth noting this, but this potential issue is put aside for now as it is similar in concern to the objectivity-of-analyser issues: interesting, but not relevant to this thesis. Second, as expressed in Section 5.2.1, Coates himself considers the criteria for a "faceted classification" to be looser than Ranganathan, so analysis using Coates' criteria would say that the scheme *is* fully faceted. Again, this asks useful questions. However, using the author's criteria to judge the scheme itself (plane 1) takes away from the separation between planes, so will not be explored further.

although in a section entitled “formulae” and called “combination orders” (Dickinson 1938, pp. 12-14), these in practice serve the same function as citation orders.⁶³ Unusually, there is a choice: six different “formulae” are presented, belonging to three different categories of library type – “loan and performance libraries”, “reference and musicological libraries” and “general or small libraries”. While citation orders are not strictly necessary to being considered a faceted classification scheme – see Section 2.1 – the presence of citation orders within this scheme strengthens its faceted credentials.

However, while on the surface Dickinson appears to be a classified classification scheme, a closer examination reveals non-faceted aspects to the scheme. For example, there are places where compound subjects have been written out rather than listed in their simplest forms, such as “keyboard chamber music with plectral instrument” (Dickinson 1938, 514). However, while “514” can be broken down into its constituent parts and each of these parts represents an aspect of “keyboard chamber music with plectral instruments” – chamber music is “5”, keyboard instruments are “1” and plectral instruments are “4” – there are places in the classification scheme where complex terms are not only listed, but they cannot be broken down in a meaningful way. For instance, “bowed string and wind ensembles” (55) is a complex term; yet if “55” is broken down into simple terms, it represents “chamber-chamber” which is obvious nonsense. Another example of non-faceting is written into the fabric of the scheme. The CD facet contains two types of things: the first foci are related to formats, while the rest of the foci in the facet concern musical medium. This is potentially problematic in a faceted framework, as each “facet” should contain foci representing the same *type* of thing.⁶⁴ So, it can be surmised that from looking only at the schedules of the scheme and its “citation orders”, Dickinson is a somewhat faceted scheme. It mostly follows the general principles of facet analysis, with some parts of the scheme being less faceted than others.

⁶³ For ease of reference, the pagination and date used in reference to Dickinson refer to the original *Dickinson Classification* (Dickinson 1938). However, it should be noted that in this thesis, it was Bradley’s 1968 reproduction of the scheme as part of her cataloguing and classification manual (Bradley 1968) which was consulted. The reasons for this are pragmatic: copies of the original edition of the scheme are extremely rare and Bradley (1968) offers reproduction of layout, typography, and so on, of the original.

⁶⁴ Note that this section does not list *all* the non-faceted elements of Dickinson, only one example of the more prominent issues. Therefore this section should not be taken to be exhaustive.

5.3.2. Plane 2: authorial description and analysis

In this plane, Dickinson's own accounts of faceting are considered, and for this, the introduction to his scheme is used as a source. In the introduction to the scheme (Dickinson 1938), the author describes the technical and scientific features of his scheme. Though he does not use faceted classification terminology, there are a striking number of similarities between his description and common ideas in faceted classification theory. For example, Dickinson suggests his scheme uses the technique of "synthesis", elaborating that this means that his scheme consists of "factors capable of assembly" (Dickinson 1938, p. 7).⁶⁵ This allies itself with general definitions of facet analysis as a method whereby complex classmarks are constructed from a scheme of simple concepts (for instance, see Section 2.1). Dickinson also discusses the nature of these categories. For instance, he identifies a primal need for "scientifically sound categories" (Dickinson 1938, p. 7) and states that "provision must be made for categories covering all the special differentiations characteristic of musical compositions" (Dickinson 1938, p. 7). In other words, every aspect of the composition needs to be covered in the classification scheme. If "categories" were replaced with "facets", these statements would not appear out of place. Finally, though Dickinson calls the device which tells a classifier how to build a complex classmark a "combination" in a section entitled "formulae", in practice, these "formulae" act in an almost identical way to citation orders.⁶⁶ (Note that the contents of these citation orders are within the boundaries of plane 1, how the scheme works; however, how they are presented to the reader is part of plane 2.) So, we can see that the author espouses faceted ideas, which could be read as faceted intentions; vitally, the author does not use the vocabulary of faceted classification, only its ideas.

5.3.3. Plane 3: external criticism and analysis

The external descriptions and criticism of Dickinson generally do not mention faceting: for example, the most in-depth contributions about Dickinson, by the late music librarianship researcher, Carol Anne Bradley (Bradley 2003, Bradley 1972, Bradley, Dickinson 1968), do not discuss faceting. (See Lee (2015, 2016), reproduced in Appendices B2 and B3, for discussions about the methodological issues in discussing a

⁶⁵ Dickinson's use of the term "synthesis" is also very interesting: the term "analytico-synthesis" is used by some classification theorists to describe what we have termed "facet analysis".

⁶⁶ One small difference between a citation order and Dickinson's "formulae" is that the formulae not only tell the classifier which facets to use, but also the typographical layout of the classmark. This is essential for the Dickinson scheme, as the different facets do not use unique notation, so the only way to distinguish one facet from another is by the typographical position of each part of the classmark.

scheme's criticism.) One source consulted, by Redfern, discusses faceting: he (Redfern 1978, p. 38) believes that Dickinson has faceted and enumerative aspects but that the scheme is not fully faceted as the facets do not work in the correct way. However, when looking closer at Redfern's criticism, questions start to emerge. Redfern (1978, p. 38) suggests that before a formula is selected, the scheme is faceted; however, once this formula is imposed, a specific, enumerative scheme is written. Redfern (1978, p. 38) appears to suggest that a formula can be selected each time an item is classified, which directly contradicts Dickinson's instructions for his scheme which demand that the same formula is used for every item. It is difficult to understand why Redfern believes that the scheme becomes enumerative once the formula is chosen; even with a fixed formula, classmarks are created by combining the simple classmarks listed in the schedule according to a consistent formula. Unfortunately, Redfern (1978) does not elaborate further so we cannot follow his reasoning on this matter, nor have any instances been found where other commentators comment on Redfern's interpretation. While Redfern's conclusions about Dickinson's faceting are arguable, they do show that faceting is (briefly) discussed; however, taking the body of criticism of Dickinson as a whole, faceting is not a popular topic.

5.3.4. Plane 4: context and author background

Considering Dickinson's background and the context of the scheme's creation are insightful. The *Dickinson Classification* was first published in 1938 (Bradley, Dickinson 1968, p. viii); however, its development started a decade earlier when Dickinson commenced his responsibility for Vassar College's music library (Bradley 2003, p. 470). These dates are interesting due to the general historical development of faceted classification theory by the "father" of faceted classification, the Indian library theorist Ranganathan. So, it is useful to consider whether Ranganathan's early works on faceting would have been known by Dickinson.

Ranganathan's seminal work on faceted classification, *The Prolegomena to Library Classification* (Ranganathan 1937), was first published in 1937 (Ranganathan 1992, p. 458); his *Colon Classification*, which was the first fully faceted classification scheme, was first published in 1933 (Ranganathan 1992, p. 458). Therefore, in the 1920s and early 1930s Dickinson was developing his scheme and arranging his library using his scheme before Ranganathan's theories were published. Even in the later 1930s, it is an interesting question about how much Ranganathan's scheme (Colon classification) and theories (the Prolegomena) were known in the United States. *The Prolegomena to*

Library Classification was first published in 1937 (Ranganathan 1992, p. 458), just a year before the publication of Dickinson's classification scheme. Ranganathan's fully faceted classification scheme, the *Colon Classification*, was first published a few years earlier in 1933 (Ranganathan 1992, p. 457). While we do know that the *Colon Classification* was publically available in the USA – Bliss' curiosity and interest in Ranganathan was apparently instigated by seeing a copy of the *Colon Classification* for sale in a New York bookshop at the end of 1933 (Kumar 1992, p. 87) – there is no evidence that Dickinson would have encountered it. Another potential way that Ranganathan's faceted classification theories might have been known by Dickinson is through any personal appearances by Ranganathan in the United States: yet Ranganathan's first visit to North America was in 1950 (Ranganathan 1992, p. 460).⁶⁷ So, it seems extremely unlikely, from a historical perspective, that Dickinson would have known about Ranganathan's ideas while creating his scheme, and still unlikely that he would have encountered the *Colon Classification* or *The Prolegomena to Library Classification*.

We must also take into account Dickinson's background: he was not a librarian by training or practice. Rather, he was a musicologist of at least a little note (Nettl 1960, p. 71) who started work at Vassar College in 1916 as a musicologist before "progressing" to his task of creating a music library in 1927 (Bradley 2003, p. 470). How much knowledge and interest did Dickinson have in classification theories of the time? Bradley – a champion of Dickinson and his scheme, and author of a number of publications on the subject – does not suggest any particular interest. Therefore, Dickinson's faceting appears to have been uninfluenced by formal theories of faceting as exemplified by Ranganathan. It must be noted that proto-faceted systems of classification occur much earlier – for example Kaiser's 1911 treatise on "systematic indexing" is considered by some to be the originator of facet analysis (Dousa 2010, 2013). However, although the dates allow more time for Dickinson to have heard of these theories, their lack of use in North America during the early 20th century, especially at the "coal-face" of libraries, and Dickinson's non-librarian background, suggest that it is unlikely that Dickinson was aware of these faceted developments. Thus, the most likely chain of events is that Dickinson created his scheme without reference to faceted classification.

⁶⁷ He visited the United States from May to September 1950 on a tour organized by the Rockefeller Foundation (Ranganathan 1992, p. 460). In addition, in the sources consulted, which include a number of biographical items about Ranganathan, there was no evidence that his ideas about faceted classification had spread to the wider American librarian community in the 1930s – at least, this was not deemed important enough to be mentioned in histories and biographies of Ranganathan. However, Ranganathan was in contact with America-based doyens of classification theory and schemes, such as Melville Dewey and Arthur Bliss (Kumar 1992).

5.3.5. Multiplane approach to faceting in Dickinson

When putting all the planes together, our understanding of faceting in Dickinson is enriched; more importantly, valuable information about music classification generally also starts to emerge. The scheme itself (plane 1) suggested a mostly faceted structure – albeit not a fully faceted scheme. However, the authorial description (plane 2) discussed faceting ideas, even though faceting vocabulary was not used. Most importantly, the authorial background and context (plane 4) suggest that formal theories of faceting were not used to create this scheme. While Dickinson’s faceted-ness taken by itself is interesting, it is not remarkable. However, combined with the almost certainty that Dickinson did not know about theories of faceted classification, the *Dickinson Classification* becomes invaluable to understanding the relationship between faceted classification and music.⁶⁸ If Dickinson, a musicologist who happened to be in charge of the challenge of establishing and arranging a music collection independently developed a structure which is, to all intents and purposes, faceted, then this is revealing. This suggests that there is something inherent in music which suits and demands faceted treatment;⁶⁹ something about music means that Dickinson believes that faceting is the best system of organizing it, although he has to “invent” faceting in order to do it. It also offers up Dickinson as another example of a proto-faceted system, or “faceted-before-faceting”; in other words, while popular librarian-lore equates Ranganathan with the birth of faceting, Dickinson can be added to the more nuanced, complex and accurate history of faceting, as another step along the way between Kaiser and Ranganathan.

⁶⁸ Comparing the external criticism (plane 3) with the other planes suggests that the faceting aspect of Dickinson was either not noticed or ignored. There are many possible explanations for this, including differences of interpretation between *my* analysis and the analysis of published reviews, or criticism not tackling faceting because the scheme was unexpectedly faceted. These are not further discussed because they are concerned with classification scheme analysis so outside of the scope of this thesis.

⁶⁹ When presenting the COLIS paper in Uppsala in June 2016, where I spoke about the multiplane method generally and used Dickinson as an example of its application, Birger Hjørland asked a question concerning the uniqueness of this result. He argued that computer scientists also created a form of faceting, without utilising the existing theories of faceting by Ranganathan and others, and faceting can be traced back to Aristotle’s systems of knowledge (Question, Hjørland, COLIS conference, 29th June 2016). This is an interesting question and raises the point that if other communities (such as computer scientists) worked out independently that faceting is a useful way of organizing information, then surely there is nothing special about a music classification scheme doing the same. However, I would argue that computer scientists finding the usefulness of facets do not dilute the Dickinson example. Perhaps facets are an inevitable way of organizing all types of knowledge (the Aristotle example) and the ideal state of all classifications is faceted (going a little further than Hjørland here); still, out of all the possible ways to organize Dickinson’s library – and past conventions based on other music classification schemes and general classification schemes of the time would point to non-faceted classification being chosen – a proto-faceted scheme was developed. The faceted solution was seen as best to describe and breakdown music, and whatever happens before and afterwards, was (probably) created by Dickinson *as if* it were being invented. If faceting were inevitable for all knowledge, then surely it would have been used already in classification schemes; if it were not inevitable, then something about music effected its quasi “invention” by Dickinson, suggesting a strong link between faceting and music.

5.4. Conclusions concerning the multiplane approach

Therefore, this novel multiplane perspective has revealed its worth in these BCM and Dickinson examples. The multiplane method reduces to an epistemological question of knowledge *about* the schemes: studying the connections between each plane of knowledge has revealed some interesting findings. First, Dickinson is an example of a scheme which is by analysis (mostly) faceted (plane 1) without an intention of faceting (planes 2 and 4) suggests how music could be considered as inevitably faceted. Second, BCM shows the difficulties of trying to make a faceted scheme for music (plane 1) even when the intentions of the authors (plane 2), the perceptions of the scheme (plane 3) and the background of the scheme's invention (plane 4) all point towards a landmark faceted scheme. This demonstrates how music may not be as easy to break down into facets as first thought, or as evidenced in the literature (see Chapter 2). The BCM result could be seen as enhancing our knowledge of music classification gained from Dickinson, rather than contradicting it; music invites itself to be faceted (Dickinson) even when faceting is not known, but there is something in music which makes the practicalities of developing a faceted classification (BCM) very difficult. Third, both the Dickinson and BCM examples add a little to our general knowledge about faceting, providing another example of a faceting-before-faceting scheme to join Kaiser and friends (Dickinson) and how a landmark in UK classification development (BCM) might not be as revolutionary as first thought, with all the ramifications that this brings. So, while the multiplane analysis of BCM and Dickinson has outlined the importance of faceting to music classification, it has also shown how in small ways, music classification is important to understanding general KO.

6. Conclusion to Chapter 4

This chapter has demonstrated that faceted classification and music make a rich and rewarding combination, but one which is fraught with complexities. To start, there are many different labels for music's facets, and even labelling music facets is not straightforward. Some of the biggest nomenclature tensions occur when discussing character/purpose/function and form/genre. For simplicity, this thesis is going to generally use Elliker's (1994) labels for facets. One significant difference is offered: the name of the facet for character, function, purpose, and so on. As described throughout this thesis, there are issues with naming this facet. While Elliker chooses "character", the title of "character" is not adequate for the discussions in Chapter 9 which is devoted

to this facet. So, in order to avoid confusion, the title of “function” which is the most appropriate in Chapter 9, is also adopted when discussing this facet in Chapters 5 to 11. There are other differences and caveats between Elliker’s list and usage of facet labels in this thesis. First, the contents of Elliker’s facets will not necessarily be used where there are points of debate; for instance, Elliker’s boundaries of the format facet include elements relating to accompaniment/arrangement, which will not necessarily be followed in this thesis. Second, it is worth repeating that the purpose of Elliker’s facets is very different from the usage of these titles in this thesis. Third, Elliker’s facet-names are used as a base, but as the thesis progresses, potential extra facets or sub-facets will be discussed. So, henceforth, music facets will be referred to as follows: medium, form/genre, function, time, place, composers and format.

The research in this chapter revealed that not all of these facets are equal in terms of importance and significance. The analysis of three example classification schemes and Elliker’s findings showed that there were three important facets: medium, form/genre and function. The LIS music classification literature suggested that medium and form/genre were particularly important, with for instance, Smiraglia (2006) suggesting that these two properties *are* music. The importance of certain facets is also seen in the music domain, where, for example, Busoni (1957) suggests that medium, form/genre and function – albeit, using different terms – are the elemental properties of music. Therefore, these findings suggest that the facets of medium, form/genre and function should be explored in detail, and are thus the focus of this thesis. There are, however, some interesting omissions from this list. The first is the absence of space and time, two ideas usually considered important at least to the study of music. The PMEST discussion showed how these facets appear to be engulfed in the facets for character, form and genre. The composer facet is also missing from this list of the key facets for music, and this is discussed in particular in Section 3.1.4. While “composer” is a facet in Redfern and Elliker’s meta-facets and is present in Dickinson, there are good reasons to omit it from this study. First, Elliker (1994) shows how it does not make as strong an appearance in classification schemes as the three selected facets. Also, it seems that “composer” identifies individual works rather than being used as a classification device. “Format” is omitted for a different reason: the discussions in this chapter highlighted how format has a quasi-facet state – see Section 3.4. Hence the idea of format will make an appearance in discussions about arrangement and accompaniment, but this is not treated as a separate facet.

In addition, this thesis gives unequal space to the three facets of medium, form/genre and function, and some of the antecedents for this can be identified in this current chapter. First, there is an order of importance of these three facets, as seen in analysis of LIS schemes and literature, which is reflected in citation orders and descriptions. Medium usually wins. This adorns “medium” with the tag of potentially-most-important facet, and is one factor why it receives the most attention in this thesis. Second, the analysis of classification schemes revealed the composite nature of medium. Categorizations based around vocal/instrumental divisions appear to be important – for instance, see Line’s “anti-medium scheme” which has the medium-esque vocal/instrumental categorization at its core; in some schemes, such as Redfern’s meta-facets, a singular medium facet is replaced by “numbers of things” and “types of things”, illuminating the facets versus sub-facets conundrum. These potential sub-facets and the divisions of medium are explored in detail in Chapters 5 and 6.

This chapter has shown that the LIS and music domains have much synergy when it comes to the facets of music. While rejecting it on a theoretical level, Busoni’s description of the status quo of music’s elemental properties – sound-medium, form and purpose – bears much resemblance to those found when analysing LIS classification schemes. In addition, music philosophy discourse validates the idea of “medium” as a facet and medium is a vital facet in LIS classification of music, although there are differences between what the music domain considers to be medium and the LIS classification construct of medium.

Another important relationship has been elucidated in this chapter: the relationship between general KO ideas of faceting and music classification. Using a novel conceptual analysis to consider information *about* classification schemes, the multiplane analysis of faceting from two example LIS classification schemes, BCM and Dickinson, revealed some interesting results. Dickinson shows how music could be considered to be irrepressibly faceted, becoming a newly discovered member of the faceting-before-faceting trope; yet, BCM revealed how even with impeccable faceting pedigree, entirely faceted music is difficult to achieve in practice. This suggests there is something very interesting about music and facets, and helps to justify the faceted-centred approach taken by this thesis. Intriguingly, exploring the multiplane approach also illuminates cracks between the traditional narrative of KO development – BCM as first fully faceted classification scheme in the United Kingdom, Ranganathan as creator of faceted

classification, and so on – and the slightly different reality. Exploring music classification in a small way thus demists and demythologises traditional understanding of the development of KO.

In conclusion, faceting is significant to music classification, and the importance of music classification can even be seen in its symbiotic relationship to faceting more generally. The desire to break music down into elements is shared by the music and LIS domains, and there is accord between the elements of music identified in the music domain and the key facets identified in LIS discourse and classification schemes. Thus, the facets of medium, form/genre and function will be analysed and explored in detail in the next five chapters.

Chapter 5. Musical medium 1: the vocal and instrumental categorization

1. Introduction to Chapter 5

The previous chapter highlighted the importance of medium as a facet, and this chapter is the first of three which considers the facet of medium in more detail. This chapter considers a critical part of the musical medium facet: the division of musical medium into voices and instruments. It explores this seemingly binary division, considering its importance to, and impact on, the classification of music. While on the surface this categorization appears straightforward, this chapter demonstrates the complexities involved with this categorization, both in its definition and application.

The discussion covers this categorization in both the library and information science (LIS) and music domains, seeking to understand how this vocal and instrumental categorization is manifested (or not) and the corollaries of this categorization for other parts of music classification. First, the nature of the categorization is explored in detail, contemplating what the categories mean and how instruments and voices differ. Next, the categorization in LIS schemes is considered. This is followed by an exploration of the categorization within the music domain, using examples from musicological discourse and the classifications of Grove worklists from a selection of 25 composers. Next, the boundaries of the categorization and the types of musical works which in some way transgress or challenge this categorization are considered. This is presented in two parts. First, a taxonomy is constructed and analysed, which presents various categories of works which typify the blurred boundary between vocal and instrumental music. Then, a detailed exploration of one particular type of work is presented: the choral symphony. Two examples – Beethoven’s Symphony No. 9, Op. 125 and Berlioz’s *Roméo et Juliette* – are explored, extracting and intertwining classification issues from the LIS and music domains, and showing how choral symphonies encapsulate general structural issues with traditional music classification.⁷⁰ Thus, this chapter presents and analyses

⁷⁰ Note that the work by Beethoven is considered a generic title so is not italicised, but the work by Berlioz is considered a true title so is italicised, according to the RILM style guide for writing about music (Cowdery 2006, pp. 48-51). Generally, the editorial conventions of this guide will be followed in this style guide for describing musical works.

the categorization of medium into voices and instruments from a perspective of dual domains, showing that this categorization is critical to music classification, yet also highly problematic.

2. Introducing the categories and defining terms

2.1. Separating voices from instruments

This chapter discusses a binary classification of music into voices and instruments: before contemplating the impact of this categorization, it is important to examine the boundary and relationship between these two antagonists. Some commentators describe the relationship as opposite terms. For example, Kartomi (1990, p. xvii) explores a definition in *Webster's Dictionary* which defines instruments by the fact that they produce music but are not a human voice; thus, in the *Webster's Dictionary's* universe, one category of objects which produce music (instruments) is defined in terms of what it *isn't* (human voice). This not only reinforces the idea of a strict categorization, but also demonstrates that there is a fundamental relationship between those categories. Organological (the study of musical instruments) literature demonstrates that historically, instruments were frequently described and sometimes judged on their similarity to voices. For instance, Bicknell (2011, p. 276) discusses the French Enlightenment encyclopaedia *Encyclopédie*, which suggests that instruments the criteria of an instrument's worth was its similarity to the human voice. A more modern example sees Cottrell (2013b, pp. 338 and 341) compare the saxophone's tone to that of the human voice. These types of description suggests a relationship where the members of one category (instruments) are described – and sometimes judged – in terms of another category (voices), which could perhaps poetically be described as a “classificatory yearning”. So, from a classification perspective, the categorization between voices and instruments is important, but the relationship between the two categories is dynamic.

Further dynamism in the relationship between voices and instruments is seen in another approach, where voices are considered to be a particular type of instrument; in classification terms, this means that there is a single category for instruments and thus voices are demoted to a sub-category. Kartomi (2013) suggests that this idea gained currency in the 20th century; however, she also suggests that the viewing of voices as a type of instrument is not entirely a child of the 20th century, mentioning 10th-12th century Nārada's five categories of instruments (*Saṅgīta-makarāṇḍa*), where one of

these five categories is for human voices. Placing voices as type of instrument is seen in certain LIS classification schemes of music; for example, Colon6 places voices as a type of percussion instrument, Colon7 considers the voice to be part of the “mechanical instrument” class and Expansive places voices in alphabetical order alongside all other types of instrument. These LIS examples enforce the idea that voices are not inevitably a separate category, and the parallels between the LIS and music domains.⁷¹ So, this chapter will adopt the traditional thinking that voices and instruments are separate categories, while acknowledging a blurred relationship between the two entities.

A more practical consideration concerns the position of “accompaniment”, which is discussed in detail in Chapter 6, Section 3. If music for an instrument or instruments is accompanied, then the accompaniment will usually be for an instrument – for instance, a solo flute with piano accompaniment; however, if music for voices is accompanied – for instance, a solo soprano with piano accompaniment – then the accompaniment will usually be for instruments rather than voices, creating a void in the conception of a binary voice-or-instrument categorization. For the purposes of this chapter, music for voices will be taken to include an instrumental accompaniment, and the issue of accompaniment will be temporarily ignored unless pertinent to the discussion.

2.2. Voices and instruments, or, vocal and instrumental

Describing the presence of voices and instruments within a musical work is not only confined to the use of these specific terms: “vocal” and “instrumental” are also used. Therefore, some examples of the terms’ usage in LIS classification schemes and music discourse are presented. A brief consultation with musicological discourse shows that the terms “instrumental music” and “vocal music” are normally used to describe the categorization of music into these types, rather than “instruments” and “voices”. For example, the important musicologist, Carl Dahlhaus, whose output includes key texts about the aesthetics of music for instruments in the early 19th century uses the term “instrumental music” in chapter titles in his *The Esthetics of Music* and *The idea of Absolute Music* (Dahlhaus 1982, Dahlhaus 1989a).

⁷¹ The separation between voices and instruments could be conceived as a division based on whether the sound is human-made or not. However, this is negated by the existence of musical sounds made by humans which are not vocal, such as clapping or hitting the body – see for example, Nārada’s scheme of the early 2nd millennium (Wachsmann et al. 2013) which includes a category for hand clapping, and Olsen’s (1986) proposal of a fundamental category of human-body-instruments called corpophones. “Vocal” does not equate to “human”, so the voice’s humanness cannot be used within a rigorous categorisation system as the sole point of separation from instruments.

Classification schedules provide a less decisive answer to the question about how “instrument-ness” and “voice-ness” are described. Using the 18 example LIS schemes for music reveals a variety of approaches to describing this phenomenon. Some schemes reflect the findings from the music domain; for instance, BCM and Flexible have categories entitled “Instrumental music” and “Vocal music”. Other schemes use more noun-based approaches; for example, Subject has a class for “musical instruments”. However, this is muddled by having the opposing class as “vocal practice”, generating a level of confusion about whether this scheme is classifying objects (instruments) or actions (the act of singing). DDC22 attempts to cover all bases by including instruments and “their music” as part of a category heading, which could be indicative of an attempt to dispel any possible confusion. Sometimes even the schemes themselves are inconsistent within a category; for example Dickinson has an overall category of “instrumental”, but categories within “instrumental” include “Wind solo” and “String solo”, showing a mixture of adjectives and nouns. Therefore, we can conclude that unlike the musicological discourse, LIS classification schemes are less unified in whether they are categorizing objects (instruments/voices), actions (playing/singing, including Brown’s “vocal practice”) or the music generated by instruments and voices (instrumental music/vocal music).

It is imperative to consider whether there is any significant difference in the meaning of the terms voices/instruments as opposed to the terms vocal/instrumental, and what can be gleaned from any differences. At first glance the difference between the two types of terms is merely grammatical. “Instrument” and “voice” are both nouns, whereas “instrumental” and “vocal” are both adjectives.⁷² Positioning “voice” and “vocal” as separate concepts, another approach is to consider the relationship between them, and thesaurus construction discourse proves useful for this endeavour. This type of relationship does not fall easily into the eleven types of associative relationship listed in the thesaurus standard BS ISO 25964-1:2011 (BSI 2011, Section 10.3). However, Aitchison, Gilchrist and Bawden (2000, pp. 60-61), writing over a decade before the 2011 BS ISO standard, offer the relationship type “Concepts related to their properties”, which could prove insightful for the voice/vocal and instrument/instrumental

⁷² The discussion of terms is entirely based on English-language terms. It would be interesting to consider how the differences discussed above would pan out in languages other than English, and whether the differences are dependent on the syntax of an individual language or language family. For example, see the later discussion, Section 6, about the term “choral symphony”, and its French equivalent “symphonie avec chœurs”. Unfortunately there is not space to discuss “voices”, “vocal”, “instruments” and “instrumental” in multiple languages.

connections. Using this relationship type as a model, “vocal music” could be considered a concept, and “voice” is its related property. This asks interesting questions about the exact relationship between vocal music and voice (and similarly, instrumental music and instruments); for example, it could suggest that “voice” is in deference to “vocal music”, by virtue of voice being a property of such music.

It is also useful to consider exactly what is meant by the terms “vocal music” and “instrumental music”. While the common feature of these bodies of works are indeed the type of medium (voices or instruments), the terms “vocal music” and “instrumental music” are describing a type of *music* rather than a *medium*. Therefore, the terms “vocal music” and “instrumental music” describe categories of music using a categorization from musical medium, but the resulting categories are not necessarily describing medium. This also highlights how ideas from the medium facet, such as the categorization into voices and instruments, can cleave to other facets.

In conclusion, there is no single set of terms which will cover all the usages within LIS and the music domain, and the choice of any pair would prove unideal in some contexts. The terms “vocal” and “instrumental” will be used. Reasons for this include the more prolific use of these terms rather than “voices” and “instruments” in the music domain and LIS schemes; furthermore, labelling some of the discussions later in this chapter as “voices and instruments categorization” would be disingenuous to the nature of those discussions, as the complexities do not apply to classifying objects (and quasi-objects, such as voices). However, the terms “vocal music” and “instrumental music”, while more in keeping with term usage in music and LIS, have also been discounted. The reason for this is clear: this is a discussion about musical medium, and the discussions above indicate that once “music” is introduced into a category label, whether that category is purely describing medium is debatable. Therefore, this chapter discusses an important categorization, labelled in this thesis as the vocal/instrumental categorization or vocal/instrumental divide.

3. Vocal/instrumental categorization in LIS classification schemes

In order to establish the extent of the vocal/instrumental categorization within the LIS domain, it is necessary to explore LIS classification schemes: the LIS literature concerned with music classification does not discuss this issue, so it is imperative to explore the

manifestation of LIS music classification through considering the conduit of exemplar classification schemes. So, the three example classification schemes are joined by the broad set of 15 schemes – see Methodology, Section 3. However, another, older edition of *Dewey Decimal Classification* (DDC) has been added: the 13th edition of DDC, abbreviated to DDC13. This has been selected in order to represent an earlier version of the broad structure of music inherent in DDC classification, selected especially to represent DDC before the seismic changes introduced by the 15th edition of DDC (the importance of the 15th edition of DDC is discussed in Chapter 7, Section 4.2.4). So, 19 schemes in total are considered in this chapter.⁷³

The results are striking. Fourteen out of the 19 schemes have a primary categorization into vocal and instrumental categories. In some cases, where medium is strictly differentiated as a separate facet, this division appears as the primary categorization within medium; in other cases, usually for more enumerative schemes, the types of music and genres associated with vocal or instrumental music are strongly separated and grouped by the vocal/instrumental division.⁷⁴ Furthermore, even a quick glance at these 14 schemes shows the entrenchment of the vocal/instrumental categorization. For instance, BCM specifies separate citation orders for vocal and instrumental mediums; this illustrates that BCM considers the two types of music to have different elements or for these elements to have differing orders of importance, validating the importance of the separation between vocal and instrumental.

Even most of the remaining five schemes have important vocal/instrumental categorization. For example, DDC13 has main categories for types of music, which are based around a mixture of function, form/genre and medium; however, most of these main categories only include music which is vocal or instrumental, not both, and the categories which (mainly) contain vocal music all appear before the categories which contain instrumental music. In fact, it is only the schemes by Cutter which show utter indifference to vocal/instrumental categorization. Therefore, the categorization between vocal and instrumental music is an important part of musical medium for LIS

⁷³ List of schemes with abbreviated names is as follows: BCM, Dickinson, Flexible, Ayer, Bliss1, Colon6, Colon7, Cutter1902, DDC13, DDC19, DDC22, Expansive, Haroon, LCC2015, McColvin and Reeves, Olding, Ott, Subject, UDC.

⁷⁴ It must be noted that three of these fourteen are less clear-cut than the others. Colon6 and Colon7 separate voices from instruments, but voices are a subset of instruments rather than being on an equal level of the hierarchy. Ott appears to have tied primary divisions, as its three medium-based classes could be considered as simultaneously divided by both the vocal/instrumental categorisation and a size division.

classification; in fact, this scheme analysis shows that it is the primary categorization of musical medium.

4. Vocal/instrumental categorization in the music domain

Considering the vocal/instrumental categorization from the perspective of the music domain provides contextual information to the LIS discussions, as well as adding extra complexities into the mix. It is noteworthy that “vocal”, “instrumental”, “vocal music” and “instrumental music” appear to defy definition within the music domain; for example, the primary encyclopaedic source for music, Grove, declines to define these terms (*Grove music online* 2016). One hypothesis for this omission is that the meanings of these terms are so obvious that they require no definition. A corollary of this assumption is that its implied categorization – namely, music divided by the presence of voices versus instruments – is also too obvious to be described. However, the music domain does show *implicit* signs of categorization between the vocal and the instrumental, and some examples of how the categorization reveals itself within the music domain are now given. The first examples discuss the vocal/instrumental categorization at play within musicological and music aesthetics discourse. The second example utilizes a selection of 25 composer worklists found in Grove, analysing how the vocal/instrumental categorization is utilized in what could be very loosely defined as a series of music-domain classification systems.

4.1. Music domain example 1: the position of text and the concept of “programme music”

There are a number of implicit ideas within historical musicology and musical aesthetics which hint at vocal/instrumental music categorization, without explicitly suggesting classification. Two of these concern categorizations of music which are not based on medium, but have some correlations to a vocal/instrumental divide: text and programme. Text plays a significant part in most vocal music, as voices usually – but not always – sing words. If music were to be categorized into music which had text and music which didn’t, most vocal music would be in the text category, while all instrumental music would be in the category for no text – see Figure 13. Hence, the value of text is a pertinent question for studying the categorization of music into instrumental and vocal groups. The value of text within music has fluctuated depending on the stylistic period. In the 18th century, the prevailing attitude amongst those

contemplating music was that text was vital – for instance, Morrow (1997, p. 7) indicates that text was the mechanism by which meaning was achieved and Hegel (Dahlhaus 1982, p. 30) goes even further, stating that instrumental music was incomplete without text. However, the tables turned in the 19th century, where text was seen as an obstacle standing in the way of music’s journey towards the sublime (Dahlhaus 1989b, p. 27), as non-textual music communicates without the need for an intermediary. So, in musical aesthetics, music is categorized between music with text and music without text, with each category having its turn as the critics and philosophers’ favourite. So, there is a categorization of music which is important to the music domain which is not the vocal/instrumental categorization; however, this text/non-text categorization is related to the vocal/instrumental categorization.

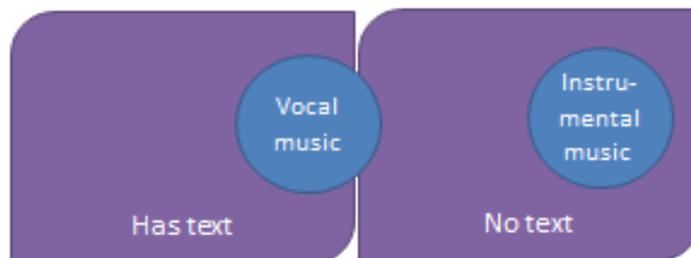


Figure 13. The text/no text boundary and the vocal/instrumental categories

A similar conclusion emerges when considering categorizations based on programme. In simple terms, programme music has an explicit narrative or emotion, whereas its antithesis, absolute music is abstract. (“Absolute music” is a label invented and popularised by the music philosopher, Dahlhaus, see for example, Dahlhaus 1989a.) Like text and non-text categories, the categories of programme music and absolute music do not map on to vocal and instrumental music directly, as it is possible for programme music to be instrumental – for instance, the genre known as “Battle symphonies”; however, it almost inevitable that pre-20th century absolute music *will* be instrumental as it was text which was considered to have meaning – see Figure 14. Again, this example shows a categorization which is important to the music domain, which like the text/no-text categorization discussed above, is a categorization which is similar to, but does not replicate, the vocal/instrumental categorization.

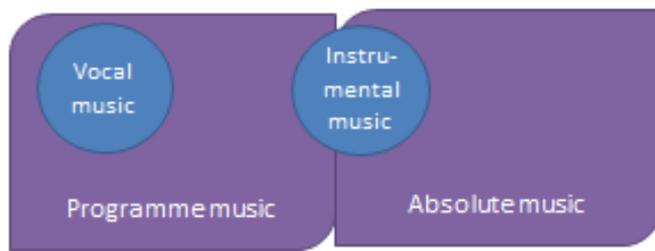


Figure 14. The programme music/absolute music boundary and the vocal/instrumental categories

4.2. Music domain example 2: Grove composer worklists

Another source of information about the vocal/instrumental categorization is to examine the organization of worklists of specific composers. As discussed in the methodology (Chapter 3, Section 4), worklists found at the end of encyclopaedia entries for composers in the seminal Grove are a useful resource for this purpose. The following 25 worklists are examined, as selected by the sampling discussed in Chapter 3, Section 4.3:

- Adam de la Halle
- Jacopo de la Bologna
- Machaut
- Binchois
- Du Fay
- Pierre de la Rue
- Palestrina
- Albinoni
- Cavalli
- Handel
- Alessandro Scarlatti
- C.P.E. Bach
- Beethoven
- Gluck
- Mozart
- Auber
- Liszt

- Cherubini
- Schumann
- Adams
- Boulez
- Glass
- Rihm
- Janáček
- Shostakovich.

(For full details and a full reference to all the worklists, see Chapter 3, Section 4.3.)

This set of example Grove worklists are not uniform in their structure and organization principles; however, the sum of the organization principles used for each composer gives a useful picture of vocal/instrumental categorization in the music domain. There are two important categorization ideas within the worklists pertaining to vocal/instrumental categorization and these need differentiating: whether each class of works contains only vocal or only instrumental works; if so, whether the instrumental classes are grouped together or not.

The first stage is to consider whether each of the 25 worklists includes both vocal and instrumental works; actually, some of the worklists reveal that their composer created only vocal works. For instance, Machaut’s works include a mass, motets, rondeaux, virelais and chansons, and these are all vocal works. These vocal-only composers are not “randomly” scattered throughout the group of composers. Instead, they are more heavily associated with particular temporal-stylistic periods. So, all the Medieval composers, all but one of the Renaissance and one of the Baroque have worklists which are entirely vocal. (The stylistic periods such as Medieval and Baroque refer to how they were categorized in the Grove resource list – see Chapter 3, Section 4.3 for more detail.) This is very interesting from a categorization perspective. First, this demonstrates that categorization is taking place, albeit not at the level of individual musical works; composers themselves could be considered as categorized in terms of being vocal or instrumental or both. Second, time period makes a difference to the categorization issue at hand. However, for the purposes of discussing vocal/instrumental categorization, only the 18 out of 25 composers which include both vocal and instrumental works will be considered. These 18 composers are as follows:

- Palestrina
- Albinoni
- Handel
- Alessandro Scarlatti
- C.P.E. Bach
- Beethoven
- Gluck
- Mozart
- Auber
- Liszt
- Cherubini
- Schumann
- Adams
- Boulez
- Glass
- Rihm
- Janáček
- Shostakovich.

Ten out of these 18 worklists – just over half of those composers which wrote both vocal and instrumental works – have classes which are restricted to instrumental works and classes restricted to vocal works, thus fulfilling the first of the categorization criteria. In other words, there is a strict vocal/instrumental divide in terms of setting boundaries for classes, and each member of that class shares the characteristic of “vocal” or “instrumental”. For example, the worklist for Alessandro Scarlatti (Boyd 2014) has classes for operas, contributions to other composers’ operas, serenatas, oratorios/large sacred works, cantatas, madrigals, masses/mass sections, motets, keyboard and other instrumental. Each one of these classes contains vocal *or* instrumental works, not both. Again, there is much temporal variation about occurrence of strict vocal or instrumental classes within different stylistic periods. The ten composers which appear to have strict vocal or instrumental categories are not evenly distributed: this group includes the entire list of Renaissance, Baroque and Classical composers (who have vocal and instrumental output), while far fewer of the so-called Romantic and Modern composers.

So, while instrumental/vocal categorization is taking place some of the time, it is much more common for some temporal-stylistic periods than for others.

Furthermore, seven of the ten composers who do have strict vocal or instrumental classes mostly keep the vocal and instrumental classes separate – in other words, the vocal/instrumental categorization is so strict that the instrumental classes are clustered together, as are the vocal classes. (The order of categories, whether it is vocal/instrumental or instrumental/vocal or vocal/instrumental, does not appear to follow a pattern for this sample of composers.) For instance, in the above example of classes from Alessandro Scarlatti's worklist (Boyd 2014), the classes containing vocal music are all at the beginning of the sequence, with the classes containing instrumental works at the end; everything before and including the class "motets" is vocal, while the last two classes ("keyboard" and "other instrumental") are both instrumental. Not only are the contents of the classes strictly categorized in the Alessandra Scarlatti example, but there is also a strict order which keeps the vocal classes in one place in the worklist and the instrumental in another. Again, temporal-stylistic period plays its part: the most likely period for composers' outputs to be strictly categorized into instrumental and vocal music is the Baroque period. Therefore, it can be seen that there is some degree of vocal/instrumental categorization within the music domain; yet, this categorization is not always used, and the chances of being used is to some degree determined by the stylistic period of the composer.

Looking in detail at vocal/instrumental categories reveals some other interesting findings: it seems that there are a few specific types of works which cause issues. Notable examples are ballets (and other stage works) and church sonatas. For example, Auber's works (Schneider 2014) have classes for stage, sacred, secular vocal and instrumental. While "sacred" and "secular vocal" only contain vocal works, and "instrumental" only contains instrumental works, the presence of ballets in the otherwise perfect vocal class of "stage" pollutes the vocal and instrumental categorization in this worklist. Beethoven's classes (Burnham, Johnson 2014) are beautifully pure, but the order of these classes is thrown off-course by the position of the class for incidental music and ballet: after many instrumental classes (for instance, "orchestral", "wind band", "piano four hands") there is a class entitled "operas" which is entirely vocal, followed by the instrumental classes of "incidental music" and "ballets", followed by more vocal classes (for instance, "choral works with orchestra", "songs").

So, the order of classes in the Beethoven worklist (Burnham, Johnson 2014) is instrumental→vocal→instrumental→vocal. Interestingly, if the forms/genres of ballet music, other types of stage/dramatic works, film music and church sonatas are ignored in the 18 worklists, the increase in worklists whose classes are purely instrumental or vocal drastically increases: 17 out of 18 composers follow vocal/instrumental categorization if a small number of specific types of music are ignored.⁷⁵ If these same types of work are ignored for the *order* of categories, there is an increase in those conforming to an instrumental/vocal divide when works such as ballets are excluded, but it is much more modest. Like other examples, time appears to play a big part in whether the order of categories fits neatly into vocal/instrumental (or vice versa) when works such as ballets and so on are ignored; Modern composers comprise the majority of categorization refusniks, suggesting that more contemporary, Western art music is not as naturally classified between vocal and instrumental music as music of the earlier periods.⁷⁶ One possible reason why a seemingly small number of types of works – such as ballets, incidental music, and so on – appear to have such a large impact on the vocal/instrumental categorization, is that another factor is at play, or more precisely, a higher characteristic of division. This could be labelled as “function”, and it is discussed in detail in Chapters 8 and 9.

The examples from musicological writings and the Grove worklists show that the vocal/instrumental categorization is part of the music domain, yet is somewhat equivocal. In certain situations, the indicators of such a divide are present, whereas at others, the categorization becomes blurred or even non-existent. Furthermore, the categorization is highly dependent on the temporal-stylistic period with the Baroque and Classical periods showing the most evidence of existing in the vocal/instrumental binary framework, and pre-Renaissance and Modern music showing the least. (Note that it is not possible to make a direct comparison to the LIS classifications on this point, as the LIS schemes used in this study cover multiple time periods.) While not direct equivalents, the analysis reveals some connection between vocal/instrumental categorization and ideas such as classifying by the presence of text and programme. Furthermore, the music domain analysis reveals that once the aesthetics of *Absolute music* commenced and non-text forms are celebrated (around the beginning of the 19th

⁷⁵ Only the worklist of the 20th and 21st-century composer Boulez still defies vocal/instrumental categorisation if these particular types of works are excluded.

⁷⁶ There are a number of reasons why Modern composers show such reluctance to be categorized into vocal and instrumental, such as deliberate blurring of boundaries and generic expectations. These ideas will be discussed in more detail in Chapter 8.

century), there is actually less vocal/instrumental categorization. So, the primary and inevitable categorization of vocal/instrumental that is seen in LIS, is present but somewhat diluted in the music domain, showing similarity but also divergence between the classification of music in the LIS and music domains.

5. Vocal/instrumental categorization issues

The discussions so far have been based on an assumption that separating vocal and instrumental works is procedural. However, when considering individual musical works, it quickly becomes clear that there are many situations and individual works which do not neatly fall into this bi-partite system. Considering these situations and works aids our understanding of the vocal/instrumental categorization. So, a taxonomy of categorization issues is presented.⁷⁷ Most of the categorization issues have two permutations, depending on the relative positions of vocal and instrumental. To complicate the situation even further, many of the issues are interdependent. One example of an extant Western art music work is given for each class. These examples are given to show that the classes are not just hypothetical. Note that the musical work examples are not “types” in the formal taxonomical sense of the word, as they do not typify their associated categories; instead, they provide example which display some degree of the phenomenon under discussion.

The taxonomy was inspired by thinking of individual musical works which did not fit into the binary vocal/instrumental categorization; however, the taxonomy is structured around a hierarchical system of classifying issues, in other words, top-down. The reason for this is that the act of devising taxonomies can in certain situations generate new knowledge – see for instance, Beghtol’s (2003, p. 66) discussions about new domain knowledge resulting from devising taxonomies. Please note, the taxonomy is not presented as a complete listing of all types of categorization issue within the vocal/instrumental framework; rather, it presents some of the possible issues. The taxonomy and subsequent discussion highlight the brittle-ness of the so-called binary vocal/instrument categorization.

⁷⁷ This knowledge organization system (KOS) has been called a “taxonomy”. Deciding on the official type of KOS is not straightforward due to inconsistencies in how historically KOSs have been developed and labelled (Pieterse, Kourie 2014, pp. 217-218); the KOS presented in Section 5.1 conforms loosely to the broad characteristics of a taxonomy, according to Pieterse and Kourie’s (2014, p. 221) categorisation of various types of KOS.

5.1 Taxonomy of vocal/instrumental categorization issues

1. Medium of whole is different from part

a. Vocal whole, instrumental part

i. Overture **Example: Mozart's Overture to *Le nozze di Figaro***

ii. Inter-act prelude **Example: Wagner's Prelude to Act III from *Lohengrin***

iii. Ballet/dance movements **Example: Verdi's Ballet Music from *Aida***

b. Instrumental whole, vocal part

i. Choral symphonies where only one part has voices **Example: Beethoven's finale from *Symphony No. 9***

2. Transformation of medium

a. Original is vocal, performed as instrumental

i. Normal form is instrumental **Example: Wagner's "Ride of the Valkyries" from *Die Walküre***

ii. Can be performed as instrumental or vocal **Example: Wagner's "Liebestod" from *Tristan und Isolde***

b. Original is instrumental, performed as vocal

i. Normal form is vocal **Example: Holst's "Jupiter, the bringer of jollity" from *The Planets*, transformed into the hymn *I vow to thee, my country***

ii. Can be performed as instrumental or vocal **Example: Elgar's *Pomp and Circumstance, No. 1*, sometimes sung with the words *Land of hope and glory***

3. Defying genre expectations

- a. Vocal genres, with instrumental elements
 - i. Whole **Mendelssohn's *Lieder ohne Worte* ("Songs without words")**
 - ii. Instrumental movements **Example: "Varhany solo" [movement for organ solo] from Janáček's *Mša Glagolskaja* ("Glagolitic mass")**
- b. Instrumental genres, with vocal elements
 - i. Whole **Example: Holst's *First Choral Symphony***
 - ii. Part **Example: Mahler's *Symphony No. 2* ("The Resurrection")**

4. Transcriptions

- a. Transcriptions (inter-vocal/instrumental transcriptions)
 - i. Transcriptions of vocal works, for instruments **Example: Bizet's *Carmen* reduced to piano solo**
 - ii. Transcriptions of instrumental works, for voices **No example**
- b. New instrumental works based on vocal source material **Example: Sarasate's *Concert Fantasies on Carmen***

5.2 Commentary and analysis of the taxonomy

5.2.1 "Medium of whole is different from part"

1.a. "Vocal whole, instrumental part". The whole-part class in this taxonomy splits into two, mutually exclusive classes.⁷⁸ For vocal wholes with instrumental parts, conundrums appear once this phenomenon is examined more closely. To start, there are an almost infinite number of possible sub-units depending on how "whole" and "part" are defined. If there are no limits to the size of "part", then every bar of a vocal work – say an opera – which does not feature voices, could be classed as "instrumental". Therefore, should we only count "parts" which exist separately, and if so, what criteria are needed to be considered a separate part? First, there are issues about music-as-text versus music-as-performance. For example, a concert may include a performance of an opera overture, yet the players use notated music which contain the whole opera; the information from

⁷⁸ The mutual exclusivity of the two subclasses is dependent on the mutual exclusivity of "instrumental" and "vocal"; if the vocal/instrumental categories were found to be non-mutually exclusive, then it stands that these two subclasses of the taxonomy would also lose their mutually exclusive nature.

the performance about the whole-part relationship does not match that from the notated music. Second, there are questions about frequency of performance or availability of scores, and whether the work is equally likely to be available or heard in its part or whole; for example, while the Overture to *Le Nozze di Figaro* is heard frequently as both part of the whole opera and as a separate standalone part of concerts, this is not true of all musical-dramatic overtures; for instance, performances of the whole opera *William Tell* (by Rossini) are rare compared to performances of the overture alone, while Sullivan's *Ruddigore* is sometimes performed as part of Gilbert and Sullivan's canon of theatrical works, but the overture is rarely heard as a standalone work in the concert hall. Furthermore, there are questions of authorial consent being used as categorization techniques; in other words, should the creation or explicit permission to create a separate part have an effect on the definition and categorization of parts – for example, Wagner's pragmatic decision to organize a few concert performances of sections from *The Ring Cycle* even before the cycle's premiere, including instrumental-only sections (Grey 2009, pp. 509 and 513).

There is also an interesting theoretical question which arises from this part of the taxonomy: does the vocal/instrumental categorization of the whole have an impact on the medium of the part? For instance, we need to appraise whether the Prelude to Act III from *Lohengrin* which is written for instruments alone, when played in a concert, carries any vocal elements or not. There are no voices, but perhaps there is a vocal "shadow" based on the medium of the whole.

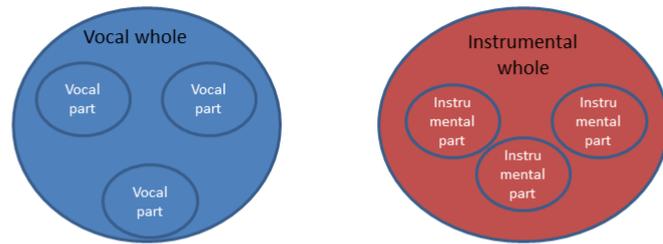
Finally, it is worth noting that whole-part issues only arise if the musical work has voices and instruments; those works which use solely one category or the other will not appear in this part of the taxonomy. This could suggest that works for voices and instruments should be treated separately from works for voices alone or instruments alone as they instigate an extra quality of complexity, potentially smashing the binary vocal/instrumental categorization.

1.b. "Instrumental whole, vocal part". Where the whole is instrumental and the part is vocal, fewer categories are suggested. This is because instrumental works are defined by being *purely* instrumental, so they cannot have a vocal part; conversely, vocal music is defined by having the presence of voices and the possible inclusion of voices, which allows for instrument-only parts within a generally vocal whole. The one category given is for vocal parts extracted from choral symphonies, where the vocal parts are taken

separately from a whole which is considered instrumental; however, this subclass relies on those choral symphonies being placed as instrumental in the first place, which is far from inevitable – choral symphonies and their categorization is discussed in detail in Section 6 of this chapter.

The lack of definitive example is interesting, and suggests a lack of commutability between voices and instruments. To explore this further, the relationship between whole/part and vocal/instrumental categorization is visualized in Figure 15. Here, the whole is represented by a larger circle, with the parts smaller circles entirely contained within the larger circle. The first part of this figure shows what we might expect if whole/part is represented for the vocal and instrumental categories. The second part of this figure shows the cuckoo in the nest: a vocal part within the instrumental whole, and vice versa. While the vocal whole-with-instrumental parts have many exemplars – as seen in part 1.a. of the taxonomy – the instrumental whole with vocal parts exists logically, but as discussed above, is less easy to define in practice. This visualisation illuminates why conceptually this may be the case, also tying in with earlier discussions about defining the vocal and instrumental categories: while presenting vocal and instrumental as equal circles, it is logical for there to be an instrumental part within a vocal whole. However, in reality, “vocal” is actually a compound category, unlike its seeming-sister category of instrumental (which is “pure”). This explains why a vocal whole can have an instrumental part, yet an instrumental whole cannot have a vocal part – unless the boundaries of “instrumental” are expanded to include works with say an instrumental *genre* but vocal medium, such as the example of the finale of Beethoven’s Symphony No. 9. This figure highlights how considering vocal and instrumental as equal, commutable categories can be problematic.

Expected



Actual

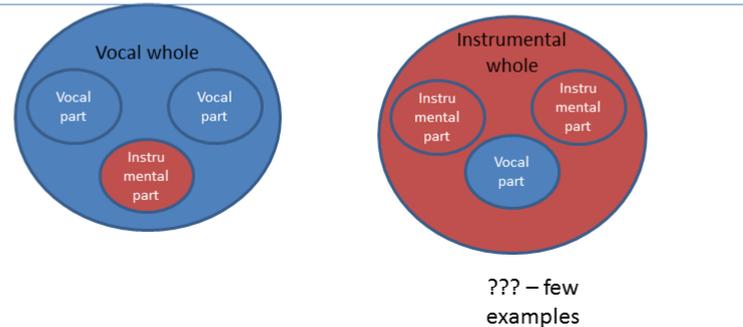


Figure 15. Vocal/instrumental categorisation within whole/part relationships

5.2.2 “Transformation of medium”

2.a. “Original is vocal, performed as instrumental”. The transformation of works from one side of the vocal/instrumental divide to the other, casts a web of depending complexities, which need to be unpicked. The transformation of vocal works into instrumental ones could be caused by pragmatism; composers realise that their works are more performable if they allow for dropping out expensive elements such as choruses and vocal soloists.⁷⁹ The taxonomy distinguishes between works which are more likely to be performed in their original and their transformed states.⁸⁰ However, this is a problematic categorization to execute in practice: it is difficult to prove whether a work is more likely to be performed in one way or another.⁸¹ So, musical works which

⁷⁹ The *Tristan und Isolde* example is particularly pertinent, due to Wagner’s musical writing and text writings. Wagner’s late works use a technique where the orchestra itself carries the narrative and “comments” upon the action. If the voices are taken away, it could be argued that music like the *Liebestod* becomes a different piece from losing its text; however, if the narrative and dramatic element remain in the orchestra, this will have an impact on where and how we draw the boundaries of new works.

⁸⁰ The transforming of vocal works to instrumental works can also involve a change of function, as the practical realisations of this part of the taxonomy are likely to be stage works transforming into concert works. For more discussion about function, see Chapter 9.

⁸¹ It would be possible to examine a sample of performances of a given musical work in order to elicit whether singers were involved in specific performances of this work – for instance searching concert programmes or performance databases such as the *Concert Programmes Project* or *Proms Archive*;

can be transformed from a vocal medium to an instrumental one will always maintain their potential to be performed with their original, vocal medium, and all we can categorize is the likelihood that this happens.

2.b. “Original is instrumental, performed as vocal”. Instrumental works transforming into vocal works employs a whole new set of considerations. To start, it is likely that any transformation of an instrumental work into a vocal one will involve adding text. However, there are then questions about whether this transforms the musical work into a whole new musical work, rather than just transforming the medium. The example selected, *I vow to thee, my country*, sees part of an existing instrumental work transformed into a vocal work, a hymn. The medium has been transformed from purely instrumental to unquestionably vocal; however, as the title of the work has changed as well as its function (from concert to liturgical), it could be argued that these are different works.

5.2.3 “Defying genre expectations”

3.a. “Vocal genres, with instrumental elements”. The taxonomy of vocal/instrumental categorization highlights various issues with genre. Even the presence within a medium taxonomy of a class concerned with genre emphasises how genre cleaves to medium. Mendelssohn’s *Lieder ohne Worte* (“Songs without words”), as used in the taxonomy, highlight issues concerning vocal/instrumental properties infiltrating genre hierarchies. Mendelssohn’s *Lieder ohne Worte* are written unequivocally for piano, making them instrumental, and a subgenre of the medium-defined genre of piano music; however, their genre is also based on the vocal genre of songs, as there would be no genre of songs without words without the parental genre of songs. (Whether *songs without words* are genres at all or just a particular title of works is debatable; however, in this chapter, they are assumed to be a subgenre, albeit one which is specific enough to merit italicising rather than written in roman type like songs, sonatas, symphonies and so on.) The vocal mother (song) gives birth to a child; yet, this child (*songs without words*) is both vocal and instrumental. This relationship is illustrated in Figure 16. Note also how this visualisation of genre is based on medium gridlines, showing the link between medium and form/genre. An alternative way of viewing these Mendelssohn works is to consider one parent as the medium (piano/instrumental) and one as the genre (song); while the genre would normally have an associated medium which is the same as the

however, this would be an extremely time-consuming approach, impractical for real-life classification and would not give a definitive answer.

medium of the piece at hand, *songs without words* demonstrate that it is possible to have a generic heritage which differs from its medium heritage.⁸²

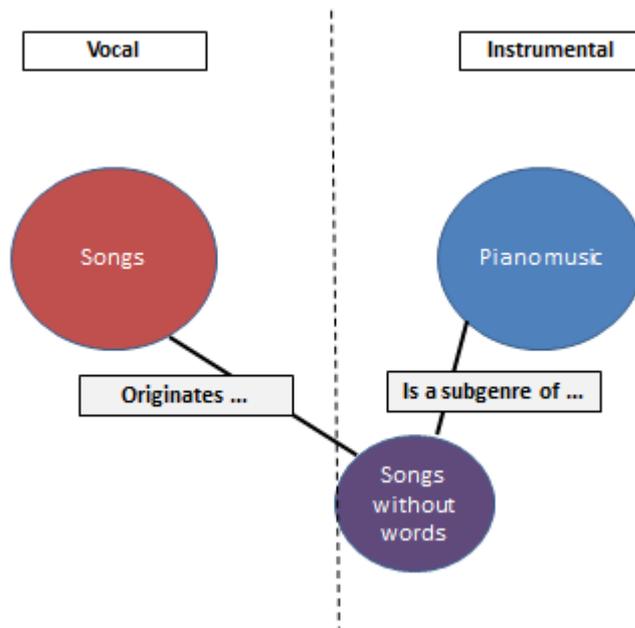


Figure 16. The subgenre of *songs without words* and its parents

The category of instrumental movements in vocal genres at first glance looks similar to category 1.a, where a vocal whole has an instrumental part. However, there is a subtle difference. Section 3 of the taxonomy is referring to the vocal/instrumental categorization associated with a particular genre. This is assumed to belong to the overall work – such as a mass – and this category of the taxonomy is concerned with the relationships between the medium associated with the overall genre of the work, and the medium of individual parts of the work. It is the generic expectations associated with vocal/instrumental categorization which are important in Section 3 of the taxonomy. So, while every opera is expected to have an overture (category 1.a) as it is part of the genre of opera, it is not part of the generic expectations of a mass to have a postlude such as the Varhany solo, a movement for organ solo, as found in Janáček’s *Mša Glagolskaja* (“Glagolitic Mass”). Nevertheless, it is accepted that in practice, it is difficult to cleanly distinguish situations belonging in parts 1 and 3 of this taxonomy.

3.b. “Instrumental genres”, with vocal elements. The instrumental genres which have vocal elements are part of the choral symphony phenomenon, and will be discussed in

⁸² It is interesting to note that these works are described as being without words, rather than without voices. This has an interesting implication for classification: it suggests that words define the genre of song rather than voices, tapping into discussion in previous sections about the relationship between words and the voices/instruments categorisation.

detail in Section 6 of this chapter. Some choral symphonies feature voices throughout – an example given in the taxonomy is Holst’s *First Choral Symphony* – while others features voices in part of the work only. This produces potential duplication with part 1 of the taxonomy: section 1.b.i and 3.b.ii. are defined by or include choral symphonies which have vocal parts amongst an instrumental whole. However, there is justification for this, as well as acknowledgement of the overlap. The finale from Beethoven’s Symphony No. 9 is used as an example in section 1 of the taxonomy, of a work which is instrumental in whole, but has a vocal part. This particular example was chosen as this one movement is detached from the others through its performances (music-as-sound) and as evidenced by publication of the finale separately (music-as-text). However, choral symphonies are more than instrumental works which have sections for voices as they evoke the disobedience of generic expectations – see the discussion below – and so need to be also described in terms of their genre. This explains their presence in the “defying genre expectations” part of the taxonomy. Furthermore, the idea of “parts” being easily detachable from a whole (as discussed above) means that most choral symphonies would be disqualified from section 1, as the parts do not have separate identities (through performance, and so on). Therefore, while both ideas about choral symphonies are included in the taxonomy, they represent different categorization issues; so, some individual choral symphonies are exemplars in both sections (for instance, Beethoven’s Symphony No. 9) while most could only be placed in section 3 (for instance, Mahler’s Symphony No. 2 (“The Resurrection”)).

5.2.4 “Transcriptions”

4. Transcriptions. Transcriptions can also cause blurring in vocal/instrumental categorization: the move from one medium to another may jump the vocal/instrumental boundary, as seen in the examples given in the taxonomy. Transcriptions are complex and link to ideas about what constitutes a musical work. As it is not possible to separate discussions about transcriptions traversing vocal/instrumental categorization from general analysis of transcriptions, the vocal/instrumental classification issues will be discussed in Chapter 6, Section 4, when classification of transcriptions is discussed more generally.

5.3 Taxonomy conclusions

The complexity of the taxonomy and corresponding discussion suggests that there is a substantial set of issues when attempting to classify actual musical works into two

mutually exclusive classes of “vocal” and “instrumental”. Furthermore, the analysis has shown how works can have an interlinked series of categorization issues; for example, the finale of Beethoven’s Symphony No. 9 shows how a vocal part can be present in an instrumental whole, but also demonstrates how vocal/instrumental categorization infiltrates generic expectations, as Beethoven’s Symphony No. 9 can also be read as the expected instrumental medium of the symphony being transmuted with vocal possibilities. The genre section of the taxonomy and subsequent discussion also illuminates a connection between the medium and form/genre facets, highlighting the potential dependency of these facets. The Beethoven’s Symphony No. 9 example also suggests that the classification of symphonies which include voices (choral symphonies) would be a fertile ground for detailed consideration – see Section 6 below.

The analysis highlighted issues with defining the vocal-ness and instrumental-ness of a work, and some works exist as both vocal and instrumental works – see for example, “Ride of the Valkyries”. It is interesting to note that the dual identity can be caused by pragmatic reasons, and that the vocal/instrumental dual identity is often the result of a tension between pragmatic and aesthetic realisations of the works. Another idea which emerged from this taxonomy questioned whether works which have connections to one part of the vocal/instrumental categorization, carry through any essence of the vocal/instrumental when they cross to the other side – for example, when the instrumental prelude (instrumental) from an opera (vocal) is transferred to the concert hall. All of these points demonstrate the fuzziness of the vocal/instrumental categorization, and could be viewed as ammunition against using the vocal/instrumental categorization as the primary characteristic of division within the medium facet. It is clear both aesthetically and practically, considering music as a binary categorization into vocal/instrumental is problematic. One solution is to develop a new category which can encompass the blurred works; the idea of a third category, called “vocinstrumental” is explored in Chapter 10 (models).

Finally, the taxonomy and general discussions reveal that an assumption made in LIS classification schemes – that music classification assumes the overall vocal/instrumental categorization is a stable quality – is not always true. The many planes of instability include, whether considering the part or the whole, the whims of the performers (for pragmatic reasons or otherwise), changes to the musical work over time, and so on. So, even if a hypothetical classification scheme was created which decided on the category

of “vocal” or “instrumental” for every type of situation, some musical works would still jump between the two categories depending on the individual performance, publication, and so on. Therefore, the solidness of a binary vocal/instrumental categorization is thrown into serious doubt.

6. Choral symphonies

An example of a particular type of work which blurs the vocal/instrumental categorization is now explored in depth: the choral symphony. These works featured in the taxonomy of blurred vocal/instrumental works – see Section 5. They are particularly useful for music classification discussions for a number of reasons. At its essence, a choral symphony is a work which is both vocal and instrumental. Also, there are multiple examples of these works, and some particular exemplars are especially well discussed in musicological discourse, opening up the classification discussions. There is a question about whether such a discussion is a *medium* discussion or a *form/genre* discussion; the choral symphony is a *form/genre*, but we are interested in its associated medium which is why it will be discussed in this chapter rather than Chapter 8.

The discussion starts by defining “choral symphony” and questioning the category boundaries of the term, including a brief outline of the developmental arc of choral symphonies. The discussion then considers in detail two specific choral symphonies, Beethoven’s Symphony No. 9 and Berlioz’s *Roméo et Juliette*, which are particularly interesting due to their pioneering qualities and the quantity of musicological discussion they generated. Discussion of each work includes analysis of their classification within the three main example classification schemes, showing how choral symphonies illuminate cracks in the binary vocal/instrumental structures of LIS classification schemes.

6.1. Definitions and boundaries

Defining a choral symphony is complex. Grove, the standard reference resource for music, does not have an entry for “choral symphony”, although it does appear in other, less comprehensive resources. For instance, *The Oxford Dictionary of Music* (“Choral’ symphony 2013) defines a choral symphony as “a symphony in which a chorus is used at some point” (note that the abbreviations have been written out in this quote, to help with comprehension). This definition will be used to consider what is meant by a choral

symphony and issues relating to their classification. This definition relies on two specific, technical-music terms: “chorus” and “symphony”. The term “chorus” is a type of musical medium referring to voices, and more specifically, multiple voices per part. In terms of categorization, *The Oxford Dictionary of Music* definition (“Choral’ symphony 2013) suggests that the term “choral symphony” describes symphonies which include voices, but symphonies which have solo voices but no chorus – for instance, Mahler’s Symphony No. 4, for orchestra and one solo soprano – would not be covered by this definition.

The next task is to ascertain the meaning of the term “symphony”. Grove does have a subject entry for this significant form/genre: “a term now normally taken to signify an extended work for orchestra” (Larue et al. 2006). This definition of symphony is noteworthy for music classification purposes. A form/genre (the symphony) is being defined not directly by its formal features, but in terms of its medium (orchestra). This has ramifications for the independence of the medium and form/genre facets as a general construct. Furthermore, the medium of orchestra is part of the instrumental category. Therefore, *The Oxford Dictionary of Music* (“Choral’ symphony 2013) is defining the choral symphony using terms which specify that this type of work is on one hand for choir (“choral”), and on the other, for orchestra (“symphony”). So, if it is accepted that an entity takes on the quality of the entities by which it is defined then this makes the choral symphony simultaneously vocal *and* instrumental.⁸³ (For the relationship between the vocal and instrumental categories, see discussions in Section 2.1, which discussed whether voices and instruments are mutually exclusive categories or not.) Therefore, a significant issue for music classification comes to the fore: LIS schemes generally have a binary categorization of vocal or instrumental, but the choral symphony is by definition, both vocal and instrumental. The choral symphony’s position within the dichotic categorization of musical medium forms the backbone of the discussions about the classification of choral symphonies.

The *Oxford Dictionary of Music* (“Choral’ symphony 2013) highlights another issue with categorizing choral symphonies, related to how much vocal music is needed for a work to be considered a choral symphony. The definition says that the choral contribution

⁸³ There is another meaning of the term “choral symphony”, as it is a generic designation which has been used for works which are purely vocal – see, for example, works listed in *The Oxford Dictionary of Music* definition (“Choral symphony” 2013). These works are outside the scope of this chapter as they are purely vocal in medium, but there is an important corollary. It highlights that although symphony is *normally* shorthand for a specific medium (orchestra) as well as defining a form/genre, this medium/form link can be broken.

only needs to be part of the work. Therefore, a symphony which only uses chorus for part of the work would be considered a choral symphony, as well as a symphony which uses a chorus for the whole work. As will be seen later in this section, this is crucial as a number of so-called “choral symphonies” only use the choir for a single movement (for instance, Beethoven’s Symphony No. 9), and in some cases this can be an extremely small percentage of the duration of the symphony (for instance, Mahler’s Symphony No. 3).⁸⁴ So, for this thesis, the term “choral symphony” will be used for works which are both symphonies but also include choral parts, however small the vocal contribution.

6.2. The development and position of the choral symphony

In order to discuss the medium categorization issues with the choral symphony, a few words are needed about how the choral symphony developed and its potential position as a category of work (form/genre) in its own right. Ulrich (1973, pp. 181-182) provides a précis of the development of the choral symphony: Beethoven’s Symphony No. 9, op. 125 (1824) and Berlioz’s *Roméo et Juliette* (1838-9) were the first choral symphonies (although note that in other music discourse, these works are considered to be “firsts” but with qualifications and sometimes less certainty than found in Ulrich’s summary). However, after these works, with a few exceptions (Ulrich 1973, p. 181) – such as Mendelssohn’s Symphony No. 2 (1840) and Liszt’s *Faust Symphony* (1854-7) – it was not until the late 19th century that the choral symphony develops, with works such as Mahler’s Symphony No. 2 (1888-94) and Mahler’s Symphony No. 8 (1906-7).⁸⁵ (Mahler’s Symphony No. 8 will be discussed as an example of “extreme medium” in chapter 6, Section 5.)

Discussions about choral symphonies as a group, as opposed to criticism of individual works, are somewhat unusual and scattered. The lack of separate Grove article for choral symphonies could be considered a sign that the choral symphony is not an established genre; furthermore, when the choral symphony does merit an entry in a musical encyclopaedia, dictionary or other resource, it is often mostly a list of examples, rather than an account of the common qualities of these works – see for example *The*

⁸⁴ It is worth noting that in some definitions of choral symphony, including those found in *The Oxford Dictionary of Music* (“Choral symphony” 2013) and *The Oxford Companion to Music* (“Choral’ symphony 2013), the term “choral symphony” can also apply to a specific work, such as Beethoven’s Symphony No. 9, rather than a whole genre. This highlights issues concerning generic designation, but this is outside the scope of this thesis.

⁸⁵ Interestingly, Ulrich (1973) does not use the term “choral symphony”, instead labelling them as works where a choir is used within a symphony. However, though he might be using a different term, the entity Ulrich describes is unquestionably a choral symphony, and thus these discussions have been included.

Oxford Dictionary of Music definition (“Choral’ symphony 2013). The dearth of discourse about choral symphonies as a group is one reason why looking at examples of individual choral symphonies might be fruitful for understanding their categorization issues. The location of choral symphony discourse can also be illuminating: for example, Grove mentions choral symphonies as part of the entry concerning symphonies (Bonds 2006) situating the choral symphony as part of the symphony genre and alongside works which are entirely instrumental. Conversely, Ulrich’s (1973, pp. 181-182) account of the choral symphony is part of his work about choral music, which is illuminating as the choral symphony is discussed in a monograph discussing vocal music rather than instrumental music. Therefore, these examples show that the music domain does not place the choral symphony as a separate genre. Furthermore, the little discussion of choral symphonies as an abstract group can be found in sources about instrumental as well as vocal genres, highlighting there is some categorization fuzziness about these works within the music domain. So, two individual choral symphonies will be discussed in order to elicit information about the vocal/instrumental categorization, and the two examples selected are two of the so-called first choral symphonies: Beethoven’s Symphony No. 9 and Berlioz’s *Roméo et Juliette*.

6.3. Beethoven’s Symphony No. 9: the seminal vocal and instrumental fusion

Beethoven’s Symphony No. 9 in D minor, op. 125, was completed in 1824. The four-movement structure was revolutionary in numerous ways, and has inspired copious quantities of musicological thought and scholarship; however, for classification purposes, our interest is centred on the inclusion of voices in the fourth and final movement, which will be referred to as the finale. The choral parts are a standard SATB (soprano, alto, tenor, bass) formation, and these are augmented by a standard SATB group of vocal soloists; the first three movements are for orchestra alone, and the orchestra also has a substantial role in the final movement. The choir and soloists sing a setting of Schiller’s *An der Freude*.

As stated above, this symphony – which bears the vocal inclusions in its nickname “The choral” – is considered in some respects to be the first choral symphony. However, the use of voices in a symphony was not entirely new in Beethoven’s Symphony No. 9. For example, Winter’s *Schlacht-Sinfonie* (Battle Symphony), which predates Beethoven’s Symphony No. 9 by around ten years, is called a symphony and includes a chorus, and

this work is sometimes called the first choral symphony (Matthew 2012, p. 129). Bonds (1996, p. 23) suggests that Winter's work was either unknown or ignored, which would explain why it is Beethoven's symphony which is strongly identified as the first choral symphony. Furthermore, Beethoven himself set antecedents for the choral/symphonic hybrid in his choral fantasy, first performed in 1808 and written for piano, chorus and orchestra. However, whatever antecedents of choral symphonic works existed before Beethoven's Symphony No. 9, it was this symphony where the use of voices within a symphony seems to have startled.

6.3.1. Musicological background and classification

"Unthinkable" and "epoch-changing" are some of the expressions used by musicologists such as Layton (1993, p. 105) and Levy (2003, p. 102) to describe the use of voices in Beethoven's Symphony No. 9. The significance of the voices in the instrumental form of symphony that is Beethoven's Symphony No. 9 can on the surface be assigned to generic expectations, the presence of unexpected executants (voices) in a form/genre (the symphony) defined by being written for another sort of executants (orchestra). At a deeper level, the profundity of Beethoven's inclusion of voices is also part of the aesthetic fabric and categorizations at place in Western art music in the early 19th century. Beethoven's Symphony No. 9 enters a landscape where a musical work's categorization as either vocal or instrumental directed its reception, with instrumental music considered the aesthetical superior:

"By introducing text and voice into a traditionally instrumental genre, Beethoven implicitly brought into question the aesthetic superiority of instrumental music over vocal music at a crucial historical juncture, just when the former had established itself as a category of equal if not greater rank." (Bonds 1996, p. 20).

This quote highlights the importance of the vocal/instrumental categorization in the 1820s – which can be read as confirmation that the strong vocal/instrumental categorization found in LIS classification in the 20th and 21st centuries, is mirrored in the music domain at least in one temporal period. It also shows the dependency between the medium and genre facets, by acknowledging that symphonies (genre) are usually linked with a particular medium (instrumental).⁸⁶

⁸⁶ There are arguments in musicological literature that this work's use of voices is either not as radical as it seems, or that the voices are not as defining as it might first appear: for example, the voices are part of the aesthetics of instrumental music through the conduit of being considered "absolute music"

6.3.2. LIS classification schemes and Beethoven's Symphony No. 9

Considering how LIS classification schemes would deal with examples of choral symphonies aids our understanding of the vocal/instrumental categorization. The three sample classification schemes will be used to demonstrate the complexities and frustrations of classifying Beethoven's Symphony No. 9. (The analysis will show that the classification of Beethoven's Symphony No. 9 is involved, and hence the analysis will not be extended to more LIS schemes.)

BCM

BCM divides its medium schedules into instrumental and vocal. There is no obvious home for works with voices in the instrumental schedules. So, the classifier has a number of options: either classify Beethoven's Symphony No. 9 as an instrumental work, ignoring the voices, or, represent the full medium (including voices) and attempt to add the form/genre of symphony if possible. So, Beethoven's Symphony No. 9 induces a fundamental categorization decision about instrumental versus vocal as the first, and most important, classification decision.

The first option is straightforward in terms of assigning a classmark (MME). As there is no way of adding extra elements to the musical medium, the voices have to be ignored and Beethoven's Symphony No. 9 would sit with all the other symphonies – both instrumental and instrumental with voices. The second option treats Beethoven's Symphony No. 9 as a choral work, and this proves more complex. If only the main schedules are followed, then the closest classmark available represents a choral work with orchestral accompaniment (EM). However, BCM includes an alternate schedule which allows the classifier more specificity for choral music. While representing a standard four-part chorus (SATB) is straightforward (DB), the addition of the soloists proves problematic – the general problems of multiple voices/instruments are discussed in Chapter 6, Section 2. There are multiple readings of the schedules, and the results are ungainly (such as the medium being represented by EGXGHFQFLDB). Once issues relating to vocal medium have been overcome, the pertinent question for this chapter is

(Cook 1993, discussing Schenker's views), that the programming context meant symphonies were part of a mixed vocal/instrumental concert anyway (Matthew 2012, p. 127) and that Beethoven had second thoughts about the voices with an idea of re-writing the last movement for instruments alone (Levy 2003, p. 102). However, the general premise remains that this seminal work helps our understanding of the vocal/instrumental categorisation even if in musicological terms this categorization can be diluted. Further discussion of these ideas is outside of the remit of this LIS thesis.

whether the form/genre for symphony can be added to a vocal medium. Unfortunately, even though BCM is billed as a faceted scheme, there are restrictions on the permitted range of forms/genres that can be added for vocal music (DC to DW), and the form/genre “symphony” cannot be added to a vocal medium. Therefore, when using BCM to classify Beethoven’s Symphony No. 9, the classifier can either classify the work as an instrumental symphony, or a vocal work (with various levels of detail about the medium), but not as a work which includes voices *and* is a symphony.

Dickinson

Unlike the other three sample schemes, Dickinson lists a focus specifically for choral symphonies within the “species” facet (loosely aligned to a form/genre facet). However, this form/genre can only be used with a specific range of mediums (81 and 85) all of which are vocal. From a faceted perspective, this demonstrates how Beethoven’s Symphony No. 9 prompts a dependency of form/genre on medium: the choice of foci in one facet (form/genre) is determined by the focus in another facet (medium). Therefore, to use the choral symphony class, the classifier must make the primary decision that the work is vocal, rather than instrumental. Dickinson is unusual in acknowledging and having a direct option for choral symphonies and their associated vocal/instrumental hybridity. So, Beethoven’s Symphony No. 9 would be classified using a combination of a vocal medium and the special form/genre for choral symphony – as Dickinson offers various different citation orders, the exact classmarks are given in Appendix A.

Flexible

Like BCM, in Flexible the options are either to ignore the voices and classify Beethoven’s Symphony No. 9 as an instrument-only symphony or place it in the vocal section and try to add “symphony”. Classifying Beethoven’s Symphony No. 9 as an orchestral symphony is straightforward in Flexible. However, unlike BCM, if a vocal categorization is selected, building up a classmark for the vocal forces involved with Beethoven’s Symphony No. 9 is relatively straightforward in Flexible; there are fewer questions about how to create the complex classmark, and the results are (slightly) shorter (864’78’774’339 represents the choir, orchestra and soloists). Wonderfully, there is nothing outwardly forbidden about adding an “instrumental” genre to a vocal medium, so “symphony” can be added to a vocal medium (Beethoven’s Symphony No. 9’s full medium and form represented by 864’78’774’339-511.6). Nevertheless, the classifier still has to decide whether they

want the work to be considered primarily as a vocal work – and thus scattered from its purely-instrumental cousins – when only one movement involves voices.

6.4. Berlioz's *Roméo et Juliette*: a synthesis of vocal and instrumental genres?

Berlioz's *Roméo et Juliette* (1839) is an unusual work from many perspectives; accordingly, it illuminates multiple phenomena of the vocal/instrumental categorization puzzle. The work is written for large orchestra and voices; the voices appear in multiple movements. The choral forces consist of a prominent semi chorus (ATB) and a double chorus (arguably SATBSATB, but in most movements written as STBSTB). There are three soloists: mezzo-soprano, tenor and bass. Interestingly, of the three soloists, the bass alone is assigned a specific character name, that of Father Lawrence; conversely, the choirs are named as Montagues and Capulets. The work is based on the dramatic narrative of a version (Garrick's) of Shakespeare's *Romeo and Juliet*; in other words, this is Shakespeare filtered through the dual lens of Garrick and Berlioz. Though the work is often termed "a symphony" it does not follow the usual formal structure of a symphony; for example, it has seven "movements" (Rushton 2000, p. 42) rather than the more typical three or four.

Roméo et Juliette is claimed to be the first work which self-describes as a choral symphony. The source for this claim is the composer's introduction to the vocal score (Berlioz 1995), where Berlioz describes his work as a "une symphonie avec chœurs". This term could be translated in two ways: as a "choral symphony" or a "symphony with choir". While they both have similar meanings, the former is more significant for the development and history of the "choral symphony".

6.4.1. Musicological background and classification

Various genre boundaries are stretched in Berlioz's work. Unlike the unquestionably symphonic-nature of Beethoven's Symphony No. 9, *Roméo et Juliette* is a double hybrid: orchestra and voices combined, and symphony fused with other forms/genres. While seemingly about form/genre and thus out of the scope of this chapter, the form/genre part of the hybrid is significant for questions about vocal/instrumental categorization as the forms/genres in question are singularly associated with instruments *or* voices. For example, Langford (2000, p. 61) describes *Roméo et Juliette* as "Berlioz's most perfect

synthesis of operatic and symphonic elements". So, not only does Langford suggest that *Roméo et Juliette* is made up of opera and symphony, but also that this genre mutation is a success. Musicologists do not seem to frame discussion about *Roméo et Juliette's* hybrid nature in terms of medium, but instead in terms of genre. For example, when Rushton (2000) lists the aspects of *Roméo et Juliette* which defy convention, the use of voices is not even mentioned. (While Rushton's inclination towards genre is what we would expect in a chapter entitled "Genre in Berlioz", the fact that the chapter is called "Genre in Berlioz" rather than, say, "Musical medium in Berlioz" is to some degree indicative of musicological thought.) This adds more weight to the idea that genre and medium facets are dependent in the music domain.⁸⁷

Looking within the work itself reveals more about the vocal and instrumental expectations. Berlioz does not use the voices in every movement (according to the author's analysis of the score), but when used they do have a dramatic function (Rushton 2000, p. 49); for instance, the two choirs in *Roméo et Juliette* are the Montagues and Capulets, and argue, wail and eventually reconcile in the extended final movement. However, Berlioz does not always use the voices in the way that would be expected; for instance, the great love scene (3rd movement: "Scène d'amour") between Roméo and Juliet is for orchestra alone rather than voices, and this is so unexpected that it is commented upon by Berlioz in his introduction to the vocal score (Langford 2000, p. 63). Another example involves the appropriation of other types of forms/genres. The funeral march (5th movement: "Convoi funèbre de Juliette") contains a chant/psalmody, which moves between the chorus and the orchestra (Langford 2000, p. 63).⁸⁸ The form/genre of the chant/psalmody is typically associated with sacred vocal music, and this wavering between voice and instruments is an added ingredient in the voice/instruments mix. These examples show that within movements in a musical work, there is conventions and expectations about how each of the categories of voices and instruments will behave – conventions which Berlioz happily rips apart.

⁸⁷ This can also be seen in Langford's (2000) discussions about *Roméo et Juliette*, which are couched in terms of "operas" and "symphonies", not the combination of voices and instruments. This hypothesis was also backed up in readings on Beethoven's Symphony No. 9, where even with the vast quantity of discourse on the symphony, it was difficult to find authors who spoke directly about the use of the voice. Form, text and reception were all covered amply, but the invasion of the voice was frequently ignored.

⁸⁸ The movement of the psalmody is described by Berlioz in his performance directions in the vocal score (Berlioz 1995, p. 93).

6.4.2. LIS classification schemes and *Roméo et Juliette*

Classifying *Roméo et Juliette* in LIS classification schemes both amplifies the classification issues seen in Beethoven's Symphony No. 9, and adds new challenges to the mix. First, there are extra complexities in representing the choral parts, associated with incorporating the semi-chorus and the double-chorus aspects, as well as complications about number of choral parts. (For a discussion about the complications of designating number of parts, see Chapter 6, Section 2.) These will be mentioned but are generally outside the remit of this chapter as not directly involved with vocal/instrumental categorization. Second, unlike Beethoven's Symphony No. 9, the genre of *Roméo et Juliette* is uncertain, as it does not share some of the formal qualities enjoyed by symphonies. It will be shown that the LIS schemes find it challenging to coherently represent a work which resembles, but is not entirely, a choral symphony.

BCM

The fundamental decision about whether to classify *Roméo et Juliette* as vocal or instrumental is similar as described above for Beethoven's Symphony No. 9. Either the work is classified as an instrumental symphony without voices (MME) or as a vocal work but not as a symphony. *Roméo et Juliette*'s more complex vocal forces highlight some of the problems with BCM's structure. A significant issue concerns the choral parts, as BCM's alternative schedule relies on a work having a discrete number of choir parts; however, various factors such as the semi-chorus, and not writing a separate part for the choral altos, mean that there are different ways to count. While BCM causes the classifier to make the same *technical* decision about whether to emphasise the symphony (and lose the voices) as seen in Beethoven's Symphony No. 9, *Roméo et Juliette* presents a different argument to the classifier; for example, it shares less formal qualities with a standard symphony, the vocal parts are narrative, it is a hybrid genre between opera/symphony. All of these reasons might cause a classifier to opt for classing *Roméo et Juliette* as a vocal work even if they had placed Beethoven's Symphony No. 9 as a symphony. This highlights that BCM does not differentiate between different types of choral symphonies, this is up to the classifier; it also illuminates potential issues with scattering, and how choral symphonies could end up not being in a single, cohesive group.

Dickinson

As well as Dickinson's useful genre category of "choral symphony", which must be used with a vocal medium, Dickinson also has another useful category: "combination with

incidental chorus” (CD facet, 66). This shows again how Dickinson acknowledges the existence of hybrid, vocal-symphonic works. Unlike “choral symphony”, this category (CD facet, 66) is a medium (“Class and division” facet) rather than a genre “Species” facet); furthermore, it is part of the instrumental categories within the medium facet, rather than vocal. So, using the “incidental chorus” category means acknowledging the dominance of the instrumental, but also relinquishing the possibility of adding a species (genre) of symphony as this is not permitted for this particular medium (see “appropriate” divisions listed for species 1, in Dickinson 1938, p. 26).

Therefore, the classifier of *Roméo et Juliette* has two possible paths, which are based on a number of factors. First, the term “incidental chorus” requires a consideration of *how much* the chorus contributes to the work and by which metrics this is measured – for example, the chorus in *Roméo et Juliette* only sing in a few of the movements, rather than all the way through, yet they sing in the dramatically significant conclusion. Second, as discussed above, *Roméo et Juliette* is considered by musicologists to be a fusion of genres, rather than being primarily symphonic, which would influence the decision of the classifier. Problematically, the foci of “incidental chorus” and “choral symphony” are not mutually exclusive as they come from different facets; as a corollary, *Roméo et Juliette* could be considered to be neither incidental chorus or choral symphony by one person’s reckoning – in other words, the work is not considered symphonic enough in form to be a choral symphony, yet the chorus is too significant to be considered “incidental” – even though both foci describe choral-symphonic-type works.

The possible classmarks for *Roméo et Juliette*, using both the “incidental chorus” and “choral symphony” options for each possible citation order, are given in Appendix A. (Actually, the difference between citation orders is minor for *Roméo et Juliette*, as species is often ignored in the citation orders; conversely, the decision between incidental chorus and choral symphony makes much more of a difference). The discussion and classmark analysis highlights a number of useful points about vocal/instrumental categorization as found in *Roméo et Juliette*. Dickinson shows that the vocal/instrumental categorization is the primary categorization, which influences all subsequent categorizations. Having separate spaces for choral symphonies and incidental with chorus is useful, but means that hybrid works – such as *Roméo et Juliette* – are scattered from other works with which they share characteristics, as the primacy

of the vocal/instrumental categorization sees these two foci very scattered. (Consider how Beethoven's Symphony No. 9 and *Roméo et Juliette* could be very far apart if the decision was made to treat *Roméo et Juliette* as an orchestral work with incidental chorus.) The *Roméo et Juliette* example also furthers the idea of dependency between facets. If deciding the chorus is incidental, then symphony cannot be selected as form/genre; if wanting to use the form/genre of choral symphony, then a vocal medium cannot be used.

Flexible

Roméo et Juliette's complex medium cause some issues in Flexible; issues include not being able to unequivocally identify the number of vocal lines and uncertainty as to how to represent more than 9 choir parts. Alongside the non-standard grouping of soloists, this adds up to long and unwieldy classmarks (such as 863.72'82'84'779'39 to represent just the medium). As mentioned above, it is possible to add the form/genre of "symphony" to a vocal medium (such as 863.72'82'84'779'39-511.6). As an alternative to treating *Roméo et Juliette* as a choral symphony, its hybrid nature might cause a classifier to look for a genre which matches the work's dramatic text and story, for instance, adding musical drama (-731) rather than symphony (-511.6). While this would be technically possible, it is unideal as "musical drama" is part of a theatrical hierarchy: while *Roméo et Juliette* is a hybrid of dramatic *forms/genres*, it was not written directly for the stage.

6.5. Choral symphony conclusions

Examining the classification of choral symphonies has highlighted some important issues regarding the vocal/instrumental categorization. The lack of coherent treatment of a work such as Beethoven's Symphony No. 9 in the three LIS classification schemes suggests issues with classifying choral symphonies: the schemes treated Beethoven's Symphony No. 9 variously as something which cannot exist (BCM), which is a combination of voices and the genre of symphony (Flexible) or is so established within vocal music that the whole subgenre of choral symphonies have their own place in the classification scheme (Dickinson). Variants are compounded when classifying *Roméo et Juliette*, as the generic designation of "symphony" is debatable for this musical work. For instance, Dickinson's useful option for choral symphonies offers little solace if you are forced into either squeezing *Roméo et Juliette* into the generic confines of symphony or degrading the vocal parts by selecting the class for instrumental music with voices

representing extra colour; furthermore, the potential for cross-classification in these instances is large.

The examination of choral symphonies demonstrates the primacy and importance of the vocal/instrumental categorization on the classification of the work. Classifying Beethoven's Symphony No. 9 and *Roméo et Juliette* requires the classifier to decide in the first instance whether the work is instrumental or vocal; deciding on vocal over instrumental yields rewards such as being able to specify the types of voices and soloists, which is not possible if the primary categorization is instrumental. Furthermore, the options for adding genre are vastly altered depending on the vocal/instrumental categorization, showing how the facet of form/genre is dependent on the facet of medium. In particular, BCM does not allow the addition of the genre "symphony" to a vocal medium, so the classifier has to decide between representing voices (medium facet) or the symphony (form/genre facet).

Adding the music domain's perspective into the mix is enlightening. The LIS classification schemes demonstrate the entanglement between genre and medium when *Roméo et Juliette* is classified – as demonstrated by Dickinson; while on the surface musicology speaks exclusively of genre to discuss works such as *Roméo et Juliette*, the boundaries of the genres it discusses are often based around medium, and more pertinently, the vocal/instrumental divide. This demonstrates how discussions of works such as *Roméo et Juliette* in the music domain reveal the cleaving of medium and form/genre, concurring with the LIS domain.

There are also divergences between the music domain and LIS domains' approaches to choral symphonies. For example, while the genre of *Roméo et Juliette* is radical as it crosses categories of genre, fusing together the symphony with the opera (or similar dramatic vocal work), when needing to be classified – for instance in the Grove worklist and books about Berlioz's works organized by genre – musicologists generally treat it primarily as a symphony. However, as the LIS classification schemes sometimes demand a choice between indicating voices and selecting the genre of symphony, there is no guarantee that LIS classifiers will match the music domain's generic designation of "symphony".⁸⁹ In addition, Beethoven's Symphony No. 9 reveals a schism in musicological and bibliographic classificatory thought. The musicological writings

⁸⁹ Note this is not an exact comparison between the music and LIS domain, as the music examples demonstrate the actual classification, whereas the LIS analysis is of the structures that will potentially be used to classify the musical work rather than how the work has been/will be classified within LIS.

demonstrate that Beethoven's Symphony No. 9, while influenced by choral music, is part of the instrumental music canon; the voices are there to break *out* of the instrumental music confines. Conversely, the LIS classification schemes suggest that to represent the voices at all, Beethoven's Symphony No. 9 must be classified as vocal; in fact, the desire to break *in* to instrumental music and borrow the instrumental genres is the ultimate desire.

7. Conclusion to Chapter 5

Exploring the vocal/instrumental categorization has illuminated many ideas about music classification. LIS classifications of music demonstrate the primacy of the vocal/instrumental classification: the LIS schemes sampled showed that the majority of schemes treated the categorization of music into voices and instruments as the first characteristic of musical medium. There are more subtle manifestations of this primacy. For example, the discussion and analysis of choral symphonies showed how selecting one of vocal/instrumental as the initial medium category affected the detail of medium that could be expressed. Analysis of this categorization in the music domain suggests a less explicit categorization, and that any resulting categorization is often through the conduit of genre rather than directly through medium.

While vocal/instrumental categorization might be the overall intention of LIS classification of music, this chapter reveals that from a theoretical and practical standpoint, a binary vocal/instrumental classification can be problematic. An examination of Western art music through a taxonomy of vocal/instrumental issues shows the myriad of complications induced by this binary categorization – for instance, vocal parts of instrumental wholes, musical works which can be performed with or without voices, instrumentally-associated genres associated with works written for voices, and so on. An examination of choral symphonies – one prominent example of a type of work permanently undergoing a vocal/instrumental identity crisis – reveals that the LIS schemes themselves come up with multitudinous methods of dealing with such blurred works, and can force classifiers into compromises between providing either a full account of medium or of genre, but not of both. So, from a perspective of the musical works themselves and exemplars of LIS schemes designed to classify them, the actualities of a binary vocal/instrumental categorization appears unideal. A possible third category, “vocinstrumental”, is mooted as a theoretical solution, and will be discussed in more detail in Chapter 10 (models).

A recurring theme illuminated by the discussion in this chapter concerns the dependency seen between the medium facet and the form/genre facet: for example, the presence of a category for defying *generic* expectation in a taxonomy of issues associated with *medium* categorizations, the concept of a choral symphony which is partly defined by its medium and partly by its form/genre, the forced choice between expressing details about voices (medium) and expressing symphony (form/genre) seen in LIS classification schemes, and so on. When vocal/instrumental categorization seeps into various decisions about form/genre, these leaks show how the facets of medium and form/genre are not as independent as they might first seem.

Finally, the vocal/instrumental categorization reveals nuggets of information about the relationships between music classification in the LIS and music domains. For instance, the genre-breaking qualities of a work such as Berlioz's *Roméo et Juliette* as seen from a musicological perspective, is neatly transformed into an LIS classification conundrum. Significantly, the decisive binary categorization thrown down by the LIS domain, is a transmutation of the music domain's more nuanced and blurred categorization, where the concept of genre often takes primacy over the vocal and instrumental categorization; furthermore, even though the music domain does sometimes indicate primary vocal/instrumental categorization – for example, in some of the Grove composer worklists – the categorization demonstrates the vagaries of time, with the vocal/instrumentation categorization changing in importance and nature over the history of Western art music. So, while the realisation of the schemes and nature of musical works might impede the implementation, at least conceptually LIS classification is usually based on a primary, binary categorization into vocal and instrumental; in contrast, the music domain is far less committed to this categorization. However, after this chapter's account of some of the multitudinous complexities of vocal/instrumental categorization and a revelation of this categorization's somewhat fuzzy boundaries, it could be argued that there are advantages of rethinking LIS domain's conception of music as containing a primary, binary, vocal/instrumental categorization.

Chapter 6: Musical medium 2: numbers, accompaniments, accompaniments and “extreme” mediums

1. Introduction to Chapter 6

This chapter explores further complexities in classifying the medium of musical works. There are a number of ways in which the seemingly simple act of categorizing who is playing or singing a musical work becomes an interesting classification conundrum. This chapter is going to consider these from a theoretical, library and information science (LIS) perspective. However, in order to understand the musical concepts being discussed, an introduction to them from a musicological standpoint is also needed.

Four particular aspects and issues associated with classifying musical medium are explored in this chapter. The first issue concerns numbers and looks at number-of-things sub-facets and their interplay with other aspects of musical medium. The section starts by considering situations when *more than one* instrument or voice are needed for a musical work; then, two specific counting issues are explored, concerning an example of the pragmatic difficulties involved in counting (using example of vocal parts in choral works) and considering what exactly is being counted (using example of pianos and multiples). The second issue looks at accompaniment, in other words when one part of the musical medium is deemed more important than the other. The third issue covers arrangements; the importance of arrangements for classification purposes is found in the decisions about which works to classify, as well as how to represent arrangements in classification systems. The fourth issue concerns the classification of “extreme mediums”. This section introduces a novel methodology entitled “stress-testing”; stress-testing is used to unpick how classification schemes are *really* structured, and how their failures to adequately describe musical works illuminates the critical cogs (in other words, the facets) of the music classification systems.

The various medium issues are represented symbolically in Figure 17, which helps compare the different issues at stake.

Issue	Comparative representation
Multiples	$m = m_x + m_y$
Accompaniment	$m_x < m_y$
Arrangement	$m_{\text{actual}} \neq m_{\text{original}}$
Extreme	m is large

Key: m = the overall medium; m_x and m_y are constituent parts of the overall medium, and can each be made up of any number of constituent parts; m_{actual} = actual medium of the musical work and m_{original} = the medium that the work was original written for

Figure 17. Symbolic depiction of various medium issues

1.1. Which parts of medium are *not* covered

However, there is a question about why these particular aspects are explored in this chapter, and whether there are other elements of musical medium which are not discussed. “Numbers” was selected because when initial analysis of the three example schemes was carried out, it soon became clear that the treatment of multiple numbers of instruments, voices, and so on, caused the three example schemes some problems. While “accompaniment” did not cause such an obvious breakdown in the schemes, the initial analysis of the example schemes suggested localised issues, particularly associated with “assumed” accompaniments (to be discussed in more detail in Section 3). Furthermore, accompaniment appears to be connected to two other somewhat contentious categorizations: the numbers issue (which opens up a theoretical need to understand exactly what is meant by this freely used term “accompaniment”) and the vocal/instrumental categorization (when vocal works are considered to be accompanied). “Arrangement” is discussed in detail in this chapter for a number of reasons. First, LIS music classification literature is concerned with this particular issue. Second, exploring arrangement opens up more general ideas about what exactly is being classified, which has explicit connections to musicological ideas about music classification. Unlike the other three topics in this chapter, “extreme mediums” are not a sub-facet; instead, they are a specially-designated type of musical medium. This particular type of medium has been selected as it deliberately provokes the classification schemes, highlighting any areas of weakness and inconsistencies. These four aspects of music classification were not the only possibilities, however; Section 1.2, which gives the citation order of three example schemes, identifies other aspects which are not directly explored in this chapter – tessitura, voice type, instrument, unknown versus known voices, solo versus 1-per-part versus group. These are not explored in this chapter for

various reasons: they do not appear to be particularly prolific sub-facets (for example, tessitura), they are straight forward in theory and practice and thus do not warrant exploration (for example, unknown versus known voices), or they are indirectly covered in other chapters (for example, instruments are covered in Chapter 7). Other types of mediums could have been selected in addition or instead of “extreme mediums”; however, they would not have fulfilled the precise purpose of choosing a particular medium in order to try and break the classification schemes. So, numbers, accompaniment, arrangements and extreme medium will all be investigated in order to elicit deeper understanding of the classification of notated Western art music.

1.2. Example classification scheme citation orders

It is useful to consider the relative importance of various parts of medium. Ascertaining the important sub-facets and their citation orders is not straightforward, hence only the three example schemes are explored. (Note that “sub-facet” is used to refer generally to all constituent parts of musical medium; however, it will be established that in some cases the aspect is more attuned to an ordering principle rather than a standalone sub-facet.) While BCM has an explicit citation order of its medium facet, and Dickinson has “combination orders” for its various iterations, Flexible’s citation order within medium has to be deduced. Comparing citation orders requires a common terminology and boundaries of the various sub-facets to be set, which will inevitably involve compromise and imprecision in order to squeeze everything into a common set of sub-facets. Examining these schemes reveals that instrumental music and vocal music have different citation orders – a manifestation or reflection of vocal/instrumental categorization. Figures 18 and 19 show a summary of the citation orders in the three example schemes. Note that various simplifications have been made, and data has been simplified, especially if it does not refer to medium or the issues discussed in this chapter.

Scheme	Citation order	Source
BCM	I → N → Ac → O	Introduction
Dickinson “Combination 1 – Loan and performance libraries”	NX → I → Ac → N → O	Introduction
Dickinson “Combination 2 – Reference and musicological libraries”	NX → I → Ac → Ar → N	Introduction
Dickinson “Combination 2a – Reference and musicological libraries”	NX → I → Ac → N → Ar	Introduction
Dickinson “Combination 2b – Reference and musicological libraries”	NX → I → Ac → N → Ar	Introduction
Dickinson “Combination 3 – General or small libraries”	NX → I → N → O	Introduction
Dickinson “Combination 4 – General or small libraries”	NX → I → N	Introduction
Flexible	I → Ac (solo instrumental) NX → N → I (one-per part music/chamber music) NX → N → I or Genre or Type of music (instrumental groups/orchestras)	

Figure 18. Sub-facets for instrumental music and the order of their employment, found in three example schemes

Key: I = instrument; N = total number in ensemble or description of size of group (e.g. size of orchestra); Ac = accompaniment; O = original medium, if classed under arranged medium; Ar = arranged medium, if an arrangement and classed under original medium; NX = whether solo, one-per-part in an ensemble or a group (e.g. an orchestra)

Scheme	Citation order	Source
BCM (listed)	$N \rightarrow V \rightarrow Ac$	Introduction
BCM (actual - choirs)	$NX \rightarrow V \rightarrow Ac$	Deduced from schedules (D \rightarrow J)
BCM (actual – groups of single voices and single voices)	$NX \rightarrow V \rightarrow N \rightarrow Ac$	Deduced from schedules (JN \rightarrow K)
BCM (alternative schedules – choirs)	$NX \rightarrow V \rightarrow S \rightarrow N$ Probably actually: $NX \rightarrow Ac \rightarrow V \rightarrow S \rightarrow N$	Deduced from alternative schedules (DAAX \rightarrow EH, and accompaniment from EL)
Dickinson “Combination 1 – Loan and performance libraries”	$NX \rightarrow Ac \rightarrow V \rightarrow N \rightarrow T \rightarrow O$	Introduction
Dickinson “Combination 2 – Reference and musicological libraries”	$NX \rightarrow Ac \rightarrow Ar \rightarrow V \rightarrow N \rightarrow T$	Introduction
Dickinson “Combination 2a – Reference and musicological libraries”	$NX \rightarrow Ac \rightarrow V \rightarrow N \rightarrow Ar \rightarrow T$	Introduction
Dickinson “Combination 2b – Reference and musicological libraries”	$NX \rightarrow Ac \rightarrow V \rightarrow N \rightarrow Ar \rightarrow T$	Introduction
Dickinson “Combination 3 – General or small libraries”	$NX \rightarrow V \rightarrow N \rightarrow O$	Introduction; N is included in combination order but omitted in introduction
Dickinson “Combination 4 – General or small libraries”	$NX \rightarrow N$	Introduction; N is included in combination order but omitted in introduction
Flexible	$NX \rightarrow AcX \rightarrow K \rightarrow V \rightarrow Ac$ (solo) $NX \rightarrow K \rightarrow N \rightarrow AcX \rightarrow V \rightarrow Ac$ (ensembles) $NX \rightarrow S \rightarrow AcX \rightarrow K \rightarrow V \rightarrow N \rightarrow Ac$	Scheme, plus examples in logographs

Key: V = voice type; N = total number in ensemble or number of voices in the choir; NX = whether solo, one-per-part in an ensemble or a group (e.g. a choir); Ac = accompaniment; AcX = whether accompanied or not; S = soloists (in choral music); K = if voice types are known or not; O = original medium, if an arrangement; Ar = arranged medium, if an arrangement and classed under the original medium; T = tessitura, a type of categorization of voice when specific voice-types are not used.

Figure 19. Sub-facets for vocal music and the order of their employment, found in 3 example schemes

The citation orders show a number of salient ideas. Certain sub-facets appear to be vital, appearing in virtually every citation order: for example, the total number of instruments/voices/size of group (N) appears in virtually every citation order, and the

overall categorization of size (NX) appears everywhere unless N comes first. Conversely, tessitura (T) and the unknown/known binary categorization of unknown-ness (K) are relatively unimportant. Differences between instrumental and vocal citation orders highlight the vocal/instrumental divide, which is so deep that the citation orders could not be neatly described using the same order for vocal and instrumental; in these three example classification schemes, there is a notable difference in complexity between vocal and instrumental citation orders, with vocal works necessitating more complex citation orders than their instrumental cousins. Furthermore, there appear to be fissures in certain sub-facets of medium. For instance, the broad number-of-things (NX) is often separated from the precise number-of-things (N); in fact, the broad number-of-things is elevated to such an important position that it appears first in every citation order which doesn't start with N, and there are actually separate citation orders *within* each of vocal and instrumental for Flexible based on the choice of NX categorization. Therefore, the number-of-things is clearly worthy of further investigation, including the part of the number devoted to the broad categorization. So, this brief foray into example orders of the medium facet demonstrates the complexities of classifying musical medium.

2. Numbers

2.1. Introducing the multiples issue

While there is plenty of music written for one instrument or voice, there are many musical works which involve multiple instruments or voices. Examples include string quartet, two flutes or a piano duet. So, this will discuss multiples in musical mediums – in other words, cases where there are more than one instrument or voice. (Note that multiple performing groups are an extant but non-typical musical medium, which present their own classification issues. As these are usually associated with large-scale works, they are going to be discussed in Section 5, dedicated to extreme mediums.) It *isn't* going to discuss cases where those entities have such an unequal relationship that one or more entities could be considered accompaniment, which will be considered in Section 3; however, it should be noted that the lines demarking multiple equal parts and accompaniments are not always clearly and consistently drawn (also discussed in Section 3).

On the matter of terminology, the term “ensemble” is used in this chapter to mean a group of instruments and/or voices, where one person plays/sings each of the parts written by the composer. The term “ensemble” has been adopted to differentiate the concept under discussion from “groups”. (“Groups” are taken to be an orchestra, choir, chamber orchestra, and so on, or any scenario where more than one person plays/sings at least some of the parts.)

2.2. How do classification schemes treat numbers?

It is interesting to see how classification schemes treat multiples and the general essence of “number-of-thing”. So, the citation orders for the three example classification schemes (Figures 18 and 19) have been examined, and they reveal some interesting results. Number/size of ensemble appears (N) in all the citation orders, attesting to its importance. However, there is no consistent place for the number-of-things (N) in these three schemes: it appears first, last and virtually every position in between. Also of interest is how the number-of-thing (N) sub-facet relates to the type-of-thing facet (type of instrument (I) and type of voice (V) respectively). In some, but not all, citation orders, the number-of-thing is adjunct to the type of voice/instrument – for instance, BCM, and some of Flexible. Conversely, in Dickinson’s instrumental ordering, accompaniment is frequently a wedge between the two sub-facets. From a collocation and scattering perspective, it is useful to note that the number-of-thing usually succeeds type-of-thing; this means, for instance, that all instrumental quartets are not kept together, but music for ensembles containing violins will be found near each other.⁹⁰ (Note that debates about whether the members of the group or the number in the group are the designation of similarity is not limited to musical medium; for instance, the same type of discussions take place when classifying chemical structures.)

Classifying musical groups demonstrates a difference in approach to numbers for instrumental and vocal music: instrumental groups rarely get more consideration than a rough “number type” – for example, orchestra, band, chamber, wind, and so on – but the example schemes show that choirs are often delineated based on number and types of voices. This is a natural division if considered alongside musical warrant; however, it does demonstrate a difference between the two types of medium. So, from the

⁹⁰ There is not space to discuss issues concerning the order of those instruments within the classmarks, which could mean that all the works including violin are not actually kept together in the final reckoning.

perspective of considering number-of-things sub-facets, there are three types of music out of a possible six which are of interest: one-per-part music (ensembles) for instrumental and vocal music, and groups within vocal music (such as choirs).

A significant numbering phenomenon emerges from these tables: the tripartite categorization into one, one-per-part and group, which is consistent for (nearly) all three schemes for both instrumental and vocal music.⁹¹ This is indicated by NX in the example citation orders, and the brief discussion in 1.2 mentioned the importance of this sub-facet in terms of prolificity and position. So, it seems that there are number-of-things and there are *number-of-things*. This important overall categorization determines which parts of the schedules can be accessed, and in some instances, even the citation order deployed of the sub-facets. Frequently, the precise number-of-thing – such as the number in the ensemble, number of parts in the choir, and so on – is considered much less important. This tripartite division has warranted little discussion in music classification discourse, yet is clearly a significant part of classifying music, revealing what is *really* underpinning the structure of music classification.

2.3. The number-of-thing (sub-)facet(s)

2.3.1. Introducing number-of-thing in the context of musical medium

Analysis of the three example classification schemes reveals issues when classifying works written for more than one instrument or voice. In BCM, faceted principles break down at the point of combining instruments: the chamber music schedules (1960, pp. 30-31) feature compound foci for combinations of instruments, which when broken down do not reveal their constituent parts. In Flexible, the use of ready-made combinations of instruments or voices dilutes the faceted nature of the scheme. Clearly, investigating the principles behind dealing with numbers-of-things is vital in furthering our knowledge of music classification.

⁹¹ The one exception is the division between ensembles and solo works for instruments in BCM. While there are separate instructions for building classmarks for ensembles in BCM, the citation order treats the instrument first for these works, meaning that works for one instrument and works for three of that instrument would be classed with that instrument. There is a division between groups and instruments. Although the citation order for vocal music in BCM (1960, p. x) does not include this tripartite sub-facet for number type, the schedules themselves reveal that the first foci selected depends on the division into solo, one-per-part and group.

At a fundamental level, the problem with describing a medium of, say, two flutes is that two aspects are actually involved: type-of-thing (flute) and number-of-thing (two). To start, there are questions about whether ensemble size is a separate sub-facet, or merely an ordering device within a sub-facet. Its appearance as the latter is taken as given by Langridge (1992, p. 49), who uses solo, duets, trios, and so on, as an example of order within a facet, much like chronological order and evolutionary order. The other approach is to take the number of musicians in an ensemble out of the classes for specific ensembles, and treat these numbers as belonging to a separate sub-facet. The two different approaches are visualized in Figures 20 and 21. From purely a theoretical perspective, treating the number within an ensemble as a separate sub-facet has advantages: it cuts down on possible redundancy that would be created by listing sizes of ensemble for every instrument and voice. So, whether works for solo flute would be collocated with works for two or more flutes or works for oboe, if number was treated as a sub-facet, would depend on the citation order. For the rest of this section, number-of-thing is going to be considered as a potential sub-facet rather than an ordering device.

In classification scheme



Facet structure

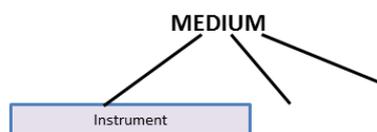
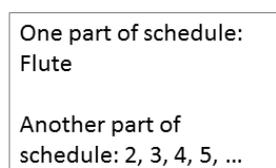


Figure 20. Example of no. of instrument used as ordering tool

In classification scheme



Facet structure



Figure 21. Example of no. of instrument as a separate facet

2.3.2. Multiple types of number-of-things

The flute example above was deceptively simple; this is because there was only one kind of instrument/voice involved, and these ensembles are less common than those which contain different types of instrument/voices. Examples which include different types of instruments and voices include the piano trio (piano, cello and violin), a bassoon and clarinet duet, a trio of soprano, alto and tenor, and so on. Combining different kinds of instruments/voices introduces complexities when classifying ensembles. The reasons for this are manifold and will become clear once number-of-thing is dissected.

So, one way to classify ensembles is to have two facets: the type of instrument/voice and the number of that individual instrument/voice. This would give a precise indication of everything that is contained within the ensemble. This is visualized for an example medium, the string quintet, in Figure 22. However, this approach has something missing: the qualities that being a certain size of ensemble brings and the qualities wrought by the shared (or not) qualities of all instruments/voices in that ensemble. For instance, a string quartet (two violins, one viola and one cello) would have qualities of the interaction between four parts – which would be very different from something written in two parts; similarly, a work for all stringed instruments has a certain timbre, information which is not explicit if the classmark only included three individual string instruments. Furthermore, the specific information represented by the concept of a “string quartet” also infers elements of a genre, as there has been a whole history of works for this very specific medium – see Chapter 8, Section 5 for a discussion of medium/genre entwinement in string quartets. So, it is clear that the approach of only representing each instrument/voice and number of instrument/voice is problematic.

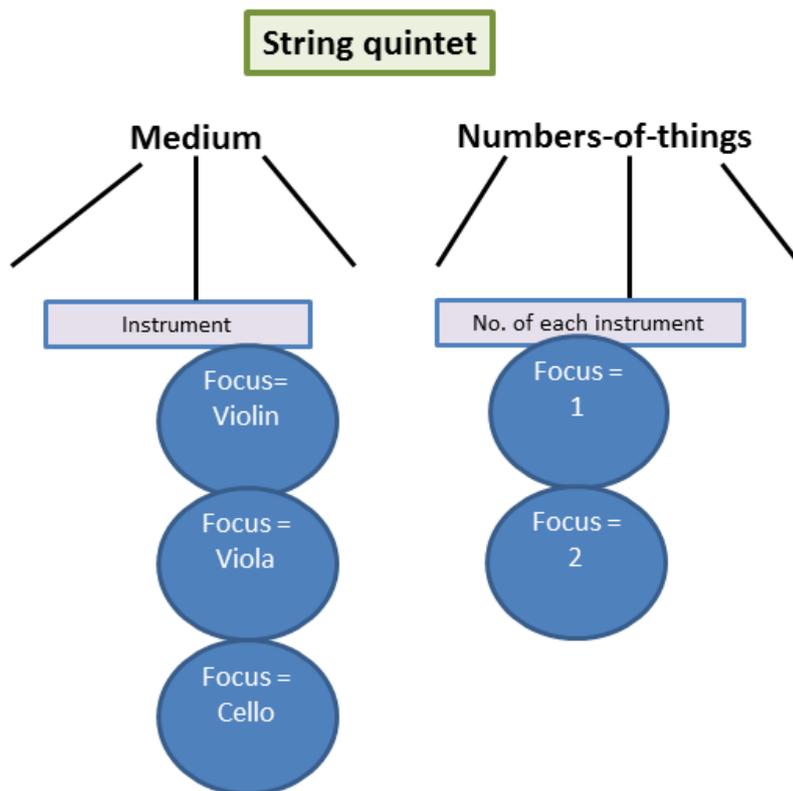


Figure 22. Example of the number of individual instruments and type of each instrument for a string quintet

An alternative approach is to classify the whole ensemble – an approach adopted, for instance, in part by BCM. There are two sub-facets: the category of instrument/voice and the total number of instruments/voices. The “type” part might include foci such as “string ensembles”, “ensembles for one wind instrument and string instruments”, and so on; the number foci would include a term such as duo, trio, quartet, quintet, and so on. This approach is visualized in Figure 23. The advantages include collocating similar “repertoire” together – rating similarity as being based on the assumption that if the category(ies) and number of instruments/voices in the ensemble are similar to another work, then the works are similar. However, in this approach, vital information about exactly which instruments/voices are involved is missing; for example, “string” and “5” might be the foci, but this may not be helpful if wanting to retrieve music which specifically involves a cello.

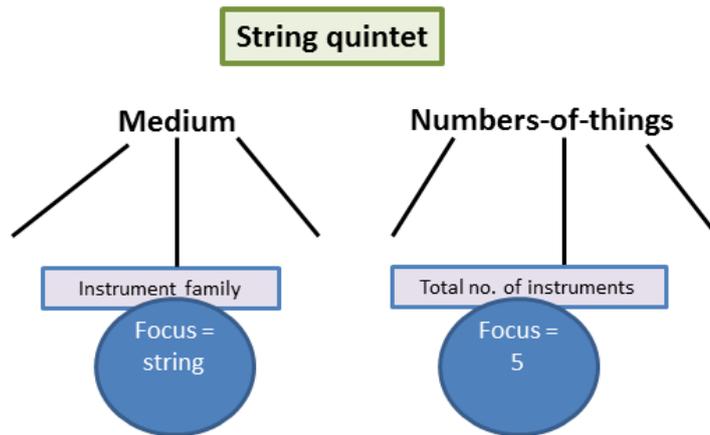


Figure 23. Example of the total number of instruments and the instrument category for a string quintet

2.3.3. Relationships between sub-facets

Therefore, it is clear that there are four useful types of information for chamber music: the category of instrument/voice (I); the total number of instruments/voices (N); the type of instrument/voice (i); the number of that individual instrument/voice (n).

Exploring how these four types of information interact is important. The number sub-facets (N and n) have different meanings; however, in some cases, the foci for each sub-facet will be the same. If an ensemble has two flutes, then N and n are the same as the total number of instruments is the same as the number of flutes; if an ensemble has a piano, violin and a cello, then N is three, while n is one for each of piano, violin and cello. (This is one reason why music for one type of instrument/voice is simpler than other types of ensemble.) So N can sometimes equal n, but it is less likely than N and n having different values ($N \neq n$, in most cases).

Interesting interactions also occur between sub-facets between i and n, and between I and N. From a theoretical perspective, each number-of-thing (n and N) cleaves to its relevant type-of-thing (i and I). For instance, when there is a string quintet consisting of two violins, two violas and a cello, a classification which only has “five” and “violin” would be an untrue classification: there are five stringed instruments, including two violins, but there are *not* five violins. This asks interesting questions about the nature of the “number” sub-facets; they are general sub-facets applicable to many disciplines and unrelated to medium in their knowledge type, yet cleave to sub-facets of medium (in other words, I and i). In fact, what we have are two closely-bound pairs: NI and ni. For, “number of instrument/voice” has no meaning without being followed by a focus from

the type of instrument/voice facet. The relationship between n and i is visualized in Figure 24 with the example of a string quintet.

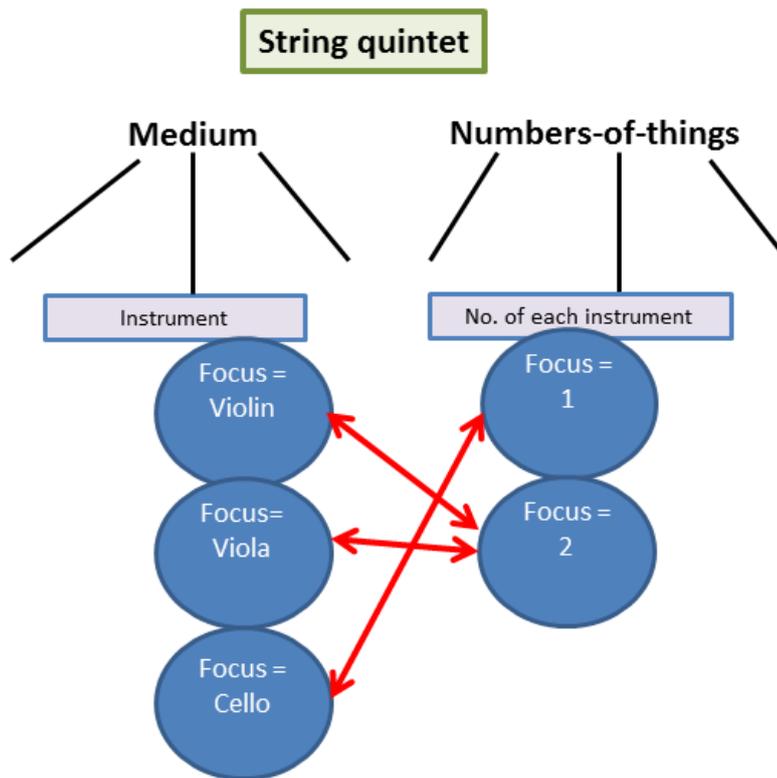


Figure 24. Example of the connections between n and i for a string quintet

However, this combination of number-of-thing and type-of-thing is not borne out by all of the example classification schemes. To start, even when N and I , or n and i , were present in the schemes, not every citation order placed them directly next to each other. More significantly, analysis of the three schemes revealed a practical weakness: lack of clarity in how to deal with multiple instruments/voices of the same type. While adding the instruments/voices as $i_1 + i_1 + i_1$ is technically possible in some of the schemes, representing this information as $3i_1$ is problematic. So, while theoretically there are four facets, it seems that the three example schemes did not have a mechanism for expressing one of these (n). This is explored in more detail for voices in Section 5.

There are also relationships between N and n , and between I and i . These both could be described as hierarchical, parent-child relationships. The relationship between the total number of instruments/voices and the number of individual instruments/voices could reasonably be described as a "whole-part" relationship. For example, a string quintet

would have N as five; this includes the (repeatable) sub-facet of number of individual instruments with three separate foci (two, two and one). If an extra cello (say) was added in, and values of each n became two, two and two, then N would no longer be five but six; the foci of each n must collectively sum the foci of N. While the relationship between category of instrument/voice (I) and type of instrument/voice (i) is also hierarchical, it is more aligned to a genus-species relationship than being whole-part. This is because all the violins and cellos in the world will not add up to being “string”; instead “string” is the quality that violins, cellos, and all the other foci in the group possess. (This is a simplification and the categorization of instruments is complex, including the role of categories such as “string”; discussion about the broad categories and the classification of instruments discussed in Chapter 7, Section 3.) The full set of relationships is visualized in Figure 25.⁹²

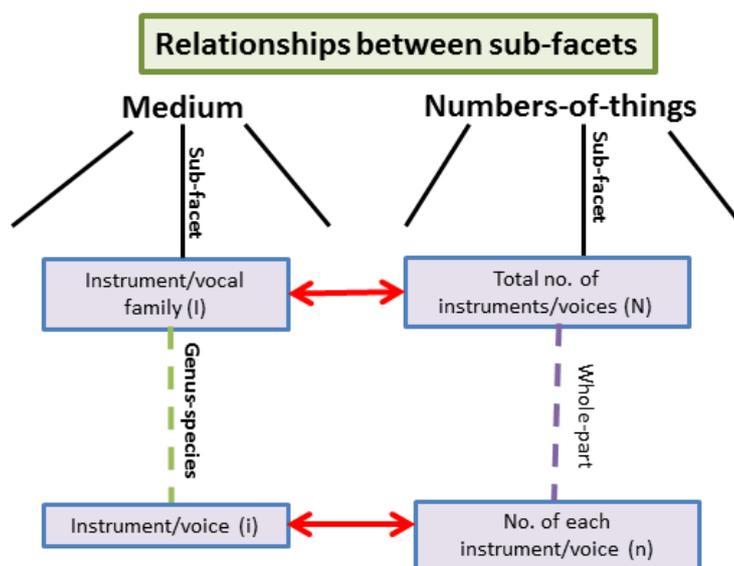


Figure 25. Relationships between sub-facets relating to multiples

2.4. Counting issue 1: number of parts in a choral work

The classification scheme analysis reveals that the number of parts within a choral work is an important sub-facet, helping to identify and to organize works written for choir.

⁹² Although “vocal” is included as part of the sub-facet names, the specific examples are taken from instrumental music. In vocal music, similar issues arise as for instrumental music. However, while some degree of provision is generally made for the existence of small groups of instruments in classification schemes this is rarer for vocal ensembles – for example, see BCM. So, in some respects the issues with number-of-thing are more pronounced for voices than instruments. Conversely, the relationships between individual voices and types of voices are arguably less prominent, so in some respects the issues described are also more diluted than for instruments. Groups of individual voices are discussed in detail as part of “extreme mediums” (see Section 5).

“Part” has many meanings in music, but in this instance is taken to be “the line or lines of music read by an individual performer or performing section in the realization of a musical work” (Drabkin 2016). While in theory, including a “part” sub-facet is straightforward, the reality of doing the counting can be more ambiguous. Problems occur when a choral part splits itself into two or more subsidiary parts, either for some or all of the work; in other words, some of the choir section is asked to sing one set of musical notes, and the other is asked to sing another, and this may or may not be represented by separate “staves” of music in the score. So, at what point are these separations considered separate, independent parts? This largely relates to the broader question about the most appropriate sources of information for classifying music. It is important to note that analysing a score might reveal a different answer from description of medium on the title page, and be different again from how the music is perceived in scholarly listings (such as thematic catalogues, articles in Grove, and so on). Similar problems arise when a self-contained smaller group is used – called a “semi-chorus” – who again might appear briefly, or play a very different role for the whole work (for instance, in Berlioz’s *Roméo et Juliette*). So, counting choral parts can be challenging, which is important to note when LIS classification schemes use this sub-facet.

2.5. Counting issue 2: instruments, players and hands

Sometimes, ascertaining *what* is being counted can be an issue in music classification. This problem is thrown into sharp relief when considering music for multiples and pianos.⁹³ LIS classification schemes often reflect the complications of multiples and pianos; for example, in Flexible, music for two pianos appears within instrumental listings, whereas other forms of instrumental duet appear as chamber music.

The difficulties of pianos and multiples lie in what is being counted. The “piano duet” is a common medium representing two people playing one piano; in other words it is two agents and one object. In contrast, a flute duet would represent two people each playing their own flute, so two agents playing two objects. To complicate piano matters further, there *is* a piano equivalent of the flute duet: two people playing two pianos. Moreover, not only are piano duets and two-piano music different mediums, they also

⁹³ The issues described in this section can be applied to other keyboard instruments, such as harpsichords, organs, and so on. However, for simplicity, the section will use pianos to discuss the general issues presented by multiple keyboard instruments.

have different repertoire, so it is important that music classification can differentiate between the two.

LIS classification schemes tend to represent the object (instrument) rather than the agent (performer); for instance, schemes have foci for “violin”, “viola”, “cello”, rather than “violinist”, “violist” and “cellist”. Hence it is challenging to represent “piano duet”, where the “two” aspect aligns to the number of players and not the number of instruments in an object-based system.⁹⁴ Music classification could be considered to have an extra element representing number of performers. Thus this part of music medium really has three parts: number of objects, number of performers, instrument. Using this tripartite system, a piano duet would be represented by the foci of one, two and piano (respectively). Conversely, a musical work for two pianos would be represented by two, two and piano – see Figure 26. LIS classification schemes have varying approaches to utilising these three elements. Dickinson has a general “grouping” facet which includes extra elements for multiples and keyboard instruments; although all within one facet, the ordering of this section of the facet demonstrates two distinct elements, in the form of division by number of performers followed by number of instruments. DDC22 specifically mentions the difference between number of instrument and number of players, instructing classifiers to treat the number of keyboard performers playing any one instrument as if they were separate instruments. While this conceptual approach acknowledges the difference between both types of information, and also results in keyboard multiples being treated like any other instrument, a side-effect is that the differences between person and object as classificatory units are ignored.

⁹⁴ Music for percussion instruments can cause almost the opposite problem in an object-based system: multiple instruments but one performer. Practically, this issue can be resolved by using the parent of the individual instruments (“percussion”, though Chapter 7 will show how this category is often actually two categories); however, the conceptual issues it represents highlights how the object/agent issue found in piano duets is not isolated.

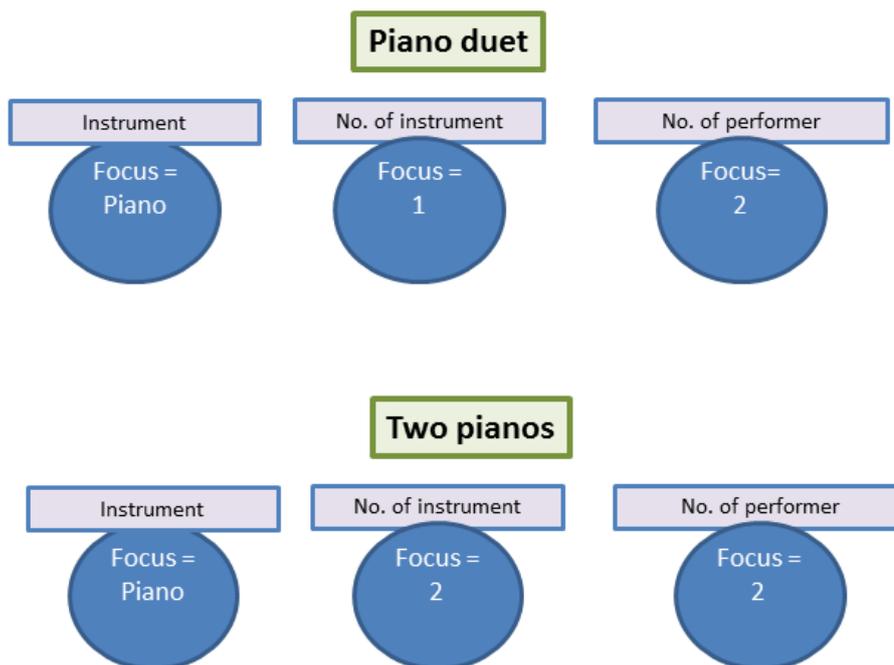


Figure 26. Number of instruments, number of performers and instrument for piano duet and music for two pianos

Interestingly, while Section 2.3.3 showed how number-of-things cleave to what they are describing, this tripartite system has two numbers but only one object. “Number-of-performers” appears to be complete in its own right, not directly related to another sub-facet; in other words, this information should not be divided up between number-of-thing and thing. It is assumed that the type-of-thing (the performer) is not interesting in this case so does not need to be stated – terms such as “pianist” being shorthand for “someone or something who plays piano”, thus represented by a combination of instrument (object) and person (agent). The corollary is that a (hypothetical) musical work designed for one cat playing the piano could be accommodated in this system, but the feline nature of the performer could not be represented!

Music for multiples and pianos can also involve another unit: hands. While we would traditionally expect that each pianist would play with two hands, this is not always the case. For example, there is a small repertory of music specifically written for the left hand only.⁹⁵ So, if this music were described just using number of instruments (one), type of instrument (piano) and number of performers (one), there would be no

⁹⁵ For example, the pianist Paul Wittgenstein, who lost his right arm during World War I, inspired virtuosic works for left-hand only including Ravel’s *Concerto for left hand* and Prokofiev’s piano concerto no. 4 (Zank 2009, p. 309, Andersen, Preston 2016).

difference in classification from “standard” piano music. So, in theory there are four elements of musical medium where pianos (and other keyboard instruments) are involved: number of instruments, type of instrument, performers and hands. Flexible is an example of an LIS scheme which uses number of hands, albeit seemingly just to order the array rather than a separate sub-facet: piano is divided first by number of instruments and then by number of hands.

The keyboard issue shows that what is being counted, the kernel of the music medium, is surprisingly flaccid: while for most instrumental music it is the object, this is not always the case. Keyboard music reveals four potential sub-facets – number of performers, instrument, number of instruments and number of hands – fleshing out the typical conjoined pair of number of instrument and type of instrument. Witnessing LIS classification schemes’ generally messy usage of parts of these sub-facets to order multiple keyboard music suggests that understanding the existence and interplay of these four elements would greatly aid music classification.

2.6. Conclusions concerning numbers

Numbers are complicated. They are so complicated that there are potentially six sub-facets which need to be employed to adequately describe them. Four of these sub-facets – category of instrument/voice, total number of instruments/voices, type of instrument/voice, number of that individual instrument/voice (n) – apply to all types of ensembles, but are especially useful when there is more than one type of instrument. These four facets share a series of interlocking relationships: number-of-things cleaves to types-of-things, the category of instrument/voice is a parent to its child of specific instrument voice, and the total number of instruments/voices is the sum of all the numbers-of-things in a whole-part relationship. However, the multiple piano examples reveal an extra two sub-facets: number of performers and number of hands. Therefore, it is no surprise that an analysis of LIS classification schemes reveals how schemes appear to come unstuck when dealing with multiples, and how faceting breaks down for these types of mediums. Furthermore, the counting conundrums are also seen outside of ensembles; for instance, the theory of numbers of choir parts is straightforward, but the nature of musical works makes the practice complex – as seen in Section 2.4. The findings of the whole numbers section could be used for other occurrences of multiple things; for example, counting elements such as number of groups or ensembles of soloists within a larger medium are not explored – these are mostly associated with

large-scale works, so will both be discussed in Section 5. Thus, the counting is not yet over.

3. Accompaniment

3.1. Accompaniment or duet?

The example citation orders in section 1.2 demonstrated that accompaniment is one of the sub-facets of medium for both instrumental and vocal music. In common usage, the term “accompaniment” suggests a secondary and supporting role, which is similar to its colloquial musical usage. Grove (Fuller 2016) defines accompaniment as “the subordinate parts of any musical texture made up of strands of differing importance”.⁹⁶ This definition is very important, as it helps to answer an important categorization question: accompaniment or duet? Accompaniment occurs when there are at least two separate entities within the musical medium. The difference between, say, a duet and accompaniment is codified by the relationship between them: inequality means that the medium should be classified as lead-and-accompaniment rather than as a group of equal parts (for example, duet, trio, and so on). While in theory the difference between an accompaniment and duet is clear, in practice the definition is not always so definite. For example, the position of the orchestra in Wagner’s works for voices is given as an example of the lines between accompaniment and equal partner blurring in Grove (Fuller 2016), and according to the noted (pianist) accompanist Gerald Moore, even a seemingly simple accompaniment to a Schubert song is still a vitally importance part of the musical work (Moore 1959, p. 14).⁹⁷

3.2. Accompaniment in classification schemes

The three example classification schemes exhibit some intriguing points relating to the classification of accompaniment, and these are now explored. The citation orders in Figures 18 and 19 show a number of details about accompaniment. First, accompaniment is included in all the citation orders apart from Dickinson’s third and

⁹⁶ Note that there are other meanings of accompaniment listed in Grove, but it is this one which is of interest to the classification questions being asked in this chapter.

⁹⁷ For piano accompaniment especially for songs such as the German *Lied* and French *Mélodie*, even the title of “accompanist” is arguably inappropriate such is the importance of the pianist’s role. For instance, Katz (2009, p. 3) talks of a new term: “collaborative pianist”. However, for simplicity and to avoid unnecessary musical detail, this section of the thesis will generally ignore any discussions about the relative importance of the piano in individual works or particular forms/genres, and focus instead on a *general idea* of accompaniment where the piano or other accompanying entity is assumed to have (at least nominally) an accompaniment role.

fourth orders, demonstrating that it is an important sub-facet. Second, accompaniment is usually near the end of the order of sub-facets; for example, it virtually always appears after the base statement of voice or instrument type – the exception being Dickinson’s citation orders involving voices – and even appears *after* numbers of instruments/voices in Flexible and BCM. This suggests that accompaniment is considered relatively unimportant for collocation.

3.2.1. Categorizations of accompaniment

The three schemes illustrate a variety of categorization systems for accompaniment. For example, Flexible’s vocal music citation order gives much prominence to whether the musical work has an accompaniment or not (in Figures 18 and 19, represented by “AcX”); however, this binary decision occurs before the details of that accompaniment. So, Flexible is representing accompanied and unaccompanied vocal music as fundamentally different types of vocal music. Furthermore, “unaccompanied” in this instance is arguably treated as a type of accompaniment in its own right; this is also seen, albeit in different ways, in the other schemes. For example, BCM (Coates 1960a, p. x) explicitly states that “unaccompanied” is a type of accompaniment in its introduction.

BCM has three broad categorizations for types of accompaniment in Auxiliary table 1, moving beyond Flexible’s binary categorization: keyboard accompaniment (P), unaccompanied (PM) and everything else (PL).⁹⁸ For vocal music, the same set of categories are used but with different instructions for notation: keyboard (add nothing), unaccompanied (EZ) and everything else (E). In addition, vocal music with orchestral accompaniment has its own specified class (EM), which matches the class that would be built even if orchestral accompaniment had no written-out class. BCM’s treatment of accompaniment is noteworthy in a few ways. First, two types of accompaniment are perceived as being more common than others, so they gain their own sub-classes – namely keyboard and no accompaniment. Furthermore, BCM highlights the vocal/instrumental categorization by treating accompaniment of vocal and instrumental works differently. BCM also spotlights a particular accompaniment phenomenon, which could be labelled “accompaniment assumptions”.

⁹⁸ The BCM schedules appear to show two classification numbers for non-keyboard accompaniment. The logical position of PL, confirmed by its usage as such in the State Library of Western Australia catalogue (2012), means that for the purposes of this thesis, PL will be taken as the number for non-keyboard accompaniment.

3.2.2. Accompaniment assumptions

A phenomenon exists in all three example schemes: a specific type of medium is deemed so likely to exhibit a specific form of accompaniment that the corresponding classification numbers assume that particular accompaniment. For example, in Flexible's classification for vocal solos (5) and choral music (7), the classifier is instructed to add nothing if the accompaniment is piano, but when it is not piano, to build a classmark using foci for the instrument. Yet, the vocal ensemble class in Flexible (6) does *not* have this piano-assumption; for instance, to classify a work for four solo singers with piano accompaniment, the accompaniment foci will need to be added. Furthermore, it is not just piano accompaniment which is assumed. Various Dickinson classes "assume" different types of accompaniment; for instance, while keyboard is assumed for string solo (2) and single choruses (82 and 86), orchestral accompaniment is assumed for choral works in more than one movement (81 and 85).

These accompaniment assumptions present theoretical and practical issues. In principle, they could be perceived as a problem in a purely faceted universe, as it would be expected that the accompaniment sub-facet would be independent from the other medium sub-facets, such as broad size categorization (NX). This also creates problems with the foci. For instance, what might be described as "vocal" in reality means "vocal (and assumed) piano accompaniment", making foci which appear to be simple actually compound. On a practical note, the Dickinson examples above suggest that where a scheme has accompaniment assumptions in place, the classifier needs to look up whether this focus has an assumption of keyboard accompaniment, unaccompanied, orchestral accompaniment or no assumption at all.

3.2.3. Vocal/instrumental categorization and accompaniment

Vocal/instrumental categorization can be seen as part of classifying accompaniment. To start, within the example schemes, the accompaniments are always instrumental rather than vocal. Furthermore, the example citation orders demonstrate that the accompaniment sub-facet is not necessarily treated in the same way for instruments and voices.⁹⁹ Accompaniment assumptions also vary between vocal and instrumental music. This can be seen clearly in the Flexible scheme; for example, one-voice-per-part instrumental ensembles are assumed to have no accompaniment yet the equivalent

⁹⁹ The Dickinson citation orders appear to show a different treatment of accompaniment for vocal and instrumental music. However, this is due to the different treatment of voices and instruments within this scheme – types of voices do not appear in the medium classes, but types of instrument do – which has a corresponding impact on accompaniment's position within the citation order.

vocal ensembles have this option. As described above, BCM has different assumptions for vocal and instrumental music; for instance, vocal music generally assumes a keyboard accompaniment whereas instrumental music does not.

For *some* types of instrumental and vocal music, the differences between accompaniment in vocal and instrumental music is logical following the dictates of existing musical works. For instance, orchestral music does not normally have any “accompaniment”, whereas choral music – music for groups, where the group is vocal rather than instrumental – regularly occurs in both accompanied and unaccompanied form. So it is interesting to note that the schemes appear to follow the most likely situations of the music; for instance, they do not introduce or allow for deducted mediums such as orchestra accompanied by piano, which would be a logical inclusion from a classification perspective but has no basis in the real world of Western art music. Therefore, we could say that the schemes follow literary warrant, which could be termed “musical warrant”.

However, there is more that can be gleaned from these examples. If the LIS classification schemes could be considered, in part, to reflect the classifications within the domain, then these gaps in combinations of accompaniment with specific types of mediums are particularly meaningful: Beghtol (2003, p. 66) suggests that one purpose of within-domain classification schemes is to “discover gaps in knowledge”, and gives an example where developing a classification revealed gaps which led to new knowledge being discovered. So, where the LIS classification scheme analysis identifies gaps such as a group of works for orchestra accompanied by piano, this could be read through a more radical lens: not a necessity which just reflects the real corpus of musical works, but instead offers an opportunity and challenge to future composers.

3.2.4. Accompaniment’s relationship to the (quasi) format facet

The classification schemes demonstrate that the accompaniment facet in some circumstances cleaves to a facet outside of medium, the *format* of the musical work – for further discussion of the format facet, see Chapter 4, Section 3.4. The most common scenario of accompaniment/format conjuncture is where a work for voice(s) and instrumental accompaniment has been produced in an alternative format to aid practice or study; usually an orchestral accompaniment that has been arranged for piano. While this situation occurs for a variety of types of music, it is so common for vocal music – for example, operas, oratorios, and so on – that there is a specified format for these

accompaniment-arrangements called “vocal scores”. So, vocal scores mark the intersection of format (facet), accompaniment (sub-facet of medium) and arrangement (sub-facet of medium).

However, Chapter 4, Section 3.4 discusses the nebulous nature of the format facet, and whether it is a format at all; this ambiguity is shared by the LIS classification schemes and this can be seen in their varying treatment of vocal scores. For example, BCM treats the vocal score/full score categorization as the primary division within vocal music, thus putting this accompaniment/arrangement-driven format categorization as the first division point within half of the medium schedules; however, the scheme emphasises the format as categorizing force.¹⁰⁰ Dickinson has a specific facet for accompaniment-arrangements, which appears as a pseudo-subset of arrangements.¹⁰¹ Dickinson’s note for this facet states that “Choral and dramatic works of which the acc. only has been arr. for pf. [piano] solo, are commonly said to have been the form of “piano-vocal” scores” (Dickinson 1938, note 126).¹⁰² Thus, the categorization is driven by accompaniment-arrangement, but there is a formal link between format, accompaniment and arrangement. It could be argued that Dickinson’s positioning of accompaniment-arrangements is a purely faceted approach, as it breaks down the concept of a “vocal score” into its constituent parts. Furthermore, the idea of a connection between arrangement and accompaniment is anticipated from the musicological perspective; for instance, Fuller (2016) states that historically, accompaniment and arrangement were inseparable. Whatever the position of format as a facet, it is clear that “accompaniment” as a sub-facet is not entirely independent from other information within the medium facet (arrangement) and beyond (format).

3.3. Conclusions concerning accompaniment

Accompaniment is a significant sub-facet of musical medium, albeit often appearing near the end of citation orders and accompaniment highlights some issues with the faceting of music. The “accompaniment assumptions” reveal how information from different sub-facets has been combined within the same foci – for example, all instrumental solo works having piano accompaniment unless otherwise stated. This

¹⁰⁰ Peculiarly, BCM does not take a faceted approach to vocal scores. Instead the schedules are duplicated, with each type of opera and dramatic work listed twice, once for vocal scores and then the sequence repeated again for full scores.

¹⁰¹ Note that in the citation order examples seen in Section 1.2, these were treated as arrangements, as the accompaniment-arrangements always appeared as part of the arrangement sub-facet.

¹⁰² “Piano-vocal” scores can be taken as an old-fashioned and fuller version of the contemporary term “vocal scores”.

breaks down the faceted structure of the classification schemes which were studied. Furthermore, the lines between certain formats, accompaniments and arrangements are blurred, highlighting how music does not always break down into facets easily.

4. Arrangements

Another complexity of classifying musical works is concerned with transformation. A musical work may start life as one musical medium, but through the course of time exist in versions which have different mediums. The resulting version of the work is called an arrangement or a transcription (the difference between the terms will be discussed in this section). This raises two key points for categorization purposes. Which version of the work should be classified – the original or the new version? Deciding on which version to use goes beyond classification, asking significant questions about the nature of the musical work itself. Unsurprisingly, musicologists have much to say about how arrangements and transcriptions fit together with theories about musical works; perhaps less obviously, music classification discourse in the LIS domain is also very interested in whether classification schemes classify/prioritize the original or the new version. Therefore, musicological discourse about classifying arrangements will be interrogated, alongside LIS discussion about arrangements and analysing whether LIS schemes classify the original or the new version.

The second point is more prosaic, concerning how information about the arrangement is reflected in the classification of the work. This point has a somewhat briefer resolution, and analysis of LIS schemes provides answers.

4.1. Introducing arrangements

4.1.1. What is an arrangement or a transcription?

Before embarking on an exploration of the classification of arrangements and transcriptions, it is imperative to consider what is meant by the idea of an arrangement or transcription. Alas, both the concept of arrangements and transcriptions are far from straight forward within musicological literature. Within the English language there are two words which are possible candidates for the concept that is explored in this chapter: “transcription” and “arrangement”. However, as it will be shown, this not a matter just of terminology: there are actually many different concepts described under the umbrella of the terms “transcription” and “arrangement”.

The New Grove definition of arrangement (Boyd 2001) states that an arrangement involves “reworking”, as well as being highly likely to be accompanied by a change in medium.¹⁰³ This account of arrangement is the type of construct relevant to this chapter. Another author has a similar definition, but in this case, is referring to transcription instead: Sachania (1994, p. 62) describes a transcription as a “strict arrangement that recasts the medium of the original but which otherwise adheres closely to the original musical conception”. Note that not only is Sachania’s (1994) definition of a transcription similar to Boyd’s (2001) description of an arrangement, but the term “arrangement” is used by Sachania within a definition of a transcription. So, Sachania (1994) sets up parent-child relationship between arrangement and transcription.

4.1.2. Terminology

Alas, deciding which term should be used for the medium-changing process that is relevant for this chapter is not straightforward. From a musicological perspective the terminology of arrangements and transcriptions is neither homogenous nor temporally-stable. Even as early as 1935, Howard-Jones (1935, p. 305) suggests that there are many different terms for arrangement and transcription, and that the meanings differ. Boyd (2001) points out that it is not just musicologists who have been inconsistent: what are commonly referred to as Liszt’s piano “transcriptions” have the word “arrangement” on some title pages. Also, the terminology use has evidently changed over time: Sachania (1994, p. 62) clearly defines the medium-changing construct discussed in this chapter but calls it an “arrangement”, then notes that the meaning of transcription and arrangement have switched over near the time of writing and that what he describes would now be called transcription. “Transcription” in the second edition of Grove from the 1900s (Fuller Maitland 1910) is assigned to those works where the musical work itself is changed, and “arrangement” (Parry 1904) to those which change medium only; yet in the latest edition of Grove (Boyd 2001), some of the definitions of arrangement describe changes outside of medium, and it is implied that the meaning of the terms has switched from the days of the 1900s edition of Grove. Therefore, using either “arrangement” or “transcription” for this element of music classification would be

¹⁰³ There are many other meanings of arrangement and transcription other than the medium-based change relevant for this chapter: a type of notation (Ellingson 2014), relating to sound recordings (Rye 2016, Seeger 1990, p. 105), relating to jazz (Tucker and Kernfeld 2016), a simplification or elaboration of the original work using the same medium (Boyd 2001), and so on.

justifiable; however, there are some arguments that using “transcription” would echo current musicological thought.

However, it is important to consider the terminology used in LIS music classification schemes. A broad set of 19 example schemes reveals some interesting findings. (In a similar fashion to Chapter 5, the 18 schemes are also joined by DDC13, to give an extra example of a relatively early classification scheme.) First, eight out of 12 of the 19 schemes which use a term to express arrangement/transcription of musical medium use a variation of the term “arrangement” – for instance, BCM has the words “for arrangements” in its citation order. Of the other four LIS schemes, three used arrangement *and* transcription (sometimes including other terms too), and one scheme, Flexible, used a completely different term to describe this phenomenon. (Note that, though some schemes also used the term “arrangement” as a type of composition rather than a type of medium, echoing the alternative meanings of the terms in some musicological thought, as described above.) This makes sense in context: the musicological discourse suggests that arrangement was the more common term until recent years (around the 1990s), and all the example LIS schemes are from the 20th century or have their routes in the 19th or 20th centuries. Second, LIS classification schemes appear to reflect the musicological confusion over terminology. However, determining which terms are being used in the 19 schemes was far from straightforward. For instance, some LIS schemes only use the term(s) arrangement/transcription in passing rather than explicitly, or use different terms for the same phenomenon in different parts of the schedules. In addition, as mentioned above, some LIS schemes hedge their bets and use multiple terms; for example UDC (2008 reprint) has a classification number entitled “Transcriptions, arrangements for other instruments or voices (without other alteration)” while Bliss1 has a class (VXN) within “Scores for Ensembles of Stringed Instruments, Chamber Music” entitled “Transcriptions and arrangements” (Bliss 1953, VXNK). So, knowledge organization (KO) within the LIS domain, in this instance, accords with the music domain. LIS schemes are unlikely to achieve clarity on the arrangement/transcription issue when it is terminological fuzzy in musicological discussion and music practice.

Taking the musicological and LIS findings into account, the term “arrangement” will be used in this thesis to describe situations where the medium of a work has been altered but other aspects of the work are unaltered. Even though using “arrangement” may not

fit the most up-to-date musicological thinking (although still fits within the definition of “arrangement” espoused by the most current edition of Grove (Boyd 2001)), using “arrangement” rather than “transcription” utilizes the terminology which is more likely to be found in LIS – albeit with frequent crossovers with other terms and sometimes inconsistently – and is therefore more appropriate.

4.2. Importance of arrangements

4.2.1. Importance of arrangements from a musicological perspective

The position and importance of arrangements has changed over the course of music history, and certain mediums have become more or less important within the arrangement developmental arc.¹⁰⁴ From a classification perspective this is significant: music classification schemes might find that the treatment and need for arrangement categories changes depending on time that the version of the musical work was written. Early music (before around 1600) does not distinguish between voices and instruments in the same way as later periods (Howard-Jones 1935), and Boyd (2001) gives examples of types of music from the late 16th and 17th centuries where the possibility of different combinations of singers/players was built in to the publication and promotion of the music. Before 1600, most arrangements changed the medium from vocal to keyboard/lute (Boyd 2001) – crossing the vocal/instrumental divide will be discussed in a later section. The 18th century saw some notable arrangements, such as Mozart’s arrangement of Handel’s *The Messiah* (Howard-Jones 1935), and Mozart’s role in the history of arrangements is mentioned by Boyd (2001). The growth in arrangements in the 19th century is remarked upon by a number of authors, and the rise of the piano arrangements of works for bigger forces is one part of this phenomena; for example, Plantinga (1990, p. 8) discusses the commercial potential of producing piano arrangements of the latest new operas in 19th-century Paris. Thus, historical period becomes an important consideration, not necessarily as a facet or arranging principle, but how different historical periods may demand different weightings and treatment of arrangements. The idea that music from different time periods will have its own needs for classification is stated by Line (1963, p. 353), and his proposed *Historical Principles Classification* scheme also prioritizes historical period above most aspects of medium and form/genre (Line 1963). The corollary of concepts such as arrangement having

¹⁰⁴ Note that this section only draws upon a small number of musicological sources. This is because the musicological detail and debates are not of interest here, only establishing enough musicological detail in order to discuss the issues pertaining to LIS classification.

different meanings and importance over time is to challenge the static idea of specific music facets: if “arrangement” has had various meanings in the past and will continue to change in the future with music which has yet to be written, then this could undermine arrangement’s fitness as a sub-facet.

4.2.2. Importance of arrangements from an LIS perspective

Nuggets of information from the broad set of 19 LIS classification schemes can help define the position and importance of arrangements to music classification.

Contemplating the schemes which do not account for arrangements is especially revealing: they are the earliest music schemes. For example, Ayer and Cutter¹⁹⁰² do not include arrangements. However, the reason may not be a temporal one; these are all relatively short classification schemes, and the brevity of the schemes could be the reason for their omission rather than a reflection about the importance of arrangements at the time of the schemes’ creation. To bolster this argument, it is noted that later schemes which are also relatively short – such as Ott (presented in 1959, published in 1961), Colon⁶ (revised version of 6th edition first published in 1963) and Colon⁷ (1987) – also omit reference to arrangements, so the temporal element is probably a red herring. However, we can conclude that while arrangements are important enough to appear in some LIS schemes, when space is short, arrangements are not considered special enough to warrant distinct treatment.¹⁰⁵

In some classification schemes, arrangements are considered a significant part of medium. For example, BCM includes arrangements as part of its stated citation order of the medium facet; so, arrangements are a fundamental part of the structure of this scheme, albeit only in the citation order for instrumental music (the differing treatment of arrangements for vocal and instrumental music is discussed below). LCC2015 uses arrangements as a significant factor in organizing musical medium; for instance, works for piano, string orchestra and cello, to name just a few examples, have an important and primary division between “original compositions” and “arrangements”. (Technically, the primary division is between collections and non-collections, but assuming it is individual works being classified, then original/arranged is the first division of individual works.) However, this importance could also be viewed another way. The primacy of

¹⁰⁵ Note that just because there is not a reference to arrangement does not mean that an arrangement cannot be accommodated in the scheme; instead, it means that either the arrangement aspect of the work is ignored and it lives alongside original works for the new medium, or that the classifier makes a case-by-case decision to class the arranged work with its original medium without referring to its actual medium.

the arrangement categorization means that arrangements and original works occupy completely different spaces within an instrument/group category; this could also demonstrate a value-judgement based on originality, with “pure” originals needing to be kept away from their “impure”, arrangement cousins.

LIS schemes also highlight the tension between arrangements as change in medium versus arrangements as change in musical forms, and these differences usually manifest themselves via the conduit of terminology. For example, in the LCC2015 example above, the important categorization into the non-arranged and the arranged is expressed as “original compositions” and “arrangements”. It is prudent to consider carefully what this means. In terminology, the LCC2015 example seems to be about the *other* sort of arrangements: arrangement as form. This is due to the arrangement being expressed as a form, not a medium. However, looking more carefully reveals that say, a separation of compositions within solo piano for those originally written for piano and those not, is actually classification by medium after all – the characteristic of division used is a binary categorization into “original medium” and “not original medium”.¹⁰⁶ This highlights the tension between *process* and *result*. The medium is the process by which the compositions are categorized, but the result is concerned with, and is described in terms of, the compositions. A similar phenomenon is seen in Dickinson; there is an arrangement facet, but arrangement is described using the word “form”. The facets of F and Fa are given the titles “Arranged for or from” when presented as a list of foci; however, the statement of the citation orders (called “combinations” in Dickinson) uses the terms “actual form” and “original form”. The terminology suggests the form/genre facet, but the foci of the facets undoubtedly refer to medium. These examples show how arrangements can blend the lines, if they even exist in the first place, between the facets of medium and form.

LIS music classification discourse discusses arrangements, in particular when discussing specific classification schemes. The importance of arrangements can be seen, for example, when Forrest and Smiraglia (1990, p. 61) use arrangements as one criterion for assessing DDC19 and the new version of *Dewey Decimal Classification* (DDC); this suggests that arrangements are significant enough, in terms of their importance and previous problematic treatment, to warrant use as a “metric”, in this case for chamber

¹⁰⁶ Even though no further classification takes place concerning medium within these categories, it is still assumed that the categories themselves are unequivocally based around medium, not form, as the dividing principle describes medium.

music scores. Another can be seen in the criticism of Dickinson. (The term “criticism” is used in the framework of reception-based analysis, see Lee (2015).) Dickinson is atypical in having a choice of citation orders. While they vary in a number of ways, one of their biggest differences is in the treatment of arrangements, in other words whether to classify by the original or actual medium. Unsurprisingly, this aspect of Dickinson relating to arrangements is picked up by commentators – see, for example, Bradley (2003, p. 471). Thus, it can be seen that in LIS schemes and LIS discourse, arrangements are an important part of the classification of musical medium.

4.3. The arrangement and the work

4.3.1. Musicological considerations of arrangements and works

To consider how original and arranged versions of works are classified, it is imperative to position arrangements in terms of the musicological concept of the work. This is an important concept to musicologists, and thus a brief summary of the key arguments is presented, in order that they can be applied to the question of LIS classification of arrangements.

A fundamental question concerns whether the arranged version of the work is the same musical work as the original; the answer is fought over by certain musicologists. Levinson (1990, p. 87) suggests that a transcription which changes one “performance-means structure” to another, even if the “sound structure” is not altered, will result in a separate musical work. In other words, an arrangement is a new work, as long as different instruments and voices are needed to produce it.¹⁰⁷ Levinson’s (1990, p. 87) arguments are based on his ideas about the fundamental structure of music, where “instrumentation music be considered inseparable from them [musical pieces]”. Aesthetically, once the medium changes, the piece of music changes. So Levinson’s designation of transcriptions as different works from their originals is based on aesthetic considerations. Not everyone agrees with Levinson, in particular the musicologist Kivy (1993), who directly challenges Levinson’s writings. Kivy’s (1993) starting point is to argue against those who dismiss the Platonism approach of “instrumentation or orchestration is not an essential part of the musical work” (Kivy 1993, p. 75) . So Kivy,

¹⁰⁷ Levinson’s description of “performance-means structure” and “sound structure” (1990, p. 78) as the combination of which makes a musical piece. They could be considered as subset of the general term “medium” that has been used in this thesis, being separated from each other by the separation between potential sound-making mechanism and actual sound-making mechanism. While interesting to note the potential for describing medium, for the purposes of the transcription discussion, it is enough to note that Levinson is discussing musical medium when using these two terms

according to Sachania's (1994) description of the debates between Kivy and Levinson, argues that an original work and its transcription are in-fact the same musical work (Sachania 1994, p. 70).¹⁰⁸

4.3.2. LIS ideas of the original and the arranged

One of the most important arrangement decisions in LIS schemes is whether to prioritize the medium which is front of you (arrangement) or the medium that the original work possessed (original). As well as being a practical concern, this also illuminates the conceptual structure of the scheme as it elicits information about how the scheme conceives the musical work. If the medium is expressed as is, this could be affiliated to the idea of transcriptions as separate musical works; if medium is expressed as part of the "mother" composition, this could be seen to correspond to the view that a composition and its transcription are at some level the same musical work. So, the broad set of 19 schemes is used to identify how arrangement is expressed in the LIS realm. A note about terminology is needed: while in classification schemes, the terms "original" and "actual" are frequent, in order to provide a comparison with the musicological discussion, the terms "arrangement" and "original" will be adopted.

The schemes were analysed to see whether they primarily classify arrangements with the original musical medium or with the arranged medium: the answer is that most schemes choose to classify music with the medium of the arrangement, rather than the original. BCM, Flexible, DDC22, DDC13, Subject, Cutter1902, LCC2015 and McColvin and Reeves, all would place arrangements primarily with their actual medium.¹⁰⁹ So, in terms of the musicological debate above between the Levinson and Kivy camps, this aligns with Levinson winning the fight. A closer look at this list of schemes reveals

¹⁰⁸ It is interesting to note how discussions about the relationship between the original and the arranged evoke ideas expressed in FRBR-ised terms (International Federation of Libraries and Archives 2009) – though most of the original musicological sources are written before the first publication of FRBR in 1997. For example, the first edition of *New Grove*, published in 1980 (Boyd 1980, p. 627) discusses a scale of arrangements, which ranges from a simple transcription to a paraphrase where the responsibility moves from being definitely with the composer, to the paraphrase being considered the responsibility of the arranger; note its similarity to the FRBR diagram of related works and expressions (Library of Congress 2012, slide 25). In another example, Busoni (1957, p. 87) says that "notation is itself the transcription of an abstract idea"; this almost exactly foreshadows the FRBR group 1 entity of "expression".

¹⁰⁹ As discussed in section 3.2.2, some LIS schemes do not discuss arrangements at all, so it is not possible to unpick their position regarding original versus arranged medium; sometimes arrangements are discussed, but it is still not clear whether to classify by the original or the arranged. Therefore the list of schemes which opt for arranged over original is a subset of the group of schemes which have explicit principles for treating the medium of arrangements.

something of interest. The list includes DDC13, McColvin and Reeves and DDC22; yet, both DDC22 (through the conduit of the *Phoenix Schedule*) and McColvin and Reeves were conceived as schemes which reject early editions of DDC. This suggests that treatment of arrangements was not the problem which caused schismatic editions and versions of DDC. This could be read as arguing that arrangements are not important enough to be a seismic issue; an additional possibility is that the DDC (and “friends”) examples show the entrenchment of prioritising the arranged medium over the original.

Categorizing the treatment of arrangements is not always straightforward. To start, some schemes treat different types of arrangements in different ways; for instance, Cutter1902 has one instruction for instrumental arrangements of operas and dramatic works, but another for works which have no arranged medium. Some schemes give the classifier the option of prioritising its original or arranged medium, so the “original” or “arranged” tags cannot be assigned to the scheme as a whole. For example, in Dickinson, this is an important difference between its various citation orders (combinations); the arranged medium features first for the combinations designed for loan and performance libraries (1) and general and small libraries (3), but reference and musicological libraries are seen to prefer classification by original medium. So, Dickinson considers the musicologists to be interested in families of musical works, arguably aligning Dickinson with Kivy’s views about arrangements; whereas Dickinson considers performers to prefer arrangements to be kept with their actual medium, which could be argued elides with Levinson’s view of transcriptions as distinctive compositions. (These observations rely upon a preference for the arranged medium aligning with considering the arrangement a separate work.) Subsequently, this would mean that Kivy’s argument about performers considering arrangements as the same work as the original is not borne out in Dickinson’s scheme; in fact, Dickinson and Kivy are diametrically opposed on performers’ considerations of arrangements, showing (small) discord between LIS classification and the music domain.¹¹⁰

4.4. How to indicate the new/old medium

Another factor in the classification of arrangements is how the arrangement-factor is expressed when classifying musical works. Unsurprisingly, the answer depends on the classification scheme. Furthermore, the level of detail about arrangement that is

¹¹⁰ Of course, there is a time difference between Kivy’s comments which were originally given in a paper in 1987 (Kivy 1993) and Dickinson’s early 20th-century scheme (devised in the 1920s, first published in 1938).

provided might also depend on the faceted-ness of the scheme. For instance, the very enumerative LCC (1998) does not allow for an expression of the original medium, yet Dickinson allows for full expression of both the actual and original mediums. This hypothesis is proposed because to express the medium of the original or arranged work will require foci from other sub-facets from medium – such as type of instrument/voice, and so on; faceted schemes have the potential mechanism to pilfer from these other sub-facets, whereas an enumerative scheme would need to list every possible type of medium for the original, for every type of arranged medium. (In other words, the selected number of mediums in the scheme, then squared in order to accommodate every possible arranged/original combination.) This is clearly burdensome, thus describing both arranged and original mediums is, from a theoretical perspective, a more likely phenomenon for those schemes which display faceted-ness.

4.5. Music domain categorization of arrangements

Within the music domain there is evidence of categorization of *types* of arrangements. Sometimes musicologists state these categorizations explicitly, while sometimes they are implied. The arrangement categorizations are too detailed to feature in most LIS classification schemes; this demonstrates a disjuncture in categorization practices, rather than categorization results, between the two domains. Even though there is no scope to compare LIS and music classifications of arrangements, it is still worth outlining the main issues within musicological categorizations of arrangements; such a discussion addresses RQ4 by contributing to our understanding of the music domain's classification structures of music. A full musicological discussion would be beyond the scope of this LIS thesis, so a brief outline of the key points is offered.

The people doing the arranging are the focus of some categorizations. For example, Keller (1969) gives three different types of transcriptions, which are stated as three discrete categories: arranger/composer different people; arranger/composer same person; arranger unknown.¹¹¹ Sachania's (1994) categorization is based around how much the arrangement changes from the original: at one end of the spectrum are "bar-by-bar" and "note-by-note" arrangements, and then the spectrum moves to freer arrangements. This categorization (Sachania 1994) is especially useful for elucidating the difference between those arrangements where the same notated music is played by

¹¹¹ Note that being unknown does not negate the possibility that composer and arranger could match so it is technically possible that the composer and arranger are the same, unknown person. There are issues with the logic presented by taking Keller's system as discrete categories, but there is not space to discuss these further.

two different instruments (for instance, piano and organ), and arrangements where the notated music changes in order to accommodate the different mediums (for instance, piano and harp). Are both categories included in “arrangements” as found in LIS schemes? The answer is possibly not, if the schemes are classifying notated music, rather than sound/performance. Howard-Jones (1935, pp. 305-306) has similar categorizations of arrangements based on notation-changing-mediums; however, his arguments see the categorization of the freedom of the arrangement intertwined with whether the medium is an intrinsic part of the (original) work or not.

4.6. The arrangement and vocal/instrumental categorization

The classification of arrangements highlights useful information about another medium-based categorization: the vocal/instrumental divide. Within a vocal/instrumental framework, arrangements have changed over time. Up to around 1600 most arrangements consisted of vocal parts being arranged for instruments, usually keyboard or lute (Boyd 2001); whereas from the Baroque era, most arrangements are instrumental-to-instrumental (Boyd 2001). Amongst other things, this means that the needs of classifying arrangements from 1600 will not be the same as those from 1900 or 2000. However, as well as the change of fortunes of certain types of arrangements, it is important to note the dominance of the instrumental-to-instrumental arrangements from a certain time period onwards. This dominance is reflected in how music is described and categorized: for example, the proto-taxonomy of arrangements by Keller (1969), as discussed above, uses examples which are predominantly instrumental-to-instrumental.¹¹²

Crumbs of vocal/instrumental categorization can reveal themselves in many places within LIS, one of which is terminological. For example, the term “instrumentation” (as well as harmonization) is used in Flexible to describe what is generally accepted to be an “arrangement” (see discussions above concerning definitions). The word “instrumentation” obviously suggests instruments rather than voices. This equation of arrangement with instrumental is assumed in other LIS schemes. For instance, Duff Brown only mentions arrangements in conjunction with instrument classmarks; McColvin and Reeves (McColvin, Reeves & Dove 1965, p. 49), discusses arrangements in

¹¹² The sole exception in Keller’s (1969) examples is the spoken (but not sung) *Pierrot Lunaire* by Schoenberg, where the “arrangement” is executed on the instruments, not the lone voice.

the introduction, but assumes that arrangements will be from one instrument to another. In other schemes, arrangements make an appearance within the structure of the scheme, as part of the specified citation order; BCM has a place for arrangements in its subdivision of the “executant” facet, but the sub-facet of arrangement only appears in the instrument citation order, not the vocal one (Coates 1960a, p. x). Therefore, we can see how in this instance, the LIS classification is reflecting the music domain.

How can this instrumental-to-instrumental autonomy be interpreted for classification purposes? First, it suggests a sub-facet of music medium which only applies to one type of medium: instrumental. This enforces a bifurcation of musical medium around vocal/instrumental categorization, where one category deals with arrangements and the other does not. Second, there are conceptual and practical questions about classifying those arrangements which do involve voices – vocal-to-vocal, instrumental-to-vocal, vocal-to-instrumental – within a world which only makes space for arrangements involving purely instruments. Vocal arrangements do exist: for instance, arranging a soprano aria for mezzosoprano, a solo song to a choral arrangement, or the vocal arrangements of instrumental works as produced by groups such as the Swingle Singers. Conceptually, the lack of classificatory acknowledgement of arrangements such as vocal-to-vocal could be read as a signifier of “interchangeability” in vocal music and lesser attachment to the medium as identifier of a work than for instrumental music. Classification of arrangements to some extent portends how vocal and instrumental music are perceived.

4.7. Within-medium arrangements

Brief mention should be made of another type of arrangement of medium: an arrangement takes place, but the description of the musical medium does not change. For example, a work for orchestra may change what each instrument plays (and perhaps even the types of instruments), but the overall medium would still be classified as orchestra. There are number of reasons why these types of arrangements might occur, such as the “improving” re-orchestrations of Rimsky Korsakov or the simplification of a piano work for a learner. In LIS classification schemes, a musical work which changes its medium but not the overall designation of that medium – say an “easy” Beethoven piano sonata still designed for the piano, or a new orchestral version of an orchestral work – could not be adequately described using just the arrangement sub-facet in the medium facet. On a conceptual plane, these within-medium arrangements indicate how

arrangement can be a murky sub-facet, which perhaps is not wholly contained within the medium facet.

4.8. Conclusions concerning arrangements

Exploring the classification of arrangements has revealed a number of critical points. Arrangements have had mixed fortunes from a musical perspective, which is shared by their treatment in LIS. Within LIS, arrangements receive mixed messages, featuring in citation orders in schemes such as BCM, and being used to measure a scheme's effectiveness by some LIS writers; yet they barely feature in some schemes. The musicological idea of whether an arrangement is a new work or not, a position which is fiercely contended by musicologists on both sides of the argument, appears closely related to the fundamental LIS question about whether the arranged work is primarily placed with its original or arranged medium. The consensus appears to be with its arrangement, but the musicological idea of where performers wish to find their arrangement does not concur with an example scheme which specifically addresses this question (Dickinson). How to express the arranged/original part is primarily an LIS question; in most cases, this has not been fully figured out, and the advantage of faceting this element in order to fully express the original (or arranged) medium becomes clear when the alternative is expressing every original/arrangement combination. Finally, classifying arrangements is intertwined with the vocal/instrumental categorization: musicological thought and many LIS schemes appear devoted to arrangement as a purely instrumental act. However, it is clear that arrangements involving voices also exist, and so there are good arguments for models of music classification to embrace arrangement as something affecting voices too.

5. Classifying “extreme” musical mediums and “stress-testing”

5.1. Introduction

Considering the classification of musical works which have especially large and complicated musical mediums is critical for fully understanding the mechanisms of music classification. While a classification scheme may work perfectly for typical musical mediums, that scheme may not be as effective for large musical forces or an unusual combination of performing groups. Furthermore, examining exactly which aspects break the scheme and how the implosion takes place will be insightful. Deliberately

“breaking” classification schemes is not a known method or topic within LIS classification discourse. Therefore, not only will this section about extreme classification further our understanding of music classification, it also introduces a novel methodology.

“Extreme” mediums can take many guises. For example, it could include works which are for very small groups or particularly lop-sided groups of players or singers. However, as shown in Section 2 of this chapter, combinations and multiples appear to be a complexity of music classification. Therefore, though a piece for, say, solo bassoon might be highly unusual in terms of the scarcity of other works for this medium, the classification schemes’ structure means that this is relatively simple within LIS classification schemes. So, the focus is on mediums which are described as “extreme”, but are also complex in their classification and feature multiples of various kinds.

5.2. The works and the method

The discussion about choral symphonies in Chapter 5, Section 6 highlighted many issues with the mediums of these types of works. Therefore, three highly complex and “extreme” examples of these types of works will be used to “stress-test” LIS classification schemes, in order to elucidate classification issues concerning extreme mediums. The three large-scale mixed choral and instrumental works used are as follows: Mahler’s Symphony No. 3 (1893-1896), Mahler’s Symphony No. 8 (1906-1907) and Havergal Brian’s Symphony No. 1, *The Gothic Symphony* (1919-1927).¹¹³ Mahler’s Symphony No. 3 is particularly challenging due to its combination of children’s and female-only choirs, alongside a very large orchestra.¹¹⁴ Mahler’s Symphony No. 8’s challenges lie in its unusual collection of vocal soloists as well as its large choral and instrumental forces – it is not known as the “Symphony of a Thousand” for nothing! Finally, the *Gothic Symphony*’s challenges lie in the scale of its forces, as it relies on a heavily extended (double) orchestra and quadruple choruses, splitting at one point into

¹¹³ The first two of these works are what we might term “standard repertoire” – though Mahler’s Symphony No. 8 does not get performed with the same frequency as certain other Mahler symphonies for reasons of cost and logistics. The *Gothic Symphony* is an extreme rarity in terms of performance, but its score has been published, there are a number of commercial recordings of the work and the piece has attracted a published monograph dedicated to it. While there is no absolute way of positioning a musical work as within or outside the orchestral/choral repertoire it is possible to gain a very crude, numerical comparison to back up the above assertions using tools such as the *Proms Archive* (BBC 2016), which tracks the frequency of specific musical works at one particular concert series. In the case of the three selected works, the numbers of performances at the Proms from the first season (1895) to the present day (2016) are as follows: Mahler’s Symphony No. 3 (14), Mahler’s Symphony No. 8 (8) and Brian’s *Gothic Symphony* (1) (BBC 2016).

¹¹⁴ The term “female chorus” is taken to mean those people singing the upper parts of soprano through to alto, whatever their gender. For instance, it is possible that there will be some male members of these sections, although for reasons of vocal practice and timbre, male altos and countertenors are not frequently found in the types of choir which sing Mahler symphonies.

37 separate vocal parts (Marchant 2005) – though see below regarding the difficulties of counting vocal parts. The mediums are summarised in Figure 27.¹¹⁵

Work	Instrumental forces	Vocal soloists	Choral forces ¹¹⁶	Notes
Mahler's Symphony No. 3	Symphony orchestra (with off-stage instruments)	A	Children's choir in 2 parts, 3-part female choir (SSA)	Choirs for movement 5 only (approx. five minutes in duration, out of approx. 100 minutes of symphony); vocal soloist used for movements 4 & 5.
Mahler's Symphony No. 8	Symphony orchestra (with off-stage instruments, plus organ)	SSSAATBarB	Double mixed choir (SATB/SATB) and children's choir	
<i>Gothic Symphony</i>	Very large symphony orchestra plus four "extra brass orchestras"	SATB	Quadruple mixed choir (SATB/SATB/SATB/SATB, written as choir Ia, Ib, IIa and IIb), with boys choir and girls' choir	Choirs used for part II only, around 2/3 of piece

Figure 27. Mediums of three example "extreme" musical works

"Stress-testing" is an analytical tool that can be used to examine issues within extreme classification, by closely examining the classification of extreme mediums within specific classification schemes. The analytical technique has been called "stress-testing" in order to align loosely with ideas of stress-testing in other disciplines, such as engineering. It can be seen through a mental image: an elephant on a rope bridge, where the elephant

¹¹⁵ The following abbreviations for vocal parts have been used: S = Soprano, A = contralto, T = tenor, Bar = baritone and B = bass. While the standard four-part choir has very standardised abbreviations for its four vocal types, there are different possible abbreviations for voice types such as the baritone or mezzo-soprano. As far as possible, abbreviations and written conventions as laid out in Grove have been followed.

¹¹⁶ Ascertaining the number of choral parts for these works is complicated: general discussions about the difficulties of counting choral parts took place in Section 2.4, and the scale of these works magnifies those issues. The listing of choral parts in Figure 27 has been taken from a combination of methods discussed in Section 2.4, relying heavily on the quantity of staves and the description of parts as described in one edition of a full score of each of the works (Mahler 1911, Mahler 1974, Brian 1976).

represents the musical work, and the rope bridge represents the classification scheme. Perhaps a cat walking along the same bridge might represent Beethoven's Symphony No. 9 or Berlioz's *Roméo et Juliette* – the rope bridge wobbles, but stays intact; but with Mahler's Symphony No. 3, Mahler's Symphony No. 8 and *Gothic Symphony*, it is like an elephant walking across that rope bridge. The Mahler/Brian elephants are very likely to break that rope bridge. Whether the bridge (classification scheme) collapses or remains intact after the Mahler/Brian elephants have tried to cross will help ascertain the structure of that bridge (classification scheme). So, three example schemes will be used for the stress-testing: BCM, Dickinson and Flexible. The medium of each of the three works will be classified using each scheme and the results noted; questions will include whether it is possible to represent the full medium within each scheme, what are the tensions, and so on. Therefore, with Mahler and Brian as our weapons, an attempt is made to “break” the three music classification schemes.

5.3. Breaking points

Three especially pertinent breaking points have been identified when classifying the three musical works with the three example schemes: combination of choirs, representation of multiple vocal soloists and representing the scale of the musical mediums.¹¹⁷

5.3.1. Combining choirs

All three works used multiple choirs, and both Mahler's Symphony No. 3 and *Gothic Symphony* involve choirs of different kinds; yet, expressing multiple choirs and in particular choirs of different “types” proved a complex and sometimes fruitless endeavour. Most citation orders in Dickinson allow the use of a “voices” facet to express a type of choir, such as “women's voices” or “young voices” (Dickinson, 1938, p. 29); however, there is no stated way of repeating these facets, so Mahler's Symphony No. 3's women's and children's choirs cannot be stated in the classmark, nor can the *Gothic Symphony's* mixed and children's choirs.¹¹⁸ BCM presents the same problem: there are no instructions or examples of combining types of choir. However, Mahler's Symphony No. 3 can be represented by the umbrella focus “F” which encompasses

¹¹⁷ Issues which affect the classification of these musical works but are not directly related to extreme mediums are not discussed – such as the combination of symphony with a vocal medium, and so on.

¹¹⁸ One possible solution would be to list more than one value for this facet, such as “-w-y” to indicate women's and children's choir. However, though this would not appear to clash with other facets as the punctuation, there would be questions about filing such classmarks.

female adult voices and children's voices¹¹⁹; no such lucky escape exists for the mixed/children's choir combination, so *Gothic Symphony* cannot be adequately represented. In this case, the only option is to include nothing for the type of choir facet when classifying *Gothic Symphony* using BCM, and let the assumption of "mixed-choir-unless-otherwise-stated" represent these complex vocal ensembles.

Flexible proves more resilient than BCM and Dickinson on the matter of combining choirs, as some types of combined choirs can be accommodated. For example, there is a classmark for compositions for children's and mixed choirs (74 or 78, depending on accompaniment). However, Mahler's Symphony No. 3's combination of female choir and children's choir causes problems for the Flexible scheme; no classmark expresses female choir *and* children's choir, and there is no opportunity to create such a number. So, it is not possible to express both of the choirs within this classification scheme.¹²⁰ Curiously, if "children's and mixed choir" are used for *Gothic Symphony*, then there is no option to specify the number of parts; so, a choice has to be made between accurately specifying the types of choirs and given a detail about the number of parts.¹²¹ Thus, while Flexible appears to survive the combined stress of Mahler and Brian, the actuality is a broken scheme.

5.3.2. The problems of multiple vocal soloists

The issues with combining vocal soloists were broached in Chapter 5, Section 6, when discussing Beethoven's Symphony No. 9 and Berlioz's *Roméo et Juliette*: it was shown that including multiple soloists in the classmark was problematic in most cases.

Expressing vocal soloists is possible in BCM, but as mentioned in Chapter 5, Section 6, there are no instructions as to how to represent multiple soloists; thus, the results are messy, and have much potential to lead to cross-classification, as they rely on scheme

¹¹⁹ The classmark for Mahler's Symphony No. 3 assuming three female and two children's parts would be as follows: FE/FQDAB. This follows the example found in BCM (Coates 1960a, p. 35) under EL where the specific type of choral voices is followed by "E", and this has to be followed by a "/" for filling purposes. This example demonstrates how the logical order of facets is wanting in this alternative table: separating the number of voices in the choir from the type of voices seems unhelpful.

¹²⁰ The options are to use the overall number for homogenous choirs, 76, or instead place the work with either children's choir (two-part children's choir in 761.2) or female choir (three-part female choir in 762.3), is up to the classifier. There is a fourth option, to class the symphony in 74 under mixed and children's choirs, which falsely represents the female chorus as mixed but does give the general impression of multiple types of choirs.

¹²¹ Curiously, children's chorus, female chorus and mixed chorus all have the option to subdivide by number of parts – albeit with small differences in how many parts can be represented. One possible explanation is that the instructions for mixed chorus are an error – if the instruction to divide like 71 was meant to say 721 – and the intention was for all three types of choir to be divided into one to eight parts or double chorus. Whether an error or not, it does suggest that extreme mediums are applying a certain level of stress on the scheme.

interpretation. Mahler's Symphony No. 3's single soloist presents no problems, but *Gothic Symphony's* SATB soloists presents the same issues as found in Beethoven's Symphony No. 9. Thus, again, BCM fails in combining more than one of a type-of-thing (vocal solo) even for standard cases such as a brace of four soloists. These issues are magnified for Mahler's Symphony No. 8. Not only are there now eight soloists rather than four, but extra issues are raised about whether it is possible to represent "three sopranos" rather than "soprano and soprano and soprano" – eliding to the issues discussed in section 2.3.3. It seems that the only way to represent the soloists in Mahler's Symphony No. 8 in BCM is to add them, individually, by hand: this gives an extremely unwieldy classmark of FLFLFLFQFQGHGNGX just for the vocal soloists.

Flexible provides the means to build up combinations of vocal soloists. Some of these are given pre-coordinated, such as SATB – this means that representing the SATB soloists in the *Gothic Symphony* are straightforward, and would follow the same pattern as for Beethoven 9. Mahler's Symphony No. 8's soloists provide Flexible with a few challenges, and the scheme becomes unclear on what exactly is intended for this type of situation. The most obvious course of action is to treat Mahler's Symphony No. 8 in the same way as Berlioz's *Roméo et Juliette*; so, use the overall number of soloists, and build up the unusual combination of soloists one-by-one. This gives an accurate but long classmark just for the vocal soloists: 868.71'71'71'72'72'82'83'84. However, this is not the only reading. As there is a duplication of certain types of soloists (for instance, there are three sopranos), it might only be necessary to express the "soprano" factor once – a shorter 868.71'72'82'83'84; for after all, the total of eight soloists is expressed at the beginning of the sequence. Neither the examples in the scheme nor the wording of the scheme itself make it clear whether it is intended or permissible to give each voice part only once. The ideal solution of expressing the "three" and the "sopranos" but doing so without repeating the soprano class is not possible in Flexible, as there the number-of-thing sub-facet is not present. So, extremities of multiple vocal soloists appear to "break" Flexible, as there is some confusion over treatment of multiple occurrences of the same voice type and potentially long classmarks.¹²² Expressing the vocal soloists in the classmark does not appear to be possible in Dickinson, so this topic is not relevant.

¹²² Another possibility is not to express the types of voices at all. In fact, this is given as an example in the scheme for more than 9 soloists (Petthes 1967, p. 47). This would create a simpler classmark, but one which is less detailed in representing the musical work. It is noteworthy that Flexible mentions more than 9 soloists as a possibility, showing a consideration of the potential existence of extreme mediums.

5.3.3. Representing scale

The extreme works show their extreme-ness of scale in a number of ways. The large number of vocal parts can be an issue. As discussed in Section 2.4, designating a number of choral “parts” can be fraught with difficulty, and responses will vary; however, even assuming that *Gothic Symphony* has “only” 18 choral parts, the schemes struggle to absorb a number of choral parts of this size. BCM’s designation of vocal part numbers stops at “more than eight parts”; so *Gothic Symphony*’s 18 (potentially up to 37) and Mahler’s Symphony No. 8’s 9 choral parts would be represented as the same size of choral force. Dickinson can be manipulated to reflect extreme-ness, using the g (“grouping”) facet.¹²³ For example, Mahler’s Symphony No. 8’s two four-part choirs and single-part children’s choir could be represented as “-9”. The scheme could also be used without any problems in filing for numbers bigger than 9, albeit not *entirely* legally.¹²⁴ So, *Gothic Symphony*’s 16-part adult choir and two children’s’ choirs could be represented by “-18”, showing both a large number and a distinction from Mahler’s Symphony No. 8.

However, there is also extreme-ness in the instruments used in these works, not just the voices. Flexible is particularly detailed in reflecting extreme orchestral forces. There is a classmark for double orchestra as well as for “treble and multiple orchestra and orchestra of unusual dimensions” (Pethes, 1967, p. 38), which is useful for Brian’s *Gothic Symphony* (making the classmark for the Brian’s *Gothic Symphony* 864’78’78’396). However, note that there is a lack of faceting in the approach to double and treble orchestras: it is not possible to represent number of ensembles (2 or 3) and type of ensemble (orchestra) in Flexible, so the focus of a double orchestra (and so on) is a compound concept.

5.4. Conclusions concerning “extreme” mediums

Examining extreme musical medium has thrown into sharp relief a number of issues in classifying music; while these may be illuminated when considering extreme musical mediums, they potentially permeate the classification of all Western art music.

¹²³ Though not specifically mentioned in the classmarks for multi-movement choral works (81 and 85), a note elsewhere in the scheme (82) explicitly says that the details of the note can be applied to the rest of the class (Dickinson 1938, p. 38, note 80). The details of this universal note are that table g, specifying number of choral, parts can be used.

¹²⁴ Note 114 (Dickinson 1938) suggests that a work with more than 9 parts should be placed elsewhere (class 56); however, as class 56 is for instrumental music, it is assumed that this note is not applicable to choral works. Therefore, it can be deduced that using this table for works in more than nine parts is neither permitted nor forbidden.

Combining groups appears to be an issue in LIS classification schemes; the stress-testing showed that this was particularly noticeable for choirs, but could also be seen in combining instrumental groups. For instance, though each scheme had a classmark for different types of choir, combinations of choirs were described using pre-coordinated foci; the problems with this “solution” are manifold, including creating (unideal) compound foci, missing potentially warranted combinations (such as the combinations of choirs used in Mahler’s Symphony No. 3 and *Gothic Symphony*), and causing issues with representing other aspects (such as number of choir parts).

Representing groups of vocal soloists also contributed to “breaking” schemes. Stress-testing was particularly useful here: while smaller groups of soloists (for instance, as found in Beethoven’s Symphony No. 9 and Berlioz’s *Roméo et Juliette*) had made the schemes wobble, Mahler’s Symphony No. 8’s eight soloists finally made the schemes “crack”. (Put another way, the elephant is now in the water.) Two of the three schemes had the potential to represent groups of vocal soloists, though in BCM this was implied rather than explicit. Representing multiple voices of the same voice proved challenging; while both Flexible and BCM allowed representation of the *total* number of solo voices, neither scheme had instructions or accommodation for representing the number of any one type of voice – matching the issues discussed in Section 2, which focused primarily on instrumental ensembles. In conclusion, the stress-testing method has shown how stretching schemes until they break highlights fundamental flaws in the structure of LIS schemes, such as the inability to cleanly combine groups or soloists, which may go unnoticed or unchecked. Thus the vitality of the stress-testing method has been illustrated, alongside some significant issues in the classification of music medium.

6. Conclusion to Chapter 6

This chapter has shown that there are numerous aspects which make up musical medium, and various areas of complication when classifying the musical medium of Western art music. The citation orders revealed many aspects within medium and the most prominent of these were discussed in detail in this chapter: ideas relating to numbers, arrangements and accompaniment. Numbers prove to be especially complex. There are questions about what is being counted and the need to count multiple types of things in order to fully represent all the information embedded within musical medium. For example, Section 2 concluded that four sub-facets were needed for general vocal/instrumental ensembles – category of instrument/voice, total number of

instruments/voices, type of instrument/voice, number of that individual instrument/voice – with two extra candidates (probably not both needed) for multiple keyboard mediums. Furthermore, the conclusions from the discussions on extreme mediums (Section 5) showed a need for specifying the number of a particular type of vocal soloist and more systematic treatment of multiple groups. These two issues came into sharp relief when dealing with mega musical mediums. Two types of solutions are needed for the number problems. First, when classifying music it is possible to add together *all* types of things, not just those which the classification scheme author thinks might be useful; for instance, more than one type of choir could be added together, in a system which was post-coordinated, circumventing the need for classification scheme authors to guess which combinations might be needed. Second, adopt a more faceted approach to counting, so that for every type-of-thing, there is a number-of-thing, thus avoiding the confusion about how to present the two violins within a string quartet or the three sopranos within a vocal octet.¹²⁵ These findings are used as the basis of Model 2 in Chapter 10.

Another key finding is the importance of an overall categorization of size to the classification of musical medium – in other words, categorization into solo, ensemble and group: in the example schemes, this was found to be the first division within the vocal and instrumental parts of medium. There is an interesting question about whether this is an ordering principle rather than a sub-facet. This broad categorization approach, often seeing the categorization before the detail, was also seen in accompaniment – for example, categories for unaccompanied, accompanied, and so on; in rare occasions amongst the example LIS schemes, the broad categorization of accompaniment and the exact accompaniment are separated by a completely different sub-facet within the citation order.

Exploring difference parts of musical medium also showed the difficulties of isolating any one part of musical medium. The vocal/instrumental categorization loomed large in much of the chapter: for example, discussions about arrangement showed the omnipresence of the vocal/instrumental categorization. Considering the classification accompaniment revealed how the accompaniment sub-facet does not always act alone, and how the quasi-facet of format could be considered as a vortex which includes the

¹²⁵ However, this casts adrift those types-of-things where the number also includes the type, such as number of performers or number of hands. As these only apply to specific types of medium, they are temporarily ignored.

sub-facets of accompaniment and arrangement. So, alongside number-of-thing relating to multiple instruments/voices/parts/groups, this chapter showed that when dissecting the detail of the medium facet, there are sometimes incursions by completely non-medium related phenomena. Thus, the supposed independence of the medium facet is challenged. Finally, examining musical medium classification in detail unearthed information far broader than musical medium. Classifying arrangements asks pertinent questions about the musical work itself; the classification of arrangements in LIS schemes parallel discussions in musicological discourse, echoing arguments about whether the arranged work is part of the work itself or not. Using stress-testing to extract information about how LIS schemes are actually structured not only revealed vital information about music classification, but has also revealed a novel and useful tool for examining LIS schemes. So, analysing music classification has revealed a new methodology that can enhance our understanding of general KO.

Chapter 7. Musical medium 3: classifying musical instruments

1. Introduction to Chapter 7

1.1. Introducing musical instrument classification

Musical instruments are an important part of music classification. However, classifying instruments is not just the preserve of library and information science (LIS) classification schemes; organology, the sub-discipline of music devoted to musical instruments, positions the classification of instruments as one of its major concerns. Therefore, this chapter explores classifying instruments in both the LIS and music domains, and attempts to construct a path between the two.

Three topics form the heart of this chapter. First, the broad categorization of instruments is considered. This looks at how the universe of instruments – the “instrumentarium” – is traditionally divided into families; the changes of characteristic of division used to create these groups at different junctures in time is considered, as well as viewing the parallels between organological and LIS ideas of instrument groups. This is followed by a consideration of specific instruments, including discussion about the classification of the saxophone and of unusual instruments. These two examples demonstrate how tracing one instrument or type of instrument through different classification systems can yield a cornucopia of information about the relationship between LIS and organological classification and concepts of literary warrant. The final topic considers connections and influence within instrument classification. This section uses a novel, reception-infused approach to analysing classification schemes, highlighting the rich tapestry of relationships surrounding one particular classification scheme for instruments, the *Hornbostel and Sachs Classification*. This discussion highlights the interconnections between the LIS and music domains’ classifications of instruments, showing how a scheme in one domain is not only important in its own domain, but can also jump into another. This chapter shows that as well as instruments being a vital part of understanding the classification of music, analysing the classification of instruments across the two domains also helps to build theories of classification scheme analysis.

1.2. A methodological note

This chapter draws upon the methodologies introduced in Chapter 3 and seen elsewhere in the thesis: for example, literature analysis, LIS scheme analysis and analysis of taxonomies found in the music domain. However, this chapter sees a noticeable difference between the main methods used to analysis the classification of instruments compared to LIS. Within organology, the available discourse on the topic of classifying instruments is immense; therefore, secondary literature is used for discussions about organological taxonomies in this chapter, rather than focusing on the schemes themselves. The reasons for this is that any further analysis is likely to be unnecessary duplication of existing research; moreover, the secondary analyses are particularly useful due to their organology grounding, which could not be replicated by this author. Conversely, when considering the classification of instruments within LIS, there is no such existing analysis and very little discourse; so, primary analysis is needed, which matches the type of LIS research found in the other chapters of this thesis.

The broad set of example LIS schemes are utilized widely in Sections 3 and 4 of this chapter. However, there are a few modifications from the 18 schemes listed in the methodology (Chapter 3, Section 3.4). First, three of the 18 schemes are relatively early and so have been discounted: Expansive lists instruments in alphabetical order, rather than through categorization, while Ayer and Cutter¹⁹⁰² list very few instruments, so are not useful for matters of instrument classification. Therefore, the 15 schemes which are used in this chapter are as follows: BCM, Dickinson, Flexible, Bliss¹, Colon⁶, Colon⁷, DDC¹⁹, DDC²², Haroon, LCC²⁰¹⁵, McColvin and Reeves, Subject, Ott, Olding, UDC. (Note that unlike Chapters 6 and 7, DDC¹³ is not included within the set as DDC¹⁹ and DDC²² are perfectly adequate to represent the broad categorization of instruments within DDC.)

However, there are exceptions. First, Section 4, which discusses unusual instruments, does not draw on a finite set of schemes at all, thus offering no quantitative information; instead, specific examples from LIS classification schemes to illustrate particular phenomena are used, in particular when tracing the development of classification of specific instruments over time. So, as well as appearances from some of the 15 schemes, Section 4 includes examples such as the 1904 and 1917 versions of the *Library of Congress Classification* (LCC) music schedules, and multiple editions of the *Dewey Decimal Classification* (DDC) before the 20th edition. Second, even those parts of

this chapter which do use the 15 schemes occasionally include extra editions of DDC or LCC. These are used when a concept needs to be considered over different time periods so considering either multiple editions of the same classification scheme, or an edition published at a particular time, can aid discussion.

2. Instruments from the music domain

2.1. Musical instruments and organology

Before analysing the classification of musical instruments it is important to consider how musical instruments are defined.¹²⁶ Or, put in a more classificatory framework, considering which objects belong in the category of musical instruments and which objects do not. Dournon (1992) provides a useful outline of this very question. She (Dournon 1992, p. 247) suggests that the study of musical instruments, organology, considers “... any apparatus or device made by man in order to produce a sound or sounds as a musical instrument”.¹²⁷ (The categorization between instruments and voices was discussed in Chapter 5.) There are also important differences between sound and music, where music is a subset of sound; therefore, establishing whether the group that is labelled “instruments” have to produce *music* to become members of this group, or are merely objects which produce *sound*, is an important question. Dournon (1992, pp. 247-248) discusses whether the intention of the object in producing that sound, and the purpose of that sound – in other words, whether it can be used for aesthetic purposes and for cultural means – are part of the definition of a musical instrument. The importance of defining an instrument, and creating boundaries to the musical instrument world, can be seen clearly when, for instance, electronic instruments are discussed – see Section 3.4.2.

In addition, the classification of instruments is not stable. Dournon (1992, p. 248) argues that the idea of an instrument is dependent on the culture in which it is used.

Furthermore, if the function of an instrument is considered a critical factor in determining its membership of the musical instrument category, then it is not even true that a single object will always be classified as an instrument or a non-instrument; while

¹²⁶ Some authors, such as DeVale (1990b, p. 2), prefer the term “music instrument” to “musical instrument”. However, in this thesis, the more common term “musical instrument” will be used; for instance, this is the term used in the article for instruments in the standard music reference source, *New Grove Dictionary of Music and Musicians* (Brown 2016a).

¹²⁷ Although this definition of an instrument is wide, it discounts those natural objects that can be used as instruments without any alterations.

the instrument *as object* may have the same physical qualities through that object's lifetime, its purpose can vary.¹²⁸ Hence, an individual object may at some periods of time be considered a musical instrument while at others this same object could be considered a non-instrument. Therefore, for the purposes of this chapter, a "musical instrument" will be taken in the widest possible sense: any object which is used to intentionally produce a sound.

"Organology" is another important term that will be used in this chapter and it is important to consider its meaning. This term is used to depict the scholarly study of musical instruments. Unfortunately, DeVale (1990b, p. 2) suggests that the boundaries of this discipline are not universally agreed so defining organology is not straightforward. First, there is a question about whether organology is more than just classification (DeVale 1990b, p. 2). Therefore, for the purposes of this thesis, organology will be taken as a multi-layered sub-discipline, and the terms "organology classification", "organological classification" or "organological taxonomy" will be used when referring specifically to classification. Second, there is debate about the relationship between ethnomusicology and organology, as there is a common cultural component to both sub-disciplines. The relationship of sub-disciplines within the music domain is outside the scope of this thesis, so "organology" will be used where appropriate, ignoring whether cultural aspects are discussed or not. Finally, "organology" as a term has to be used carefully. While the study of musical instruments is considered one of the oldest disciplines within the scholarly study of music (Kartomi 1990, p. 199), the term "organology" is much newer. The term was first used to describe researching musical instruments by Bessabaroff in 1941, as an attempt to differentiate the scientific study of instruments from other musical study (DeVale 1990b, p. 4); however, the term itself was also used by Mahillon in the 1880s (DeVale 1990b, p. 4). For the purposes of this thesis, the terms "organology" and "organological" will be used to describe any theory, writings or schemes which are concerned with musical instruments, regardless of whether they fall before or after these dates.

¹²⁸ See for instance Hood's description of the function of an instrument, where he weighs up the importance of the function of the instrument against the acoustical and morphological factors: "A musical instrument, above all else, is an instrument of music" (Hood 1971, pp. 137-138).

2.2. A brief history of organological classification up to the late 19th century

It is important to consider the development of organological classification.¹²⁹ Different temporal eras are represented by different ideas about classifying instruments and classification systems. In Ancient times, important classification ideas came from the Old Testament of the bible (especially Psalm 150), Ancient Greek ideas (in particular, works by Aristotle and Boethius), and the Roman-era treatise of Cassidorus (Kartomi 1990).¹³⁰ In the Medieval and Renaissance periods, discussion centred on particular treatises, including those by Grocheo, Virdung, Zarlino, Praetorius and Mersenne (Kartomi 1990).¹³¹ Some theories dominated multiple time periods – for instance, Kartomi (1990, p. 150) claims that all writers on musical instruments in the 16th and 17th centuries still referenced the Greek or Roman models of instrument classification. However, no single scheme dominated thinking on instrument arrangement in the Ancient period through to the 17th century; in fact, even the basic categorization of instruments such as the order of winds and strings was a fluid concept – see Section 3.4.2. Ramey (1974, p. 21) suggests that rather than a continuously developing discourse about instruments, the development of instrument classifications and theorisation of instruments remained static for two hundred years from the 17th century onwards. DeVale (1990b, p. 9) goes further still; she suggests that aside from adding the brass category, the basics of instrument classification in the Western world were fundamentally the same from Cassidorus' scheme in the 6th century through the next 1300 years.

However, change to the static Western ideas about organizing instruments did eventually come. In 1880, the musical instrument world undertook a seismic change. Mahillon's scheme (and corresponding catalogue) for the Conservatoire royal de Musique de Bruzelles was published (Jairazbhoy 1990a), and appeared to tear a hole in the fabric of instrument classification in the West. Furthermore, Mahillon's scheme led directly to the classification scheme of Erich von Hornbostel and Curt Sachs which was

¹²⁹ This summary the summary of *Hornbostel and Sachs Classification* in the next section, are mostly a broad literature review of the organological taxonomical literature. This review centred around two particularly important monographs: a collection of essays edited by DeVale (1990b) and a single-author monograph by Kartomi (1990). (DeVale 1990b; Kartomi 1990). Both devote themselves to the classification of instruments and both were published, coincidentally or not, in the same year.

¹³⁰ For a detailed account of these and other pre-1800 Western ideas of instrument classification, see Chapter 10 of Kartomi (1990).

¹³¹ See Kartomi (1990) for a detailed account of the instrument analysis of all of these examples.

first published in 1914 – in this thesis, abbreviated to H/S.¹³² H/S did not merely tear a hole in the fabric of instrument classification; it blew away the entire structure of instrument organization.

2.3. Introducing the *Hornbostel and Sachs Classification*

The H/S system was so important to the development of instrument classification that before discussing the impact of this seminal scheme, a few details about the scheme should be noted. The scheme was first published in 1914 by Erich von Hornbostel and Curt Sachs, German/Austrian music theorists and scholars (Katz 2016, Brown 2016b). So, the scheme's authors were very much within the academic sphere and the European tradition of music. As well as the schedules themselves, the scheme included an introduction which explained the reasons for the decisions made by Hornbostel and Sachs; the introduction was such an important source in its own right that not only was it quoted by numerous commentators on instrument classification, but it was also reprinted (in translation) in various Grove resources. The introduction to H/S appeared in the *New Grove Dictionary of Music and Musicians* and remains in the current version of this resource, as an appendix to the entry on the classification of instruments (Wachsmann, Hornbostel & Sachs 1980, Wachsmann et al. 2013), as well as appearing in the *New Grove Dictionary of Instruments* (Wachsmann, Hornbostel & Sachs 1984). The scheme and its introduction were translated for an issue of the *Galpin Society Journal* in 1961, and this translation itself was reprinted in a resource about ethnomusicology.¹³³

The H/S system uses and expands Mahillon's classification from thirty years earlier (Kartomi 1990, p. 167). Some of the most salient features of H/S are as follows. H/S, like Mahillon, divides instruments into four classes rather than the traditional three-part, Western classifications of instruments.¹³⁴ (This broad categorization of instruments is discussed in detail in Section 3 of this chapter.) The system was designed to be universal, objective and not specific to any one culture. Hence, titles of classes refer to the characteristics of the types of instruments, rather than instruments as class

¹³² The scheme is referred to in a number of different ways by commentators. These include "Hornbostel and Sachs" (Wachsmann et al. 2013, Kartomi 1990), "Hornbostel-Sachs" (Jairazbhoy 1990b), Sachs-Hornbostel (Hood 1971), "Sachs-von-Hornbostel" (Grame 1963), "Sachs-Hornbostel Dewey decimal system" (Hood 1971), "Kurt Sachs categories" [Sic] (Coates 1960a), and others. For the purposes of this thesis, the Grove name has been adopted of "Hornbostel and Sachs", abbreviated to H/S.

¹³³ This thesis has used a reproduction of the 1961 English translation, which forms one of the reference aids in the ethnomusicology textbook "Ethnomusicology: an introduction" (Hornbostel, Sachs 1992). Therefore, the pagination in this thesis refers to the textbook version rather than the *Galpin Society Journal*.

¹³⁴ One important difference from Mahillon is changing the name of the "autophonic instruments" class to "idiophones" (Jairazbhoy 1990b, p. 87).

names. Named instruments, if they appear at all, are included in parenthesis – for instance, “421.221.12, With finger-holes (recorder)” (Hornbostel, Sachs 1992, p. 459). Extracts from category 4, Aerophones, are shown in Figure 28. Note how classes may include details about how the sound is created and which geographic locations the instrument might be found. In terms of order within the main categories, it is noted that unlike Mahillon, H/S does not use the same ordering within each class (Ramey 1974, p. 23). H/S also differs from Mahillon and other organological schemes in its notation, which uses a form of DDC notation – this is discussed in more detail in Section 5.

4	Aerophones	the air itself is the vibrator in the primary sense
...		
421	<i>Edge instruments or flutes:</i>	a narrow stream of air is directed against an edge
421.1	<i>Flutes without duct:</i>	the player creates a ribbon-shaped stream of air with his lips
421.11	<i>End-blown flutes:</i>	the player blows against the sharp rim at the upper open end of a tube
...		
421.22	<i>Flutes with internal duct:</i>	the duct is inside the tube ...
421.221.1	<i>Open flutes with internal duct</i>	
421.221.12	<i>With finger-holes (recorder)</i>	
421.221.2	<i>Partly stopped flute with internal duct</i>	– found in India and Indonesia

Figure 28. An extract from the *Hornbostel and Sachs Classification* in the English translation of 1992

Organological discourse from 1914 onwards frequently focuses on the new schemes developed which either utilize H/S or are a reaction to it. There are exceptions: for instance, Kartomi (1990, p. 200) is particularly enthusiastic about an upward classification method. However, it appears that the gravitational pull of H/S is so strong, that little in organology classification escapes its orbit – this will be discussed through the lens of reception-infused analysis of classification schemes in Section 5. However, it is important to remember that this history of instrument classification focuses on Western art music. Non-Western cultures have different histories of instrument classification. For instance, DeVale (1990b, p. 9) suggests that the earliest instrument classification is the Chinese Bayin system, from the 8th century C.E. (DeVale 1990b, p. 9) and she also discusses the importance of the Indian 6th-century scheme as proposed in a treatise by Bharata. The worlds of Western and non-Western instrument classifications are not always entirely independent: Jairazbhoy (1990a), among others, outlines the evidence that the main categories of H/S were borrowed from Bharata’s scheme –

discussed in more detail in Section 3. So, while this chapter will focus on the classification of instruments needed for Western art music, it must be remembered that this is only a very small part of the story and that there are many other worlds of instruments; occasionally these different worlds of instrument classification even collide.

3. Musical instrument categorization

The broad categorization of music instruments into groups is an extremely important part of instrument classification for a number of reasons. It is often the first characteristic of division within a classification of instruments. It will also betray the theoretical ethos – whether applied consciously or not – of a given classification system. More pragmatically, in less detailed schemes such as historic organological taxonomies or early LIS schemes, the broad categorization of instruments might be the only classification present. This section considers the broad categorization of instruments within the LIS and music domains.

3.1. The difficulties of ascertaining instrument categorization

It should not be taken for granted that LIS classification schedules for instruments will use any broad categories. Some schemes only have a few specific instruments mentioned and there are no categories – for instance, as found in Ayer. Other schemes have substantial lists of instruments but choose alphabetical order over any form of categorization – for instance, as seen in Expansive. Even where schemes have broad categories for instruments, it is not always easy to describe this categorization. For instance, LCC does not reflect hierarchy in its notation, so it is not always obvious where the family boundaries lie; instead, layout and indention can be used to determine which terms indicate groups and which terms are for members of groups. So, answering supposedly simple questions about the number and names of the families of instruments in an LIS scheme can be difficult to answer in practice.

In the organological taxonomies consulted for this chapter, H/S and Mahillon, there are very clear broad categories for instruments. However, as no other organological schemes were consulted directly in this thesis, it is not appropriate to comment on the practical difficulties in extracting information about instrument categories.

3.2. The world of instruments in three (or two, or four) parts

3.2.1. Organological perspective

Grouping musical instruments into basic categories of families has a long pedigree in Western cultures. It is agreed by organologists that there was a “traditional” three-category system of categorizing instruments into wind, strings and percussion from Ancient to Modern times (for discussions about the order of these classes, see Section 3.3). For instance, Kartomi suggests that the three-prong system was in place from medieval times through to the 18th century (Kartomi 1990, p. 136). In fact, the system is older than this. Porphyry (approximately 3rd century, Common Era) is largely credited with creating the first three-category scheme in the western world (Wachsmann et al. 2013); Kartomi (1990, p. 135) suggests that three-category schemes used in Medieval times and later are usually directly influenced by the Greek theorist Boethius. Some writers cite an even older “source”, suggesting that the three-category system is actually biblical (Galpin 1937, p. 25). At any rate, it seems that wind, strings and percussion were the main classes used by music theorists for nearly two thousand years.¹³⁵

While common, the three-class system had/has critics. For example, Hornbostel and Sachs describe three-category schemes as “inadequate” and “illogical” in the introduction to their scheme (Hornbostel, Sachs 1992, p. 445) and Schaeffner complains that you cannot use a three-category scheme for a scientific study of instruments or a scheme which is meant to cover every instrument (Dournon 1992, p. 252). In fact Dournon (1992, p. 252) argues that it was ethnomusicology – in other words, the need to include instruments from non-Western, and more pertinently, from multiple cultures – which drove the traditional three-part scheme to near extinction.

In the end, the biggest challenge to the three-category system came in the form of more classes rather than fewer. Mahillon’s classification scheme created for the Musée Instrumental du Conservatoire Royale de Musique in Brussels (Kartomi 1990, p. 163) was published in 1880, and took the revelatory approach of dividing the population of

¹³⁵ Though this discussion focuses on Western classification schemes, it is worth noting that three-group systems were also used in other cultures, for instance some Arabic music systems (Wachsmann et al. 2013). However, not every scheme during this period towed the three-category line. There was also an important two-category system by the late second-century theorist, Pollux (Wachsmann et al. 2013). This system had categories of “wind” and “percussion”, where the percussion included plucked (i.e. beaten) strings (Kartomi 1990, p. 137). Pollux did not exist in a vacuum: it had impact of its own, being used as the basis for Praetorius’ scheme (Kartomi 1990, p. 154). This shows that there were at least some challenges to the three-category hegemony. Nor did two-class schemes disappear even in modern times: for instance, Schaffner’s 1932 scheme has two main classes based on the nature of the vibrating material, though these are very different from Pollux’s categories (Dournon 1992, p. 253).

musical instruments into four, not three, families (this scheme will be shortened to “Mahillon”). These categories were labelled autophones, membranophones, chordophones and aerophones (Kartomi 1990, p. 163). This quadrivium became the basis of the H/S scheme, and in this guise was the basis of much organological classification from 1914 to the present day.¹³⁶ The novel approach to Mahillon and H/S’s top-level categorization was that it divided instruments on how the sound was activated, rather than how the instrument was played. For example, both a gong and a drum are struck, so in a traditional three-part system are considered “percussion”; however, in the four-part classification system, the fact that the gong’s sound is produced by the solid material of the gong itself vibrating and the drum’s sound is produced by the stretched membrane of the drum vibrating means they would be placed in different classes – classed in membranophones and idiophones respectively in H/S. (From this point onwards, the title of H/S’s four categories will be used for general discussion of the four-part categorization: idiophones, membranophones, chordophones and aerophones.)

Though Mahillon was feted for his original contribution to instrument classification, many have commentated on the fact that Mahillon’s basic categories appear to match the classification espoused in a fifth-century Indian treatise, *Nāṭyasāstra*, attributed to Bharata. Jairazbhoy’s (1990a) article about the influence of Tagore on organology takes this argument further; Jairazbhoy gives contextual evidence proving that Mahillon would have been aware of *Nāṭyasāstra* and describes anomalies which strongly infer that Mahillon consciously “borrowed” the Indian four-category system. Therefore, the grandparent scheme to Western organological classifications – if we take H/S as the parent of all 20th and 21st century Western classification schemes for instruments – was actually based on an Indian classification scheme written around 1400 years previously. Thus, the history of the categories of musical instruments is somewhat circular.¹³⁷

3.2.2. Practical music-making perspective

When we consider categorizations of instruments outside of organology, there is a different reality. Within the world of practical music-making of Western art music, organologists believe that the traditional three-category system of wind, strings and

¹³⁶ H/S changes the order of the classes, and renames “autophonic instruments” as “idiophones”.

¹³⁷ Note that the history of Western art music has seen other types of classification of instruments, which there is not space to discuss. For instance, the “haut and bas” system of classifying instruments in the Medieval period, where instruments were grouped according to the volume of sound produced and the robustness of the tone (Bowles 1954, p. 118) rather than categories based on the instruments’ intrinsic features.

percussion is still the prevalent organization system in place for orchestras and performers (Dournon 1992, p. 252, Hood 1971, p. 124). Certainly the average symphony orchestra's divisions into strings, woodwind, brass and percussion (Campbell, Greated 1987, p. 183) bear more similarity to the traditional three-category division than to the four categories of H/S – even withstanding the extra categories of brass/wind (see Section 4.2.2. for a brief discussion of the brass/wind division).

3.2.3. LIS perspective

At a very basic level, the revolution of Mahillon and H/S caused instruments to be classified by the way sound was produced, rather than how that instrument was played; the biggest visual sign of this division is seen through the separation of “percussion” instruments into idiophones and membranophones. So, this is used as a deliberately oversimplified criterion to assess whether the broad sample of 15 LIS classification schemes shows more resemblance to four or three part categorizations. Of the schemes examined, only UDC demonstrates obvious adherence to H/S's (and company) four-category structure; UDC separates out the idiophones and membranophones at the broad class level, even naming its classes using H/S terms.¹³⁸ (Note that DDC also follows some adherence to the four-category structure, but not at the level of placing all four categories at the same level of class number.) Further analysis of H/S and Mahillon's influence on LIS schemes will be undertaken in Section 5.

Therefore, in 1880 a bifurcation in the categorization of instruments occurred. The established, Boethius, three-category system was gradually replaced by Mahillon, and this was popularised by H/S from 1914 to the present day. However, the performers and librarians did not seem to have got the memo. LIS schemes whose original editions birthed at similar times to Mahillon (1880) and H/S (1914) – for instance the 1st, 7th and 10th editions of DDC (1885, 1911 and 1919 respectively) and the original and revised editions of LCC (1904 and 1917 respectively) – continued using the basic three-category system. This bifurcation of instrument categorization is visualized in Figure 29. Similarly, orchestras still kept their percussion section together, and children's guides to the orchestra to this day generally make no mention of idiophones or membranophones (for instance, see Daydream education (2012)).¹³⁹ (So, actually Figure 29 could be re-

¹³⁸ Actually, UDC has an extra class for electrophones, which was a Galpin addition to H/S in 1937 (Wachsmann et al. 2013) plus a miscellaneous class. However, in basic outline, it is close to H/S's original, broad class conception.

¹³⁹ However, there are some signs that percussion sections do separate into membranophones and other instruments, as the timpanist (timpani are membranophones) is usually separated out from other

imagined with “LIS” replaced with “LIS and (some) practical music-making”.) What is interesting is it suggests a division in the core of the ontology of music. Orchestras arrange their instruments in the way that is best for the music they perform and libraries try to arrange their music in the way that they think their readers will seek it; organologically, the instruments of side drum and xylophone may not belong together, but the music that these instruments are used to create wills them to live side-by-side as though 1880 never happened.

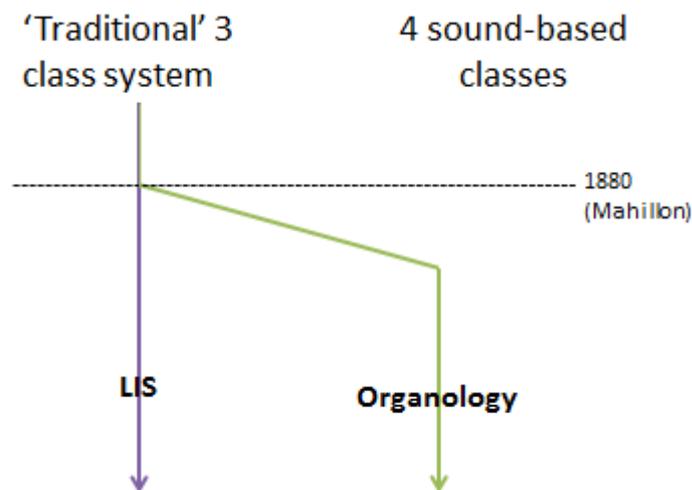


Figure 29. Bifurcation of instrument classification between LIS and organology

3.3. The order of categories

Exploring the order of categories provides a fruitful way of teasing out some of the subjective and non-musicological factors as play in designing instrument classification. The review of organological literature suggested that two aspects of ordering the broad categories would be particularly interesting: the position of percussion instruments and the varying order of strings/wind. So, the organological literature has been examined for these topics; this will be used alongside analysis of the broad sample of bibliographic schemes. The set of 15 LIS schemes have been reduced down to their ordering of strings, wind and percussion classes to see if a pattern can be ascertained. Keyboard has

percussion players. This separation can be seen, for instance when describing the personnel of orchestras in resources such as concert programmes; see for example a concert programme by the London Symphony Orchestra from 12th May 2016, where the list of orchestra members includes “Timpani” and “Percussion” as separate “instruments” (London Symphony Orchestra 2016, p. v). However, this also reflects the reality of Western art music. While the timpanist will generally just play the timpani in a work of Western art music the (non-timpanist) percussionists are expected to play other membranophones (such as the bass drum and side drum), as well as idiophones (such as the gong and tambourine) and sometimes even chordophones or aerophones which have a keyboard (such as the piano or organ).

been ignored as this is not always treated as a separate class in the schemes and is organologically problematic – as discussed in Section 3.4.1. In addition, electronic, mechanical and other classes have been ignored as these are also discussed later in this section (Section 3.4.2). (Note that the category of “wind” is used in these examples and elsewhere in the thesis, rather than separate categories for “woodwind” and “brass”. From an organological perspective, they are two parts of the same broad wind category and this approach is largely followed by LIS schemes. So, for the purposes of this thesis, “woodwind” and “brass” will be considered to be two categories within the broad wind category, while acknowledging that some areas of music knowledge such as the organization of symphony orchestras might dissent from this statement.)

3.3.1. Treatment of percussion instruments

Percussion instruments have been the unloved class of musical instruments in hundreds of years of musical instrument treatises and systems for organizing instrument. This lack of love was often demonstrated through absence; Kartomi (1990, pp. 141-142 and 149) states that the Greek theorists ignored percussion, and though things improved in Medieval times, there was still little enthusiasm for this category of instruments in the Medieval era and subsequent years. Writers did not just display ambivalence to percussion instruments. The most common “explanations” for percussion instruments being problematic were based on non-medium based factors, associated with perceptions about where the instruments came from and what they signified. For example, Viridung believed that drums were the work of the devil and that they made sick people more ill (Kartomi 1990, p. 150); the religious thinking behind his views can be seen by his categorization of instruments into those invented by the devil and those used in church services, (Kartomi 1990, p. 150), which by implication would have been considered mutually-exclusive categories.¹⁴⁰

Percussion instruments were not universally unloved. For instance, Late Roman writers did not ignore them and Cassidorus even puts the percussion class first in his classification (Kartomi 1990, p. 136). Also, by the 18th century percussion instruments became more accepted (Kartomi 1990, p. 159) and even those theorists who believed percussion instruments to be the work of the devil, such as the 17th-century theorist Praetorius, still included them in their classification schemes (Galpin 1937, pp. 26-27).

¹⁴⁰ This association with instruments and evil is not entirely limited to percussion instruments, though it appears that percussion instruments bore the brunt of this thinking; for instance, Praetorius believed that certain percussion and wind instruments were evil (Kartomi 1990, p. 149).

There were also different views depending on the type of percussion instrument. Interestingly, drums seem to have been more disliked than other types of percussion instruments, as some 16th-century writers included percussion instruments but left out any mention of drums (Galpin 1937, p. 26). Conversely, other writers were concerned with the function of the instrument, especially its religious pedigree; for instance, Virdung did not approve of most percussion instruments but he did accept a specific type of drum, the tympanum, as this was only used in church services (Kartomi 1990, p. 149). Therefore, classification of percussion instruments is not stable over time, and the treatment of percussion instruments in classification schemes was in certain periods based on opinions about percussion as a concept and their function rather than musical factors. This shows how non-medium based factors affect the classification of instruments.

So, to establish whether LIS schemes echo the musicological and organological views about percussion instruments, the broad set of 15 LIS classification schemes were analysed. The order of strings (S), wind (W) and percussion (P) are noted in Figure 30. (Note that other categories might be present but only these three have been extracted.) For simplicity, even where the scheme used H/S or other terminology, the terms strings (S), wind (W) and percussion (P) have been used.

SWP	4	DDC19, Bliss1, Subject, BCM
SPW	1	UDC
WPS	0	
WSP	4	Colon6, Colon7, Flexible, Olding
PSW	1	DDC22
PWS	1	Haroon
Can't determine/other	4	<ul style="list-style-type: none"> • Ott (no class for percussion); • LCC2015 (strings split either side of wind), • McColvin and Reeves (no class for percussion), • Dickinson (no class for percussion and placed under plectral; plectral and bowed either side of wind)

Figure 30. Order of percussion, strings and wind categories in LIS classification schemes

Figure 30 reveals some interesting trends. To begin, virtually every permutation of strings, wind and percussion is used in at least one of the schemes, showing that the order of these classes is far from fixed. The most prolific orders are SWP and WSP. What is shared by these two orders – which between them make up eight out of 15 of the schemes – is the position of percussion as the last of the three categories.

It could be argued, using the findings presented in this table, that percussion instruments follow the traditional and historical idea of not being as important as other types of instruments, as they appear as the last class in many schemes. In addition, out of the four schemes which do not present a detachable order (Ott, LCC2015, McColvin and Reeves, Dickinson), three schemes considered percussion so lowly they do not even grant it its own category let alone assigning it “last place”. This again echoes historical organological thought.

It is useful to consider those schemes which *don't* place percussion in last place. DDC22 is actually the only one to share H/S's exact order of PSW (if not sharing H/S's four-category structure). H/S's influence on DDC22 will be discussed in detail in Section 5. As mentioned above, UDC follows the four-class structure of H/S, so it is not surprising to see percussion appearing outside of last place. Haroon was specifically designed to classify non-Western music, so perhaps is emblematic of percussion's importance in non-Western music.

3.3.2. Favouring strings or winds

In organology, the preference for winds over strings, and vice versa, has changed over time amongst Western thinkers. Kartomi (1990 p. 141) states that there were two major shifts in opinion: strings were favoured in Greek times, this changed to a preference for wind instruments in late Roman times, which appears to have shifted back to a preference for strings by the 14th century (Kartomi, 1990, various). Reasons for the preferences vary, usually relating to religion directly, or religion through the conduit of similarity to the human voice. For instance, the 6th-7th century Spanish theologian and encyclopaedist Isidore of Seville (Randel, Nadeau 2016) preferred wind instruments. He justified this by stating that wind instruments imitate the human voice and that trumpets are first mentioned in Psalm 150 (Kartomi 1990, p. 241); conversely, Kartomi hypothesises that one of the reasons for the preference for string instruments in later times relates to the frequency of references to string instruments in Psalms, in particular

the cithara and psalterium (Kartomi, 1990, p. 148).¹⁴¹ Therefore, we can conclude that from the music domain's perspective, the relationship between wind and string instruments has not been stable, but that in modern times there was some small preference for strings.

Amongst the broad set of 15 LIS schemes, Figure 30 reveals no strong preference for either string or wind instruments. Out of the eleven schemes which have a discernible set of classes for percussion, strings and winds, six have strings appearing before winds while five have winds appearing before strings. So, no noticeable preference for one order of strings/winds is found. Furthermore, LCC2015 and Dickinson's string sections' entwinement around winds could be considered another sign that the strings/winds order is of little importance in the LIS classification of instruments.¹⁴²

3.4. Extra categories

One of the significant issues related to categorization is the important categories which in some circumstances add to or break up the four-category model. The first is a potential category for keyboard instruments – in other words, the category which includes instruments such as piano, organ and harpsichord – highlighting interesting details about the characteristics of division used for classifying instruments. The second is the need for a category for electronic and similar instruments. The third is the presence of a potential division in the strings/chordophones for plucked and bowed instruments; while usually a division *within* the strings/chordophones category, sometimes they appear in LIS schemes as individual categories.

3.4.1. Keyboard instruments

Keyboard instruments offer an interesting perspective on the LIS and music domains. The concept of a "keyboard instrument" is one related to the method of playing the instrument, rather than how the sound is produced. So, there are keyboard wind instruments (for instance the organ), keyboard string instruments (for instance, the piano) and keyboard percussion instruments, which are usually idiophones (for instance, the xylophone). Therefore, if a classification scheme is based on how the sound is

¹⁴¹ Kartomi (1990 p. 159) suggests that the idea of wind instruments being superior to strings as they are closer to the sound of the human voice, ergo they are closer to nature and natural music, is one which was not entirely quelled in later times and at various points challenges the hegemony of string instrument dominance.

¹⁴² It is noted that in some respects like is not being compared to like: while the organological schemes cover a wide historical period which mostly stops with the advent of Mahillon's scheme in 1880, all the bibliographic schemes considered are from at least 1880 onwards skewing towards the latter half of this time block.

produced, keyboard instruments would be scattered amongst three main categories; moreover, keyboard instruments would not have their own category. Schemes such as H/S use how the sound is produced to create their main categories, while performance-related information (such as the presence of a keyboard) is assigned a lower characteristic of division; therefore, an emphasis on how the sound is made is a factor associated with organological thinking, as found in H/S.¹⁴³ (While Western art music is the focus of this thesis, it is important to note that keyboard instruments are predominately a Western phenomenon, and thus classification schemes designed for music outside of this cultural context will treat keyboard instruments differently. This also demonstrates how instruments cannot be entirely separated from cultural and geographic considerations, again demonstrating the impurity of instruments as a part of the medium facet.)

So, it is important to consider how LIS classification schemes treat keyboard instruments. There are two factors to consider. First, whether keyboard instruments get their own class or are instead scattered amongst strings, winds, percussion and similar; second, the prominence given to keyboard instruments within the scheme. “Prominence” is a difficult quality to examine. In this case it will be considered qualitatively rather than quantitatively, and in the loosest sense of the word, by looking at the order of categories.¹⁴⁴

The 15 example LIS schemes were considered. Eleven out of the 15 example schemes have a separate category for keyboard instruments. For example, DDC19 has its own separate, unequivocal category devoted to keyboard instruments (786). Colon6, Colon7, UDC and Subject all consider either individual keyboard instruments (Colon6 and Colon7) or groups of instruments which have keyboards (UDC and Subject) as part of the general structure of winds, strings, percussion, and so on. For instance, UDC has a subsection under “Chordophones” (780.61) for “Board instruments” (780.616), which has a sub-class for “Instruments struck via the keyboard” (780.616.43), containing individual classes for “Clavichords” (780.616.431), “Fortepianos” (780.616.432) and

¹⁴³ Older classifications of instruments treated keyboard instruments differently. For instance, in the 16th and 17th centuries they were often classed as a string instrument (Kartomi 1990, p. 149), while in the 18th century they were more likely to be classed as percussion (Kartomi 1990, p. 157).

¹⁴⁴ One possible method for exploring prominence would be to count the number of pages or other space indicator devoted to keyboard instruments, compared to other types of instrument. However, there are many reasons why this information would be hard to extract and there are also questions about whether prominence can be ascertained through quantity of scheme coverage in the first place; for instance, schemes which include forms/genres within the instrument schedules are one example of the pitfalls of using a space-based method to ascertain prominence.

“Pianofortes” (780.616.433). Similarly, the “Organs” (780.649) sits in the “Aerophones” (780.64). The *Subject Classification* has three categories in strings with one devoted to keyboard instruments and three categories of wind instruments where again one is devoted to keyboard instruments.

The LIS schemes also illustrate a whole scale of separateness, from completely separate classes to fully integrated, with some fascinating hybrids in the middle. For example, in the *Subject Classification*, keyboard instruments do not have their own category, and are allotted to the wind, percussion and strings categories; however, within each category there is a separate class for keyboard instruments. So, on a theoretical level, the *Subject Classification* is stating that keyboard-ness is not part of the primary division of musical instruments, but it is important enough to be considered second. Furthermore, the presence of a keyboard category in each class suggests keyboard-ness is part of the faceting – albeit written out, rather than appearing as a stand-alone facet – rather than just an ordering device. Flexible has a different type of hybrid system: there is a separate class for keyboard instruments but this just contains the organs, accordions, and similar;¹⁴⁵ the keyboard string instruments, such as pianos and harpsichords, are in a separate subclass in the string family. So, Flexible partly adopts the H/S idea that a keyboard string instrument is a type of string instrument that happens to be activated via a keyboard, but does not employ the same progression of thought for the wind-based keyboard instruments such as organs. It is interesting to note that most of the eleven schemes which treat keyboard instruments separately do not have an overarching class for keyboard instruments. Instead, they have various main classes which feature individual types of instruments, such as “organs” or “piano”. In other words, the keyboard instruments have been taken out of the main sequence but the individual types of instruments do not appear to coalesce into a self-contained keyboard class.

The next aspect to consider is the prominence of the keyboard class. For most of the LIS schemes which have separate keyboard classes, or classes for individual types of keyboard instruments such as pianos or organs, this class appears first. For example, DDC19 has a separate keyboard class which is unequivocally treated as one class, and is also the first main class; LCC and Ott have no *singular* keyboard class, but individual keyboard instruments appear first amongst instruments. Examples of LIS schemes

¹⁴⁵ In the schedule summary the class is called “keyboards” (Pethes 1967, p. 27); however, in the schedules, the class is labelled “compositions for reed organs” (Pethes 1967, p. 32).

which do not place keyboard instruments in a prominent position include McColvin and Reeves and Olding; both have a separate keyboard class, but place it at the end and in the middle of the schemes respectively. Haroon also has a separate class for keyboard instruments; however, this class appears after most of the other classes. This is especially interesting in light of Kartomi's (1990, 166) comment that European (in other words, Western) music places higher value on keyboard and similar instruments than music from other cultures argument, thus placing keyboard categorization prominently suits European-music instruments more than instruments from other parts of the world; so, Haroon's scheme, specifically designed for Indian music which is specifically non-European, exemplifies Kartomi's words.

Therefore, it can be seen that while 20th and 21st century organological thought moves away from keyboard instruments as a separate class and shuns the dominance of this category of instruments specifically associated with Western art music, the LIS schemes as a whole largely ignore this development. Considering the original purpose of the LIS classification schemes in this study – to classify a body of music which is largely notated Western art music – it is expected, and valid, to find the keyboard instrument is often a prominent, pseudo-category of instruments. However, it does expose a rift between classificatory thinking in the music and LIS domains.

3.4.2. Electronic instruments

Technological developments in the 20th century coupled with cultural developments created an influx of instruments of a new type: electronic. Though new instruments are created continuously, these types of instruments demanded organologists to consider whether a whole new category was needed – especially those who were basing their schemes on a concept of primary vibrating material. In 1937 Galpin created a scheme which introduces a fifth category to his H/S-esque classification system, “electro-phonetic instruments”, claiming it is the first time this category is used (Galpin 1937, pp. 29-30). This category is described as the “fifth genus” (Wachsmann et al. 2013). Though the category has been given a variety of names – for instance, Sachs (1940, p. 467) calls a similar class “electrophones” in his history of musical instruments – Wachsmann et al. (2013) state that the idea of a having a category specifically for these types of instruments is generally accepted by organologists.

There are important classification questions about what types of instruments will reside in an electronic instrument category. The primary question asks whether the category

will just include instruments which *produce* sounds electronically or whether it will also include instruments which merely *process natural sounds* electronically (Wachsmann et al. 2013). Bakan, Bryant and Li (1990) explore this issue when creating a classification system specifically for electronic instruments. They argue that having a separate category for all types of electronic instruments is illogical for a classification system based on how the sound is produced (Bakan, Bryant & Li 1990, p. 40); instead, they adopted Hood's (1971) term of "electronophones" as the new category and only placed instruments within this category where the sound is entirely produced using electronic methods. This illustrates the complexities in categorizing electronic instruments.

To examine the treatment of electronic instruments from an LIS classification perspective, the set of 15 LIS classification schemes is used. Just 7 out of the 15 schemes have some sort of class for electronic instruments: UDC, Colon7, DDC22, Haroon, Olding, Flexible and Dickinson. However, there are a number of caveats. The analysis has been generous concerning its assertion that a class is devoted to electronic instruments, as it also includes classes which are also named or include some mechanical instruments (usually specified as such). For example, UDC has a category entitled "Mechanical, electrical and electronic instruments". Some LIS schemes mention electrics or electrical in some way, but cannot be considered to have a category built into the structure of the scheme, even with the generous boundaries described. For instance, BCM has no category for electronic instruments within the classes devoted to individual instruments; however, there is a class for "Electrical music" within the broader section for "Individual instruments & instrumental groups", so "Electrical music" sits alongside "Prepared music" and "Musique concrete". So, while music in classes such as "Prepared music" and "Musique concrete" might also be produced by electronic means, it still remains that the name and defining feature of this group of classes makes no reference to electronic-ness; thus BCM has not been included in the total number of schemes which have an electronic instruments class.

As electronic instruments developed in type and importance over the 20th century, it is important to consider the comparative dates that electronic instruments appeared in LIS and organological schemes. For instance, Dickinson includes the term "electric" as a category, and this scheme was published in 1938; yet, electrophones were only introduced as an organological category by Galpin in 1937. While a closer look at Dickinson reveals some ambiguity about whether "electric" is really a top-level category

or not, nevertheless, the presence of a category or even semi-category for electric instruments in a 1938 LIS classification scheme is noteworthy. The Dickinson example enhances our understanding of the connections between music and LIS classification, and contributes to our assessment of the modernity of Dickinson's scheme.¹⁴⁶ Conversely, the latest edition of LCC (LCC2015) still does not have a separate category for electronic instruments (although it does include electronic instruments as individual classes). Examining multiple editions of the same scheme can be very telling in terms of dating the advent of the electronic category; for instance, the 7th edition of Colon (Ranganathan, Gopinath 1987) has a category for electronic instruments while the revised edition of the 6th does not (Ranganathan 1963), bookmarking the intervening years for the establishment of a fixed category for electronic instruments.

Earlier editions of DDC are an example of some of a particular type of thinking about electronic instruments. Electronic instruments appear from the 15th edition of DDC (1951) onwards. However, the 15th to 19th editions of DDC (1951-1979) see electronic instruments share their class with sound recordings. This suggests that the authors of DDC are struggling with the concept of an electronic instrument as a producer of the aesthetic idea of music; instead, the means of producing the sound (electronic) is the defining feature of this class, whether that is through the act of production (electronic instruments) or reproduction (sound recordings).

Flexible shows a particularly interesting way of dealing with electronic instruments; where there is an equivalent acoustic instrument, Flexible instructs classifiers to represent the electronic instrument by adding the class number for the acoustic instrument to a base number for electronic instruments. This shows true faceted colours, as even the base unit of musical medium, the instrument, is represented as the addition of two other concepts. In addition, this idea reflects the organological concern about separating out those purely electronic instruments from those which are amplification or electrification of acoustic instruments; the former would get an "all

¹⁴⁶ The title of the single class digit at the top of this page of the schedules is "Plectral solo and various other" (Dickinson 1938, p. 20) suggesting that "electric" is not a category. In addition, in the summary of the instrument parts of the schedules, "Electric" is not treated as a category. However, typographical evidence suggests "Electric" is considered to be a category. "Electric" gets the same prominence as its bedfellows of "Percussion" and "Plectral", which in most LIS schemes and organologically are considered to be categories rather than classes. Furthermore, "Electric" also shares the same typographical prominence as the unequivocal categories of keyboard, string (bowed) and wind, building up a case that Dickinson treats "Electric" as a category. So, "Electric" could be considered to be an ambiguous category, or perhaps a semi-category.

electronic” class number in Flexible, whereas the latter’s mongrel status would be reflected in the compound class number.

Therefore, it can be seen that while LIS schemes reflect the organological development of the 20th century’s cornucopia of new instruments – electrophones – they do so with caveats. Some LIS schemes reflect the organological separation between amplification of sound and production of sound, which is perhaps best seen in Flexible’s faceted treatment of electronic instruments. Other schemes confidently include electronic instruments, if not an entirely separate category, from an early time (such as Dickinson); others even in the 21st century do not reflect the organological category of electrophones (for instance, LCC2015) even if the scheme includes classes for individual “electronic” instruments. So, while individual LIS schemes show some adoption of an electronic category or even individual foci for electronic instruments, it seems that Galpin’s electrophones has not been unanimously adopted as a category within LIS classification.

3.4.3. The plucked/bowed categorization

Another example of a potential category concerns the division of stringed instruments into bowed and plucked (plectral). From an organological perspective, it took many centuries of bowed stringed instruments’ existence before stringed instruments were strictly divided between plucked and bowed (Kartomi 1990, p. 148), perhaps caused by some instruments’ ability to be played both ways (Kartomi 1990, p. 155). Dividing the two types of instruments on the characteristic of performance didn’t gain prominence until Al-Farabi’s work in the 12th century (Kartomi 1990, p. 155). However, by the 18th century virtually all music theory divisions of instruments separated out plucked and bowed strings (Kartomi 1990, p. 159). Zacconi’s scheme from 1592 goes even further and places bowed and plucked strings as two out of four of the main classes, suggesting that this division runs at the heart of instrument groupings (Galpin 1937, p. 26). So, bowed/plucked was historically not an important division until the 18th century, where it even occasionally reached main category status.

Conversely, H/S shows little regard for a plucked/bowed categorization. The top level division in chordophones (strings) is between simple chordophones and complex chordophones, in other words a division based on the structure of the instrument rather than the playing style (Hornbostel, Sachs 1992). Furthermore, “with a bow” is a suffix within H/S, which could be added to any instrument in this class (Hornbostel, Sachs

1992, p. 458). Instruments that are traditionally thought of as bowed, such as the violin and viola, are given as examples in class 321.322 – H/S does not list individual instruments, only types of instruments, instead giving specific instruments as examples – alongside the traditional plectral “guitar”. So, H/S shows that the instrument itself, rather than the playing style is the most important categorizing principle; so, a division between plucked and bowed would be an anathema to H/S.

In LIS classification schemes, the division between plucked and bowed strings is mostly unequivocal; the string category is usually divided into plucked and bowed. This demonstrates deviance from the H/S categorization of instruments. There are exceptions: for instance, UDC has a section of typically bowed instruments (such as violins and viols) in the middle of plectral instruments (780.614.3), thus treating violins and their ilk as a type of bowed lute. So, UDC is showing some allegiance to organological ideas of string classification, but it is in the minority.

Two classification schemes used in the study, LCC2015 and Dickinson, take the bowed/plectral categorization even further. They separate plectral strings from their brethren not just by having separate categories, but they also place the wind category in the middle of plectral and bowed instruments. This is noteworthy for a couple of reasons. First, this illustrates that even the tripartite categorization of strings/wind/percussion is unstable. The configuration of categories in LCC and Dickinson is visualized in Figure 31 (not including “other” categories, which are discussed later in this chapter). Second, this unusual formation asks questions about connections between LCC and Dickinson. The first music schedules of LCC (1904) feature this unusual plectral/bowed separation. Therefore it is possible, date-wise, that either the original (1904) or revised (1917) LCC schedules influenced Dickinson, which was written in the 1920s and first published in 1938. Furthermore, Bradley (2003, p. 471) identifies some of the similarities between Dickinson and the intended principles of the 1904 version of LCC – although in this and her other writings about Dickinson (for example, Bradley 1972, Bradley, Dickinson 1968, Bradley 2003) she does not draw attention to specific organological situations. Is the plucked/bowed extra category in Dickinson directly influenced by LCC? If so, this demonstrates how one scheme can be influenced by another. (For a fuller exploration of the principles of influence (“Wirkung”), see Lee (2014) and Lee (2015), as reproduced in Appendices B2 and B3.) Thus, exploring the

plucked/string categorization does not just draw attention to a potential extra category, but is also fodder for developing a Wirkung-based methodology of use to general KO.

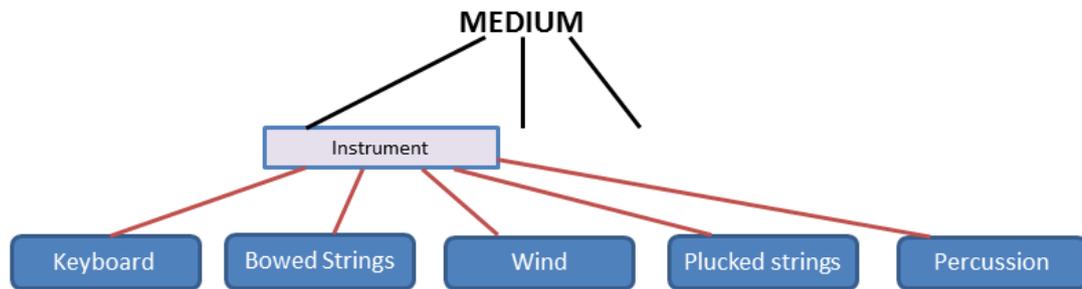


Figure 31. The order of instrument categories in LCC and Dickinson

4. Classification of individual instruments

Considering the classification of individual instruments reveals a whole cornucopia of issues relating to LIS and organological classification. Three specific areas are used as examples: obsolete instruments and issues of temporal perspective; the saxophone and its associated hybridity; unusual instruments such as whistling, sewing machines and vacuum cleaners. LIS classification of individual instruments is analysed, drawing upon the broader organological context for enhancement and comparison. Some specific schemes are used to explore and illustrate the issues discussed. These examples are extracted from the three example schemes (BCM, Dickinson and Flexible), with some help from other schemes in the broader sample of 15 schemes alongside extra editions of when tracking the development of a phenomenon.

4.1. Obsolete instruments and temporal perspective

Considering individual instruments highlights a perennial problem with classification: what is the temporal viewpoint of the classification scheme? This dilemma manifests itself within instrument classification in a particular object, the so-called “obsolete” musical instrument. So, a piano would be categorized as current, but a clavichord as obsolete – the designations based on the history of instrument design, usage, current compositions, opportunities, for study, and so. However, the problems with obsolete

instruments are manifold. To start, in a massively simplified version of music history, instruments such as the piano had direct forerunners in the clavichord, which was itself preceded by the harpsichord; in reality, this linear progression is not entirely accurate. There are overlaps with the development of instruments. In other words, clearly harpsichords did not cease to exist the moment that the clavichord and piano were invented. Also, this reductionist view does not take into account the now mainstream ideas of historically-accurate performance practices; for example, though a fugue by J.S. Bach might have been written for the “obsolete” harpsichord and played on the piano in 1820 (if played at all, but matters of historical repertoire are outside the scope of this thesis), in the 21st century it could equally be performed on a harpsichord as on a piano. This is troubling for a notion of obsolete-ness. Another anti-obsolete strike concerns the creation of new music for so-called old instruments, a movement propagated in the 20th century; this saw the revival of instruments such as the recorder (for instance, championed by instrument-maker Dolmetsch) and harpsichord (for instance, championed by player Wanda Landowska) as functioning, modern instruments, and new music was written for these instruments (e.g. Poulenc’s *Concerto champêtre*, for harpsichord and orchestra in 1927-28). So, from a position of music history, labelling any instrument as obsolete is problematic.

Earlier music domain schemes for classifying instruments did not usually include so-called “ancient” instruments; for instance, until Grocheo and the 13th century, medieval discussions and classifications of instruments would only include ancient instruments (Kartomi 1990, p. 145) and Dournon implies that Mahillon’s scheme was noteworthy for making an effort to include both ancient and modern instruments (1992, p. 251).¹⁴⁷ There are examples of other organological schemes which use obsolete-ness as a way of organizing their foci: for instance, Kartomi (1990, p. 146) suggests that as well as including instruments from both ancient and modern times, theorists such as Aegidius of Zamora used the ancient/modern division as a way to organize material. H/S not only includes instruments that might be considered ancient and obsolete, but makes no explicit reference to obsolete-ness. H/S draws its examples of instruments from both current and instruments that might be considered obsolete: for instance, 321.322 uses examples of violin, viol and guitar, showing that the “obsolete” viol is equal to the “current” violin. It can be deduced that to H/S, time does not matter. We could label this approach to historicism as “temporally neutral”; or in other words, the classification

¹⁴⁷ For simplicity, the concepts of “obsolete” and “ancient” are equated.

scheme is not placed in a specific temporal plane. (This notion of temporal position of scheme is not limited to instruments; this notion is apparent, for example, in forms/genres – see Chapter 8.) Therefore, while the ground-breaking H/S scheme takes a temporally-neutral approach, older schemes and treatises in the music domain had a different take on time.

LIS schemes display varying approaches to “obsolete” instruments. For instance, Dickinson employs the obsolete/current division at the highest level within the broad categories – for instance, “obsolete string” groups together all bowed strings that are believed to be no longer in use. Flexible often uses the same obsolete/current categorization, just at a lower level of the classification: some instrument families in Flexible are divided between current and historical – for instance, there is a category “historical zither types” within the zither family. A sense of current-ness can be seen by the order of current and obsolete groups. In BCM, the “obsolete” viols are at the end of the bowed stringed instrument class, with the violin family instruments at the beginning; Dickinson places the obsolete strings group near the end of the strings category. So, relevance trumps progression of time in the ordering of the class.

Current-ness can also outflank morphological considerations in LIS schemes. For instance, the double bass in BCM sits within the “current” violin family, rather than with the “obsolete” viols which are morphologically closer relatives (Jenny Nex, private communication, 19 March 2013). Some LIS schemes use more than one representation of obsolete-ness, suggesting obsolete-ness is not embedded within the design of these schemes. For instance, in BCM the basset horn, an early type of clarinet, sits within the clarinet family, and the recorders – so-called obsolete as associated with 16th and 17th century music, but have been much revived in the 20th century – do not show any signs of being treated as “other”; however, the viols are treated as historical “other” in the same scheme (see above).

Therefore, it can be seen that obsolete-ness is a difficult quality to define in musical terms, with issues and ambiguities provided by instrument revivals, overlapping histories of instruments, modern performance on so-called obsolete instruments, and much more. While the three example LIS schemes do not ignore older instruments altogether, as seen in early instrument classifications, these three schemes do not appear to follow H/S’s temporally-neutral approach. From a practical perspective, the differing usages of the schemes within organology and LIS make their varying

approaches to obsolete-ness and time understandable. Classifying instruments (H/S) in a museum collection would see little advantage to promoting current instruments over obsolete objects; whereas, to library users, having music for currently-used instruments near the beginning of a sequence or even separated altogether from music for obsolete instruments makes perfect sense. So, in BCM, Dickinson and Flexible, time exists. However, unlike in H/S and other modern organological thinking, *currency* overtakes purely intrinsic qualities as a way of classifying instruments so the notion of “obsolete-ness” survives.

4.2. Hybridity and a life on the edge: classifying the saxophone

The saxophone is a particularly problematic – and therefore fascinating – instrument in terms of its classification. The saxophone was created as a hybrid, and was designed by the 19th-century instrument maker and inventor Adolphe Sax to try and solve a specific problem: the lack of decent lower woodwind instruments. However, the saxophone’s place in the musical landscape, and more pertinently, the musical genres with which it is associated, has caused the instrument to have a somewhat turbulent reception. This section is going to consider the treatment of the saxophone in LIS classification schemes, and hypothesise that the thread of estrangement which runs through the saxophone as a musical instrument has been reflected in its treatment in LIS classification schemes.

4.2.1. Woodwind versus brass: the saxophone

From a morphological and acoustical standpoint, the saxophone is “interesting”. Its single reed (Campbell, Greated 1987, p. 259) is associated with woodwind instruments and in particular the clarinet, and this is attached to a conical bore (Campbell, Greated 1987, p. 271). In terms of broad category, there is no doubt that the saxophone is an aerophone (in other words, a wind instrument), and this is where H/S places it. Within aerophones, there is a basic division between the more colloquial labels of “woodwind” and “brass”. This distinction is based on “the method of sound generation” (Campbell, Greated 1987, p. 303), rather than the instrument’s material. H/S unquestionably classifies the instrument as a type of clarinet (Raumberger, Ventzke 2012) keeping it with other so-called “woodwind” instruments. However, there is confusion from the non-expert arena: Harvey (1995, p. 1) complains that many people confuse the saxophone for a brass instrument, falsely assuming that its metal material makes it a brass instrument not woodwind.

LIS schemes adopt varying approaches to placement of the saxophone. For instance, BCM and Flexible assign the saxophone to the woodwind category; Olding appears to hedge his bets placing the instrument in the woodwind section, but at the end of the woodwind sequence.¹⁴⁸ LCC2015 goes one stage further: music for solo saxophone is given a range of class numbers (M105-109) as a specific instrument (as opposed to one classmark under the “other” wind umbrella), yet its position within the wind instruments places it firmly as brass.¹⁴⁹ As discussed above, positioning the saxophone as a brass (or nearly brass) instrument is understandable given its material; however, the categorization into “brass” and “woodwind” is *not* concerned with material, but instead based upon the method of sound generation. Redfern (1978, p. 87) gives the material-confusion as a suggested explanation as to why some general and special schemes place the saxophone within the brass category, suggesting that such schemes are not consistent over whether instruments are organized by material or playing method.

4.2.2. The saxophone as “other”

From a musical perspective, the saxophone can be considered as “other” during musical history. Cottrell’s (2013b) monograph about the saxophone draws together various strands of “other-ness” relating to the saxophone. First, saxophones came to define certain genres of “other” music during the 20th century, namely popular music (Cottrell 2013b, p. 167) and jazz (Cottrell 2013b, p. 227). Second, their position as infiltrators in the symphony orchestra, also gives them a secondary use as signifiers of “otherness”, occasionally feeding the frenzy for the exotic and oriental in *fin-de-siècle* France (Cottrell 2013b, pp. 232-234). Third, there was also a growing association in the 20th century between saxophones, American dance music, jazz and African-American musicians (Cottrell 2013b, p. 317).

Fascinatingly, in LIS classification schemes, the saxophone is often treated and labelled as “other”. For example, Dickinson places the saxophone in an “other” class of wind instruments. This class is a mix of instruments typically associated with “woodwind” and “brass” instruments. One possible reading is that Dickinson – writing in the United States in the 1920s and 1930s, when the saxophone as an instrument was extremely well-known – is reflecting in his scheme the low position of saxophones within art music.

¹⁴⁸ Olding uses the spelling ‘saxaphane’. Calling these instruments the “saxophone” is described by Harvey (1995, p. 1) as a “dreaded mis-spelling”.

¹⁴⁹ Note that for some other appearances of the saxophone in LCC2015, it is situated within the general wind “other” section.

As mentioned above, LCC2015, as well as earlier editions of LCC appearing in 1904, 1917 and 1998, place some iterations of the saxophone after the end of the brass section, when they are not placing the saxophone as wind “other” (Library of Congress 1904, Library of Congress 1917, Library of Congress 1998). It is interesting that the 1904 and 1917 versions of LCC and Dickinson are all written in a country and time period where the saxophone was particularly well-known (Ashton 1998, pp. 20-21), yet their positioning and treatment of the saxophone signifies “other”.¹⁵⁰ Could this be a reflection of the “other-ness” seen in the musical world?

4.2.3. The interpolation of genre

Another dimension to saxophone classification concerns the inseparability of the saxophone to a specific musical genre: jazz. Ingham (1998, p. 125) suggests that tracing the development of the saxophone’s involvement in jazz is like tracing the history of jazz itself, such is the saxophone’s importance to this genre. So, during a certain time period, saxophones equalled jazz, and this contributed to their problematic reception (Cottrell 2013a); furthermore, Cottrell (2013a) argues that dislike of jazz translated into a dislike of the saxophone, and often saxophones were dismissed as “immoral” instruments. Note how the notion that an instrument has ethical and humanistic qualities is not unique for saxophones; percussion instruments were also dismissed for being works of the devil (see Section 3.3.1). Therefore, this points to the idea that the concept of an instrument cannot be disassociated from the genres it is played for and the human qualities imposed upon it. This has ramifications for instrument classification. Followed to its logical conclusion, (according to some theorists) there is no entirely morphological entity known as a saxophone or a percussion instrument. Thus, if saxophones and jazz become interchangeable concepts, then the corollary is that medium and form/genre cannot be independent facets.

4.2.4. Using saxophones as conduit of classification scheme change

The changing perceptions and positions of the saxophone can be tracked using different editions of the same LIS classification scheme. This can provide insights into the classification of the saxophone within LIS, as well as potentially expanding knowledge about the development of that particular classification scheme. In this instance, DDC provides an ideal set of scheme editions, combining a long history, frequent updates and a widely-used classification scheme.

¹⁵⁰ However, as mentioned in Section 3.4.3, there is a possible connection between Dickinson and LCC, hence any similarities may not be entirely coincidental.

Tracing concepts over different editions of classification schemes relies on classification schemes having a temporal dimension; this has been explored within KO discourse. For example, Tennis (2010) discusses the temporal frame of knowledge organization systems (KOSs) and the versioning of classification schemes. (However, it is out of the scope of this thesis to discuss whether DDC exists in “versions” or “states” (Tennis 2010), so instead, the DDC term of “edition” will be used.) Furthermore, there has been recent interest in tracing concepts over time – albeit in a different context and using a very different methodology; for instance, Fox (2014) explores how three editions of DDC treat gender and sex in comparison to medical discourse.¹⁵¹ So, the overall principles of tracing a concept through editions of a scheme appear to resonate with recent developments in knowledge organization (KO). The following editions of DDC appearing before the 20th edition were consulted in this study: 1st (Dewey 1876), 2nd (Dewey 1885), 4th (Dewey 1891), 7th (Dewey 1911), 10th (Dewey 1919), 11th (Dewey 1922), 13th (Dewey, Fellows & Getchell 1932), 14th (Dewey, Lake Placid Club Education Foundation 1942), 15th (Dewey, Ferguson 1951), 16th (Dewey, Custer 1958), 17th (Dewey, Custer 1965) and 18th (Dewey, Custer 1971).¹⁵²

The saxophone makes an appearance in the first version of the DDC scheme which lists individual instruments (2nd edition, published 1885). This may be surprising if only the saxophone as jazz or popular music instrument is considered; however, by 1885, saxophones had been used in orchestral music such as Bizet’s *L’Arlesienne suites* and some operas by Massenet (Cottrell 2013b, p. 234), plus there were already solo saxophonists (Cottrell 2013b, p. 109). Nevertheless, DDC is showing its modern credentials by mentioning a relatively modern instrument for the 1880s. From 1885 to 1942, the 2nd to 14th editions, the saxophone was treated as a brass “other”. A major change occurs in the 15th edition of DDC (published 1951). For the first time, the saxophone gains its organologically-appropriate position as a single reed, “woodwind” instrument in the adjacent class to clarinets.¹⁵³

The inclusion of saxophones in the 15th edition of DDC is significant and can be viewed from two different perspectives. As well as its (more negative) associations with jazz,

¹⁵¹ Note that the initial research for this chapter was carried out in 2012 and 2013, before Fox (2014) was disseminated.

¹⁵² The reason for the gaps was that initial consultation of these editions showed that the treatment of saxophones was identical – apart from spellings, typography and some punctuation – from one side of each gap to the other, therefore consulting intervening editions would not have been useful.

¹⁵³ In the 15th edition of DDC, there is no actual label for ‘single reeds’, which appears in the 16th edition onwards, but all the instruments in this section are single reed instruments.

the saxophone gained some acceptance from the musical establishment during the first half of the 20th century. For example, the 1920s saw a rush of interest in using the saxophone in American orchestral music (Cottrell 2013b, pp. 235-236) and the American premiere of a concerto for saxophone and orchestra by Glazanov took place in 1938 (Cottrell 2013b, p. 257). The 15th edition's reshuffle of the saxophone from brass "other" to its technically-correct position in the main part of the schedules could be reviewed as a reflection of the saxophone's repositioning and acceptance in the musical world.

However, there is also an important context of the editions of DDC themselves. Overall, the 15th edition of DDC was a radical departure from previous editions of DDC (Miksa 1998, Comaromi 1969); the brief of the 15th edition included bringing modern terminology into the scheme – this will be discussed in conjunction with H/S in Section 5.¹⁵⁴ It is also possible to see the reclassification of the saxophone as part of the same process: while redesigning a scheme to emphasise the new and terminologically-correct, the saxophone moves to its organologically-sound home of single reed woodwind.

So, we can read the saxophone's treatment in the 15th edition in two ways. The historical arc of the saxophone in DDC shows how LIS classification reflects musical development (if not directly the music domain's classification). The saxophone exists in the 1880s so it gets a class number; as the saxophone gains a bigger corpus of Western art music in the 20th century it moves from an incorrect and "other" position to its organologically-correct place in the main list of woodwind instruments. The second reading is that tracing the saxophone reflects the qualities and modernity of DDC. Even in the 1880s the saxophone is included in the schedules and the big changes wrought by the infamous 15th edition of DDC can be seen in the saxophone's move to a more technically-correct position – in direct contrast to say LCC, where saxophones are wind "other", even in LCC2015. Therefore, tracing the saxophone through the 15th edition of DDC reveals accords between music, organology and LIS, but also demonstrates the usefulness of this nascent methodology.

¹⁵⁴ The 15th edition of DDC was also drastically smaller than previous editions: for instance, the number of classes listed in the 15th edition contracted to under a sixth of the number found in the 14th edition (Miksa 1998, p. 21). So the saxophone surviving this cull of classes is significant in itself.

4.3. Whistling, sewing machines and vacuum cleaners: unusual instruments as signals of warrant and scheme influence

Examining unusual instruments gives us insights into the classification of musical instruments from both the LIS and music domains. (Note that “unusual” is not defined in this section but is loosely taken to mean instruments which are not conventional solo or orchestral instruments, such as whistling, sewing machines and vacuum cleaners.) Not only do the results further our understanding of instrument classification, but also offer windows for exploring broader phenomena such as ideas of literary and musical warrant, and relationships between classification schemes.

4.3.1. Exploring unusual instruments in LIS classification schemes

BCM is used as an example scheme to introduce the concept of unusual instruments. The sewing machine is a listed focus in BCM (Coates 1960a, p. 34), under the heading “Music produced by tools & machines” (YS). It is useful to consider the “instrument” of sewing machine in musical terms: information is scant, with Grove yielding no entry or section of an entry for such an instrument, nor the instrument appearing in sources such as Adler (1989) or Blades (1984).¹⁵⁵ The lack of information makes it difficult to know what is meant by a sewing-machine-as-instrument. The most likely scenario, especially considering the overall BCM category, is a regular sewing machine being used in a musical setting. For instance, there is a song by Tom Waits which is accompanied by sewing machine (Davies 2016). This idea of a sewing machine – where the instrument is a standard, functional machine, turned into an instrument only by the context in which it is utilized – is interesting from a classification perspective. The same sewing machine is used to sew and to make music; therefore, in BCM, there is classification by *usage* rather than an object’s intrinsic qualities.¹⁵⁶ BCM does not stop at sewing machines. While BCM has only been published in one edition (1960a), a working copy of the scheme was annotated while it was being used to classify the BCM catalogue. No records can be found as to details and dates of the annotations, they are assumed to be by Patrick Mills, a former employee of the British Library Music Department, who had

¹⁵⁵ It is possible that the term is referring to a type of piano which had a sewing machine attached to the underneath of the piano, which is described in an 1893 issue of the *Musical Courier* (Adams 2006, p. 16). However, this is unlikely for a number of reasons including doubt about whether the instrument described in the *Courier* was actually made (Adams 2006, p. 16), the difference in years between the article (1893) and BCM (originated in 1958), and that BCM places the sewing machine instrument as “other” rather than a keyboard instrument.

¹⁵⁶ Of course, as BCM is a special scheme, there is no opportunity for BCM to refer the classifier to the machine/technology/sewing parts of the schedules. So, the sewing machine has to sit within music, for music is all there is.

responsibility for BCM (Robert Balchin, private communication, 13 July 2013). The annotated version (Coates, Mills, n.d.) reveals extra classes in the “other” section and under tools/machines – see Figure 32, which transcribes part of the “other” class in the annotated version of BCM. So, sewing machines are joined by vacuum cleaners, various types of glass, and more. Pertinent questions are aplenty: why are these instruments added and how does this relate to literary warra

Y	Other instruments
...	...
YQ	Glass
YQR	Broken glass
YR	Glasses (i.e. tableware)
YRR	Broken glasses
YS	Music produced by tools/machines
YSS	Sewing machines
YSV	Vacuum cleaners

Note: Annotations are in red

Figure 32. Other instruments in the annotated copy of BCM

4.3.2. Literary warrant in LIS and organology

Literary warrant – as originally developed by Hulme in 1911 (Chan, Richmond & Svenonius 1985) – suggests a class should only exist when that subject appears within the literature (Hulme 1985, p. 51); literary warrant describes schemes which reflect library materials rather than potential and philosophical knowledge (Hulme 1985, p. 51). Translated to notated Western art music, literary warrant suggests that a term should only appear in a classification scheme if that instrument, form, genre, and so on, have been utilized in a work of notated Western art music.

Reconsidering the BCM examples of unusual instruments through the prism of literary warrant provides some interesting insights into music classification. An examination of the cumulative BCM catalogue from 1957 to 1985 (British Library 1988), as well as looking at the BCM schedules from 1986 until 1991 (British Library 1986-1991) suggests that the classmark for sewing machines has not been used.¹⁵⁷ While it cannot be said

¹⁵⁷ The catalogue was searched for classmarks starting with YSS, the specific class for sewing machines. This would cover all solo works and works for multiple sewing machines. Works for sewing machine and one other instrument are also covered by this search, as the sewing machine is the last focus and works for two instruments are built in reverse class order. Furthermore, as the overall category of “Other instruments” is not listed as part of any of the chamber music classes, it is assumed that the

definitely that music does not exist for sewing machines – proving a medium has not been used for a published musical work is impossible – it seems likely. Not only is this a mystery about why BCM contains this classmark, it also suggests that BCM is not using literary warrant to design its scheme.¹⁵⁸ This is noteworthy in a scheme such as BCM which has a defined purpose to classify the works in a specific classified catalogue.

Similarly, vacuum cleaners also remain unused as a classmark in the British Catalogue of Music. However, unlike sewing machines, there is strong evidence of an extant musical work which uses this instrument in a key role: Malcolm Arnold's 1956 work, *A grand, Grand Overture*, which was written for the Hoffnung Music Festival (Music Sales Classical 2016).¹⁵⁹ This leads to deeper questions about what literary warrant means for a scheme such as BCM. Although, Arnold's work was published in the United Kingdom in 1956 and 2011 (Arnold 1956, Arnold 2011), these dates are both outside of the date range where BCM was used for the classified catalogue. So, the appearance of a vacuum cleaner is justified from a literary warrant perspective; however, it also suggests that literary warrant – if it is being utilized at all in BCM – refers to the whole universe of published musical works, not just those which are eligible by country and date to appear in the BCM catalogue. Therefore, sewing machines, vacuum cleaners and BCM can help our understanding of how music classification schemes garner their foci.

Literary warrant also concerns organological theorists, though they do not use this term. For example, Mahillon includes categories where there were no known instruments of that type at the time the scheme was written (Jairazbhoy 1990b, pp. 82-83); conversely, H/S, which was heavily based on Mahillon's scheme, does not (Jairazbhoy 1990b, p. 87).

sewing machine has not been used in this part of the schedules. However, there are certain combinations not covered by this search, namely if sewing machines are used as an accompaniment for vocal works. In addition, the indexes were also searched for "sewing machine". The BCM catalogue was arranged using BCM classification from 1957 to 1985. From 1986 to 1991, the catalogue was arranged by DDC but has BCM classification at the bottom of each entry in the catalogue. From 1992, BCM stopped being used altogether. Therefore, for the years when BCM is used as the ordering system the YSS was checked in the classified schedules as well as the index for the term "sewing machine". For the 1986-1991 schedules, only the indices could be checked and it was not useful to check the volumes from 1992 onwards as these do not feature BCM classification. Therefore, it is reasonably certain that YSS was not used from 1957-1991, as it does not feature in the indexes nor in the instrumental parts of the schedules.

¹⁵⁸ This is not the only example of mysterious instruments appearing in LIS classification schemes. The provisional revision of *Bliss Classification* almost exactly follows the instrument schedules of BCM. Yet, it also adds an extra classmark to BCM's section for tools and machines: the ironing board. Again, provisional searching has so-far yielded no know works where there this classmark would be needed.

¹⁵⁹ Actually, Arnold's work is for concert orchestra with soloists of three vacuum cleaners, a floor polisher and four rifles. Taking to its logical conclusion, if vacuum cleaners were added due to Arnold's work then it is reasonable to ask why floor cleaners and rifles do not make an appearance in the annotated version of BCM (Coates, Mills n.d.).

This demonstrates a conscious decision by H/S to limit their scheme only to objects which existed – an approximate equivalent to evoking literary warrant by creators of bibliographic classification schemes. Jairhozbhy (1990b, p. 82 and 87) theorizes that Mahillon’s decision to include instruments rests on Mahillon’s family background as an instrument maker, and wonders whether having these phantom classes might encourage instrument makers to create these types of instruments. This implies that the classification scheme itself could help create knowledge – in this case, musical instruments – directly allying itself with Beghtol’s (2003, p. 66) specific ideas about how domain-based classification are used as a tool to create new knowledge. Comparing these two examples to LIS classification elicits some thoughts. Could H/S’s deference to “literary warrant” be one small factor in its successful infiltration and usage in LIS schemes (see Section 5)? Certainly, it is difficult to imagine LIS schemes wanting to use categories or classes for instruments which do not exist, especially if the LIS schemes are using literary warrant themselves. Furthermore, if LIS schemes are using an organological scheme such as H/S, there is a construct which could be referred to “double literary warrant”: to be included in an LIS scheme, both the instrument has to be extant, and then a musical work written must be published and written for that instrument.

4.3.3. Using unusual instruments to track scheme connections: LCC and Dickinson

The presence of unusual instruments also has another value: tracking the connections between classification schemes. “Whistling” is included in Dickinson.¹⁶⁰ Its unexpectedness is compounded by the brevity of Dickinson’s listings of instruments. LCC also includes whistling in the 1917 revised version, albeit in a different location (Library of Congress 1917).¹⁶¹ The presence of whistling in both schemes, which have similar geographic and temporal backgrounds, could have a number of explanations; these include a reflection on the musical landscape of the time or merely a coincidence. However, combined with the unusual instrument categorization used in both schemes – bowed and plucked strings either side of woodwind instruments, see Section 3.4. – it seems that the most likely hypothesis is that Dickinson was influenced by LCC.

¹⁶⁰ For the purposes of this discussion, whistling will be considered as an instrument even though the sound is made with the human body. This is to reflect its position in Dickinson.

¹⁶¹ The original LC schedules for music do not include classmarks for whistling, but it appears at both the musical scores (M) and music instruction and study (MT) sections of the 1917 revised edition and 1998 revision. However, while Dickinson places whistling as a type of wind instrument, in LCC it appears in the section for “Percussion and other instruments”, with instruments such as the pianola, chimes, concertina and xylophone as near neighbours.

Therefore, tracing unusual instruments through different classification schemes could be utilized as a semi-systematic method to evaluate schemes and their influence on each other.

5. Exploring the connections and influence between classifications of musical instruments: a reception-infused approach

5.1. Introducing the methodologies of reception, influence and connections

It can be argued that understanding the classificatory structures within any particular domain involves looking at the whole universe of structures together, as well as each structure in isolation. Sections 2.2 and 2.3 highlighted the importance of one particular classification scheme within the music domain: H/S. This section is going to consider how H/S interacts with other classification schemes. After establishing the theoretical basis and methodological approach to studying the connections between classification schemes, a brief account of H/S's influence on other organological schemes will be offered. The main part of this section will be to consider how a scheme developed for use within the music domain (H/S) has infiltrated the classification of music within the LIS domain, via the adoption of H/S's principles, terminology and ideas. Thus this comparative study of classification schemes illuminates the relationship between music classification in the LIS and music domains.

A brief note is needed about the reception-infused approach that is at the core of this section about scheme influence. This analytical method uses ideas from reception theories in order to provide a fuller account of a classification scheme; in this context, using reception-infused analysis provides an opportunity to examine the relationships between the music and LIS domains via the conduit of relationships between classification schemes. Three broad and interrelated types of reception-infused analysis were identified by this author in an article in *Knowledge Organization* (see Lee (2015) and reproduced in Appendix B3): criticism, consumption and influence (Wirkung). Furthermore, the analytical method of exploring interconnections between schemes was explored in more detail in Lee (2014), which is reproduced in Appendix B2. Both of these papers were inspired and modelled on examples from music classification, and Lee

(2014) includes examples of classifying musical instruments; however, the details and broad conclusions about reception analysis and schemes inter-connectedness are outside the remit of the thesis.

5.2. Why *Hornbostel and Sachs Classification*?

H/S will be used to analyse LIS classification of musical instruments. So, first, its importance and influence – in other words, its reception – needs to be ascertained in order to justify its position as analytical tool through which LIS classification schemes will be deconstructed. However, it is also useful to briefly consider H/S in its own right as it is a major taxonomy of classification within the music domain; Lee (2015) argued that to truly know a scheme, it is important to analyse its reception. However, fully tracking the influence and connections of H/S to other organological classification schemes would be a major endeavour. It is both outside the remit of this LIS-based thesis and would require an organologists' knowledge of instrument classification. So, a very brief summary is offered, showing why H/S is singularly the most important and influential organological classification scheme. Although secondary sources discuss reception-related ideas about H/S, no sources consulted used reception theories or terminology explicitly; so, the reception-infused analysis as developed in Lee (2015) offers the broad paradigm of this brief discussion about H/S. The criticism, consumption and influence (Wirkung) of H/S will be discussed within the organology domain.

In terms of criticism, H/S is generally described in positive terms; for instance, labels such as “monumental” (Grame 1963, p. 138) and “best” (Hood 1971, p. 125, describing a comment by Kunst) are used. Specific reasons for its goodness are less common, but include its intended multicultural reach (Kartomi 2001, p. 285). However, negative comments also abound. The inconsistency of how the four main classes (idiophones, chordophones, membranophones and aerophones) are subdivided is a noted disadvantage of the scheme – see for instance, comments by Wachsmann (Wachsmann, Hornbostel & Sachs 1980, p. 239) and Kunst (described by Hood (1971, p. 135), amongst others). There are other criticisms noted, such as the confusing layout (Jairazbhoy 1990b, p. 88), instruments which sit on borderlines (Kartomi 1990, p. 172) and instruments which could live in two different places in the scheme (Kartomi 1990, p. 172) – although this last criticism is suggested as a problem with the type of classification rather than the scheme itself.

The actual consumption of H/S is mixed. Positive criticism does not necessarily lend itself to actual usage, as Lee discussed when considering the theoretical underpinnings of reception as an analysis method (Lee 2015). On one hand, scholars describe H/S as a highly used classification scheme; for instance, it is labelled as “widely adopted” (Dournon 1992, p. 252) and “predominant” (Kolozali et al. 2011, p. 465), while Gnoli (2006, p. 143) describes H/S as the most well-known and used of organological schemes. On the other hand, Montagu and Burton (1971, p. 49) are not alone in stating that actually few organizations seem to use it to arrange their instruments. As no quantitative evidence is used to support either side of the argument, we are left to inferences. Kartomi (1990, p. 199) provides a possible explanation of the differing views: while many people use H/S, they are generally only using the first few steps or top few levels.¹⁶² In other words, many people are using broad ideas from H/S, but there is little evidence that many are using the full classification scheme.

The far-reaching influence (Wirkung) of H/S can be seen in a number of ways. First, there are the appearances of parts of the H/S scheme in general discussions about organological taxonomy. For instance, the introduction to H/S is deemed to be central enough to the classification of instruments that it is included as an appendix to articles on the classification of instruments in various editions of Grove (Wachsmann, Hornbostel & Sachs 1980, Wachsmann, Hornbostel & Sachs 1984, Wachsmann et al. 2013). Second, many new instrument classification schemes in the 20th and 21st century are adaptations of H/S. For instance, Galpin’s added “electroponic instruments” to H/S’s four main classes underpinning H/S (Wachsmann et al. 2013), which later metamorphosed into “electrophones” in Hood’s scheme (Wachsmann, Hornbostel & Sachs 1980, p. 239). Some used the contents of H/S to recreate the scheme using a completely different set of notation, such as Hood’s (1971) scheme based on labanotation; while, at its extreme, Matson and Lysloff convert H/S ideas into a faceted scheme with 37 different variables (Ghirardini, Gnoli 2005). Though various organologists and other musicologists might not necessarily agree on how to adapt H/S for their particular collection’s need or theory crusade, they augment H/S’s Wirkung by creating adaptations of the scheme.¹⁶³ Third, translations of a scheme are one aspect of that scheme’s Wirkung (see Lee (2015), and reproduced in Appendix B3); Kartomi (2001,

¹⁶² Ghiardiani and Gnoli’s (2005) comments on the usage of H/S imply that using only the first main classes of a scheme may be typical of a general pattern of how classification schemes are used.

¹⁶³ Adapting H/S appears to have been prevalent even from the first years of the scheme: for example, Dournon (1992, p. 252) notes an early adaptation of H/S by Montandon in 1919, which is just five years after the first publication of H/S.

p. 285) gives examples of the translated languages of H/S which, as well as the widely-used English version which appeared in the *Galpin Society Journal* in 1961, also includes Finnish, Catalan and Spanish versions.

5.3. Using *Hornbostel and Sachs Classification* to understand LIS classifications of instruments

H/S is now used as the prism through which to view the influence of organological taxonomy on the LIS domain. In Section 5.2, H/S was established as a dominant taxonomy both in terms of H/S itself and through schemes created to enhance or reject H/S; however, these connections were intra-domain, as describing the connections of one scheme within a domain to other classification or schemes within that domain. In this section, H/S is used to explore inter-domain connections between the music and LIS domains (see Lee (2014), reproduced in Appendix B2, for the theoretical background to intra-domain versus inter-domain scheme connectedness, and how interconnectedness of schemes is part of a scheme's *Wirkung*). The set of 15 example LIS classification schemes used elsewhere in this chapter is used as a starting point for this discussion about H/S and LIS classification – in other words, out of the 18 broad classification schemes identified in Chapter 3, this chapter uses the 15 schemes which have multiple classes for individual instruments. In total, 7 out of these 15 schemes showed some reference to H/S: DDC19, DDC22, Bliss1, Flexible, BCM, Haroon and UDC. In other words, nearly half of the LIS classification schemes which have classes for individual instruments had some reference to H/S.

The way in which the debt to H/S manifested itself and the magnitude of the influence ranges widely. Some schemes have H/S infiltration in one discrete section, whereas others have H/S's influence all over the instrument schedules. The types of influence also vary, sometimes borrowing H/S's terminology and sometimes its structure. So, connections between H/S and five example LIS schemes are discussed, highlighting some of the different types of connections.¹⁶⁴ In addition to these, an examination of a few editions of DDC pre DDC20 revealed that it would also be beneficial to explore multiple pre-20 editions of DDC alongside considering DDC19 itself.

¹⁶⁴ Two schemes are not discussed at all in Section 5. BCM's use of H/S appears to be for general categories of instruments, rather than the part of the schedules used to classify music and thus is not discussed explicitly in this section. Haroon is not considered as although it appears to match some of H/S's structural features, it is not clear whether the influence is from H/S, or due to its purpose of classifying non-Western instruments. The question about a shared knowledge base between Haroon and H/S, with potentially no influence between one scheme and the other is fascinating, but alas there is not space to explore this further.

For most of the schemes, the analysis is focused on how H/S infiltrates intrinsic qualities of the LIS schemes, not extrinsic factors, due to the practical difficulties in ascertaining a full contextual background and more for every scheme. One exception is the last LIS scheme to be discussed: DDC22. Actually, due to the direct relationship between DDC22 and its predecessor, both DDC22 and the DDC *Phoenix Schedule* for music will be discussed in this section as some of the extrinsic factors regarding H/S relate specifically to the *Phoenix Schedule* rather than the later DDC22. So, as the authors of the DDC *Phoenix Schedule* were extremely explicit about their intentions concerning utilising H/S, the contextual information for this scheme has been considered, while it has not been considered for the other four examples. Though this analysis of five LIS schemes or sets of schemes may not provide a complete picture of H/S influence within LIS, this selection of interactions provides some valuable insights into cross-disciplinary classification influences between music and LIS.

5.4. *Hornbostel and Sachs Classification* infiltration in LIS schemes

5.4.1. Isolated use of *Hornbostel and Sachs Classification* terminology: *Bliss Classification*, first edition

The first edition of the *Bliss Classification* was published in 1953 and the music schedules are not substantial (Bliss 1953). Instruments appear in a number of places in the schedules: VWO (instrumental study and training), VWT (instrumental rendition of music) and VX (musical compositions: scores and records). The most detailed schedules appear under VX; however the instruments here appear individually in a one-dimensional list, with no grouping. There is one H/S reference in Bliss1, which comes in the VWT part of the schedules, which has a more structured format with groups for instruments. This contains a class for entitled “stringed instruments, chordophones”; so, the H/S category of chordophones is given as an alternative name for string instruments. There are no other signs of H/S usage in the arrangement or terminology of this scheme. Therefore, this isolated H/S reference signifies the scheme author’s knowledge of H/S but tantalisingly nothing more.

5.4.2. *Hornbostel and Sachs Classification* terminology and significance: pre-20th editions of DDC

Conversely, examining pre-20th editions of DDC offers more use of terminology and perhaps some deeper significance. (As mentioned above, this section will discuss

multiple pre-Phoenix schedules of DDC.) The 15th edition of DDC, published in 1951, is the first edition of DDC to use H/S terminology: it chooses to describe what had previously been labelled as “drum” as “Membranophones” (Dewey, Ferguson 1951, p. 392, 789.1). The class has an instruction “Includes drums”; this means that though the more colloquial term (drum) is present in the scheme, the main label utilizes H/S terminology. The label for the class of “Membranophones” is present in every edition of DDC until the major changes in the *Phoenix Schedule*. The 15th edition of DDC also uses the H/S-type term of “Electrophones” (Dewey, Ferguson 1951, p. 392) – as mentioned above in Section 3.4.2 – which was a term added to H/S by Galpin in 1938. However, unlike membranophones, this term is not used in any other editions of DDC until the major revisions of the *Phoenix Schedule*.

Like the saxophone example discussed in Section 4.2.4, the presence of H/S terms in historic editions of DDC is not just a reflection of the history of musical instruments, they also reflect the history of the classification scheme. As discussed in Section 4.2.4, the 15th edition of DDC was revolutionary in a number of ways including adopting more modern terminology (Comaromi 1976, p. 396). Therefore, it is possible to see the 15th edition of DDC’s adoption of some H/S vocabulary as a reflection on the perceived standing and symbolism of the organological scheme; this positions H/S as equating to “modern” in the eyes of the DDC authors. Therefore, the presence of H/S in the 15th edition of DDC does not just provide insights and a window into the philosophical stances of the LIS schemes and their authors, but also reflects what H/S signifies to the music community.

5.4.3. Structural use of *Hornbostel and Sachs Classification* for part of scheme: Flexible

Flexible demonstrates a different type of H/S use: using H/S ideas to structure part of the schedules. Flexible uses H/S in the percussion part of the schedules. As well as the terminology of “membranophones” and “idiophones”, these H/S concepts are used to divide so-called percussion instruments. Furthermore, within each of the H/S-style classes, various H/S ideas relating to how the sound is made (for instance, struck, shaken and friction) are used to organize these sub-classes – albeit, the ideas are not employed in the same order as H/S. It is noteworthy that it is percussion which gains the detailed, explicit H/S-makeover, rather than other instruments. This makes sense in a context where on one hand LIS schemes typically treat percussion instruments poorly (see Section 3.3.1), while on the other, 20th-century organological thinking as codified in H/S,

treat percussion instruments as equals to other categories of instruments. Therefore, the Flexible scheme demonstrates that H/S can infiltrate terminology and structure of LIS schemes, but also could be seen as a comment on (traditional) LIS treatment of the maligned percussion instruments.

5.4.4. *Hornbostel and Sachs Classification as blueprint?: UDC*

When exploring classification phenomena during this chapter, it appears that UDC has many shared qualities with H/S. For instance, it has already been shown that UDC is unusual in adopting H/S's four main categories and UDC includes a plethora of H/S terminology. UDC's treatment of keyboard instruments has also been mentioned: there is no keyboard category, and instead, individual types of keyboard instrument are scattered amongst other categories. There are other similarities not hitherto mentioned: for example, UDC's idiophones class shares H/S's principle division concerning how the instrument is played (struck, plucked, friction and blown).

However, there are notable ways in which UDC veers off the H/S path, demonstrating how H/S appears to have been an influence on UDC rather than its blueprint. To start, UDC mostly has classes for individual instruments, rather than H/S's generic name for a type of instrument. Also, while H/S only lists one example of an instrument in the class which would in practice contain violins, violas, and violoncellos, UDC does not follow this structure; in UDC, there are separate classes for instruments in the so-called "violin family" such as violins, violas and violoncellos. Some orders within the main categories of UDC are fundamentally different from H/S; for instance, the order within the idiophones sub-categories is very different in UDC from H/S. Occasionally, there are complete differences in the location of individual instruments such as lyres, and UDC's separate sequences of directly and indirectly shaken idiophones are disrupted when reimaged within UDC. Therefore, UDC reflects a blend of adherence to some of the fundamental principles of H/S, while not adopting some of the other features of the scheme. Thus, H/S is not a blueprint for UDC, but a strong influence nevertheless.

5.4.5. *Embedding Hornbostel and Sachs Classification within a scheme: DDC Phoenix schedule and DDC 22nd edition*

The relationship between the DDC *Phoenix schedule* (and its later incarnations including DDC22) and H/S is especially fascinating. As there are some explicit accounts of the H/S intentions within the DDC family, extra dimensions are used to discuss these schemes. This follows the multiplane approach, as introduced in Chapter 4, Section 5 as a method

to analyse faceted features of example schemes, and developed by the author as a theoretical model for scheme analysis in Lee (2016), and reproduced in Appendix B4. However, unlike the faceted classification examples, a mixture of two versions of the scheme will be used: the *Phoenix Schedule* of DDC and DDC22.¹⁶⁵ The attention will largely focus only on the first two planes: the scheme itself (DDC22); authorial description and analysis, as found in the introduction to the separately published *Phoenix Schedule* and in articles written by the authors about the creation of the scheme. After some general points about H/S usage in DDC/Phoenix, three specific issues are discussed as discrete units, considering planes 1 and 2 side-by-side.

5.4.5.1. Authorial intent and a touch of scheme criticism

Sweeney and Clews, the authors of the *Phoenix Schedule*, are very explicit about their use of H/S and the relationship between H/S and the *Phoenix Schedule*: for example, the introduction to the *Phoenix Schedule* (Dewey et al. 1980, pp. xxiii-xxiv) mentions the use of H/S explicitly, albeit using the name Sachs-Hornbostel instead. Moreover, using existing schemes was hardwired into the methodology of creating the *Phoenix Schedule*; Clews (1975, p. 7) says the first stage of the project was to examine existing schemes. It is interesting to note that the use of H/S in pre-19 editions of DDC is not mentioned by the authors of the *Phoenix Schedule*; so while the use of H/S is portrayed as new and original, actually the *Phoenix Schedule* owes a little more to the legacy of previous editions of DDC than its authors divulge.

While a detailed discussion of the *Phoenix Schedule* or DDC22's criticism is outside the remit for this section, it is worth briefly considering whether the use of H/S attracted any attention and in what contexts. The deliberate inclusions of H/S in the *Phoenix Scheme* was identified by critics (Redfern 1991, p. 27, Philp 1982, p. 9); in particular, Redfern's review (1991, p. 27) comments on the perceived benefits of using H/S within *Phoenix Schedule*, such as being a more scientific arrangement of instruments and being easier to use for non-Western music if required. These points are interesting as in

¹⁶⁵ The reasons for mixing the schemes are as follows. In the rest of this thesis, DDC22 has been used as a substitute for all the editions of DDC which appeared with and after the *Phoenix Schedule*. However, in terms of H/S, we have much explicit discussion about the use of H/S in the *Phoenix Schedule*, due to the nature of its creation; so, when referring to H/S it makes sense to refer to the *Phoenix Schedule*. However, in order to refer to aspects of the scheme itself, it is also sensible to maintain consistency with the rest of the thesis which uses DDC22 as the version of the post-*Phoenix Schedule* to be discussed. Therefore, both the *Phoenix Schedule* and DDC22 will be discussed.

particular, Clews and Sweeney (Dewey et al 1980, pp. xxii-xxiii) state that they use H/S in order to enable representation of music of non-Western cultures.

5.4.5.2. Terminology

H/S's terminology makes a significant appearance in DDC22. Within the scheme itself, the debt to H/S is very clear as H/S vocabulary abounds. Some classes have their H/S equivalent following the colloquial title, such as "Stringed instruments (Chordophones)" (Dewey et al. 2003, vol. 3, p. 701); in other cases, the class is given an entirely H/S label, for instance "Mechanical plucked idiophones" (Dewey et al. 2003, vol. 3, p. 697). In cases like the latter, the "Includes ..." note usually indicates the colloquial name for instruments which might reside in this class, which is likely to be of great benefit to classifiers. The idiophone part of the schedule in particular has almost entirely H/S class names.

Although H/S vocabulary is in use, maintaining colloquial names was also important to Sweeney and Clews: they describe their scheme as having the structure of H/S – a claim which will be analysed in more detail in later sections – but using the instruments and terms familiar to those used to Western music (Dewey et al 1980, p. xxiii). The H/S vocabulary is a source of complaint for critics (Philp 1982, p. 9). Sweeney's reply (1982, p. 49) aids our understanding of the authors' intentions: in quickly dispatching the complaint, Sweeney (1982, p. 49) comments that technical vocabulary is common in most subjects and that the *Phoenix Schedule* provides many explanations of terms. So, using H/S's terminology was a deliberate act, as was using "non-H/S" terminology in the form of colloquial names.

5.4.5.3. Order within categories

However, the H/S influence goes far beyond the merely terminological: an examination of the scheme reveals much influence within the structures of DDC22's broad categories of instruments. For example, the overall shape of the "woodwind" part of the aerophones class in DDC22 is similar to H/S. The basic order of both schemes moves from the flute family to reeds, with the reeds divided into double reeds, single reeds and free reeds. One particular placement is very indicative of H/S influence: both schemes share the unexpected order of double reeds preceding the single reeds, which is not found often in other LIS schemes.

However, there are also major differences between the within-class ordering found within DDC22 and H/S, which could be viewed as interesting representations of

classifying instruments in the LIS and music domains. For example, although the overall structure of the woodwind section of H/S and DDC22 are the same, many classes in H/S which do not have any Western exemplars are missing from DDC22 (for instance, a single, stopped, side-blown flute with an adjustable lower end (421.121.312) which according to H/S is found in Malacca and New Guinea (Hornbostel, Sachs 1992, p. 459). This exemplifies the Western bias of DDC22. This is noteworthy, as it does not tally with the authorial description and analysis: the authors are clear about that their motivation for using H/S is to create a less Western-focused scheme, with instrument schedules that are a “value-free basis for the classification” (Dewey et al. 1980, p. xxii). Yet, the scheme itself bypasses H/S’s classes when they are not used in Western music.

5.4.5.4. Broad class divisions

Examining the classification scheme itself reveals a peculiar cuckoo: the presence of a separate keyboard class. DDC22 maintains a separate section for keyboard instruments, alongside mechanical and other types of instruments. One effect of this decision is that the main classes for keyboard, strings and wind do not change in the *Phoenix Schedule*. As discussed in Section 3.4.1, separating out keyboard instruments is the antithesis of modern organological thought and strongly defies H/S’s overall structure.

The authors’ stance on this matter is rather complex and takes some unpicking. First, the authors state clearly their rejection of the traditional categorization into strings, wind, percussion and keyboard (Dewey et al. 1980, p. xxiii). They advocate that the single characteristic of dividing by acoustical principle is a great advantage of H/S and one which the *Phoenix Schedule* adopts (Clews 1975, p. 13). Second, the authors outline their structure of the instrument schedules: there are both “functional categories” and “acoustical categories” (Dewey et al. 1980, p. xxiii). The former include concepts such as “keyboard” and “mechanical”, while the latter includes the H/S classes with the addition of electrophones.¹⁶⁶ So, traditional categories and H/S categories are both included. They also comment directly on keyboards: they argue that the application of western technology to musical instruments makes it necessary to treat keyboards in this way (Dewey et al. 1980, p. xxiii). Therefore, to Clews and Sweeney, the separating out of keyboard instruments is based on their special qualities. Yet, H/S wrote a scheme for a world which contained keyboard instruments but did not treat them differently from other instruments, which somewhat weakens the “inevitability” argument about

¹⁶⁶ There is not scope to dissect Sweeney and Clews’ explanation of their structure in detail, but the concept of a “functional category” appears to be nebulous.

separating out keyboard instruments. This leads neatly to the last point. In the sources consulted, Sweeny and Clews do not mention that by keeping keyboard instruments separate, the main class numbers for keyboard, strings and wind instruments do not change in this new version of DDC (which “happens” to be a great, pragmatic advantage to those libraries potentially adopting the new version of the scheme).¹⁶⁷

So, comparing the competing evidence of the scheme itself and the authors’ opinions about the scheme is insightful. The authors express their desire for H/S’s broad category of classes, yet they compromise with a dual approach involving so-called functional categories – which explain the keyboard class – and the acoustical categories based on H/S. While a neat solution, the system is not using the single system of division that the authors claim is preferable. Furthermore, a separate class for keyboard also appears. While problematic from an organological perspective, the keyboard class keeps its same broad notation as previous schemes, which is potentially of great benefit to libraries wanting to adopt the Phoenix schedule. Yet, the authors are silent on this matter. Thus, the broad divisions of the *Phoenix Schedule* are both H/S and non-H/S: H/S is embedded into the *Phoenix Schedule* by stretching H/S on to the bones of the traditional quadrivium of instrument categories. This ambiguity is mirrored by the authors’ explanations, on one hand advocating for H/S yet maintaining a traditional keyboard class, and (deliberately?) suppressing a pragmatic consequence of the H/S traditional mashup of classes.

5.4.5.5. Conclusions concerning Hornbostel and Sachs Classification in the DDC Phoenix Schedule and DDC 22nd edition

In summary, the *Phoenix Schedule*/DDC22 demonstrates how H/S has been folded into a general LIS scheme. However, this version of DDC also demonstrates how it is not always beneficial to adopt H/S wholesale. For instance, H/S terminology deliberately sits alongside more “conventional” names for instruments and instrumental families. Thus, the terminologically advanced H/S is countenanced with the familiar, with H/S signifying technical vocabulary and all its associations. The investigation of the broad class structure and keyboard instruments reveals how – despite the authors’ protestations – at the fundamental level, H/S’s principles of a single, acoustic-based division are forgone. It could be inferred from classification scheme analysis (even

¹⁶⁷ It is also worth noting that by definition, a *Phoenix Schedule* is deliberately designed to re-use existing notation for a different class, unlike most intended updates of classification schemes. Therefore, the omission of acknowledge of this potential benefit is even more curious.

withstanding the authors' silence) that pragmatism of maintaining the status quo of classes wins out over H/S's knowledge structure. Finally, considering the order of instruments demonstrated both adherence and defiance of H/S. To the authors, using H/S was part of a drive to create a more universal, value-free scheme. Yet, it could be argued that actually the universality of H/S has been adopted selectively; H/S is used for the non-Western parts of the instrument schedules, whereas more traditional ways of classifying instruments have been kept for Western instruments, in itself a parochial result. So, while H/S and the *Phoenix Schedule/DDC* are intimately connected, this exploration shows the complexities of the relationship between the schemes, and by extension, the presence of multiple relationships between classification in the music and LIS domains.

5.5. Cross-currents of organology and LIS classification

Up to this point, the relationship between organological and LIS classifications of instruments has only been considered as a simple, one-headed arrow: from organology to LIS. This section explores how that single-headed arrow can become a circle.

One of the special features of H/S is its decimal notation, and Hornbostel and Sachs specifically attribute this to DDC (Hornbostel, Sachs 1992, p. 448). They consider the notational system used by DDC as "ingenuity" (Hornbostel, Sachs 1992, p. 448). However, when looking at H/S it is clear that the notation does not exactly follow DDC; for a start, it has decimal points separating every three digits and class labels with fewer than three digits are present (Hornbostel, Sachs 1992). Gnoli (2006, p. 143) answers this query: it was the European version of DDC which was used, rather than DDC itself. This version of DDC was authorised by Dewey himself, and it later becomes the *Universal Decimal Classification* (Gnoli 2006, p. 143). Hence, a LIS classification scheme – more precisely, a Wirkung of DDC – infiltrates an organological scheme (H/S). As discussed in Section 5.2, H/S is extremely influential in organology; thus LIS is actually infiltrating organology. Meanwhile, this same organological scheme (H/S) is also utilized in many LIS schemes. So, LIS classification influences music classification, and music classification influences LIS classification. Thus, the arrow becomes a circle – see Figure 33.

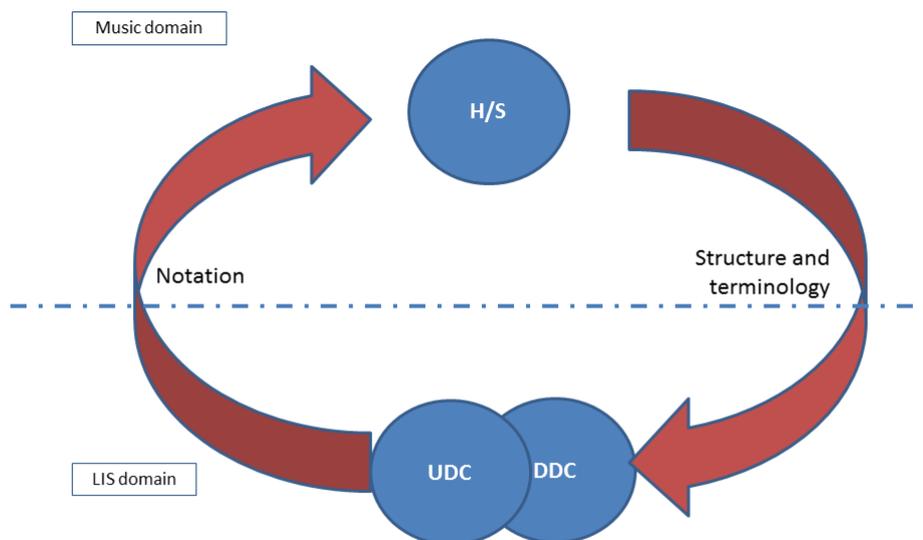


Figure 33. The cyclical relationship between DDC and H/S

However, there is another dimension to this situation: time and scheme versioning. (See, for instance, Tennis (2010) for a discussion of temporal aspects to schemes and versioning.) Early editions of the *Universal Decimal Classification* were based on early editions of DDC, and H/S builds upon Mahillon’s scheme. Each of these pairs could be considered as one scheme and one of that scheme’s Wirkungs. Furthermore, as discussed in Section 5.4, H/S is used in DDC. However, different editions of DDC have slightly different relationships with H/S: whereas the 15th edition of DDC uses H/S terminology in two places, the DDC *Phoenix Schedule* and beyond are saturated with H/S terms and also use H/S for structural purposes. Some of the relationships between DDC and H/S, and their related schemes, are shown in Figure 34. (Note that for simplicity, the debateable inclusion of H/S’s broad categories into the *Phoenix Schedule* has not been indicated.) Figure 34 illuminates the complex web of relationships that exist between these two families of schemes, and by extension, the complex web of relationships between the LIS and music domains.

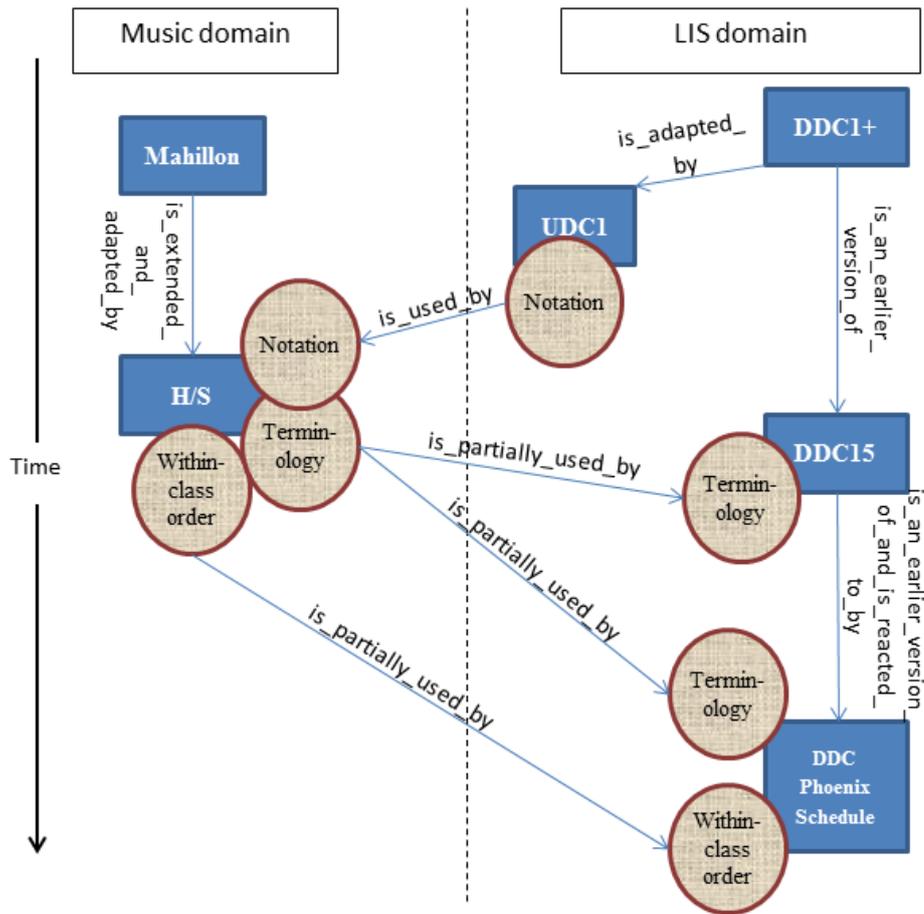


Figure 34. The intra-domain and inter-domain relationships of DDC and H/S

6. Conclusion to Chapter 7

This chapter revealed a number of aspects of musical instrument classification within LIS, as evidenced by a selection of LIS classification schemes. While portraying much variety, the LIS schemes centre upon the historical triumvirate strings, wind and percussion categories. While the level of separation and prominence might vary, this chapter showed how LIS schemes add to the three categories a distinct category, or quasi-category, for keyboard instruments. Percussion is usually the least prominent of the four groups of instruments, while the order of winds and strings undulates. The division between bowed and plucked instruments is a strong division within strings, sometimes even spilling over into completely separate categories. Electronic instruments receive prominence in some schemes, even, surprisingly, in as a scheme as Dickinson. So, the structure of the “typical” LIS scheme is visualized in Figure 35. Generally, the schemes contain a mixture of current and so-called obsolete instruments.

While there was no single method of handling a dual current/obsolete set of instruments, most LIS schemes display an important division within categories based on perceived current-ness.

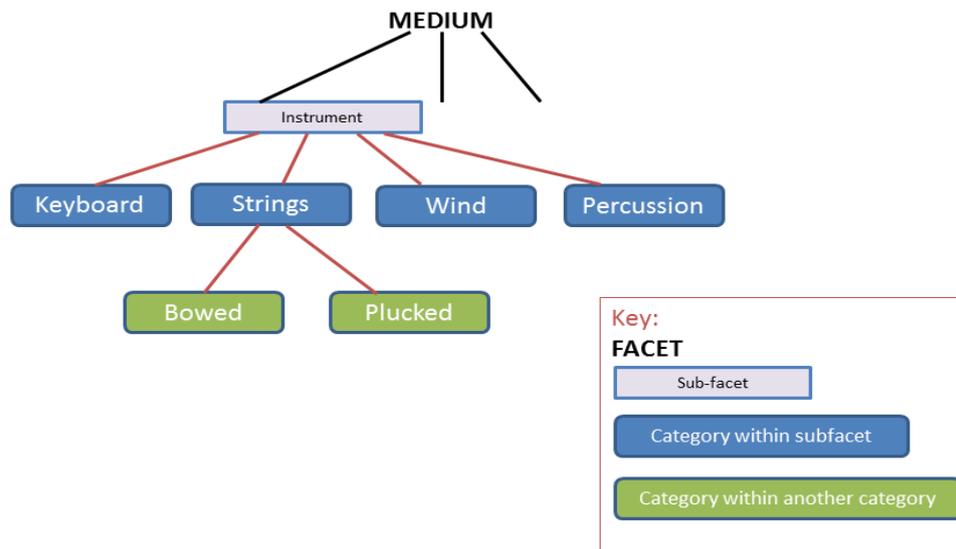


Figure 35. The “typical” instrument structure of an LIS scheme

As well as an overall structure of LIS conceptions of musical instrument classification, this chapter also revealed that classifying musical instruments was not always about medium alone. For instance, the saxophone demonstrates how an instrument can cleave to associated genres, or at least the reception and perception of those genres. Interestingly, the conjoining of instrument and non-medium ideas is not a modern phenomenon: for example, the perceived anti-religious or devilish associations of percussion instruments for much of musical history are associated with non-medium factors, rather than intrinsic qualities of the instruments themselves. This “impurity” in classifying instruments is significant: if a core part of the medium facet (instruments) cannot be entirely wrenched from other facets, then this questions the existence of an independent medium facet.

Classification and taxonomies are at the heart of the study of musical instruments in the music domain (organology), with H/S playing an important role. The explicit taxonomies within the music domain allows for more involved comparisons between the music and LIS domains than for the other topics covered in this thesis. The first thread that can be

seen is bifurcation between the LIS and music domain’s classifications of instruments. Organological classification moved on to H/S’s four categories in 1914, but this traditional triumvirate of strings/wind/percussion stayed in LIS classification. The early prominence of keyboard instruments within music domain classification gave way to a demoted position of the keyboard in Mahillon and H/S, yet it remained prominent and separate in LIS. Percussion instruments started as the devil (or similar) in many classifications of instruments in the first and second millennia but were much promoted in H/S’s scheme, while percussion remains the last and least developed category within LIS classification. Plucked and bowed instruments were separated in older musical instrument classifications but were not even an ordering principle in H/S, yet LIS schemes usually treat the bowed/plucked divide as the most prominent division within strings or even categories in their own right. So, it is bifurcation, bifurcation, bifurcation and bifurcation – see Figure 36. (Actually the picture is slightly more nuanced than Figure 36 shows, as the date of bifurcation is better described as somewhere between Mahillon’s 1880 scheme and H/S; certainly, by the time of H/S’s publication, all four phenomenon in the music domain had broken away from their traditional positions.)

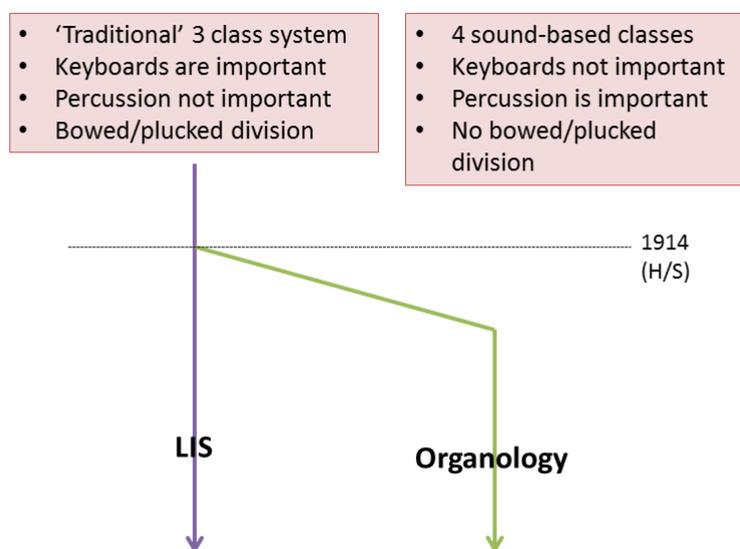


Figure 36. Bifurcation, bifurcation, bifurcation, bifurcation

Yet despite this stubborn adherence to traditional ways of classifying instruments, this chapter demonstrates how a number of LIS schemes are influenced by organological taxonomy through the conduit of its significant classification system: H/S. For instance,

H/S terminology is found in LIS schemes, as well as adoption of H/S's structural principles. As well as showing influence between the music and LIS domains, the use of H/S is shown to be part of a bigger cultural shift in the schemes that adopt it; for example, various editions of DDC position H/S as the signifier of the modern and as "the" way to organize instruments.

Finally, considering the classification of musical instruments has developed ideas related to general KO. Considering unusual musical instruments asks questions about what literary warrant means in the context of notated music. Tracing an instrument such as the saxophone through various editions of DDC shares novel information about the instrument, as well as demonstrating how tracking a single concept through a scheme is a useful scheme and concept analysis technique. However, perhaps the most significant result relating to general KO concerns the connections between schemes. Tracing the classification of musical instruments not only inspired a whole new methodology of reception-infused analysis – see Lee (2014, 2015) – but this chapter has demonstrated the value of examining and untangling the connections between classification schemes. Results include the inferred connections between Dickinson and LCC, unveiled by their shared separation of plucked/bowed instruments and inclusion of whistling. Examining H/S's infiltration of LIS schemes revealed a plethora of information not only about musical instrument classification, but also the validity and value of the method itself. Arrows of influence can become circles; the connections between two schemes can metamorphose into a web of temporal aspects, versions, multiple classification scheme and multiple domains. Thus, the classification of musical instruments has incubated a fascinating novel dimension of classification scheme analysis, which could be invaluable to KO more generally.

Chapter 8. Classifying musical form and genre

1. Introduction to Chapter 8

Music is more than medium alone. So, this chapter discusses another significant force at play within music: the facet of form and genre. Classification of forms and genres is a quite different entity from other types of classification so-far explored in this thesis. Genre classification is not confined to classificationists from the library and information science (LIS) domain; it is a well-established tool of literary analysis with a critical theory pedigree. This is reflected in the treatment of genre within the music domain. Thus, analysing the classification of genres from an LIS perspective will be within a context of genre being ontologically a categorization tool. Whereas the term “medium” is not unanimous – alternatives include instrumentation and executants – the concept of medium is agreed; form and genre do not share this unanimity, hence one task for this chapter is to consider what is meant by form and genre. While this chapter considers forms and genres, it does not do so in isolation: it considers the classification of forms and genres as a product of general ideas about genre categorization, as well as one dimension of a conception of music which also includes ideas such as medium.

This chapter is divided into three sections. The first section is concerned with form and genre as a concept and categorization system, and defines genre categorization for usage in this thesis. It summarises genre categorization as critical theory and within LIS, and considers forms and genres from the perspective of the music domain. Ideas of form/genre classification within LIS music classification are explored, considering how the form/genre facet presents itself in LIS music classification schemes. The second section explores a small selection of specific issues within the form/genre facet in order to look at places where the boundaries of the form/genre facet may be breached. An example of a genre with multiple subgenres is explored which also offers an opportunity to consider order within an array: opera. Medium-as-form/genre is explored, which considers music such as string quartets, and the idea of a “silent” form/genre. The final topic considers faceting’s extent, via the conduit of the symphony. The third section considers form/genre’s relationship to medium. The interplay between form/genre and medium is considered, including the inescapable vocal/instrumental divide; this brings

important issues to the fore concerning dependency of facets. Thus, the workings of form/genre as a facet and its wider contribution to the classification of music are laid bare.

1.1. Methodological considerations

A variety of sources are used in this chapter, many of which have been utilized elsewhere in the thesis. For instance, the three example classification schemes will be used as representations of LIS classification, backed up by most of the broader sample of 18 LIS schemes – for more details, see Section 1.3. Examples of 25 Grove composer worklists are used to analyse music domain classification of forms/genres; these worklists were also used in Chapter 5, Section 4.2 – for more information about these worklists, see Chapter 3, Section 4.3 and Chapter 5, Section 4.2. While the Grove worklists are very useful, they only demonstrate the form/genre categorization of works of an individual composer, which does not parallel the LIS classification schemes which cover all music. However, finding other, appropriate musicological taxonomies proved difficult: while musicologists refer to classification and taxonomies – a few examples of such taxonomies are discussed in Section 3.4 – it has proven surprisingly difficult to isolate actual taxonomies which work at a broad enough level to be useful for this chapter. (Other types of music-domain source, such as thematic catalogues, are discussed in Chapter 2, Section 4.2, which explain why they were not useful for this thesis.) So, in the absence of any additional collection of taxonomies, the Grove worklists will be used to illustrate form/genre.

1.2. The forms and genres included in this chapter

This thesis considers the classification of notated Western art music, and thus the forms/genres contemplated will be this particular conception and type of music. However, it is noted that the types of forms/genre and role of genre categorization may be different in other types of music. For example, in popular music, studying genre is of increasing importance and the industry of popular music is defined along genre's demarcations (Holt 2007, pp. 2-3). Furthermore, the categorization of genres of popular music has received much attention by the computer science community (through the study of Music Information Retrieval). So, as the forms/genres in popular music and notated Western art music differ, and the Music Information Retrieval specialism of computer science takes such a different methodological approach to this thesis, the categorization of forms/genres in musics outside of notated Western art music will be

largely ignored. One exception is for this chapter's discussion of the nature and conceptual background of genre; here, ideas from the sub-discipline of popular music studies will be utilized where relevant.

There is also a further complication concerning the different types of meaning conveyed by the terms "form" and "genre". The term "genre" can be used to describe types of music; examples include popular music, classical music and world music. These are terms especially associated with the music industry and music broadcasting: see for instance, the division of music in music shops, or the breadcrumbs used on *BBC i-player*. For the purposes of this thesis, though this use of genre is noted, it will not be explored further. Within a thesis focused on notated music rather than music-as-sound, and centred on Western art music, the demarcation of these broad "genres" are of little benefit as most of the music under discussion fits into one category: classical.¹⁶⁸

Individual types of music are another meaning to the terms "form" and "genre": examples might include symphony, opera, motet, overture, aria, song, operetta and string quartet. It is at this level that this chapter will focus. Whether these particular terms should be considered as forms, genres or neither will unfold within this chapter. Nevertheless, it is this type of meaning that is normally being evoked when the terms "form" and "genre" are used in this chapter.

The term "form" also has another musical meaning. This refers to the formal and structural qualities of a musical work, usually only apparent after analysis: examples include binary form, sonata form, rondo, and so on. Generally, these formal qualities are not a major factor in the classification of musical works within LIS, so these types of form are on the periphery of what will be considered in this chapter. However, these types of form will not be ignored entirely. To start, they do sometimes appear as facets in their own right: for instance, Redfern has both "major forms" and "minor forms" (1978, p. 22) in his meta-facets.¹⁶⁹ Furthermore, the division between *these* types of form and the form/genre types which are central to LIS classifications of music is not always clean; this will be partly addressed in Section 8, which discusses how a sonata

¹⁶⁸ Although sometimes classical itself has sub-categories within these systems, such as opera, choral, and so on, it is not felt that it would be useful to explore a few broad divisions. Furthermore, the theoretical constructs behind such divisions will emerge from the other discussions within this chapter, and the thesis as a whole.

¹⁶⁹ There is literary warrant for inclusions of these types of forms in classification schemes for music literature, as there is extant, monograph-length literature devoted to specific forms such as sonata form – see for instance, Rosen (1988). However, in these cases they are usually adequately treated as a subset of music theory.

form differs from a sonata within a discussion of the classification of symphonies. Therefore, this chapter's focus is on the form/genre types which define the whole composition, rather than the technicalities of how that particular form/genre is organized and structured (though the formal characteristics *will* be discussed if they are deemed relevant to classifying the universe of musical works).

1.3. Form and genre terminology within LIS

Although the type of forms and genres being discussed in this chapter has now been established, there is still a question of terminology. In other words, within LIS, are concepts such as the symphony, opera and sonata, under categories called form, genre, or something else? So, the three example classification schemes (BCM, Dickinson, Flexible) will be consulted, alongside 14 of the 15 set of broader schemes. Haroon's classification is *not* consulted, hence 14 rather than 15. The reason for this is its focus on non-Western music, making it unsuitable for analysis of forms/genres of Western art music. So, with the three example schemes added, this makes a total of 17 example schemes. In addition, the meta-facets systems (as seen in Chapter 4, Section 3.3) are also consulted. The results from this analysis are revealing.

In the 17 LIS schemes the most common terms used to describe collectively foci such as symphony and mass are "form" or "forms", with the terms "genre" and "genres" making no appearances. Examples of schemes using "form" or "forms" include Flexible, DDC22 and UDC. However, there are caveats. While some schemes used just "form" or "forms", others used compound phrases such as "form of composition", giving a slightly different insinuation to form(s) as a facet title. Additionally, some of these schemes wholeheartedly and consistently use "form" to describe individual foci, collective names for groups of foci, the name of the facet in the citation order, the concept being described in the introduction, and so on; whereas, others are more tentative and selective with their use of the terms "form" or "forms". For example, in the citation order in the introduction to BCM, the facet is labelled "form of composition" for musical works and "form" for music literature; in the schedules themselves, the term "form" is not used at all for musical works, whereas music literature has the labels "types of vocal music" and "forms of instrumental music". This demonstrates inconsistency on two planes (scores/literature and vocal/instrumental), and in the process showing the precariousness of labelling this nebulous aspect of music at all. Some schemes circumnavigate terminological issues by using no collective term for form or genre; this

solution can be found in Colon6, Ott, Cutter1902, DDC19, amongst others. Dickinson offers a total alternative to form-ish and genre-ish titles: the majority of foci such as symphony, mass, and so on, are housed in a facet entitled “species”.

Revisiting the terminology used in the three systems of meta-facets discussed in Chapter 4, Section 3.3, is also useful. The IAML facets decide upon “Gattung” for this particular idea; translations into English are not exact, but genus and type are typical translations, relating more to genre than to form. Redfern (1978, p. 22) uses the term “forms”. However, he divides his forms into two types (Redfern 1978, p. 22): major forms (for example, symphony) and minor forms (for example, binary form). It is useful to see a differentiation between these two types of thing which sometimes shares exactly the same name – see the discussion in Section 1.2. Therefore, in this chapter, Redfern’s differentiation of “minor forms” will be used to separate these from what Redfern calls “major forms”. Elliker (1994) decides that the question of form or genre is best resolved by adopting the term form/genre.

Thus, we can see that even within LIS classification schemes and metafacets there is not agreement on what to call the collective name for symphony, mass, and so on. While many classification schemes label these “form” or “forms”, some circumnavigate the problem of calling this phenomenon something and avoid a title. It is worth noting that while the LIS classification schemes avoid the term genre, which in a lot of cases might relate to the schemes predating the mainstream study of genres within the music domain, the IAML facet relates more to genre than form and Elliker wisely adopts “form/genre”. So, Elliker’s wisdom is adopted by this chapter and the non-committal term “form/genre” (or its plural “forms/genres”) will be used both for the facet and where the difference between “form” and “genre” is not central to the arguments.

2. Introducing form and genre

2.1. Genres and genre theory in critical theory

It is useful to briefly consider general ideas about genres and genre theory, as genres have spawned taxonomic discussions within critical theory and beyond. Theories of genre play an important role in understanding the concept of genre within a classification context for music. The study of genre has a long history. There are two main periods of genre-related thought: antiquity to late 19th and early 20th century, then

the early 20th century onwards (Tereszkiewicz 2014, p. 15). The late 19th and early 20th centuries see genres starting to be considered in the same way as biological species (Dubrow 1982, p. 7) – the seminal text was Brunetiere’s evolution of genres in 1890 (Frow 2006, p. 52) – which is why Gajda, according to Tereszkievicz (2014, p. 15), describes the succeeding period as “scientific”. This is a long way from genre’s origins as a pursuit within literature and rhetorics (Tereszkiewicz 2014, p. 15).

Defining genre is problematic (Dubrow 1982, p. 4). However, Frow (2006, p. 10) attempts it: “Genre, we might say, is a set of conventional and highly organized constraints on the production and interpretation of meaning”. He emphasises (Frow 2006, p. 10) that “constraints” in this context means structure, rather than restriction. So we can see that genre is about structure, and is also about setting rules of some description. Furthermore, Frow (2006, p. 51) also suggests that genre is about distinguishing things and about taxonomy – noteworthy for this thesis’ positing of genre as a facet. However, genre does not have a static meaning; Tereszkievicz, (2014, p. 15) suggests that while genre used to mean categorization by form and topic, this was no longer the case.

Therefore, we need to consider what makes up genre, and what genre is at a fundamental level. Even within only a select few sources about genre theory, many different ideas emerge about what genre actually is; these are not necessarily disagreements, instead, writers have different ways of describing genre. Frow (2006, p. 9) lists a number of things that constitute genre, including formal features, thematic structure, physical setting, “situation”, and more. It is noteworthy that form is part of the formal features of genre, and that some of the listed qualities are external to the text itself. Tereszkievicz (2014, p. 16) states that works of the same genre will have similarities in three areas: form, content and function. Note again the presence of form on this list, demonstrating that form is to some extent a subset of genre, and providing critical information about how form and genre fit together. The presence of function in this list is insightful. Furthermore, Tereszkievicz (2014, p. 15) suggests the historical importance of function to genre: function used to be the most important part of identifying genres. The importance ascribed to function by those considering genre is very useful to the situation of function as a facet, the topic of Chapter 9.

Those discussing genre also highlight how genre is dependent on extrinsic, not just intrinsic, features. For example, genre could be defined as the “relationship between

textual structures and the situations that occasion them” (Frow 2006, p. 13), positioning genre as a relationship between intrinsic and extrinsic features. The abstraction of genres is another demonstration of how intrinsic qualities do not, by themselves, constitute genre: Dubrow (1982, p. 14), quoting Guillén, reminds us that a genre is not a novel, but an *invitation to write one*. Dubrow (1982, p. 116) argues that it is how literature types interact with each other which is important, highlighting the importance of considering genres in the plural, rather than isolating one particular genre. Furthermore, Dubrow (1982, p. 116) discusses how genres have a complicated relationship to each other, and evolve and react against their “literary parents”; this again extolls the idea that to understand a genre it is crucial to consider multiple genres. If we took this idea even further, we could hypothesise that genre only exists in the context of other genres; this conceptualisation brings about issues with genre-as-facet.

This brief and somewhat limited foray into ideas about genre within critical theory reveal some useful points to consider when studying genre as part of music classification: genre is a compound idea, and its encompassment of form and function in particular, need careful consideration; genre is more than its intrinsic qualities, and how this impacts upon its position within a faceted classification system requires investigation; similarly, ideas about genre only existing in relation to other genres could have an impact on genre as a potential classification device.

2.2. Genres and genre theory in LIS

The possibilities of genre have not gone unnoticed by LIS scholars, and there has been a variety of research within the information field which considers various LIS phenomena through the lens of genre and genre theory. One prolific protagonist is Andersen – see for example, Andersen (2008, 2015a) – whose edited volume (Andersen 2015a) dedicated to genre theory within LIS is designed to produce a cohesive approach to genre within LIS. However, Andersen’s (2015b, p. 5) approach to genre is based on a seminal essay by Miller, which Andersen states moves studies of genre away from a focus on classification and form. Thus, from the perspective of this thesis, Andersen’s approach and demonstration of the potential of studying genre within LIS is not deemed to be useful, as it is precisely form and classification which are the useful elements to considerations of genre as music classification entity.

However, this is not the only type of usage of genre within LIS. Genre as it appears in art forms such as literature is considered by LIS scholars. For instance, Rafferty’s writings

develop new ways to consider the retrieval of fiction and are reliant on genre (see, for example, Rafferty 2010); within this discourse, the classificatory aspects of genre are part of the argument, and thus this discourse is aligned to ideas about genre within music classification. Therefore, it can be seen that music classification is not alone in considering the importance of this type of conception of genre in furthering our knowledge of LIS, and more specifically, within knowledge organization (KO).

2.3. What is musical form?

The next stage is to consider genre and form as specific musicological concepts, in order to ascertain how they fit into theories of music classification. The first part of this process is to look at how form and genre are defined in the music domain. Grove (Whittall 2016) defines form as the “constructive or organizing element in music”. This idea of form as the quality which builds musical works is ratified by other definitions; for example, Cole (1969, p. 1) defines form as “... the structural plan of a musical composition”, and “structure” is also used to describe form in *The Oxford Dictionary of Music* (“Form” 2015). The organizing element in Grove (Whittall 2016) and other definitions of form is noteworthy; the musical works themselves can be broken down into smaller units, and form could loosely be considered a quasi-citation order, which outlines how the parts of the composition are put together. Unsurprisingly, this idea of form as an organizing element is not limited to musical works; for instance, *The Oxford English Dictionary’s* (“Form, n.” 2016) definition of form that is applicable to literary and musical works (definition number 9) also describes form as an arranging and ordering process. Positioning form as structure and organization has other implications: it belies form as an intrinsic feature, rather than extrinsic. For if a musical work’s form can be determined by its internal logic, this suggests that contextual information or other works of the same form are not needed.

Another important idea emerges from musicological literature about forms: the relationship between form and content. (In these cases, content is assumed to be aspects such as medium, texture, and so on.)¹⁷⁰ For instance, *The Oxford Companion to Music* (Arnold 2016) states that “form cannot be separated from content”. Intriguingly, this parallels classificatory idea of dependence within faceted classification. So, “form” is dependent on another part of music, namely “content” and content includes medium;

¹⁷⁰ “Texture” is a loose term taken to mean how all the individual lines of notes intermingle with each other, for instance at the most basic level describing whether all the parts move together or separately; it is less concerned with sonority, such as whether a flute is playing or a violin or a soprano, which is more aptly described as “medium”.

thus, viewing this musicological idea from a classificatory perspective, “form” as a facet is *not* medium, but could be considered to be dependent upon it.

2.4. What is musical genre?

Genre is described by musicologists as being a kind or sort (Campana 2012, p. 202), a description backed up by general definitions of genre, such as *The Oxford English Dictionary* (“Genre, n.” 2015). Another idea expressed by musicologists is genre as category (Holt 2007, p. 2, Griffiths 2006); this is especially noteworthy due to the importance of categories to classification. The sociological parts of genre are emphasised by musicologists: for instance, Samson (2015) and Fast (2009) suggest that genres are related to social elements. Holt (2007, p. 3) suggests that genre is not just contained within the music itself, but within the social context of particular groups of people. This social aspect of genre could be important for classification, as it suggests that if genre were a facet, it would be dependent on a concept outside of that facet (namely, society and social aspects). It also contrasts with ideas of form, which are arguably mostly intrinsic, and appearing only within the musical work.

Musical genre discourse posits that genre includes a number of attributes and considerations. For instance, Dahlhaus (1987, p. 38) suggests that genre is made up of text, function, scoring and formal model. Translated into the terms used in this thesis, Dahlhaus’ concept of genre is that it consists of text, function, medium and form – see Figure 37. This is significant in a number of ways. First, Dahlhaus’ conception of genre is one where genre is compound, and can be broken down into smaller elements, where each of these elements is actually a different type-of-thing; this is noteworthy considering genre’s potential canonisation as a facet of music and how facets are traditionally defined. Second, the presence of medium in this list is particularly noteworthy, and echoes other theorists such as Samson (2015) who mention instrumentation in their definition of genre. Dahlhaus (1987, p. 40) goes further still, defining genre as the expected connection between form and medium (or as he puts it, “formal model” and “type of scoring”). So, within musicological definitions of genre, genre cannot be separated from medium. Whereas form might be dependent on medium, genre goes even further by describing genre as *containing* medium (Dahlhaus 1987). So, from (one) musicological perspective, genre *is* medium. This is highly significant for classificatory purposes as it contraindicates that genre and medium are separate entities.

Genre

Function
Text
Medium
Form

Figure 37. Dahlhaus' conception of genre (using LIS terms)

2.5. Historical development of musical forms and genres

It is important to note that composers' consideration and usage of genres has varied over time, and genre as a compositional feature is contingent upon the wider contexts of musical development at any given time. For example, in the years up to 1600, genres were defined by function, text and texture; whereas post-1600, medium and form define genres (Dahlhaus 1987, p. 33). The 19th century sees changes in the relative importance of genres, due to the rise in prominence of the individual musical work (Samson 2015): genre becomes less important than the individualisation of "the work" – see, for instance, Goehr (1994) for a critique of "the work", and the discussion about musical works in the Introduction to the thesis (Chapter 1, Section 2.3).

Genre is more comprehensively rejected in the 20th century (Lobanova 2000, p. 178). Dahlhaus (1987, p. 32) describes the mid-20th century as the "disintegration of genres". Part of that instability can be seen in the rejection of genre titles within titles of musical works in the 20th century (Lobanova 2000, p. 174); for instance, composers might give a work no genre name, select a neutral name such as "music", or else invent a highly specific genre name such as "aphorisms". While, the reasons for the changing fortunes of genres are outside the scope of this thesis, the consequences to LIS of the music domain's changing usage of genres are not. To start, there are practical implications: classifying a work with no genre or an invented genre within a classification system which uses genre as a facet, is difficult and can lead to unwanted cross-classification. If accepting all generic designations by composers, then the use of individual genres means potentially infinitely expanding classification schemes; however, this also asks questions about whether "genres-of-one" can be genres at all, if musical genre is defined as being about how works of the same genre relate to each other. So, the musical-historical narrative of a decline in genres in the 20th century and wilting of genre

as an evergreen part of musical compositions means the LIS construction of genre-as-facet becomes less stable.

“Form” has its own discussion points regarding musical history. The definition of form in *The Harvard Dictionary of Music* (“Form” 2003) argues that writings about form from 1700 to 1830 are the basis of our understanding and knowledge about forms, and that even 20th-century discussions about form will be dependent on writings from these earlier times. From a classification perspective, this could have serious implications for hospitality. If the LIS classification schemes emulate this historical approach to form, this could prove problematic for forms incubated in the 20th and 21st centuries. Another historical idea about forms is concerned with “prescribed forms”, which were a product of the 17th to early 20th centuries (“Form” 2006); prescribed forms provided the rules of composition for the composers, which were thus learnt by the listener (“Form” 2006).¹⁷¹ However, those studying music no longer necessarily subscribe to ideas of abstract types of form. For instance, Bonds (1991, pp. 14-16) suggests that the label “sonata form” is not something musicologists will commit to in the later 20th century. The decline in usage of types of forms is important for this thesis, as it asks the question, can a facet of music such as “form” be based on a principle that musicologists no longer value?¹⁷² It seems that history and fashion in a small way debases form and genre’s application in to the realm of facets.

2.6. Classification of form and genre within the music domain

Classification is part of musicological discussions about form and genre. In fact, some sources imply that form and genre are so likely to be discussed primarily in terms of classification terms, that they explicitly state that genre has a world outside of taxonomies; for example, Everist (1994, p. 149) says that genre is not only “simple taxonomies” and Grove’s entry for genre also emphasises genres’ reach beyond taxonomies. However, the form/genre and classification connections wax and wane over time. For example, Grove (Whittall 2016) suggests that writings about form became more likely to concern categorization over time. Therefore, studies of form and

¹⁷¹ This is close to the idea of “genre expectations” found in genre theory and ideas of genre within musicology. The key difference seems to be that the focus in prescribed forms is on the composer, with an almost unintentional side-effect of listener knowledge of the rules. Genre expectation puts the listeners at the centre, rather than the composers.

¹⁷² Note that this is a slightly different issue from the 20th-century-genre-dilemma. In the case of genres, the problem is that genres are no longer used in compositions; in the case of forms, it is the theoretical consideration of form which becomes unfashionable, rather than any part of the composition themselves.

genre have a close association with classification, but more contemporary music thinking is to move beyond categorization as form and genre's only asset.

However, attempts to locate general taxonomies and classifications of forms or genres for this thesis were unfruitful. At a finer level of granularity, examples were found. For example, Everist (1994, p. 75) discusses the classification criteria used for vernacular motet – such as people who encouraged a particular style of motet (for instance, “Petronian”), type of notation, language of text, style, and so on; while Everist (1994) later dismisses these criteria as unhelpful and proposes his own concept of genre later in the book, it is interesting to note how this taxonomy acts at a fine level of detail. Burkholder (1995) produces a different sort of taxonomy: a categorization system of types of musical borrowing in the music of Charles Ives. Furthermore, strengthening the position of this taxonomy, Burkholder's taxonomy (1995) was also utilized and adapted for a work about borrowing in another composer, Erik Satie (Hare 2005). As well as being about specific composers, the “borrowing” taxonomies are related to musical processes below the structural outlines of form/genre. These examples demonstrate two salient points: the importance of taxonomic thinking for those analysing musical compositions and how domain-created taxonomies of music are at a generally finer level of granularity than their LIS distant cousins.¹⁷³ This means that when examples of classifications and taxonomies from the music domain are needed for this chapter, a few things happen. First, if appropriate, Grove worklists are used as a source of information about classificatory thinking. Second, while general taxonomies of forms/genres prove elusive, where classifications are required within a particular form/genre – which is the case for opera – then classificatory thoughts and groupings are elucidated from the music domain instead.

3. The facet of form/genre in LIS classification schemes

3.1. What is form/genre as a facet?

The importance of the facet of form/genre was laid out in Chapter 4. The next task is to investigate what this facet might mean in practice within the LIS realm. Chapters 5, 6 and 7 of this thesis have explored the facet of medium, and these revealed that the

¹⁷³ Interestingly, the type of form that is not being examined in this chapter – the minor forms, such as binary form and sonata form – do have clear taxonomies at macro level in musicological discourse, even appearing as such in dictionaries and encyclopaedias. For instance, *The Oxford Dictionary of Music* (“Form” 2015) lists six fundamental categories for the form of music: simple binary form, ternary form, compound binary/sonata form, rondo form, air with variations, fugue.

medium facet is an umbrella for a number of different aspects, sometimes pertaining to independent sub-facets. Hence, it would be useful to consider whether the form/genre facet behaves in a similar way.

BCM provides a useful comparison between the makeup of the medium and form/genre facets: there are no citation orders in the introduction to BCM for forms/genres, as there are for medium. Considering the separate types of information discussed in Chapter 6, and considering whether there are form/genre equivalents confirms the singularity of form/genre. Expressing the medium of a musical work will often rely on expressing multiple instruments/voices; conversely, while some musical works are considered to be a fusion of two genres from a musicological perspective – for instance, Berlioz's *Roméo et Juliette* – the LIS classification approach is usually to decide upon one form/genre rather than adding two together. “Extremity” is usually transfigured into “novelty” for forms/genres; in LIS classification terms, the solution is again to decide upon one form/genre rather than allow the classifier to add or combine forms/genres. Arrangement is interesting for forms/genres: for example, a work for violin in the form/genre of a “fantasy” which is taken from themes from the form/genre of “opera” would be an example of such a work. However, while the change in medium from orchestra/chorus/vocal soloists to violin solo/piano or orchestra might be reflected in the classification of this work in an LIS scheme, there is not usually a systematic way of reflecting this form/genre transformation. (There may be a separately listed focus of “opera fantasies” within the permitted forms/genres for solo instruments, but it is unlikely there will be anything in the citation order reflecting a *systematic way* of building transformed forms/genres.) The conceptual basis of accompaniment as one foci being dominant over the other can occur for forms/genres, but again usually would be expressed as a single foci in LIS classification. Therefore, to answer the question of what is form/genre as a facet, it appears to be a significant facet of music, where the form/genre of a single musical work is represented by a single focus.

3.2. The temporal perspective within the form/genre facet

Time and evolution play an important role in the discussion of genres. Within general genre theory, Todorov (1990) suggests that the time of writing can create different perspectives about a genre; for instance, 19th-century genres are not as appreciated during the 20th century, when the idea of genre itself became less popular (Todorov

1990, p. 13). Dubrow (1982, p. 117) discusses the evolution of genres and how parent and child genres can live on simultaneously. Ideas of time and genre are echoed in musicological thought. For instance, Dahlhaus (1987, p. 33) suggests that the usage of various musical genres and views about particular musical genres change over time; Rosen (1988, p. 3) compares the development of genres to biological development – albeit while denying that the sonata form takes on such a journey – thus linking into general comparisons of genres and biological thought. Jones (2003, p. 178) taps into an important idea within musicological accounts of genre, relating to sudden creation versus slow and organic evolution: he suggests that we seek a specific moment when a genre is born, but in the case of the string quartet this is 19th-century idealism triumphing over the 18th-century reality (Jones 2003, p. 178). Thus, we can see that to the study of genres, time is important and genres evolve. So, how is this temporal aspect reflected in LIS classification schemes?

The LIS schemes demonstrate varying ideas about time and temporal perspective – these ideas relate to the evolution of instruments and representations of obsolete instruments, as discussed in Chapter 7, Section 4.1. LIS classification schemes have a temporal quality of their own as they have all been written (or edited) at a particular time; yet, as discussed in Section 2.5, genres are born, evolve and sometimes even die. So, what it is interesting to ascertain is whether the LIS schemes show awareness of being positioned in time, and how they deal with representing multiple time periods simultaneously.

Some schemes make specific mention of time, either by stating that at a particular form/genre is “old” or “new”. For instance, UDC has classes for “Older ballroom dances” and “derived from early dances”. This shows some positioning of this scheme within a certain timeframe; the timeframe is merely more recent than “older”, and later than “early”. Other schemes represent the same idea but use newer music. For example, Olding has a class for “Modern popular dance music”; this presents an interesting conundrum. Say a library uses Olding for 200 years. Should all the music within the class for “Modern popular dance music” stay there for 200 years, or be moved to another class at an unspecified intervals when “modern” is no longer the music’s correct descriptor? While this highlights the issues with using relative rather than absolute words for current music, it also reflects something important: Olding

assumes that his scheme is for classifying today, rather than tomorrow or yesterday.¹⁷⁴ Thus, in these cases forms/genres reveal that these schemes are anchored at a specific moment in time.

Other LIS schemes reveal their temporal perspective by including forms/genres which are not generally composed within the lifetime of the scheme. For instance, DDC22 lists frottole and villancicos as part of a class for madrigals; however, by even the first edition of DDC in 1876, frottole had long been superseded by another form/genre (the madrigal) and villancicos had declined earlier in the 19th century. Therefore, as well as the inclusion of such forms/genres, the treatment of these forms/genres within the scheme can help pinpoint DDC22's consideration of time. So, DDC22 represents music of earlier times, not just the music written at the time of the scheme's creation. As DDC22 places these forms/genres within the main part of the schedules, rather than a specially-labelled "obsolete" section, it can be seen that DDC22 takes the perspective of all times at once, ignoring current-ness. Flexible shows an opposite approach: troubadour songs, lays, and minstrel songs –three forms/genres associated with various periods in the 12th to 15th centuries – are all confined to a class called "historical songs" (-646). In this case, the inclusion of the older forms/genres yet categorization between historical and current, shows how Flexible's temporal perspective is that of a specific time. Thus, the choice and position of certain forms/genres can reveal a scheme's temporal intentions. See Figure 38 for a summary of three types of temporal perspective. (Note how this table could also be applied to the musical instrument discussion in Chapter 4, Section 4.1., concerning obsolete instruments and temporal perspectives.)

¹⁷⁴ Bliss1 presents a similar issue as it has, for example, a class entitled "Modernist Music, "New" Music" (Bliss 1953, VXPW) within the forms/genres given for instrumental music. While modernist music can be explained away as a specific movement (Modernism) which has a start and end (of sorts), any idea of "new music" shares the same difficulties and questions as Olding's terms.

Temporal perspective	Forms/genres included	Position and direction of classifier
Current only	Current	Date of scheme creation/edition, looking at present day only
Specific time	Historic and current	Date of scheme creation/edition, looking backwards
All-time	Historic and current	No fixed position, looking everywhere

Figure 38. Types of temporal perspective

There are other ways in which schemes can reflect their temporal perspective. For instance, Flexible also makes good use of historical-stylistic adjectives before some forms, such as “Classical symphony” and “Baroque sonata”; this both acts as a fixing of temporal perspective – standing very much at the present, looking back upon the Classical symphonies of the 18th century, for instance – as well as promoting history as a facet under forms/genres. To makes matters more murky, sometimes the same scheme can occupy different temporal perspectives; for example, while DDC22 takes an all-time approach to certain historic vocal forms (see above) it also includes a specific section for 19th-century dance forms including waltzes, which means the classifier is firmly placed in the present.¹⁷⁵

Therefore, genre’s position as an evolving entity is met with different approaches and solutions by LIS classification schemes. Some LIS schemes clearly demarcate the generally historical, while other schemes subtly group together those forms/genres which are no longer current. Sometimes current-ness is ignored with genres of all times treated equally, while at other times it is an important ordering device within a scheme. It is clear that time is an important part of genre categorization, and is also plays an important role in the construction of music LIS classification schemes. So, genres evolve over time and LIS classification deals with this temporal invasion in different ways.

¹⁷⁵ Future research could also compare how LIS schemes treat historical instruments with historical forms/genres. This would ascertain whether a certain temporal position is ingrained within all parts of a scheme, and determine whether the temporal perspective was within the bones of the scheme or merely a clothing which can be changed at will.

3.3. Some notes about order of foci within the form/genre facet

Unlike the complexities of the medium facet, the form/genre facet is usually a single level, thus discussing the order of foci in this facet does not involve sub-facets, and such like. The three example schemes provide a useful starting place to consider general trends in the order of foci within form/genre facets, as well as considering examples from the 14 other LIS schemes considered in this chapter. First, the order of foci tends to depend on other facets; for example, schemes will divide the list of forms/genres into vocal and instrumental, and will often also have divisions based on function. Both these concepts are discussed in detail in later sections and chapters (Section 7.1 for the vocal/instrumental categorization and Chapter 9 for function-based categorization) so will not be discussed further at this juncture.

Second, the 17 schemes sometimes showed a sense of order other than alphabetical, even within these categories. Typically, the order of instrumental foci prioritised larger-scale forms/genres such as the symphony and the sonata: for instance, Olding gives the symphony its own class, which even comes before a general class for orchestral music; Cutter1902 mentions only two types of forms/genres for instrumental music, one of which is symphonies; Bliss1 starts its list of orchestral foci with symphonies, followed by sonatas. So, it appears that not all (instrumental) forms/genres were created equal. Interestingly, the privileging of specific instrumental forms/genres does not appear to be one of Vickery's (1975, p. 26) list of eleven ways to order classes to achieve what is known as a "helpful order";¹⁷⁶ for example, putting a symphony or sonata near the beginning of the list is neither chronological or developmental, nor can it be adequately described as an order by size. Instead, it could be seen as echoing the musicological prioritisation of certain "serious" genres associated with absolute music designed for the concert (such as symphonies, sonatas) over those which could be considered programmatic (such as fantasies, suites) or associated with a non-concert function (such as marches, dance forms). Thus, the order could be described as "musicological", where the order is part of musical aesthetics.¹⁷⁷

¹⁷⁶ Vickery's list uses nine orders stipulated by Cushing Richardson, plus adds on three more orders mentioned by Ranganathan (Vickery 1975, p. 26).

¹⁷⁷ Foskett (1996) gives a different list and description of helpful orders and one of these is described as "Preferred category" (Foskett 1996, p. 150). An order based on "preferred category" puts the one or two foci that are most likely to interest users at the top of the list (Foskett 1996, p. 150). So, we could see the treatment of symphonies and sonatas as a reflection of the priorities of users; however, even the users' wishes could be seen as a reflection of musicological order, with the users' wishes acting out the priority of forms/genres seen in musicological thought.

4. The subgenres of opera

To explore the classification of forms/genres further, three specific types of form/genre will be considered. The first of these is operas, which will be explored as an example of the quantity, type and order of divisions within a particular form/genre. From the perspective of the music domain, there are numerous types of operas: for example, Campana (2012, p. 202) uses the example of Grove having entries for over sixty types of opera, and also suggests that there are even more types of opera contained within Wikipedia. This is a significant piece of information for LIS scheme analysis, for we would expect this prolificacy of opera types to be represented in classification schemes. It is also useful to consider musicological ideas about the categorization criteria used to divide up different types of operas. For example, Campana (2012, p. 204) discusses this issue in conjunction with the opera-types found in various musical dictionaries; she (Campana 2012, p. 204) states that the different opera type titles can refer to different types of information, such as formal qualities, subject, medium, historical aspects, and so on. First, this demonstrates musicological interest in how operas have been categorized. Second, Campana's list of aspects suggests opera-as-genre rather than form – see for example, musicological determinations of the aspects making up genre, as discussed in Section 2.4.

Considering how LIS classification schemes categorize types of opera reveals a startling piece of information: some LIS schemes do not categorize opera at all. For instance, LCC2015 is generally an extremely detailed enumerative classification scheme both for mediums and forms/genres; yet, it does not choose to list categories for types of opera nor separate opera from other musical-dramatic musical works. LCC2015 is not alone: this treatment of opera categories is also followed by DDC19. Some LIS classification schemes reflect their distaste for opera categorization explicitly: for instance, Expansive and Olding both state that they do not consider dividing opera into subcategories to be a useful activity (Cutter 1891-1904, vol. 2, p. 14, Olding 1954, p. 16). Even where LIS schemes have opera classes, such as DDC22 and BCM, very few are listed. Therefore, it seems that in the relative importance of categorization of opera, the LIS and music domains are in disagreement.

However meagre the pickings of opera categories, the LIS classification schemes which do include these are still useful as a starting point for considering how this form/genre is classified within the LIS domain. Eight out of the 17 example LIS classification schemes

considered in this chapter contain types of musical-dramatic works, and these are listed in Figure 39. (Note that to avoid having to determine the nebulous boundary of opera and not-opera, all musical-dramatic works are included. In addition, some schemes provide subgenre information in multiple places, so where this is an issue the source is specified in the heading for the scheme in Figure 39.) The types have been placed in alphabetical order in order to avoid imposing a list of priorities on the data, and all types have been translated to their singular form. Though the sample of eight schemes is far too small to get statistically-relevant data, it does give some ideas about the types of music drama and their relative importance to LIS schemes.

Unsurprisingly, “opera” is the most common type. Following this are “operetta” and “revue”, closely followed by “comic opera” and “opera buffa” (another term for which is “opera bouffe”). The popularity of “operetta”, “comic opera” and “opera buffa” is interesting; they are all works which emphasise the light or perhaps the comic. “Opera buffa”, in particular, is partly defined by its opposite number and 18th century nemesis, opera seria.¹⁷⁸ Thus, the most common subgenres of opera witnessed in these example schemes are concerned with separating out the comic from the serious, even where the precise subgenre varies. It is also interesting to note the lack of coherence represented by these schemes; out of 27 listed subgenres, 11 appear in only one of the eight schemes. While six of these 11 “single-appearances” are from one, particularly detailed scheme (Flexible), five other “single appearances” occur in schemes other than Flexible, suggesting the idea of “single appearance” subgenres cannot be dismissed as the consequence of a single “rogue” scheme. Thus, the non-conformity of the subgenres within the LIS classification schemes could be interpreted as a manifestation of the chaotic musicological genre categorization of opera described by Campana.

The LIS classification schemes demonstrate that numerous different criteria are being used to categorize the opera-types. Some separations are based on form, such as “comic opera” and “opera buffa”; whereas other subgenres are delineated by their

¹⁷⁸ It should be noted, however, while opera buffa and operetta have some similarities they are considered to be separate subgenres (Bartlet 2016, Lamb 2016), whereas comic opera is considered a non-specific designation which might refer to an opera bouffe or operetta (“Comic opera” 2016). In addition, some of the divisions between these three types might be based on how much of the work is sung, but this itself can depend on the nationality of the opera. The musicological nomenclature and genre divisions are outside the scope of this LIS thesis; however, needless to say, they are not clear-cut.

time-period, as they only exist in certain historical periods within opera's history, such as "opera seria", "opera semi-seria" and the non-opera genre of "musical". "Zarazuela", "Singspiel" and "English comic opera" represent categorization by national school (Spanish, German and England respectively), and "opéra comique" is categorization by a specific opera house in Paris – perhaps taking categorization by geographic location to its natural limit. "Operas for children" represent categorization by audience, while "music dramas of Wagner" suggests a subcategory based on musical output of only one composer. Therefore, the example LIS schemes concur with the musicological idea of multitudinous categorization principles used to classify opera.

	BCM	Dickinson	Flexible	UDC	Subject	McColvin and Reeves	DDC22	Bliss1 (VXLA only)
Ballad operas							Y	
Burlesque operas and scenes		Y						
Children's operas (= + scenes)		Y	Y					
College and school operas and scenes		Y						
Comic opera				Y	Y			Y
English ballad operas or musical plays	Y				Y		Y	
Grand opera				Y	Y			Y
Great operetta			Y					
Light opera						Y		Y
Minstrel show music		Y						
Music dramas			Y					Y
Music dramas of Wagner								Y
Musical comedies			Y			Y		
Musical plays for children	Y							
Musicals			Y	Y			Y	
Opera	Y	Y	Y			Y	Y	
Opera buffa (= opera bouffe)			Y	Y				Y
Opéra comique	Y			Y				
Opera semiseria			Y					
Opera seria			Y					
Operettas	Y		Y	Y	Y			Y
Revue	Y		Y			Y	Y	Y
Singspiels			Y				Y	

Small opera, chamber opera, intermezzo, other operas			Y					
Small operetta			Y					
Variety			Y					
Zarzuelas							Y	

(Note that apart from changing some plurals to singulars, the classes have more-or-less been taken as found in the classification schemes. Where there are different class names but direct equivalents, these are represented by the “=” sign).

Figure 39. The subgenres of operas in LIS classification schemes

However, Figure 39 and the associated discussion is a somewhat simplification. In reality, the LIS classification schemes also illustrated relationships between the subgenres. Sometimes classes were labelled as multiple subgenres; for example, McColvin and Reeves has a shared class for light opera, musical comedies and revues. This could represent a number of different things; for instance, there is no space in the schedules to have each type of opera in its own class, or that the two types of opera are considered to be more-or-less equal. It could represent issues with genre boundaries, with classification scheme authors preferring to place similar subgenres of opera in the same class rather than battling nebulous boundaries. The LIS schemes also demonstrate a few hierarchical relationships between subgenres of opera; in particular, Flexible often has an extra level of hierarchy which sees subgenres such as “great operetta” as a child of the subgenre of “operetta”. This shows how operas can potentially contain multiple levels of hierarchy within the overarching foci of “opera”. So, far from being a linear list, the LIS classification schemes show how subgenres of opera are part of a web of relationships with other subgenres of opera.

This discussion of subgenres of operas has highlighted a number of useful points. First, the LIS classification schemes show that rather than being a single linear list of foci, subgenres of operas are a multi-levelled set of foci with various types of relationship between different foci. This gives insight into one small part of the form/genre facet. Second, the representation of subgenres of opera is relatively low in the example LIS schemes, especially compared with the number found within the music domain. This discord between LIS and music classification could be due to the finer levels of detail found within music classification, as compared to LIS. This is similar to the findings of Chapter 7, where classification of instruments within the domain of music acted at a finer level of detail than within LIS. Third, the multitudinous types of categorization

methods used within the genre of opera found within LIS echoed the music domain, showing similarity between both domains' versions of classifying opera. Fourth, notwithstanding the variety of subgenres, there appears to be an important loose division between dramatic and comic within the LIS classification schemes.

5. Medium as form/genre and the silent form/genre

As discussed in Chapter 4, the standardised approach to classifying music is a combination of medium and form/genre. However, there is a phenomenon which can potentially wreck the simplicity of the medium and form/genre duality: no form/genre.¹⁷⁹ As discussed above, provocations to the boundaries imposed by forms/genres were common by composers in the 20th and 21st centuries. Lack of form/genre is not limited to modern times: this section is going to focus on the common string quartet, a type of composition which came of age in the 18th century.

The string quartet is defined by Grove (Eisen, Baldassarre & Griffiths 2016) as “A composition for solo string instruments, usually two violins, viola and cello”. So, the string quartet has a fixed musical medium. Thus, the string quartet’s medium separates this type of composition out from all the non-string-quartets. The problem is, while “string quartet” can describe a musical work’s medium, the term “string quartet” is also used as a type of form/genre. For instance, the Grove entry for genre discusses string quartets as an example of a genre (Samson 2015). Even within the same source, there can be confusion as to whether “string quartet” is a medium or a form/genre; for instance, while the preface to Stowell’s edited tome on string quartets (Stowell 2003, p. 7) describes the string quartet as a medium, on the same page the string quartet is described as a genre. Griffiths (1983, p. 7) directly specifies the medium/genre conundrum, even throwing in form to the mix: “... only the string quartet is at once a medium and a genre, even a form”. This simultaneously provides both comfort and concern: comfort that the chameleonic qualities of the term “string quartet” are identified within the music domain, and concern that the classificatory tenets of music having two basic qualities have just come tumbling down.

¹⁷⁹ It is an interesting question whether it is possible to have a musical work with no medium; for example, aleatory approaches to medium in the 20th and 21st centuries or the infamous example of Cage’s *4’33”* might be suitable candidates. However, even in Cage’s *4’33”* where a medium is specified but does not play (piano), there is still an actual medium too (random, non-instrument noises) even if it is not directly specified.

Considering how LIS classification schemes treat the form/genre of string quartets provides some insights into this conundrum. In Subject Classification's instrumental chamber music section, which includes string quartets, the following happens: whereas most broad groups of medium in Subject, such as orchestral music and solo instruments, list forms/genres to be added to those mediums, the chamber music section instead lists "quartets", "quintets", and so on. The term "quartets" could be read as dyadic in this context. "Quartets" is the literal meaning of four players, and thus referring to musical medium; "quartets" is also used in the position of a form/genre, and therefore could be read as the form/genre. The form/genre of the string quartet in Subject is *silent*. DDC22 offers a different perspective. In DDC, it is possible to add a form/genre to the medium of string quartet if so-desired, such as "scherzo" or "nocturne"; however, it is equally possible not to add any form/genre for the medium of string quartet. The possibility of adding a "scherzo" or "nocturne" as the form/genre, suggests that "string quartet" is not a form/genre; however, in the cases where there is no other identifiable form/genre, where does this leave the string quartet? The answer is a string quartet is again classified as medium-plus-nothing. Thus, as well as showing the potential for a silent form/genre, DDC22 also confirms that the form/genre facet is entirely optional.¹⁸⁰

These two example schemes demonstrate different conceptions of string quartet form/genre, which also offer insights into the classification of forms/genres more generally. First, the form/genre can be replaced by a term representing the medium, as seen in Subject; this could be considered as realising the music domain discussions about string quartets, where information about medium *is* the form/genre. A victim of the string quartet as both medium and form/genre is the dependency of the medium and form/genre facets. For how can medium and form/genre be entirely independent if the value of the foci in one (string quartet, in medium facet) is shared by the other (string quartet, in form/genre facet). Second, form/genre is optional, as seen in DDC22; no value of foci has to be entered for form/genre. While this might be expected within faceted classification, because it is the usual practice for foci to be used only when there is information to give, it is noteworthy from a music classification perspective. Smiraglia (Smiraglia, Young 2006, p. 7) argues that music classification has to use medium and form/genre to organize music because music *is* medium and form/genre: so, within this fundamental conception of music, is something still music when there is no form/genre?

¹⁸⁰It is interesting that the LIS classification schemes did not circumnavigate the string quartet situation by asking classifiers to repeat the information "string quartet" in form/genre if it appeared in medium

Finally, this section has discussed string quartets as a good example of the silent form/genre. In some respects it is not a typical example due to the prolificacy of this particular combination. In order to investigate another aspect of string quartet classification, the string quartet will be compared with an example taken from the broader reach of chamber music: a work for violin and viola.¹⁸¹ As discussed above, string quartets can be considered to have a form/genre which can only be described in terms of their medium; however, they do have what can be identified as a genre. This genre manifests itself in a many different ways: the long history of the string quartet, the compositions that push towards the boundaries of audience expectation of a string quartet, the existence of performing groups who spend their careers playing mostly string quartets, and so on. Hence, there is a genre “string quartet”, but it is tied up with its medium. As discussed in Section 2.3., form concerns different qualities to genre; the qualities described above concerning string quartets suggest a genre, rather than a form, showing a significant split between form and genre.

When comparing string quartets to duos for violin and viola, it seems that the duos have few of the string quartets’ genre qualities or if they exist they are more diluted; for instance, taking a specific example of Mozart’s duo for violin and viola, there are fewer audience expectations of how Mozart’s work will unfold, because the audience is less likely to be familiar with other works calling themselves “Duos for violin and viola”. So, comparison between music for string quartets and music for violin and viola demonstrates some pertinent points. LIS schemes generally appear to treat all music for string ensembles (and usually other types of ensembles) in the same way concerning generic designation; in other words, the string quartet and the duet for violin and viola would have the same treatment of form/genre, belying the variation between their musicological consideration of being a genre or not. Therefore, as duos for violin and viola do not have a separate genre identity and LIS schemes do not differentiate between string quartets (which arguably have such an identity) and duos for violin and viola, two options remain. The lack of form/genre information for string quartets and violin and viola duets in LIS classification schemes might be a reflection of a silent genre which is not always activated in classification terms or else medium can always be used to define genre.

¹⁸¹ The terms “duet” and “duo” will be used interchangeably for works using this medium.

To summarise, two things about string quartets and other types of string ensembles are clear. First, LIS classification of string quartets (with help from their friends) reflects the confusion concerning form/genre found in music domain discourse. Second, string quartets illuminate the weakness of the medium and form/genre duality as laid out in LIS music classification discourse, in addition to dismissing any notion of independence of the medium and form/genre facets in the process.

6. Symphonies and “orchestral sonatas”

The symphony is a musical form/genre of major importance to the study and performance of music. Its medium is usually orchestra, or some variation thereof. The dependency of symphony on an orchestral medium is a vital issue, and will be discussed briefly in this section and in more detail in Section 7. The role of this section is to consider the symphony as a concept, and ask whether in classification terms, this type of work could be considered a combination of medium and form/genre instead – namely, orchestra plus sonata.

The first task is to consider, briefly, whether there is any *structural* justification for considering symphonies and sonatas as relations at all. In terms of overall structure, there are strong similarities between both types of composition. The sonata typically has three movements (Mangsen et al. 2014) while most symphonies have four (Leichtentritt 1956, p. 170);¹⁸² the difference between the three-movement and four-movement structure is usually a second or third movement in the dance forms of the scherzo or minuet (Leichtentritt 1956, p. 121, although note that Leichtentritt is collectively describing a number of forms in this description under the banner of “sonata” including the sonata and symphony). Furthermore, the structure of the first movement of a symphony in both types of composition is typically “sonata form”, described by Rosen (1988, p. 1) as “... a three-part form, in which the second and third parts are closely linked so as to imply a two-part organization”. (Confusingly, the form in “sonata-form” refers to what Redfern (1978) would term a “minor form”, in other words, the structure underpinning a part of a work rather than the whole work. The musical differences between minor forms and the form/genre being discussed in this chapter are outside the scope of a LIS thesis.)

¹⁸² Note that the four-movement symphony is time-bound: symphonies written before around 1750 – perhaps more accurately described as proto-symphonies, as the term “symphony” itself changed its meaning over time – would more typically have three movements (Cuyler 1995, p. 11).

Some musicological works treat the symphony as a type of sonata. For instance, Leichtentritt's (1956) work about form includes a section entitled "The sonata" which discusses the symphony (as well as other non-sonatas). In addition, concertos are described by Leichtentritt (1956, pp. 170-171) as "A sonata for a solo instrument with orchestral accompaniment", an opening gambit for sonata's acceptance and applicability to any type of medium. The term "orchestral sonata" is not common – see for instance, a search of this term on RILM – but it is not completely without precedence. For example, Stephan (1981, p. 391) uses the term "Orchestersonate" in passing to describe the forms used by Mahler and his contemporaries. However, there are many musicological arguments which prevent orchestral sonatas equating, even in broad terms, to symphony. For instance, Rosen (1988, p. 14) suggests that there were functional and social differences between sonatas and symphonies: while symphonies had a previous existence as a court composition before their reinvention as concert works, the sonata was according to Schulz (writing in the 18th century) "pure instrumental expression" (Rosen 1988, p. 14). Moreover, Rosen (1988, p. 14) considers symphonies' dark history as court music to be the reason why the form became known as sonata form not symphony form. From a categorization perspective, this suggests that the difference between sonatas and symphonies is extraneous factors, rather than the works' intrinsic qualities. Translated to a classification environment, the foci in a form facet would be the same for symphonies and sonatas, but the extra qualities that genre reflects would see sonatas and symphonies assigned to different classes within a genre facet.¹⁸³

Attempting to classify a symphony as an orchestral sonata in the 17 example LIS classification schemes was revealing. Although no scheme specifically omitted symphony in order that a symphony could be described as a combination of orchestra (medium) and sonata (form/genre), some interesting ideas emerged in the process. The difference between foci seemingly in the same facet starts to surface. In Subject Classification, a piano sonata is indicated by combining the medium of "piano" and adding the form/genre "sonata"; however, symphonies are kept entirely within the

¹⁸³ It is also useful to ask whether there are any musical works which call themselves "orchestral sonatas". Searching resources such as RILM, COPAC and Grove suggest that this exact term is rare; however, there are a few works with this exact or close designation by 20th and 21st century composers such as Colin Matthews and Werner Egk. For example, Matthews' *Sonata No. 5: Landscape: for orchestra* (Matthews 1984) and *Monody: Canto, Ostinato, Threnody: Sonata No. 6 for orchestra* (Matthews 1989), and Werner Egk's *2. Sonata für orchestra* (Egk 1970), although note that in his programme note for the *Sonata No. 5*, Matthews (Faber Music 2016) states explicitly that his designation of sonata does not mean the work will have a "sonata-like form or shape".

medium of orchestral music. So, in Subject there is nothing to prevent a classifier adding “sonata” to “orchestra” in the same way that they could add “sonata” to “xylophone”; however, a classifier would not do this because – understandably – “symphony” is covered elsewhere in the scheme. However, technically, “sonata” can be added to “orchestra”, whereas “symphony” could not be added to “piano” or “xylophone”. This suggests a difference between the type of information that is purveyed by “sonata” and “symphony”. “Sonata” is treated as a form, while symphony is being treated as a form which has expectations of a specific medium. We could call this “genre”. (Note that while Sections 2.3 and 2.4 discussed the connections between medium and form, and medium and genre, the former represented a connection while the latter concluded that genre *was* medium and other things.)

Other schemes treat sonatas and symphonies in a more equable fashion. For instance, Flexible and DDC22 place sonatas and symphonies near to each other and surrounded by forms that are associated with instrumental music of all mediums. Thus, the type of (instrumental) medium has no bearing on the ordering or grouping of the forms/genres. Like Subject, neither Flexible nor DDC22 place any barrier on adding the form/genre “sonata” to the medium of “orchestra”. DDC22 goes one stage further: there is an example under “Instrumental forms” (784.183-784.189) which is a “symphony” for a solo instrument (Widor’s *Symphony No. 5 for organ*), demonstrating how “symphony” can be added to “organ” (Mitchell et al. 2003, vol. 3, p. 683). This could be read as DDC22 treating both “sonata” and “symphony” as forms, as the terms are used in a way which suggests no information about the nature of the medium (other than the fact each medium is instrumental). BCM demonstrates even more blurring of sonata/symphony lines – albeit, the reason may be a pragmatic one based on available space in the schedules. BCM places sonatas and symphonies in the same class (Coates 1960a, p. 38, Auxiliary table 1, Class E). Thus, in BCM a symphony is automatically an orchestral sonata, and vice versa.

Considering the symphony as an orchestral sonata reveals some important points. First, in some LIS classification schemes (for example, Subject), there are small signs of dependency between medium and form; not the dependency between the vocal/categorization and form/genre as discussed in detail in Chapter 5, instead dependency between broad size of instrumental medium (group or solo/ensemble) and available foci for forms/genres. (This dependency will be discussed in more detail in

Section 7.2.) If the “symphony” in Subject Classification was viewed as a genre, then this scheme realises Dahlhaus’ (1987) statement from the music domain, that genre is the expected connection between form and medium. Second, some LIS schemes show independency of medium and form/genre instead, allowing for orchestral sonatas and organ symphonies, and keeping sonatas and symphonies close in the schedules. Thus, it could be argued that LIS classification schemes do not agree with each other in terms of whether the broadly-termed “form/genre” facet is actually forms, genres or a mixture of both. Finally, no LIS classification schemes actually chose to present orchestral sonatas instead of symphonies, even when there was a facility in the scheme to do so. While this could of course be read as a reflection of the music domain literature which acknowledges the close connection between the two forms/genres but seldom describes symphonies in this way, a bold conjecture can also be made. There is a malfunction in faceting for this type of music, as the composite idea of “symphony” is preferred to a purely faceted “orchestra plus sonata” formation. So, the orchestral sonata might not be the chosen way of classifying a symphony within LIS, but it reveals a lot about the classification of forms and genres.

7. Dependency and orthogonality: the relationship between medium and form/genre

Within a faceted system of classifying music, medium and form/genre are presented as separate facets, and in an ideal scheme facets are independent of each other (see for example, Frické (2012), Satija (1984), and for a discussion about this point, see Chapter 4, Section 2.5). However, analysis of the 17 LIS classification schemes in this chapter has demonstrated how this is not always the case. This connection between facets manifests itself in many different ways and to different degrees. Furthermore, the musicological views about defining form and genre (Sections 3.1 and 3.2) show how dependency between form and medium, and genre and medium, may be hardwired into these musical concepts. This section explores how dependencies between medium and form/genre appear and their impact on music classification, using the 17 classification schemes as a starting point.

7.1. Dependency on vocal/instrumental categorization

The vocal/instrumental categorization is usually the primary categorization within medium, as discussed in Chapter 5. However, this categorization is also endemic within

the forms/genres parts of LIS classification schemes. For example, Dickinson divides its list of forms/genres in the Species facet (S) (equivalent to a forms/genres facet) according to whether that form/genre pertains to voices or to instruments; for instance, Flexible has separate lists of forms in its auxiliary table for instrumental forms (-5) and vocal forms (-6) – notwithstanding the dramatic forms (-7), which will be discussed in the next section. It must be noted that there are counterexamples where forms/genres are undivided by vocal and instrumental concerns: for instance, Expansive has all its forms/genres in one alphabetical list. The typical vocal/instrumental split in the list of forms/genres is noteworthy, but does not indicate the depth of this medium “interference”. For this, the operations of the schemes need to be further explored.

BCM is a self-described faceted scheme (see Chapter 4, Section 5.2); yet, only certain combinations of medium and form/genre are permitted in this scheme. When using a vocal medium, only the forms/genres from a specific range of classes associated with voice are permitted, and a similar restriction is in place for instruments. For example, Auxiliary table 1 contains forms/genres associated with instruments, such as sonatas, marches, suites, and so on; it is available only to instruments, instrument groups, orchestral music and chamber music (Coates 1960a, p. 38). Dickinson has a separate facet for form/genre (S); however, it is divided between forms/genres for voices and forms/genres for instruments, with specific instructions about which mediums are appropriate for each form/genre. This thwarts any attempts to use a vocal form/genre for an instrumental medium, or vice versa. DDC22 contains much faceting, but only instrumental forms/genres can be added to instrumental mediums, illustrating again form/genre’s dependency on medium.

However, there are chinks in this dependent relationship. For example, while Flexible divides up the listing of forms/genres into instrumental, vocal and dramatic – the division between vocal and dramatic will be discussed in the next section – there does not appear to be any restrictions on adding any particular form/genre to any particular medium; therefore, in this matter, Flexible has independent medium and form/genre facets. The Subject Classification provides an interesting example of rule-bending versus literal rule-reading. The guide to the Subject suggests that for large collections, subdivisions by instruments and forms are advisable, and classes for instruments and forms are added together (Brown 1914, p. 22); so, in this way, a pseudo-faceted system of instrument and form is achieved. However, Subject’s introduction and scheme

(Brown 1914) make no mention of adding vocal forms to voices, nor is adding vocal forms to instruments (and vice versa) outlawed or mentioned at all. Unlike Flexible, the faceted nature of Subject is not necessarily deliberate, especially considering its early date; so, the lack of specific instruction to utilize *any* form/genre in Subject could represent the author not considering mixing vocal and instrumental to be a possibility, rather than Subject's radical attempt to open up music classification. While it is not worthwhile to consider the intentions of Subject further, the possibility that a scheme can be designed where form/genre is not entirely dependent on medium, whether by intention or omission, provides insightful information about music classification.

Not all schemes are easily demarcated between their dependent or independent treatment of the medium and form/genre facets. There are some schemes which are not faceted at all (or not faceted for these aspects); for example, Ayer, McColvin and Reeves, LCC2015 and DDC19 all place forms/genres within individual mediums, but this is an inevitable part of being an enumerative scheme (or at least being enumerative for this particular aspect). Thus these schemes are not of any further use for discussions about dependency. Within the faceted-aspect schemes, the dependency between vocal/instrumental categorization and forms/genre might manifest itself in parts of the scheme, rather than throughout. While DDC22 mostly shows dependency between vocal/instrumental categorization and forms/genres, there is at least one exception. For vocal music, there is a possibility to add a form gleaned from instrumental music, such as a waltz. In DDC22, Brahms' *Liebeslieder Waltzer*, which involve piano duet and a group of vocal soloists (or choir) and are considered to have a vocal medium, would be legitimately allowed to have a form taken from the instrumental schedules (the waltz).

To conclude, there is a significant dependency between the vocal/instrumental categorization and form/genre, signs of which can be found at various junctures in this chapter and in Chapter 5. This connection means that the parent facet for vocal/instrumental categorization (medium) and the form/genre facet are dependent on each other; thus music's facets are not orthogonal. However, examples presented by Flexible, Subject and parts of DDC22, suggest that dependency between medium and form/genre is not necessarily of the same strength in every LIS music classification scheme.

7.2. Dependency on broad size categorization

Medium interference is not limited to vocal/instrumental categorization: its interference can also be felt within coarse divisions of mediums based on size (see Chapter 6, Section 2.2). So, this section discusses the connections between form/genre foci and the categorization into solo/ensemble/group. In practical terms, can classification schemes represent a symphony (usually associated with orchestra) for solo flute or a madrigal (usually associated with multiple solo voices) for one solo singer? (One particular example of this phenomena was discussed in detail in Section 6 above, when discussing symphonies as possible orchestral sonatas. This section broadens out the discussion to all forms/genres and all mediums.)

In some LIS classification schemes, there is a connection between the broad size of the medium and the choice of forms/genres. For example, Dickinson sees the choice of form/genre (within the Species facet) restricted by whether the medium is, say, orchestra, solo piano, instrumental ensemble, chamber vocal solo, vocal group, and so on. In Expansive, there is a group of classmarks for “Concerted music” and another sequence for “Single instruments and single classes of instruments”. Expansive’s “Concerted music” has classes divided by a mixture of style, medium and form/genre: examples include “Concerted music/orchestral music”, “Dance music”, “Operas (etc.)”, “Religious music (concerted)” and “Symphonies”. Some of these represent forms/genres in their own right (such as “Symphonies”), and many of these categories are subsequently subdivided into unequivocal forms/genres, such as gavottes, song cycles, masses, and so on. However, the “Single instruments and single classes of instruments” section is treated very differently: there are no main categorizations involving form/genre and few opportunities to include form/genre at all. So, in Expansive, the treatment of forms/genres is very different depending on an aspect of medium. In schemes which show little or any sign of faceting, then choice of medium inevitably leads to a specific set of forms/genres; for example, in LCC2015, the orchestral music part of the schedules includes all the permitted forms/genres and it is not possible to add a form/genre from say the piano solo section.

However, some LIS classification schemes showed general independence between size of medium and form/genre – not surprising, considering that some schemes technically allowed for the specific example of orchestral sonata, as discussed in Section 6. For instance, the Subject Classification appears to have no impediments to combining any

vocal medium with any vocal form/genre, and the equivalent for instruments and instrumental forms/genres; this also appears to be the case with Flexible, BCM and DDC22. However, even within these schemes, there are exceptions to the any-form/genre with any-medium-size situation. As these exceptions usually involve opera and similar musical-dramatic works, opera will be considered.

The LIS classification schemes reveal that there is something particularly interesting about opera and dependency. For example, in BCM, any vocal form/genre can be added to any vocal medium; the exception is the form/genre of opera, which can only be added to single voices in combination – see note under JNF-JNHT in BCM (Coates 1960a, p. 27) – rather than any other types of vocal medium. Dickinson takes the division further: the form/genre of dramatic vocal music is a roped-off area of the medium schedules, with medium and form/genre all bundled up as one. Furthermore, while DDC22 allows non-dramatic vocal forms to be added to any type of vocal medium, opera is an exception. The medium of opera is usually a combination of solo singers with some form of orchestral ensemble; there is also likely to be a chorus. (There are exceptions of course: for example, Poulenc’s opera *La Voix Humaine* for one soprano and orchestra and Wagner’s *Das Rheingold* for vocal soloists and orchestra, but no chorus.) So, in terms of medium alone, opera has the same medium as orchestrally-accompanied “choral works” – works for choir(s), orchestra and probably a brace of vocal soloists.¹⁸⁴ As well as not being able to add the form/genre “opera” to any vocal medium of choice, the separation of “opera” from non-dramatic musical forms/genres in the schedules – see for example, Dickinson or BCM – alongside the broadly fixed medium associated with opera, mean that “medium” in the case of opera becomes redundant. Opera’s separation from other forms/genres has something to do with this dramatic/non-dramatic categorization, which clearly needs more analysis. This mysterious, extra factor will be explored in detail in Chapter 9.

7.3. Further thoughts and visualisations of dependency and orthogonality

The analysis of LIS classification schemes reveals vital information about how music is classified. First, the form/genre facet is almost always dependent on medium, and this

¹⁸⁴ Flexible offers an ingenious halfway house solution: opera is primarily classed as a medium (89), a special subset of works for choir, orchestra and soloists. Then, the dramatic form/genre of “opera” is added to this medium (-89). However, the use of the dramatic medium enacts a bypass of building up every element of the medium, which saves extremely long classes.

dependency manifests itself in a number of ways. Usually the choice of medium will determine which broad category of forms/genres is available for use. In more enumerative schemes, the forms/genres are interspersed with mediums in the classification scheme, so the choice of form/genre choice is governed entirely by medium – see Figure 40. Ayer provides an example. In more faceted schemes, the seemingly open combination of the medium and form/genre facets is in reality an invitation to join any foci *within a specific section of the form/genre facet* with foci from a specified section of the medium facet – see Figure 41. DDC22 provides an example. The difference between this false-independence and actual independence can be seen by comparing Figures 41 and 42.

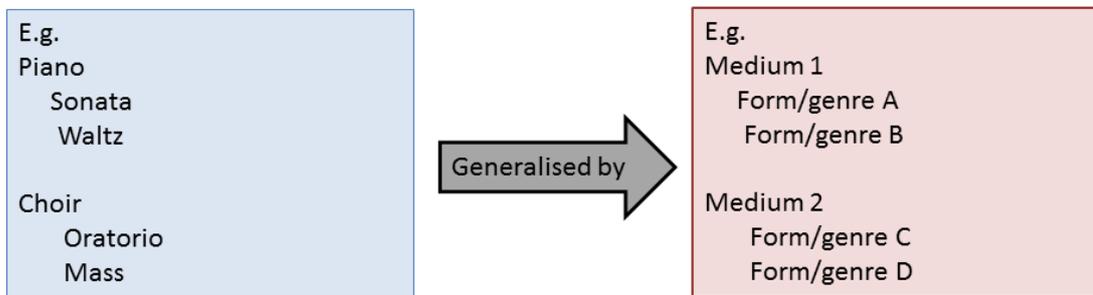


Figure 40. Mediums and forms/genres in an enumerative scheme

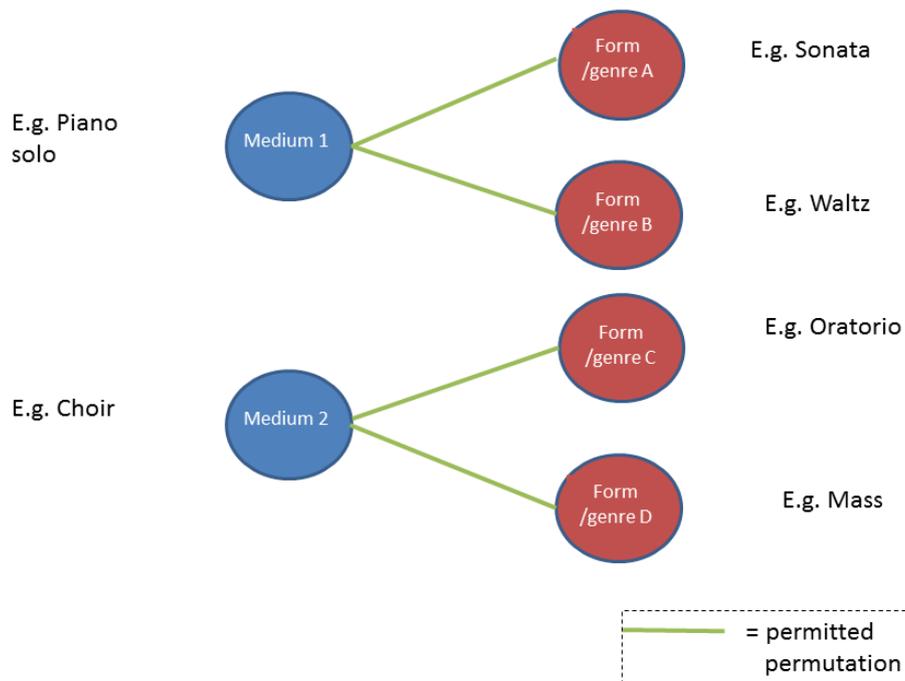


Figure 41. Form/genre facet dependent on medium facet

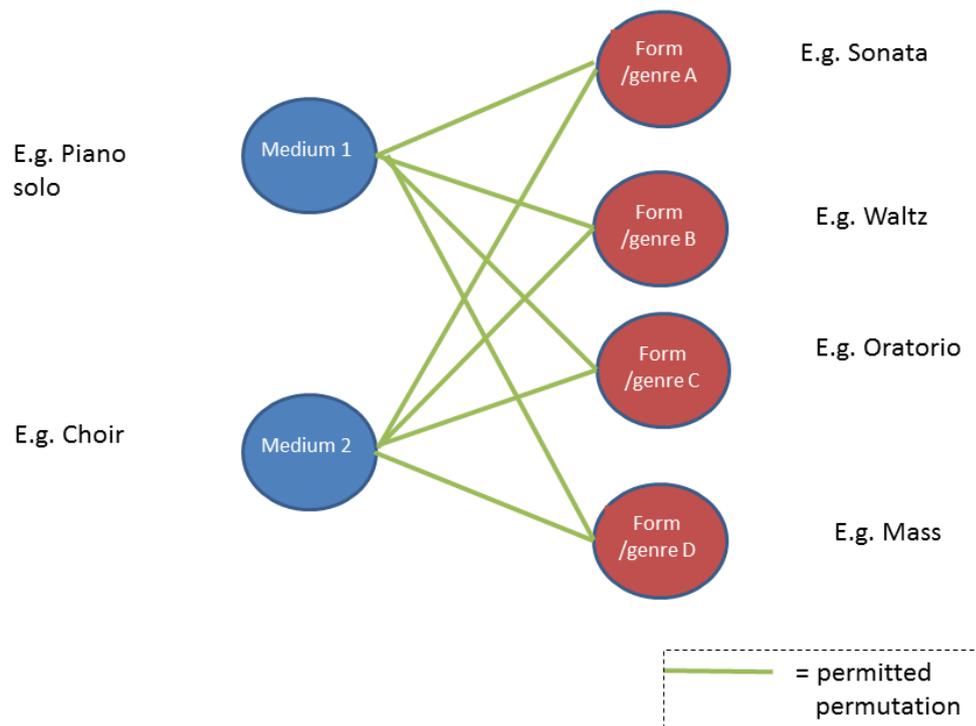


Figure 42. Medium and form/genre facets as truly independent facets

The strength of the dependency varies by level and type of medium categorization. So, the categorization of medium into voices and instruments manifests itself in the treatment of forms/genres in virtually all of the classification schemes examined; in other words, virtually every scheme had the choices of forms/genres based on whether the medium was categorized as voice or instrument. Categorization within instruments and voices did not have quite as strong impact on forms/genres. While some schemes linked specific forms/genres with certain types of medium based on a broad number, this was not universal. For instance, DDC22 allowed any instrumental form/genre with an instrumental medium, so technically one could even classify an orchestral sonata with DDC22 or a symphony for digeridoo. The difference between this and the previously mentioned dependency is that while dependency on vocal/instrumental categorization was found to be almost universal, the dependency between broad type of number in the medium facet and the form/genre facet is common, but not inevitable. The visualisation of a truly independent set of medium and form/genre facets is visualized in Figure 42, while the more typical layout of forms/genres dependent on vocal/instrumental categorization but independent of broad number categorization is shown in Figure 43. (Note how although Figure 43 allows for all combinations within the

vocal/instrumental categorization, some of the examples would be unlikely, such as orchestral sonatas (see discussions in Section 6) and oratorios for soprano solo.) Thus, the form/genre facet is usually dependent on medium, in one or even two ways. So, in faceted classification terms, medium and form/genre are not orthogonal facets, and this has a huge impact on the structure of music classification.

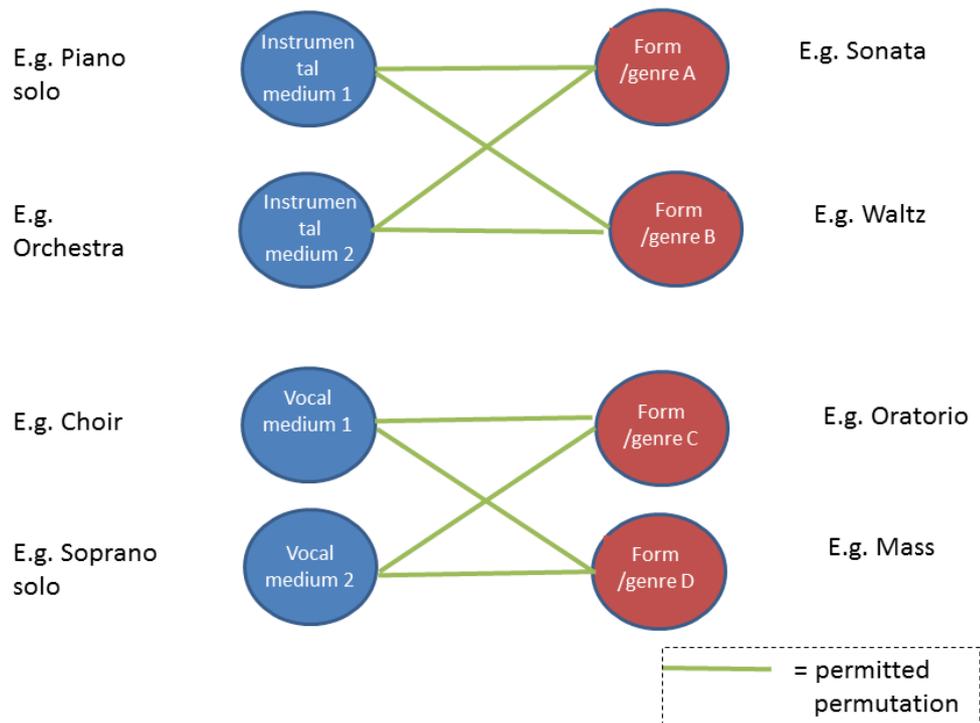


Figure 43. Typical semi-independent form/genre facet with independence within vocal/instrumental categorization

8. Conclusion to Chapter 8

Form/genre has proven to be an interesting but tricky facet of music classification. It is not clear whether LIS classification schemes are concerned with form, genre or both. Explorations such as those carried out for symphonies as orchestral sonatas suggest confusion as to whether the facet refers to form or genre. While the symphony could be considered as a combination of orchestra and sonata, the reluctance of LIS schemes to do so suggest that the facet is genre rather than form. However, the foci found in LIS schemes pertaining to form/genres would be potentially problematic if considered to be only genres: some schemes do not reflect the temporal evolution of genres. Medium and genre as the two primary facets of a hierarchical classification system would be

doomed on a conceptual level, as to musicologists, genre is a concept which is bound by and contains medium. Furthermore, there is also another mysterious quality which creeps into investigations of form/genre: function. Whether this is part of form/genre, an ordering device, or something else entirely will be discussed in detail in Chapter 9. To summarise, LIS schemes give mixed messages over the constituency of the “form/genre” facet.

Further interrogation of the form/genre facet is provided by string quartets; certainly, the duality of music as medium plus form/genre – as espoused by LIS music classification theorists – is severely challenged by these types of musical works, as it appears the form/genre facet is not compulsory after all. The string quartet situation of the medium (string quartet) being the form/genre (string quartet) can be turned on its head: actually, the medium could be considered to be vanquished, and instead subsumed into the form/genre. This neatly meshes with two other points seen in this chapter. First, the special treatment of opera within LIS classification schemes could also be viewed as another scenario where the form/genre of opera squeezes out medium, and rendering medium irrelevant for this form/genre. Second, musicological ideas of genre (as seen in Section 2.4) suggest that genres are composite, relational entities, which consist of medium and form (amongst other things). Through this lens, operas and string quartets could be considered as genres, in a classification system where the composite entity known as genres, rather than mediums and forms, are the main classificatory unit.

Another key idea seen in this chapter refers to dependency. When studying the form/genre facet, it becomes clear that it is dependent on two aspects of the medium facet: the vocal/instrumental categorization and the broad division into size of medium (in other words, solo, ensemble or group). This destroys the orthogonality between the medium and form/genre facets. According to Frické, Satija and other classification theorists, while a faceted scheme can still contain dependent facets, it is less than ideal; therefore, the seemingly inevitable dependency of medium and form/genre could be one of the reasons that music is so difficult to classify.

There are also interesting comparisons between the music and LIS domain’s conceptions and treatment of form/genre, where usually musicological ideas are reflected in LIS. For example, opera categorization showed accord between the different ways of

categorizing opera in the LIS and music domains (although the LIS classification appeared to show less importance to subgenres than found within the music domain). A music source's verdict of the string quartet's position as part medium, part form and part genre is beautifully realised in some of the LIS classification schemes. Therefore, far from being a peculiarity of LIS classification, it seems that the problems with divining (Western, art) music as two-fold facets of medium and form/genre actually stem from the nature of music itself.

Chapter 9. Function and friends: the “quasi”-facet

1. Introduction to Chapter 9

The previous chapters have both explicitly and implicitly indicated that there is another factor to the medium/form dualism, a mysterious quality that is difficult to label. It divides the dramatic music from the decidedly non-dramatic, the secular from the sacred, puts the Christmas into Christmas music, amongst many other things. The endless possibilities for these types of concepts are commented upon in the preface of a thesaurus which attempts to map some of them (Dorfmüller 1980, p. vii). Clearly many different factors are at work here, for Christmas, drama and religion are not necessarily the same *type* of thing. In addition, they are not all necessarily employed in the same way or at the same level of priority. This chapter untangles the heap of ideas and processes which are taking place, including ascertaining whether this mysterious extra information is a facet, an ordering device, or something else entirely.

The quality in question has been identified by those creating classification schemes and meta-facets of music classification. For example, BCM’s citation order for scores includes “character”, which is given as the third characteristic of division; the name and position are repeated in the DDC Phoenix schedule, which is modelled on BCM. Furthermore, Nettl (1960, p. 11) lists “function” as one characteristic of arranging music and some examples of foci in his music classification dissertation, while “character or content” is listed as an important facet amongst Buth’s (1974, p. 429) list of potential facets.¹⁸⁵ Drawing back to Chapter 4, Section 3.3 briefly, the meta-facets also indicate an “extra” facet. The IAML facets of music include a composite facet translated as purpose/occasion/content;¹⁸⁶ Elliker (1994) acknowledges Redfern and IAML, and places this facet amongst his seven facets for analysing classification schemes, with “character” as the chosen moniker. (Music classification discourse from Library and information science (LIS) does not tend to discuss function or character so has not provided fuel for

¹⁸⁵ It is interesting to note that Nettl and Buth’s comments are in the context of analysis of multiple classification schemes of music. Perhaps there is a quality to this mysterious facet that becomes transparent once schemes are compared, appearing in the abstract once the other facets are marked off?

¹⁸⁶ The German term “Inhalt” appears to be especially problematic to translate meaningfully and succinctly for this particular context.

this chapter.) So, when facets are stated for music, this particularly idea of an extra quality outside of medium and form/genre is stated; however, there are multiple solutions as to its name.

It is important to ask whether all the classification schemes, systems of meta-facets and classification discourse are even discussing the same ideas. The answer is they probably are not. So, this chapter is going to expend most of its effort discussing ideas such as church, dramatic, and so on, as these were the nebulous qualities which were revealed by studying form and genre in Chapter 8. The name “function” shall be adopted for the collective term which includes these ideas. (Note this is a deliberate departure from the adoption of Elliker’s nomenclature of facets, as discussed in the conclusion of Chapter 4.) However, ideas such as Christmas, children, military, and so on, will not be forgotten; they will be discussed as a discrete unit at the end of the chapter. Note that this division is arbitrary, and itself encapsulates one of the slippery features of discussing this mysterious extra force.

This chapter starts by discussing the musicological idea of function, viewing the possible antecedents of this classification idea. Then a discussion arises about whether function is really a facet at all followed by an analysis of the main types of function. Then, more detailed consideration of two particular categorizations takes place, based around dramatic and religious functions. The connections between dramatic function and medium are dissected. The nature of religious function is explored by connecting to ideas of sacred and secular qualities, followed by considering how religious function interacts with other functions and the medium facet. Finally, the various categorizations are put together, showing how functions, medium and sacred/secular qualities form a tangled web of connections. A short examination of the extra qualities of “occasion” and “character” is offered as a postlude.

2. Musicological perspectives on function-as-category

Musicological ideas about functional music, and its antonym, autonomous music, demonstrate how function is used as a categorization within musicological discourse. In some historical periods, music which was deemed to have a function (such as to be staged, to be part of worship in a church, and so on) was separated from music which exists solely as an aesthetic experience. Dahlhaus (1987, pp. 34-35) highlights the importance of function in defining music, giving an example from the 17th century where

function, rather than medium, is used to categorize a musical work (in his example, different sonatas by the composer Corelli). The importance of functional versus autonomous music also changes over time. The idea of autonomous music, part of a general aesthetic movement of “art for art’s sake”, gained strength in the 19th century (Dolar 2006, p. 15); autonomous music became more important in the 20th century, while there was a decline in functional music (Dahlhaus 1987, p. 40, Dolar 2006, p. 15). The musicological discussions about these types of music are outside the scope of this thesis; however, the categorization represented by this bipartite version of music into functional and autonomous music is highly significant. It should be noted that on a general and literal level, “function” and “autonomy” are not mutually exclusive; however, this musicological categorization is taken *as found* in this chapter, as it appears to be the categorization system adopted by musicologists.¹⁸⁷

The musicological idea of function has some added complications. For example, the functional/autonomous divide also evokes an extrinsic/intrinsic division, which is foreshadowed by Lipmann in his contribution to a roundtable discussion about the value of music (Dahlhaus et al. 1970, p. 390). Function is a quality of a musical work which looks outwards, away from the musical work; conversely, autonomy within a musical work looks inwards. This could be translated to the relationship between function and other facets in the LIS classification realm. The stability of the function categorization over time is also important when considering its potential induction as a music facet. Ideally, a facet would be valid over all periods of music that are to be represented in a classification system, even though it is expected that the foci themselves within that facet would change; function, according to musicologists, offers mixed usefulness in this regard. Lipmann (Dahlhaus et al. 1970, p. 391) comments that music’s basic functions are abiding, as Aristotle’s uses of music more-or-less hold true even today; conversely, 20th-century music seems to treat the idea and importance of function differently from previous eras (Dolar 2006, p. 15). From a classification perspective, this means that a classification system that wishes to categorize contemporary music may find function of ever-decreasing use as a facet. Another complication arises in that an individual musical work may have multiple function properties. Dahlhaus (1987, p. 35) hints that function and autonomy – in this instance he describes function and art, but from the context the

¹⁸⁷ Adorno (1988, p. 39), in his chapter about the function of music, calls the music which considers itself an art to have “esthetic autonomy”. This is an interesting term as it precisely describes exactly what is autonomous in the autonomous/functional duality laid out so far. However, the content of Adorno’s chapter (1988) is concerned primarily with social aspects of function such as entertainment, rather than function-as-type, so is not directly relevant to this thesis.

term “art” in this case is aligned to “autonomy” – can coexist in the same musical work, using the form/genre of madrigals to highlight his point. Translated to the LIS classification world, this could cause complications in using a function facet, and perhaps compromise its use altogether if the basic unit of classification is whole musical works.

So the categorization of music by function has its genesis in the music domain. While musicological thought may divide music into two categories – functional and autonomous – which are not exactly replicated in the LIS domain, the general principle of dividing music by function is firmly a musicological idea. Ideas presented in the musicological literature about the changing fortune of function over time, works with multiple values of function and function’s dependence on extrinsic features are a useful indication of function’s potential complications as an LIS facet.

3. What are the functions of music?

Once function is taken to exist – whether function is a facet or not is discussed in Section 7.1 – then it is important to consider the significant types of function. The composer and music theorist Busoni (1957) discusses the idea of musical purpose and gives three purposes of music: opera, church and concert.¹⁸⁸ (For ease of reference, Busoni’s “purpose” is taken to be a similar concept as this chapter’s the “function”.) This list is clearly not exhaustive as it stands. For instance, ballets, incidental music to plays, masques, and arguably operatic forms which are not strictly opera, would all fall in a non-man’s land between “opera” and “concert”. Similarly, “church” stipulates a particular religion, so music for other religious purposes would also prove problematic.

Other musicologists discuss types of function. While the actual categories might be different, there is still much commonality. For example, Wolf (2002, p. 579) states that music has “traditional divisions” and gives these as “church”, “theatre” and “chamber”; this list is a similar triptych to Busoni’s, with a more general term for staged forms than Busoni’s “opera”, and “chamber” rather than “concert” – “chamber” could be considered a subset of “concert”, if using modern performance sensibilities of performing works such as string quartets in concert halls rather than homes. Lipmann (Dahlhaus et al. 1970, p. 391) gives five categories: concert, opera, church service, pedagogy and amateur performance. Interestingly, the categories of concert, opera and

¹⁸⁸ Although the context of Busoni’s writing about purpose is to reject this system of categorising music, it is a really useful realisation of how at least one music theorist believed music was *already* categorized.

church are concurrent with Busoni. This leaves Lipmann's (1970) "pedagogy" and "amateur performance" as extras. So, it seems that in the music domain, at least to some music writers, music has three important possible functions: church, opera (more broadly, theatre) and concert (which could be considered to include chamber).

It is also useful to consult a primary musicological source: a selection of 25 Grove worklists for specific composers – see Chapter 3, Section 4.3 for discussion of this method and sampling. As discussed in Chapter 5, Section 4.2, the mysterious idea of function sometimes trumped the primordial vocal/instrumental division. Usually the names of the functions are not given, as in most cases the categorization is only one level deep meaning that only the names of specific forms/genres are given. However, general ideas of the important functions are often evident, even if the names of these functions are rarer. In most of the 25 example Grove worklists, the functions are based around dramatic/non-dramatic music and church/non-church music. (Note that pedagogical works would only appear in Grove worklists if the composer wrote a specific work of pedagogical intent. This is one of the methodological issues with comparing general musicological discourse with taxonomies of a specific composer's works.)

The LIS classification schemes also demonstrate the prolificacy of certain functions. For example, BCM organizes its music schedules for vocal music so that dramatic, religious and secular music are all separated, although it does not always makes these labels or the separations clear. Dickinson has a completely separate medium for "dramatic ensemble", emphasising the dramatic/non-dramatic division. Furthermore, its two types of vocal medium (solo and choral) have divisions between "sacred", "secular" and "liturgical", although they are somewhat blurred. Flexible presents a number of different functions. However, the presence of a whole separate class for full dramatic works and other so-called dramatic music (for instance, film music) suggests the importance of the dramatic/non-dramatic categorization. Furthermore, while there are number of functions in other parts of Flexible's schedules, "secular" is separated from "religious" in both the instrumental and vocal parts of the schedules.¹⁸⁹ These function divisions are not just found in faceted or semi-faceted schemes: for instance, DDC19 has divisions that can be loosely divided up into dramatic, religious and concert music. So, it seems that LIS classification schemes often divide function into a triptych of dramatic, religious and concert, albeit often with different names.

¹⁸⁹ The term "secular" is used in the vocal parts of the schedules, but not in the instrumental part.

LIS classification schemes sometimes include divisions based around other functions, as seen in Lipmann's (1970) list (see above). For example, DDC22, BCM, Dickinson and Flexible have ways of adding pedagogical aspects, in order to represent music "tutors" and exercises. However, these often sit in a separate part of the schedules or are added in a different way to the dramatic/church/concert triptych. For instance, in BCM, a class number for educational material can be added to any musical work; however, this is an additional feature rather than being part of the schedules for form/genre. In Dickinson, educational aspects are found in the species facet, which means that the educational function is added as a type of form/genre. It could be read that functions such as education are important, but as they are an extra aspect (or replace form/genre) they are not as intrinsic to the classification of musical works as other functions. Without this close interaction with forms/genres they lose their complexity; so, the focus in this chapter will be on the more intrinsic and complex divisions based around dramatic, religious and concert functions. This choice of focus for this chapter is reinforced by the analysis of musicological sources, which suggest that these functions are the most important or utilized ones. Thus pedagogy and other functions outside of dramatic/religious/concert will now be laid aside.

So, in order to fully understand function and its role in music classification, and to answer questions about how it works within a music classification system, the three functions of dramatic, religious and concert will now be explored in detail. This will help determine the nature and names of what constitutes this nebulous quality called "function".

4. "Dramatic": dramatic function and its relationship to medium

It is clear that the meaning of the term "dramatic" is opaque and needs some consideration. A musical work can be considered dramatic through its musical character (for example, Beethoven's Symphony No. 5 is arguably dramatic, especially its infamous opening), through its programme (for example, the story in Berlioz's *Symphonie Fantastique* which includes sections entitled "Marche au Supplice" ("The procession to the stake") and "Songe d'une nuit du Sabbat" (Berlioz 1900, pp. 76 & 97), through its text (for example, Bach's *St. Matthew Passion*, whose text tells the story of the crucifixion), and so on. However, in the context of this chapter, "dramatic" refers to

something more specific: a theatrical work. Thus, the focus of a dramatic function concurs with terms such as “staged” or “theatrical”. This chapter is going to use “dramatic” to refer to works which are designed to be consumed on the stage. However, musical works themselves do not always neatly slot into dramatic and non-dramatic groups. For instance, some musical works were originally designed to be un-staged, but might be staged in today’s musical-theatrical climate, such as 21st-century staging of certain Handel’s oratorios or Berlioz’s oratorio *The Damnation of Faust*. The confusion occurs in intention; in other words, whether “dramatic” means works which were intended to be staged, works which are usually staged in modern times, works which belong to a form/genre which is usually staged, and so on.

The 25 Grove composer worklists give good examples of the dramatic categorization in action within the music domain, and its extent. For instance, Schumann (Daverio, Sams 2014) has the following groups: theatrical (which includes 2 operas and 1 "dramatic poem"), choral with orchestral, orchestral, chamber, partsongs for mixed voices, partsongs for womens' voices, partsongs for men's voices, songs, index to the songs, keyboard. Here we can see a clear dramatic/non-dramatic division. The “dramatic” works are separated from other works, and all the non-dramatic music is kept together. Mozart’s list of works (Eisen, Sadie 2014) also demonstrates a clear dramatic category: works in the “operas, musical plays, dramatic cantatas” and “ballets” categories, are separated from works in other categories such as “masses, mass movements, requiem” and “symphonies, symphony movements”. (Note how there are no overall functions given for the categories, instead the categories are named by the forms/genres contained within the category.)

However, there is an important difference between the Schumann and Mozart worklists. While Mozart’s opera and ballet categories are adjacent, they have non-dramatic categories either side of them; in other words, the dramatic/nondramatic division is weakened by the order of categories. It seems that separating dramatic and non-dramatic music is a common way for Grove worklists to organize their oeuvres: of those worklists which had dramatic works at all, all but one had a dramatic/non-dramatic division. Furthermore, most of the composers demonstrating a dramatic/non-dramatic categorization were more like Schumann than Mozart; in other words, they did not only have distinct categories which contained only dramatic or non-dramatic works, but the dramatic and non-dramatic categories were separated from each other. The Mozart and

Schumann scenario are illustrated in Figure 44, which also includes a scenario for comparison purposes, where the categories include a mixture of dramatic and non-dramatic works. So, we can see that categorizing by dramatic function has precedent in musicological classification; however, the dramatic function can be served straight or diluted.

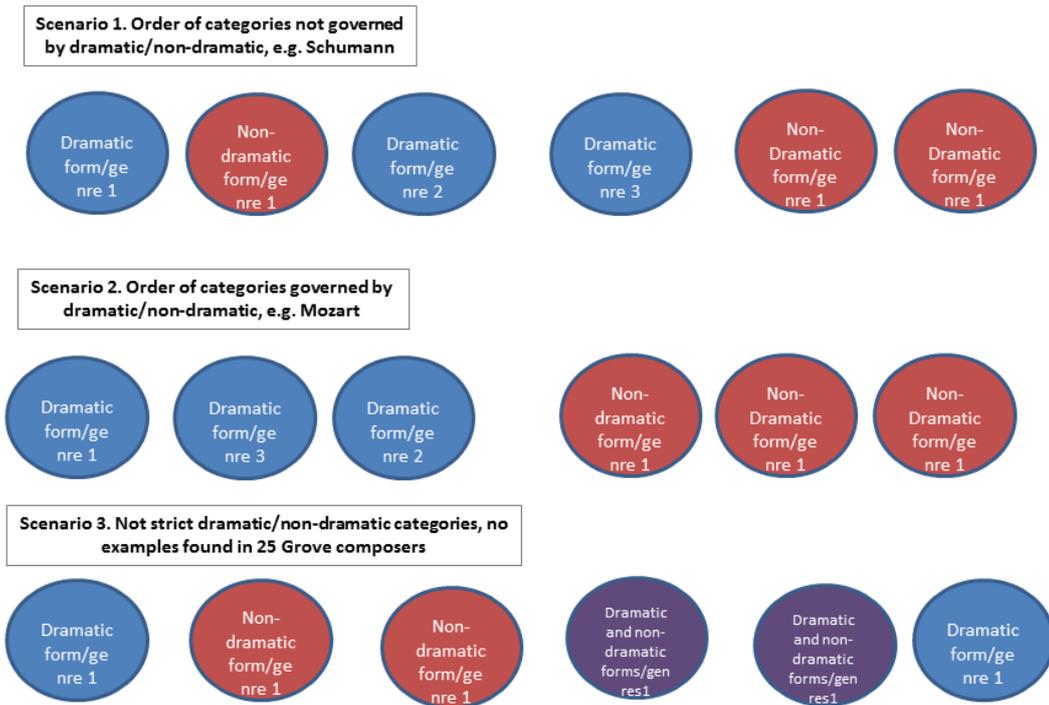


Figure 44. Examples of dramatic/non-dramatic categorizations

The dramatic category in LIS classification schemes is strong, and some examples of this strength were given in Section 3. Other examples which illustrate the primacy of the dramatic function within LIS include Colon6. This scheme lists only a few types of music, yet this select few includes “dramatic music” and “orchestral music” – reading “orchestral music” as a type of music defined by its non-dramatic nature. Within vocal music, BCM issues an explicit categorization between the dramatic and non-dramatic: music with a dramatic function is placed at the start of the vocal schedules and is given as a discrete section. In addition, this dramatic vocal music has different rules about number building than other parts of vocal music in BCM. Therefore, the LIS classification schemes and musicological examples are in alignment in their strong use of a dramatic function to categorize music.

4.1. The relationship between dramatic function and the medium facet

The dramatic function is connected to the classification of musical medium. First, there is the matter of the order of the facets (citation order). In some LIS classification schemes, the instrumental and vocal divide trumps all categorization by function. (For this and other discussions in this chapter which use LIS classification schemes, selections from the three example schemes and broader set of 15 schemes will be used.) For instance, in LCC2015, certain dramatic types of music such as “motion picture music” and “music for radio and television” appear twice, once within instrumental music and then again within vocal music. Bliss1’s vocal and instrumental division is strong enough that types of dramatic instrumental music live with instrumental music rather living in a separate class for dramatic music. In other schemes, the dramatic categorization is so important, that it is employed before the fundamental division into vocal and instrumental music; this can be seen in *Subject Classification* and DDC19. For instance, DDC19 has dramatic music as the first type of music, with this section including both vocal and instrumental musics. Therefore, we can see that medium (or at least, the vocal/instrumental division) is in an eternal tangled dance with the dramatic function, and the dominant partner is not predetermined.

There is also a question of the dominance of vocal dramatic music. Dramatic music is often considered to be something which is vocal, rather than instrumental. For instance, the BCM example given in Section 4 discusses the separation of dramatic music within the vocal parts of the schedules; yet, no such division occurs in instrumental music. This idea of a dramatic/non-dramatic division being part of vocal music, but not an arranging principle of instrumental music is carried by other schemes too – see, for instance, Dickinson. The inevitability of dramatic music as vocal music is a possible reading from Colon6 which has categories for “dramatic music” and “orchestral music”: if the classes are taken to be mutually exclusive, one interpretation is that music which is non-dramatic must be orchestral (a subset of instrumental music). Figure 45 shows a matrix which combines two simplified binary categorizations: dramatic/non-dramatic and vocal/instrumental. While there are four possible combinations, the combinations are not equal in terms of their prolificacy: dramatic is often linked with vocal, and opera and its ilk dominate dramatic music. However, there are forms/genres which are both

instrumental and dramatic, such as ballet and incidental music.¹⁹⁰ So, it is useful to consider a specific type of *instrumental* dramatic music, ballet, and see how it fares in both LIS classification schemes and the Grove worklists.

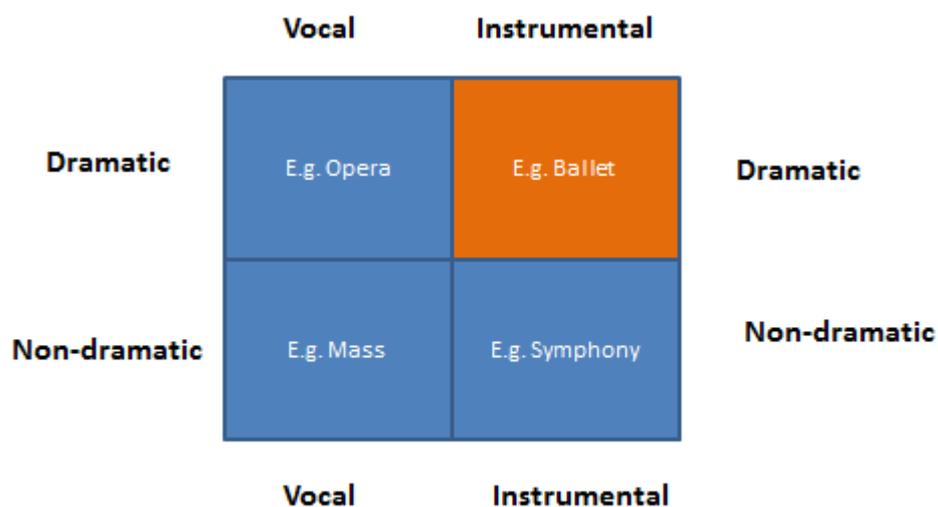


Figure 45. Vocal/instrumental and dramatic/non-dramatic matrix

4.2. Dramatic *and* instrumental: Ballets

In the *Subject Classification*, ballet appears in a joint vocal/instrumental, dramatic music class; so, ballet is considered part of a “medium-neutral” class of dramatic music. Bliss1 provides an example of a different solution: here ballets sit within orchestral music. The class for dramatic and operatic music is considered vocal, and thus ballet does not belong. The difference between the two solutions concerns the importance of the dramatic element versus the medium; when ballet sits within a (non-dramatic) instrumental music such as Bliss1 it is scattered from music with the same purpose, yet sits amongst works with similar mediums. This shows a preference for the medium, rather than the function, to be collocated. This situation is reversed for the *Subject Classification*. Meanwhile, LCC2015 proffers a different solution: ballet is placed within a dramatic part of vocal secular music, even though ballet does not normally include any voices. This placement is noteworthy as it places ballet in a category where the form/genre (ballet) does not include the properties of the class (having voices).¹⁹¹ Thus,

¹⁹⁰ Depending on the boundaries of “dramatic” this category can include instrumental film music, music for radio, and so on, all found within a dramatic part of the instrumental schedules of LCC2015.

¹⁹¹ The connections between form/genre and vocal/instrumental categorisation were discussed in detail in Chapter 8, Section 7.1.

LCC 2015 can be seen to offer a pragmatic solution, but it does not truthfully represent the theoretical knowledge organization of music. Finally, *Expansive* offers a novel solution: there is a separate set of classes which are defined as having the function of “dance”, a type of function hitherto not explored.¹⁹²

Seven out of 25 of the Grove composer worklists include ballets, and these provide some useful reflections on ballets’ classification within the music domain. The majority emphasise ballets’ position as dramatic music, over its medium of instrumental music.¹⁹³ Ballet-as-dramatic-music is realised in two ways. Some lists of works (Shostakovich, Auber, Cherubini and Janáček) put ballets into the same category as operas (and other works for the stage), usually calling this category some variation of “stage”; this can be equated to the LIS schemes above such as *Subject Classification*, where there is a single medium-neutral class for dramatic music. Other composers’ lists (Mozart and Beethoven) give ballets their own class, but situate that class adjacent to other types of vocal and instrumental dramatic music.¹⁹⁴ The single-level categorization employed in many Grove worklists which often results in classes dedicated to only one form/genre are difficult to equate to the multi-level, hierarchical systems used in LIS classifications; this perhaps explains why there are no exact equivalents to the separate-ballet-class situation in LIS schemes. The overall message though is clear. Ballet demonstrates that the dramatic function is very important to musicological classification of music, but not inevitable. Comparing this to ballet’s treatment in LIS schemes shows concurrence between the presence and importance of the dramatic function. In both domains, the dramatic categorization is somewhat tempered by medium, though it appears that medium is more likely to get the upper hand in LIS than musicological classifications.

¹⁹² The function of “dance” is interesting. While “dance” could be seen as a natural subdivision of dramatic music in the case of ballet, this is not always the case as not all dance music is intended for the stage. “Dance” as a separate function would be complex as some forms/genres which started life as music specifically designed to be danced to, have metamorphosed into forms/genres for the concert hall. This issue is foreshadowed by *Expansive*, who urges classifiers only to place “practical dance music” not “concert pieces” in the function-category of dance music.

¹⁹³ Gluck is the exception. While ballet gets its own class, it is not near other dramatic forms/genres such as opera.

¹⁹⁴ Note that these are particularly important composers with large outputs, and thus it can be argued that this alone is enough to increase the probability of more separate classes than lesser-known composers, rather than being a statement of ballet’s importance to their oeuvres.

5. “Liturgical”: religious function and the sacred/secular categorization

5.1. Terminology

There are many issues with a “religious” function. To start, there is a distinction between music which is religious and that which is liturgical. Liturgical music describes music which is part of worship; so, it can be considered as a subset of religious music. Liturgical music is by definition religious, but not all religious music is liturgical – see Figure 46. Moreover, liturgical music suggests a function and a meaning beyond art, whereas religious could be considered an essential aspect to the music itself. Even the term “religious” is complex. For instance, there is “sacred music” and “religious music”. *The Oxford English Dictionary* (“Sacred, adj. and n.” 2016, 3b) defines sacred music as that which “accompanies sacred words or which has a certain solemn character of its own”; however, one definition of “sacred” itself is defined in *The Oxford English Dictionary* as “set apart for, or dedicated for some religious purpose” (“Sacred, adj. and n.” 2016, 3a). So, for this thesis which is concerned with classification only, “religious” and “sacred” will be considered as synonyms.

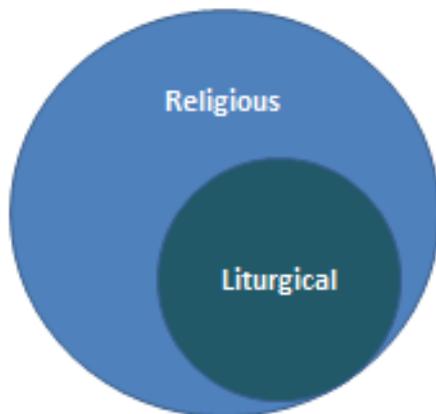


Figure 46. Relationship between “religious” and “liturgical”

There is also a difference between “liturgical” and “church”, the latter a term used by one of the musicological commentators to describe a function. “Church music” describes liturgical/religious/sacred music of a specific religion, that of Christianity.¹⁹⁵ Hence the term “church” is a hybrid of function (or character) and religious denomination,

¹⁹⁵ Sometimes, schemes include only forms/genres of Christian music, but still prefer a religiously-neutral term to describe the category; for example, this is found in the *Subject Classification*. Note that the Christian-dominance that is seen in many LIS classification schemes is likely to be at least in part a reflection of the available extant Western art music.

effectively combining one musical and one non-musical facet. Interestingly, the text of the Grove definition of Church music appears to discuss Christian liturgical music rather than Christian sacred/religious music, while the usage in LIS classification schemes tends towards a more general meaning. For the purposes of this thesis, a religion-neutral way is preferable: while Christian music dominates these parts of the schedules, most of the later schemes also include non-Christian religious music. So while Church music might feature in some examples due to its prolificacy in classification schemes, the term “Church” is rejected for use in any models.

The multiplicity of terms for some type of religious/sacred/liturgical function is evident in LIS classification schemes. For instance, UDC combines church, sacred and religious in the same class heading, while Bliss1 combines religious, sacred, church and ecclesiastical. For simplicity, “liturgical” will be used to describe the quality of religiousness which is specifically about the function of the music. When describing the religious quality of the music, “sacred” will be used alongside its antonym “secular”. The difference between “liturgical” and “sacred” in the classification of music will be elicited in the upcoming sections.

5.2. How religious-ness is expressed in the LIS and music domains

The set of 25 example Grove worklists suggest that religious divisions are important: for instance, Auber’s works (Schneider 2014) are divided into stage, sacred, secular and instrumental. This shows that some categories are defined by their sacred versus secular qualities. (However, note how the sacred/secular division is not necessarily mutually exclusive. This will be discussed in later parts of this section.) Interestingly, the Medieval and Renaissance composers follow a stricter sacred/secular categorization, which not only has distinct categories for secular and sacred forms/genres but also has a strict division to the order of the forms/genres. It is also interesting to note how Medieval and Renaissance worklists move from sacred to secular (rather than vice versa), reflecting the importance or quantity of works in both spheres; this could be a powerful indication of classification representing musicological ideas and thoughts.

The LIS classification schemes also demonstrate a strong sacred/secular categorization. For instance, Ayer has a strict separation between sacred and secular music. This can be seen by the repetition of the form/genre “song” in both sacred and secular music. This Ayer-type approach is represented in Figure 47. A strong divide between sacred/secular

music is also seen in LCC2015; in this case, the sacred/secular categorization is strong enough to override even the dramatic/non-dramatic categories, as there are categories for secular dramatic music and sacred dramatic music, under their respective sacred/secular parents. This LCC2015-type approach is represented in Figure 48, and it can be contrasted with Figure 47.

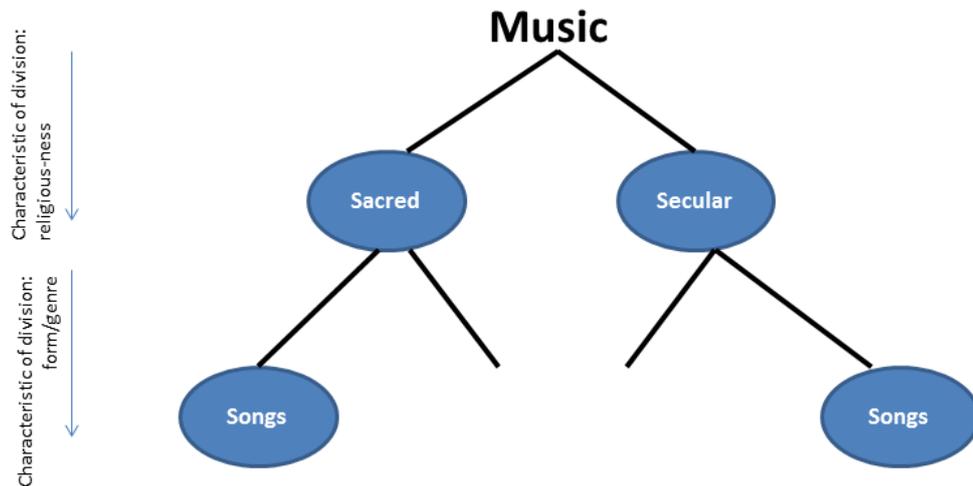


Figure 47. Ayer’s approach to religious function

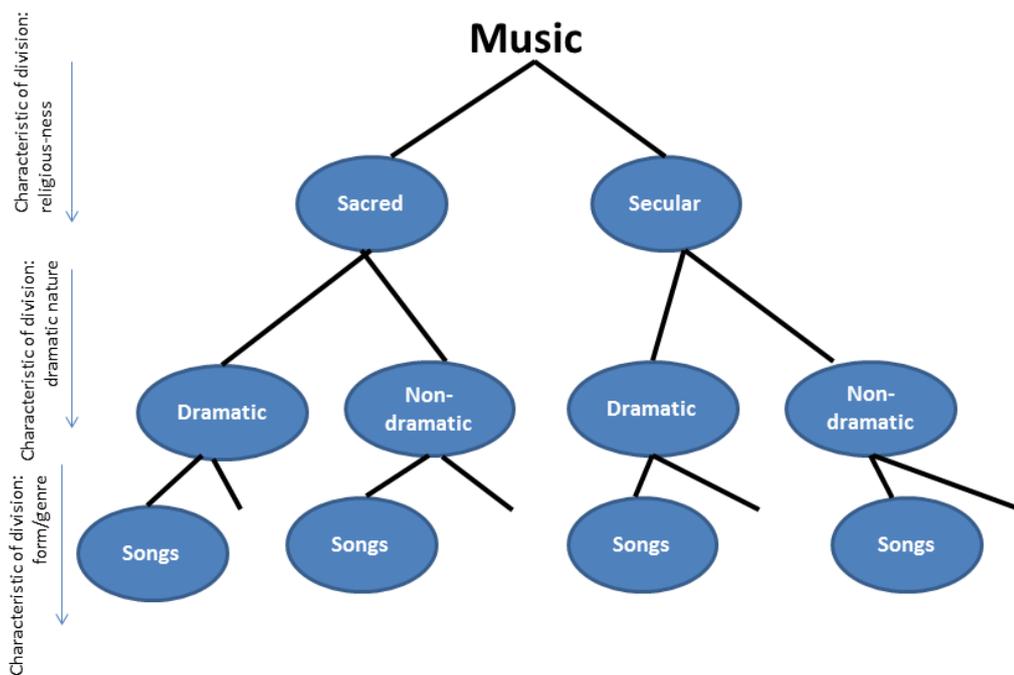


Figure 48. LCC2015’s approach to religious function

5.3. Different treatment of liturgical and sacred

Sometimes LIS classification schemes treat sacred and liturgical music separately, eliciting interesting ideas about how the liturgical function is working. For instance, BCM has a division between sacred and secular music with a separation made between liturgical and non-liturgical sacred music. The conceptual reasons explaining this division relate to the nature of the relationship between classes; whereas the sacred/secular categorization is a binary division into two concepts at equal levels, the sacred-liturgical categorization is that of parent and child – see Figure 49 for a visualization of the two different types of relationships.

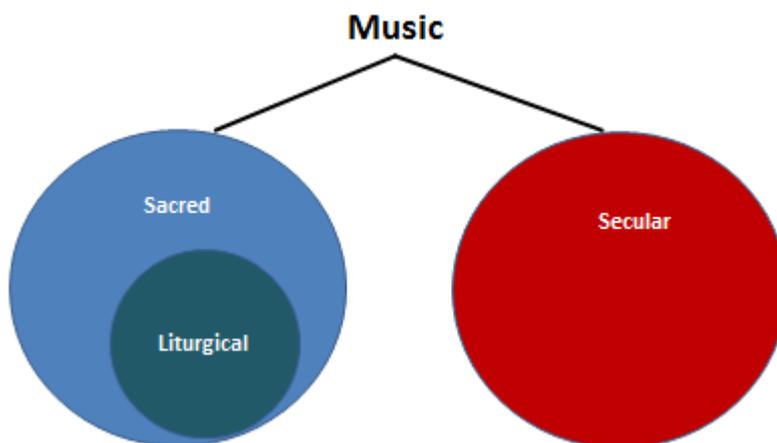


Figure 49. Relationship between “sacred” and “liturgical”

The set of example Grove worklists sometimes parallel the separation made between the liturgical and the merely sacred. For example, Janáček’s works (Tyrrell 2014) are divided as follows: stage works, liturgical, choral-orchestral, other choral, other vocal, orchestral, chamber and keyboard. While at first glance the presence of a liturgical category could be a simple change of category appellation from the more typical “sacred” found in Grove worklists, considering the works within these categories reveals something different. Janáček’s *Glagolitic Mass* is a setting of the Old Church Slavonic translation of the Catholic Mass, so is unequivocally sacred; however, it does not appear in the liturgical category in the Grove worklist, instead appearing in the choral-orchestral category alongside secular choral-orchestral works. There are a number of possible explanations. It could be read that there is a strong function categorization within this Grove worklist, placing a work which may be sacred but often appears in the concert hall with its function, thus bypassing a sacred/secular division entirely. Or, “liturgical” could be considered as a category where works have to have two properties for entry: sacred-

ness and a worship function. Janáček's *Glagolitic Mass* fulfils the former, but (arguably) not the latter. Conceptually, the latter conclusion is insightful. "Liturgical" could be considered as a compound facet, being a simultaneous statement about function and sacred-ness. In this viewpoint, we end up with a two-dimensional system with the facet of function and the quality of sacred-ness *both* acting upon the classification: liturgical just happens to be the crossroads of the two. The impact of this combination within classification systems of music is discussed in more detail in Section 7 and the combination of liturgical and sacred will be discussed in more detail in Section 7.2.

5.4. Sacred *and* secular: motets

Sacred and secular qualities are assumed to be mutually exclusive. However, this is not always the case. The form/genre of motets illustrates some of the potential pitfalls of this particular classification. Though the motet is normally considered a "sacred polyphonic composition with Latin text" (Sanders et al. 2016), over its long history as a form/genre it has not always fallen neatly within the sacred boundary lines. For instance, in the Middle Ages motets were an important secular form (Sanders et al. 2016), demonstrating how a single form/genre can change its sacred/secular categorization over time. Furthermore, individual motets from the Renaissance would sometimes combine sacred and secular texts, or use secular music alongside sacred texts, such as Josquin des Prez's (1450-55? – 1521) *Nymphes des bois/Requiem Aeternum* and Jean de Ockeghem's (1410 – 1497) *Mort tu as navré/Miserere*.¹⁹⁶ Thus, in terms of musical works, the sacred/secular categorization does not always hold.

The LIS classification schemes class motets as a sacred form/genre. For instance, DDC19 places motets as "non-liturgical choral works" alongside anthems, choruses and cantatas, which gives the motet a likely categorization of "sacred"; McColvin and Reeves – written as a reaction to the pre-DDC20 schedules – places motets as church music and sacred music, alongside oratorios and chorales. (Note the mixing of sacred and liturgical within these examples.)

The example Grove worklists place motets as sacred works – see for instance, Du Fay, Machaut, Binchois and Palestrina. This is expected: the Grove articles seek to classify specific works rather than forms/genres in general; therefore, each specific motet is secular or sacred, and the Grove worklists are expected to be built around this.

¹⁹⁶ Note that Ockeghem's *Mort tu as navré/Miserere* is strictly speaking not a motet as it is labelled a "motet-chanson" by sources such as Perkins (2009), and chansons were distinctly secular forms/genres; however, this does not diminish the sacred/secular hybridity of this example.

However, Machaut, one of the example composers, wrote motets which are simultaneously sacred and secular; in the Grove worklist for this composer (Arlt 2014), these works are in the loose category of “sacred”. This shows how even an arguably sacred/secular work has to choose sides within a sacred/secular categorization. The example of motets also shows the vulnerability of a sacred/secular division because forms/genres are dynamic; the categorization of function or sacred/secular character which is valid for a particular form/genre in one period may, not be valid in another.

5.5. Liturgical *and* dramatic: liturgical dramas

Passion plays, liturgical dramas, and similar sorts of works, confuse the boundaries between different types of function, as they fulfil criteria of being both dramatic and liturgical. While Stevens and Rastall (2016) make clear that “theatre” is not appropriate for works of this period, nevertheless, works such as liturgical dramas have some liturgical and some dramatic qualities. These types of works ask some interesting questions about the exact boundaries of functions. For example, where is the boundary between “liturgical” and a sacred event within a church? Should dramatic be more precisely defined as having a specific location, such as a theatre? The exact definition of the dramatic and liturgical categories will determine whether liturgical dramas (and similar works) live in two functions – unideal within a faceted classification scheme – or just one.

Where LIS schemes use sacred and secular divisions instead of a specific liturgy (or church) function, liturgical dramas reveal a different problem. If a scheme is truly open to any combination of sacred/secular and dramatic/non-dramatic then, for example, the form/genre of liturgical dramas has a place: they are sacred and dramatic. However, the LIS schemes often make an assumption that dramatic music is always secular; in other words that the conflation of dramatic and sacred, as coloured orange in Figure 50, does not exist. This is potentially problematic for works such as liturgical dramas. Alas, it is not possible to check where the example LIS schemes and Grove worklists place liturgical dramas: few LIS classification schemes include them amongst their foci, and these works are not represented in the set of 25 Grove worklists.¹⁹⁷ (One exception is LCC2015 which mentions liturgical dramas specifically; however, LCC2015 is unusual in having a specific section for dramatic music under its category of sacred music, thus not

¹⁹⁷ The absence of Liturgical dramas may be caused by the early date of these works and because, according to Stevens and Rastall (2016), some of these works have little extant music.

helping to determine where LIS schemes generally place the form/genre of liturgical dramas when there is sacred or dramatic, but no option to indicate both.)

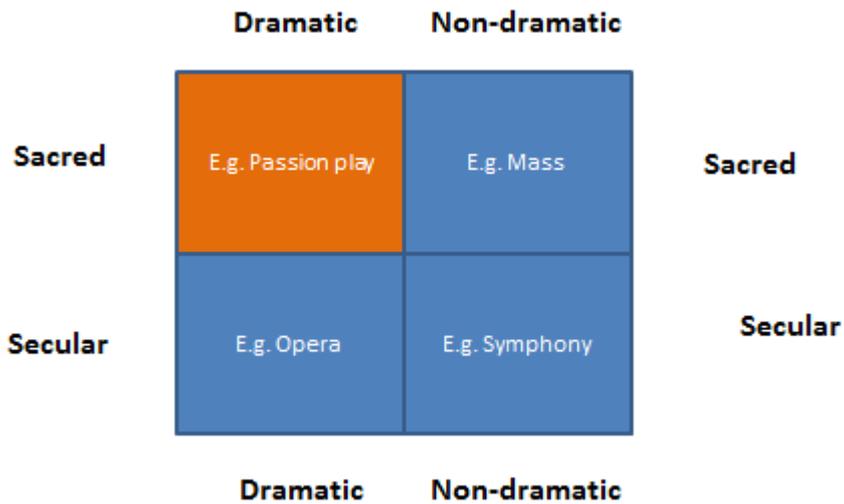


Figure 50. Sacred/secular and dramatic/non-dramatic matrix

5.6. Sacred *and* instrumental: church sonatas

Liturgical and sacred works are more likely to be vocal rather than instrumental. From a music perspective, this is understandable considering the usefulness of texts to convey meaning – see Chapter 5, Section 4.1. A matrix considering the combinations of the binary divisions sacred/secular and vocal/instrumental is given in Figure 51; the sacred-instrumental category is coloured orange to demonstrate the sparsity of types of music belonging to this combination. One such form/genre which belongs firmly in this less common sacred-instrumental category is the church sonata, so discussing this form/genre is useful in order to understand the junction between the sacred/secular and vocal/instrumental divisions.

	Vocal	Instrumental	
Sacred	E.g. Mass	E.g. Church sonata	Sacred
Secular	E.g. Opera	E.g. Symphony	Secular
	Vocal	Instrumental	

Figure 51. Sacred/secular and vocal/instrumental matrix

Church sonatas (*Sonata da Chiesa*) are instrumental works which, at least in some cases, were specifically designed for (liturgical) church use (Mangsen 2016); thus these works could be considered both liturgical and sacred. To most LIS schemes, church sonatas present a challenge too far. The “Church sonata” is not usually listed as a specific form/genre, nor is it generally possible to indicate an instrument and a sacred/liturgical function. The church sonata example highlights one common feature found in more enumerative (and even some semi-faceted) LIS classification schemes: vocal parts of LIS schedules can express function or a sacred/secular categorization, whereas instrumental parts of the schedules are organized by medium alone. This can be seen, for instance, in McColvin and Reeves. Even in more faceted schemes such as BCM and Dickinson, it is not possible to “add” sacred to a regular instrument and form/genre combination. Dickinson has a strong sacred/secular division within the vocal classes, but the sacredness or liturgical function cannot be extracted and repurposed for instrumental music. The lack of provision could be viewed in another way: as a reflection of form/genre more generally. While the form of church sonatas is similar to other sonatas, the sacred/secular aspect creates something new: this combination of medium, form and function (or character) could be considered a genre.

However, not every LIS scheme ignores sacred or liturgical instrumental music. For instance, LCC2015 includes sacred organ music, thus acknowledging the sacred/liturgical

and instrumental combination; for example, DDC19 acknowledges sacred instrumental music, although places it in the middle of the vocal section, and only allows this class to be used for literature rather than scores. Moreover, as a faceted scheme, UDC allows full faceting for sacred music and mediums, so in theory church sonatas could be represented precisely in UDC.

Unfortunately, only one of the 25 Grove worklists includes Church sonatas, the worklist for Mozart (Eisen, Sadie 2014); Mozart's church sonatas are placed as their own category in the sacred music section showing how the sacred-ness outruns any other considerations in this case. The lack of other church sonatas within the example worklists means that they are of limited use determining whether the music domain shares LIS classification's issues with combining sacred and instrumental.

6. "Concert": function no function

The third function, concert, is different from the previous functions discussed. This is because the idea of "concert" is in some ways the absence of a more specific function. For instance, in LIS classification schemes, function is usually represented by a positive focus – for instance, liturgical, church, dramatic, and so on; however, while each scheme has forms/genres associated with "concert", this function is seldom specified. Similarly, the Grove composer worklists rarely indicate a function when there is an absence of dramatic music or religious content (aside from "secular" which as discussed in Section 5, is not necessarily a function).

Conceptually, "concert" could be considered within the framework of a matrix: if function is a series of two binary categorizations (dramatic/non-dramatic and liturgical/non-liturgical), then "concert" is the confluence of both of the "nons" – see Figure 52. (Note that in Figure 52 "liturgical" is used rather than "sacred" and "secular" which has been seen in other matrices; this is because Figure 52 is concerned only with function, making the definitive function-ness of "liturgical" more useful here than the more ambiguous idea of "sacred".) Considering function as two separate divisions has some practical use: for example, an LIS classification scheme might demonstrate pure divisions between dramatic and non-dramatic music but lack clean categorization between other functions (for example, *Subject Classification*). Therefore, if function were considered to be two binary categorizations, rather than a single division into (usually) 3 foci, this would help to distinguish schemes such as *Subject Classification*,

which make use of parts of function, from schemes which have no classification by function at all.

	Dramatic	Non-dramatic	
Liturgical	[No specific function]	Sacred; liturgical; church; etc.	Liturgical
Non-liturgical	Dramatic; theatre; opera; etc.	Concert; orchestral; chamber; etc.	Non-liturgical
	Dramatic	Non-dramatic	

Figure 52. The “concert” function as a combination of two negatives

However, the idea of the function of “concert” is a simplification. First, not all music theorists agree that “concert” best describes the negation of liturgical and dramatic: for instance, in Section 3, it was discussed that Wolf (2002) includes the term “chamber” as the division of music which is not church or dramatic, rather than “concert”. This illuminates an issue with the function of “concert” concerning the performance of Western art music over time, and the difficulties of classifying by function. What might have been originally designed for the parlour and considered chamber music at the time of writing, is likely to be the concert music of today; for example, the usual place of performance of the form/genre of string quartets today is the concert hall, yet the earliest string quartets written in the 18th century were designed for domestic settings and for the purposes of entertaining the players rather than a large or external audience (Bashford 2003, p. 3). Thus, while “concert” will be used to describe that which is neither liturgical nor dramatic, it must be noted that the term’s meaning and the boundaries of the category it depicts are not as watertight as they might first seem.

7. Models, theories and conclusions

The complexities of function have been demonstrated in this chapter; moreover, so has the importance of this critical aspect of music. Thus, the task now is to put together all these ideas about function. This falls into three, sequential parts: to consider whether

function is a facet or not and its relationship to the facet of form/genre; to model the interaction between the dramatic/liturgical/concert triptych and the sacred/secular binary division; to consider how all these ideas fit together, including their interactions with the medium facet.

7.1. Function as facet

Function may be an important part of music classification, but this does not make it a facet. This section will consider the mechanics of function within LIS classification schemes. For this section, there are taken to be three functions: dramatic, liturgical, concert. For all the reasons described in previous sections this is clearly an oversimplification, but a necessary one in order to dissect function's facet-ness.

7.1.1. If function were a facet: considering how function would work as a facet

Whether function acts as a facet in fully faceted or semi-faceted schemes is difficult to ascertain, so a number of methods are employed to unpick function's role in a faceted environment. First, it is useful to consider some examples of describing musical works using a combination of foci from medium, form/genre and function, to see how function works as a potential facet. Some examples are given in Figure 53. In examples A and B, it is clear that the function of "liturgical" is useful: not all motets are liturgical (see Section 5.4) and few toccatas are liturgical. Here, function is acting as a facet, independent from medium and form/genre. Conversely, examples C and D show function providing less useful information: oratorios are usually performed in concerts and so are songs – see Figure 53. However, in these examples, the function of "concert" could be considered useful for confirmation: sometimes oratorios are staged instead, and songs could be dramatic or liturgical. So, function is still acting as a separate facet, albeit the information offered is largely contained within the expectations of the form/genre, suggesting dependence between form/genre and function.

Example	Example of combination of foci (medium + form/genre + function)	Notes
A	4 solo voices + Motet + liturgical	Function acts as facet, and distinguishes work from secular Motet
B	organ + Toccata + liturgical	Function acts as facet, and useful as Toccatas usually secular
C	choir/orchestra + Oratorio + concert	Function mostly repeating form/genre but useful for classification
D	choir + Song + concert	Function mostly repeating form/genre but useful for classification
E	orchestra + Symphony + concert	Function duplicates form/genre
F	choir/orchestra/7 solo voices + Opera + dramatic	Function duplicates form/genre
G	choir/orchestra/4 solo voices + Mass + liturgical	Function duplicates form/genre

Figure 53. Examples of medium, form/genre and function combinations

Examples E, F and G provide counterexamples as to function’s position as a facet – see Figure 53. Symphonies are exclusively written for concerts, operas are dramatic, and masses are designed for liturgical purposes – even if many masses end up in the concert hall. Thus, in these examples, the function facet is merely repeating information inherent in the forms/genres. So, these examples show how function can act as an independent facet, or that function can be contained within the form/genre. Positioning function as part of form/genre is a more serious case of combined facets than simply having two facets which happen to be dependent – the idea of dependency between facets is discussed in Chapter 8, Section 7, as well as elsewhere in the thesis. In a case of simple dependency, the choice of foci from one facet (say medium) influences the available choices of foci from another facet (say forms/genres); however, if function is an appurtenance of form/genre rather than just related to it, this suggests that function is not a facet at all.

Another important consideration about function’s faceted-ness, is whether the foci of function can exist outside of the realm of form/genres. Up to now, function has always been considered when it is adjacent to form/genre, but arguably its potential position as a facet would be strengthened if the foci of function could potentially appear in any position in the citation order. In other words, does a focus of function such as “dramatic”, make sense when it is not adjacent to the form/genre’s facet’s foci? For instance, does the following string make sense: liturgical – choir – mass? Or this one: dramatic – orchestra – ballet? The answer is that they do: a “mass” might be inevitably

liturgical in function, which asks a question about unnecessary repetition, but the word “liturgical” stills makes sense when it appears separately from “mass” in a list of terms. Likewise, the same argument holds for the ballet chain of foci. This strengthens the arguments that function acts as a facet, as these examples show that function can exist as a separate unit and does more than just clarify or extend the form/genre.

7.1.2. If function were not a facet: the facet-as-broad-categories alternative

If function were *not* a facet, then it must have another role within music classification. So, examining the contrary position of function-as-facet will also provide insight. The most obvious non-facet role would be for function to act as a broader heading, as a parent to all the forms/genres under its care. This is visualized in Figure 54, where the categories are shown as ellipses, which contain examples of appropriate forms/genres. Figure 54 highlights an important corollary of function-as-parental-term: each child can have exactly one parent. Zero or two parents, or split custody is not allowed. This proves problematic for certain forms/genres, which are shown outside of the coloured ellipses in Figure 54. For instance, we have seen how songs can be considered concert, liturgical or dramatic, depending on the individual song; so the form/genre of song is shown outside of the ellipses for function yet connected to all three potential “parents”. Liturgical musicals are problematic in another way, as the form/genre belongs under two functions *simultaneously*. (While we might hope to just quietly ignore the particular concept of a liturgical musical, alas, they do exist and even the enumerated scheme LCC2015 makes space for them as part of sacred, dramatic music.) Therefore, we can conclude that some forms/genres have multiple possible functions; in other words, the relationship between certain functions and forms/genres is sometimes many to one, which is not permitted within a strict parent-child hierarchical system of function-as-category-headings. While the majority of forms/genres “behave themselves”, the existence of multiple exceptions makes the idea of functions as merely the broad categories contained within the form/genre facet problematic. Thus, function may not be a facet, but Figure 54 and this section show that function is also not the parent of forms/genres either.

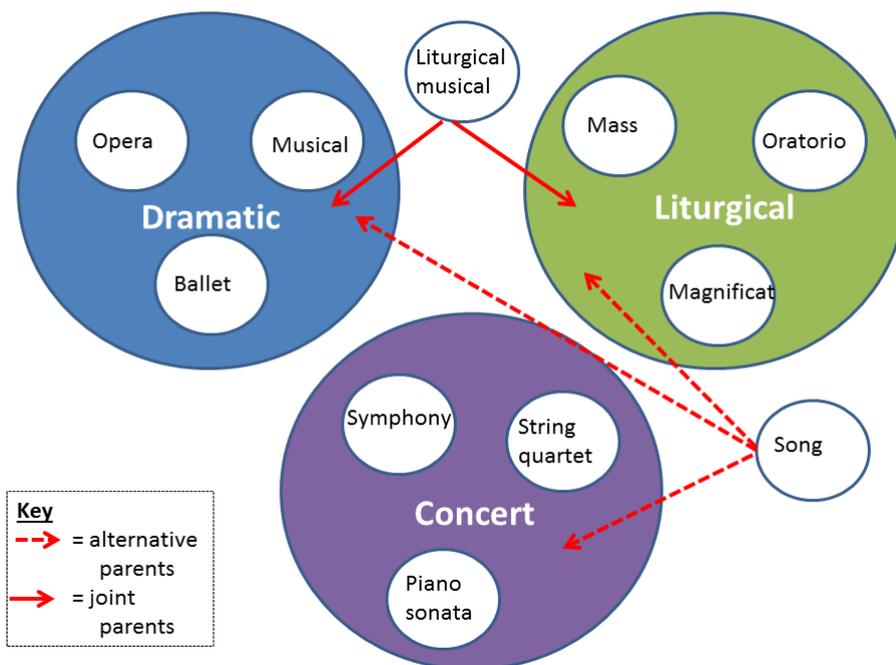


Figure 54. Function as broad categories

So, function shows signs of being a facet, but also signs that it is not a facet. In some situations function can be happily situated as a completely separate entity from form/genre, and acts as a useful signifier of information, independent of the form/genre facet; however, in other cases, function nestles cosily within the arms of form/genre, where only a provocative attempt at genre-bending will dislodge the function/form/genre union. Thus, function could be termed a “quasi-facet”.

7.1.3. Relationship between function and form/genre facets

A significant and novel finding resulting from the conceptual analysis above is that function’s position as a facet or category of form/genre seems to depend on the form/genre in question. This could be conceived as a *dynamic relationship* between function and form/genre; although not specifically mentioned in music classification discourse, most systems and commentary appear to make the assumption that there is a singular, static relationship between function and form/genre. Moreover, it could be argued that faceted classification generally works on an assumption that there are static connections between all facets within a certain subject area. The results from this thesis show that a new way of thinking is required in order to more accurately model music classification: not only is function a quasi-facet, but the relationship between function and form/genre could be considered a dynamic one.

7.2. The interaction between function as dramatic-liturgical-concert triptych and a bipartite sacred/secular categorization

This section will consider an important interaction: between the dramatic-liturgical-concert triptych of functions and the function-flavoured division of music into sacred and secular. (This section assumes function to be a facet, and oversimplifies function so as to consist of only three types of function, dramatic-liturgical-concert. Both containments are necessary in order to model these interactions.) As discussed in Section 5, which considered religious-ness as a function, a division into sacred and secular can be seen in some LIS classification schemes. For instance, LCC2015 strictly divides its vocal music into sacred and secular, and within the sacred and secular parts of the schedules there are separate classes for sacred dramatic music and secular dramatic music. This shows how both sacred/secular categorization and functions (such as dramatic) might be used in the same LIS classification scheme, with the sacred/secular categorization trumping function in this instance. So, LIS classification schemes show warrant for combining sacred/secular categorization with function. The conceptual foundation of the interaction between these systems now needs to be explored.

The first visualisation of the relationship between the three function-based categories and the sacred/secular division can be seen in Figure 55. The three functions are placed on to the sacred/secular division. Concert music splits equally between sacred and secular, while liturgical is by definition only sacred; the dramatic function is more problematic, as though it is overwhelmingly associated with secular music, it is possible to have dramatic sacred music – as discussed in the LCC2015 example above, in Section 5.3, and in other places in this chapter. So Figure 55 depicts something very important: each of the three functions has a different relationship with the sacred/secular categorization, hence there is no simple relationship between the function triptych and the bipartite sacred/secular categorization.

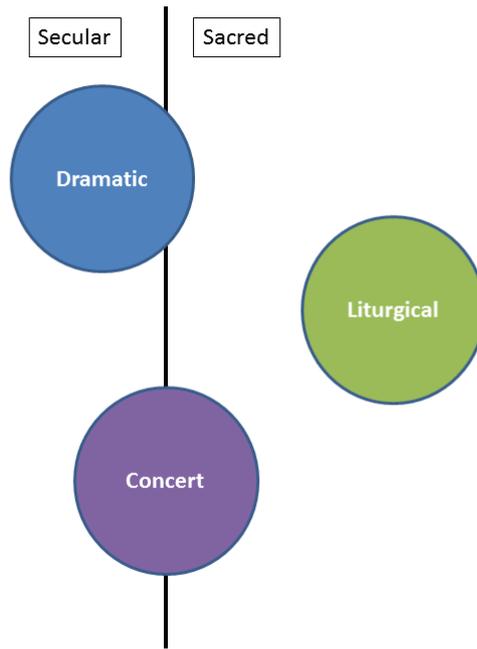


Figure 55. The three functions and their positions within a bipartite sacred/secular framework

The second visualization is seen in Figure 56. This three-by-two matrix lists which combinations of function and religious-ness are possible. One combination proves impossible: secular and liturgical. The reason for this is that secular is the antonym of sacred, and sacred and liturgical share a parent/child relationship – as discussed in Section 5, and shown in Figure 49. However, Figure 56 highlights that while all other combinations are possible, Section 5.5 showed that one is possible but particularly rare: sacred dramatic music.

	Liturgical	Dramatic	Concert
Sacred	Yes	Yes, but rare	Yes
Secular	No	Yes	Yes

Figure 56. Which combinations of sacred/secular and liturgical/dramatic/concert are possible and likely?

A final visualisation is shown in Figures 57 and 58, which shows the intersection of these two categorizations as two steps of a hierarchical classification system. This creates a two-level facet (or two facets which should be adjacent in a citation order). The hierarchies are presented with both permutations of order of characteristics of division. As expected from Figure 55, either way around, there is a redundant category: “liturgical secular music”. However, Figure 57, which has the order of function → character, produces a liturgical category which has no meaningful subcategories, as in addition to the non-existent “secular liturgical music”, “sacred liturgical music” is an oxymoron. Alternatively, the order shown in Figure 58, character → function, produces only one redundant category, “secular liturgical”, but all the categories created after the first characteristic of division (religious-ness) have at least one sub-category. From a classification perspective, both orders (function → character, character → function) are asymmetric, but the second order could be considered more symmetrical in a vertical plane.

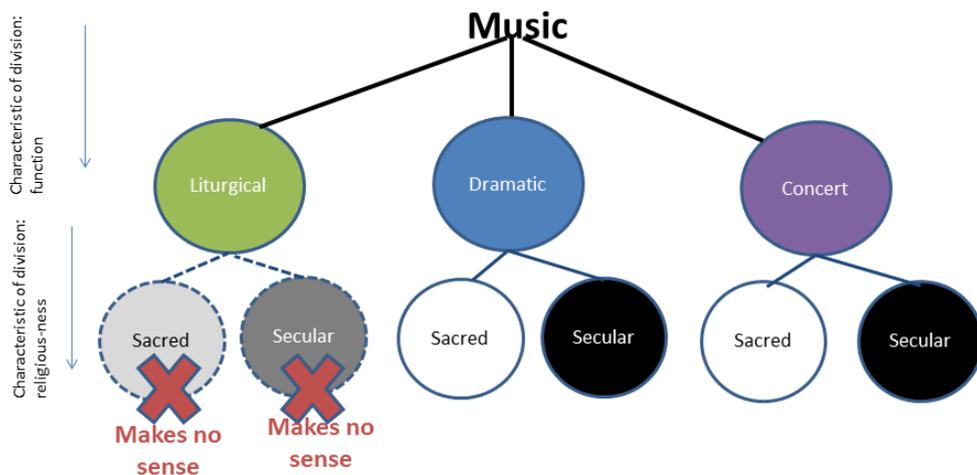


Figure 57. Three functions and sacred/secular division as a two-tier facet: function → religiousness

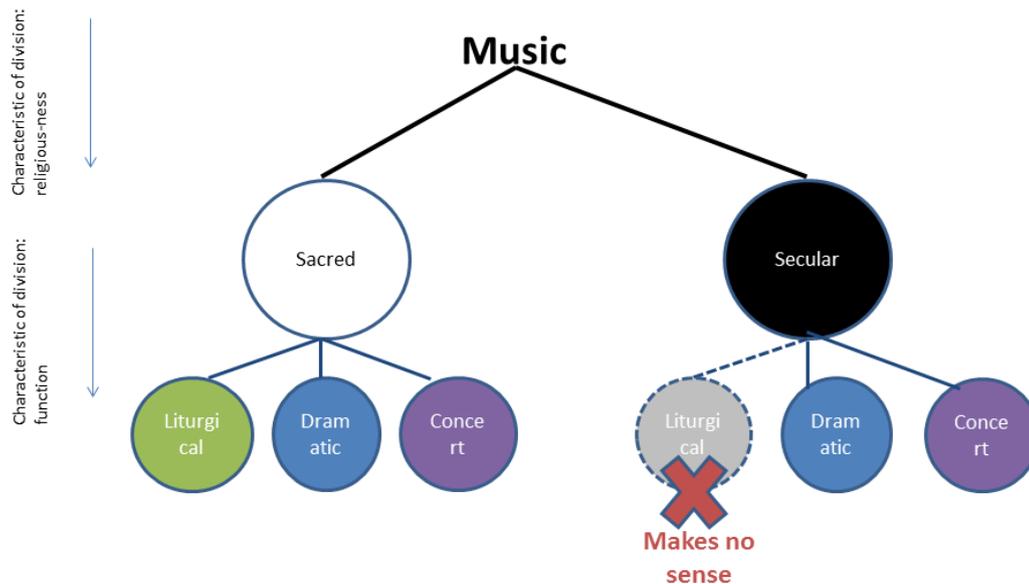


Figure 58. Three functions and sacred/secular division as a two-tier facet: religious-ness → function

So, having some form of combination of function and religiousness offers a more precise theorisation of the function conundrum than applying only one of these categorizations; however, the three visualisations have shown that these two different categorizations – both of which are used in LIS classification schemes, sometimes at the same time – do not fit together neatly.

7.3. Interaction between function, form/genre and medium

7.3.1. Combining matrices

Medium is the final complexity to stir into the function, religious-ness and form/genre mix. As already discussed in Section 4.1 and Section 5.6, function and medium can sometimes interact. One way to consider the interactions of all these elements is through combining the individual matrices already seen in this chapter. Three matrices were shown in Figures 45, 50 and 51, using two-by-two matrices, with each matrix featuring two of the following three dualities: sacred/secular, dramatic/non-dramatic and vocal/instrumental categorizations. Combining these matrices is an interesting endeavour. One possible visualisation is shown in Figure 59. It shows how any musical work could hold three values separately, one from each of the three binary divisions. So, every musical work can be plotted along the three axes. Figure 60 gives some examples of forms/genres using this visualisation, with each form/genre representing the typical characteristics of its members rather than the exception. The relative position of one form/genre from another is an important part of this visualisation. For

instance, ballet is instrumental, dramatic and secular. It is in the opposite corner of the cube to a mass, which is vocal, non-dramatic and sacred. Ballet is close to opera, which is vocal, dramatic and secular; it is equally close to symphonies, which are instrumental, non-dramatic and secular. Importantly, using this visualization, ballet is positioned close to both opera and symphonies, but in different directions.

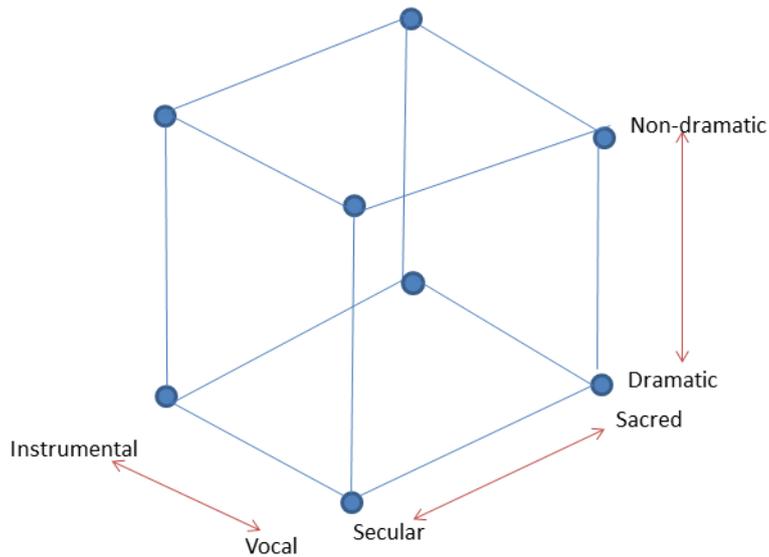


Figure 59. Combining three binary categorizations: sacred/secular, dramatic/non-dramatic, vocal/instrumental

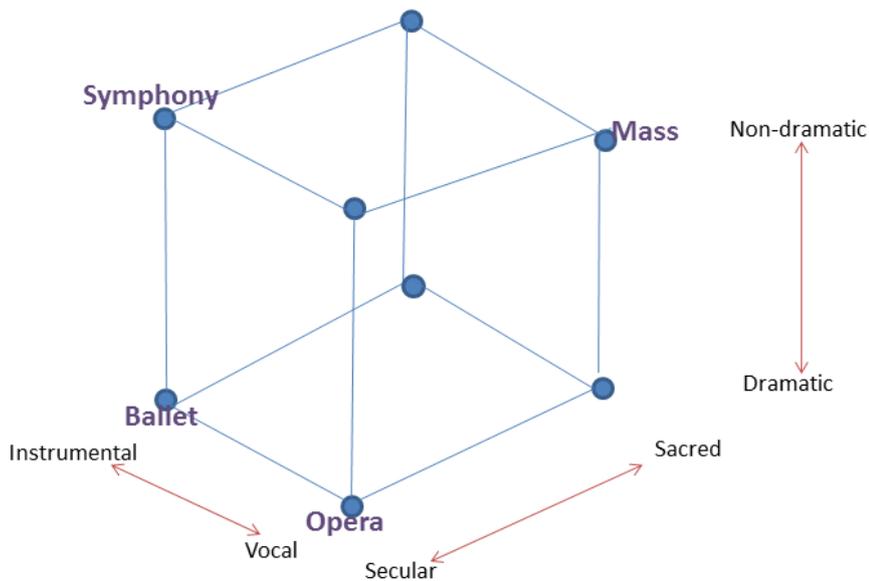


Figure 60. Combining three binary categorizations: examples of specific forms/genres

Note that these examples are taking the categorizations of sacred/secular, dramatic/non-dramatic and vocal/instrumental as bipartite, with only two discrete

values for each categorization. Therefore, a musical work will be placed on one of the nodes, rather than along an axis or in the middle of the cube. However, the categorizations are not inevitably binary: it has been shown in Chapter 5, works can be considered to be a mixture of vocal and instrumental, opening the way towards non-binary values. This would mean a form/genre such as a choral symphony could be placed part way along the vocal/instrumental categorization axis, rather than at a node. Although the cube has value, it is worth remembering that it only covers one part of function, rather than the whole gamut. So, to cover function fully, a different model is now explored.

7.3.2. Hierarchy of function, religious-ness and vocal/instrumental categorizations

The visualisation presented in Section 7.3.1 (Figures 59 and 60) allowed for equitable power in each of its three dimensions. However, in faceted classification, different levels of power are usually assigned to each criterion, in a series of hegemonic steps; in other words, a series of characteristics of division sees the first characteristics have more power than the later ones, and a set of within-array organization principles which sees some entities appearing before others. So, it is important to also consider how the different categorizations for function and function-type qualities interact within a hierarchical system.

The LIS classification schemes demonstrate different approaches to this question of order-of-importance. Some schemes have clear sequences for the characteristics, but decide to “squeeze” a form/genre in the “wrong” place in order to maintain the order of divisions while placing an individual form/genre closer to where they believe it belongs. For instance, LCC2015 has a strict division between vocal and instrumental music, with vocal music strictly divided between sacred and secular and each of vocal/sacred and vocal/secular divided between the dramatic and non-dramatic. However, instrumental music has no option of dividing into dramatic and non-dramatic. So, LCC2015 places the instrumental, dramatic form/genre of ballet within vocal, secular, dramatic music; the incorrect parent of “vocal” is deemed a small price to pay in exchange for near collocation with opera and other dramatic vocal forms.

We could view such breaking of rules for individual forms/genres as one-offs, and consider them (negative) traits of particular schemes or indicating a specific “awkward” form/genre. An alternative view is to consider situations where characteristics of

division are not consistently applied as a potentially novel classification structure and a rich seam of information about music classification. For example, unlike LCC2015, DDC19 does not appear to squeeze awkward forms/genres in the wrong parent facet. At first glance, DDC19 is a model scheme for promoting purpose – and the function-ish idea of religious-ness – as the first characteristic of division. DDC19 has categories for dramatic music, sacred music and secular music; the secular music category is implied to be non-dramatic, and acts much like a category for the function “concert music”. As two of these categories include both vocal and instrumental music, it seems that there is a somewhat clear order of characteristics: function → medium. However, looking at some example forms/genres reveals something fascinating. Sacred organ music, such as offertories, is a meeting of the sacred/secular and vocal/instrumental categorizations: vocal/instrumental wins. Ballet music is a meeting of the dramatic/non-dramatic categorization with the vocal/instrumental categorization: dramatic/non-dramatic categorization wins. Staged, sacred oratorios are a meeting between the dramatic/non-dramatic and sacred/secular categorizations.¹⁹⁸ However, when these two categorizations square up via sacred, staged oratorios, it is not straightforward to determine the victor. The comprehensive number for oratorios (782.82) is found within “Theater music”; yet, there is a see-reference for sacred oratorios to be instead placed under a class for oratorios found in “Sacred music” (783). This suggests that a sacred, staged oratorio would be expected to reside within the sacred class *not* the dramatic class.¹⁹⁹ If this interpretation is accepted, then in the case of staged, sacred oratorios, sacred wins over dramatic.

Putting these relationships together produces a fascinating result: vocal/instrumental > sacred/secular; dramatic/non-dramatic > vocal/instrumental; sacred/secular > dramatic/non-dramatic. Reduced to a logical statement, if $a > b$, $b > c$, then we would

¹⁹⁸ Unlike the Oratorios discussed in Section 4, where 21st-century performance practice means that sometimes these works are staged, “staged sacred oratorio” is taken to mean works which are sacred in nature but originally designed to be staged. Such works exist, although are rare: for example, the form/genre of *sepolcros*, a close relation of the oratorio and considered under the broad umbrella of oratorio studies, dramatize the Crucifixion and are specifically designed to be staged (Neville 1998, p. 597).

¹⁹⁹ There is an alternative reading of this see-reference: “sacred oratorios” read as specifically *not* dramatic, which would lead to staged sacred oratorios being placed in the “Theater music” class for oratorios (782.82) rather than as sacred music (783.3). However this is less convincing, especially as everything else in the Theater music class (782.8) is associated with secular music. So, the sacred “win” is offered as the most likely intention, but it should be noted that it would be possible to interpret the scheme in a way which generate a different result to the sacred/dramatic standoff. However, this DDC19 example offers interesting insights and new directions concerning classificatory hierarchies and function, so even if the case it rests on (the placement of staged, sacred oratorios) were to topple, the discussion it inspires is still fruitful.

expect $a > c$. In mathematical terms, this would be a transitive relationship. However, DDC19 shows a situation where for some a , b and c , $a > b$, $b > c$, but a is not always bigger than c . This demonstrates that in DDC19, relationships between sacred, instrumental and dramatic music are sometimes non-transitive. We have a loop, where no characteristic of division comes out on top. See Figure 61 for a pictorial representation, and showing how the categorizations become an “impossible triangle”. While DDC19 and its fellow pre-DDC20 relatives are much complained about by critics (see for instance, Sweeney 1976, p. 4, Redfern 1978, pp. 55-58) and these early editions of DDC do not claim to be faceted, it is still useful to understand this phenomenon and to deconstruct what is going on from a faceted perspective. The non-transitive categorizations (probably) at play in this small example of DDC19, help us to understand more generally just why faceting and music are so problematic, as well as providing a new perspective on understanding the mechanics of classification schemes.

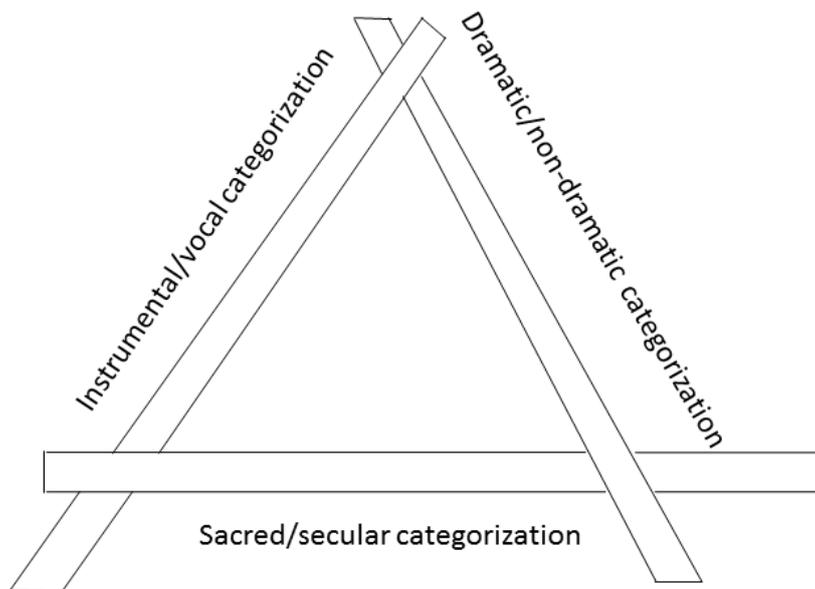


Figure 61. Non-transitive categorizations

8. A postlude: occasion and character

While this chapter has focused on function, and the function-like quality of religiousness, other parts of the IAML combined facet have been neglected. These could be described as occasion and character, and examples of foci might include, Christmas, wedding, military, student, protest, sea, nature, night, and so on. Occasion and character might manifest themselves as appendages to general musical forms/genres

such as “Wedding marches” or a “Christmas oratorio”; or whole forms/genres might be based around a combination of a specific form/genre and an occasion/character, such as “Sea songs” or “Military marches”.

Character and occasion make many occurrences in the example LIS classification schemes. Even in an early scheme such as Cutter1902, there are appearances of character-related phenomena such as “military music”, while special song collections include foci for “patriotic”, and “political”; Ayer, in one of the earliest extant discussions about specifically classifying music, includes space for military and patriotic songs. (It is possible to argue that “military” is also a function as well as a character.) The use of character or occasion is present in later LIS schemes too: McColvin and Reeves (1965) includes hunting songs and sea shanties while Bliss1 (1953) includes college songs. LCC2015 has a cornucopia of characters including songs for Alcoholics Anonymous and student groups, as well as a plethora of song subjects including farmers, convicts, hiking and hobbies.

Occasion does not appear as frequently as character, perhaps, but there are still multiple examples of its use: for instance, McColvin and Reeves has songs for special occasions, days and celebrations; Flexible has examples including festive and wedding songs; DDC22 has space in sacred music for Easter and Christmas. Therefore, we can conclude that the concepts of character and occasion are a prolific and solid part of LIS classification for music.

One observation from this brief foray is that character and occasion are much more likely to be considered part of vocal music than instrumental music. For instance, Ayer and McColvin and Reeves give the opportunity to specify character or occasion for parts of vocal music, but there are no similar options for instrumental music. There are some exceptions: military marches fuse an instrumental form/genre with a character and can break through into schemes which largely consider character to be solely a vocal affair (for example, Cutter1902). Unsurprisingly, the more faceted schemes tend to allow character or occasion to be added to instrumental and vocal musics. Thus in some schemes, use of a character or occasion facet will be dependent on vocal/instrumental categorization.

Whether character and/or occasion are a facet at all is an interesting question. The LIS classification schemes generally treat character as a facet. As discussed in Chapter 4,

Section 3.1.1, BCM's citation order for scores has character as its third facet for vocal scores; this structure is (deliberately) copied by DDC22. Character acting as a facet can be seen in action in DDC22: for instance, DDC22 states that music works with a non-musical character should be placed with the form/genre rather than the character. This is expected from a scheme which prioritises form/genre over character in its citation order. (Even its predecessor (of sorts) DDC19, while not faceted, prioritises form/genre above character: when having both a form/genre and an occasion such as a Christmas-related oratorio, the scheme states that form/genre takes precedence.) UDC also uses character as a facet, with the ability to add particular seasons and festivals to songs; furthermore, the character facet appears to defer to form/genre. Dickinson, the pre-faceted, faceted scheme (see Chapter 4, Section 5.3), has a facet "o" for occasion that can be added to certain forms/genres (called Species); however, "occasion" is not included directly in the combination/citation orders. So, the LIS classification schemes show that occasion/character is usually treated as a facet, coming behind form/genre in the citation order.

However, this neatness of specified facet and placement falls apart under closer scrutiny. To start, it is often difficult to differentiate between character, occasion and function. For instance, is the wedding in "wedding music" a function or a character? Military music is both military in character, but is also often military in function. Music specifically written for children has a certain character, but it also serves a specific function, namely to educate children (as discussed earlier in this chapter when discussing pedagogical function). Of course, a sensible question would be to ask whether it matters if an aspect such as "children" is considered to be a function, or character, or even both, as even meta-facet systems such as IAML hesitate to distinguish these aspects. The answer is that while it does not matter in an ontological sense, the vastly different classificatory importance and roles attached to function as opposed to character mean that a "children" function would be different in classificatory terms from a "children" character.

So, there are different ideas of character and occasion, different conditions as to where they can be added, and naturally many counterexamples and awkward isolated works; however, in broad terms, faceting of music classification perceives that there is a facet of character/occasion (where faceting occurs) and it is usually considered less important than the medium and form/genre. Importantly, the example LIS music classification

schemes demonstrate that function and character/occasion serve different purposes and act in different ways within the schemes. While individual ideas demonstrate crossover between character, occasion and function, and there are many similarities in their ontological makeup as constituents of musical works, from a classification perspective character and occasion are very different from function. Put simply, function is usually considerably more important. Thus, while important to briefly consider them, character and occasion are largely ignored in this thesis as it focuses on the makeup and relationships between the primary facets (or quasi-facets) of medium, function and form/genre.

9. Conclusion to Chapter 9

This chapter has demonstrated that the concept of function is a critical part of classifying notated Western art music. While even the name for this concept – for the reasons described earlier in this chapter, “function” was the selected title – is debateable, the presence of function is not. However, this chapter raised and attempts to answer some important questions about the nature of function as a classification device. First, there is the question of whether function is a facet or not. This chapter has demonstrated that function could be considered to be a “quasi-facet”: while it usually acts in the same way as other facets, it is sometimes considered more usefully as an ordering device or categorization device. Second, while there are multiple functions, both the music domain and LIS domain indicate three central foci for facet, based around drama/staging, religious-ness/liturgical and concert. However, the boundaries for these foci are flaccid, and there is not always accordance about the foci’s names. An interesting idea to emerge from this chapter concerns whether function is one single division, or instead two bipartite divisions. For example, the idea of “concert” can be seen as a combination of two negatives: *not* dramatic and *not* religious.

One of the most significant issues concerning the classification of function is related to the focus of religious-ness/liturgical. There are two, connected frameworks: the purely functional aspect of “liturgical”, which fits alongside concert and dramatic as the three main functions, and a bipartite division of music into sacred and secular. The crux of the issue is the parent-child relationship between sacred and liturgical; this parental relationship causes complexities when attempts are made to conjoin the two frameworks. The importance of finding a way to combine the two frameworks is highlighted by analysis of the LIS classification schemes, which show how some schemes

mix (parts of) the dramatic/liturgical/concert divisions with (parts of) the sacred/secular framework; this means that finding a way of conceptualising the integration of both views of function is critical. Three different ways of understanding the combination of frameworks were presented, although each highlighted the redundant and/or meaningless categories created by the liturgical/sacred relationship. Sacred/liturgical frameworks highlight other issues too. There is an assumption that a musical work can only hold one particular function at once; however, works such as liturgical dramas demonstrate that a work can be liturgical and dramatic, smashing the idea of three mutually exclusive foci for function.

This chapter also discussed function's relationship with other facets. Following on from discussion in earlier chapters, function also demonstrates a dependency with the vocal/instrumental categorization. This was seen in example classification systems where a dramatic function was assumed to be vocal, and liturgical music was also assumed to be vocal. For instance, this issue was actualised by viewing the treatment of the form/genre of ballet in the LIS and Grove worklist classifications, and discussed more theoretically for church sonatas. Another critical relationship occurs between function and form/genre and this is where function's mantle as a standalone facet is really tested. At times function escapes being wholly a characteristic of form/genre and becomes a facet in its own right, while at other times, function appears as an organization principle or broad categorization of form/genre. It is especially interesting to note that whether function acts like a facet or not appears to depend on the particular form/genre. This is more than "just" the dependence of facets seen in earlier chapters where the treatment and choice of foci within one facet depends on the choice of focus in another facet; here, the relationship itself between function and form/genre changes depending on the choice of focus within form/genre. This could be called a *dynamic relationship* between facets and this is discussed in more detail in Chapter 10, Model 3, Section 4.5.

This chapter also considered how (a simplification of) the two different function systems and the vocal/instrumental categorization can be combined, using a matrix of three bipartite categorizations. This system could be used as a way of presenting the relationships between different forms/genres by simultaneously representing values for all three of these categorizations. Within the LIS schemes discussed, these categorizations usually take place within a system of hierarchies: however, one scheme,

DDC19, appears to show an “impossible triangle”, where the binary decisions form a loop, with no one facet dominating. Whether error, clumsy scheme wording or ingenious, this example illuminates how function can be viewed outside the confines of a strict hierarchical system.

There are a number of issues with using function to classify music. For example, the function of a particular form/genre or individual work can change over time, such as the oratorio which was designed for the concert hall but is now usually staged.

Furthermore, individual works may not be easily categorized into one focus: for instance, a motet which uses sacred and secular texts simultaneously. However, having examples which are difficult to classify do not make a facet unusable, but these issues should be borne in mind when considering using the function facet to build a classification system.

Finally, there is the question of function as a classification device in the music domain’s conceptions of classifying music. From music literature it seems that function has historically been an important device to classify music within the music domain. Furthermore, the idea of three important categories of function – dramatic, religious/sacred/liturgical, concert – appears in musicological writings by Busoni and others. In addition, categorizations based on dramatic/non-dramatic and sacred/secular also appear in the examples of Grove worklists; for instance, virtually every Grove worklist consulted had separate categories for forms/genres which are dramatic, as opposed to those which are non-dramatic. While the example Grove worklists allow some view into function issues such as the relationship between liturgical and sacred, for more granulated issues such as the treatment of church sonatas or compound orders of different types of function, the design of the Grove worklists meant they did not yield the information required to study classification. Nevertheless, for the broad existence of function as a categorization device and the presence of three main types of function, the musicological examples and Grove worklists show the accord between music and LIS classifications of function. Thus, it can be hypothesised that for function, the music domain’s broad treatment of function is realised within LIS classification, thus further strengthening the connections between the LIS and music domains’ classification of music.

Chapter 10: Modelling music classification

1. Introduction to Chapter 10

This chapter draws together the results presented in Chapters 4 to 9, and uses these findings to produce five models of music classification. Each of these models presents a different aspect of music classification, responding to various combinations of research questions (abbreviated to RQ1, RQ2, and so on). The models in some cases show how existing library and information science (LIS) literature and classification schemes classify music at a structural level; however, in other cases, the models instead offer new ways of thinking about aspects of music classification, illustrating ways of structuring and understanding music classification that have few antecedents in existing LIS schemes or discourse. In fact in most models, a combination of both views is presented.

Importantly, the series of five models demonstrates the complexities of music classification by carefully unpicking what is actually happening when notated Western art music is classified.

Model 1 proposes a representation of the classification of musical medium, using the results of LIS scheme analysis combined with conceptual analysis of music classification from the LIS domain. This primarily responds to the first two research questions: it shows how notated Western art music is presented in LIS (RQ1), but also demonstrates how using LIS classification theories such as facets helps to model this classification (RQ2). Model 2 focuses on one particular part of medium: the vocal/instrumental categorization. It suggests a novel solution, thus conceptualizing a perennial issue within music classification (RQ2). Model 3 shows the relationships between facets of music, representing music as a series of dependent facets. This model helps to explain theoretically just why music is so difficult to classify in real life. As well as helping to explain existing LIS classifications of music (RQ1) using faceted ideas such as dependent facets (RQ2), it also presents novel ideas about faceted classification dependency in general (RQ3). Model 4 is concerned with genre, depicting the classification of music as two simultaneous systems of classification – one which is faceted, and the other a genre-based system. This innovative structure and representation of music classification uses theories of facets and genres to help understand music classification (RQ2).

However, it also introduces a number of novel general ideas about classification, thus showing how analysing music classification can help to understand classification more widely (RQ3). Model 5 considers the relationships between music classification in the LIS and music domains. It uses the conglomeration of information unearthed in Chapters 4 to 9 about how the music and LIS domains present music classification, to present a discussion and model about the overall relationships between classifications in both domains (RQ5). As well as being relevant for music classification, the model presented is also a new perspective on analysing relationships between LIS and domain classifications generally (thus, also helping to answer RQ3).²⁰⁰

2. Model 1: modelling musical medium

The thesis, in particular Chapters 5 and 6, has demonstrated that the medium facet is in fact a complex structure with a number of potential sub-facets. Model 1 uses the results and discussions from these two chapters to present a new way of thinking about the structure of the medium facet. It is important to note that Model 1 is based on understanding what is taken place within musical medium, rather than being a compilation of the schemes under analysis – particularly true in the case of multiples. The model partially answers RQ1 and RQ2: it shows how an important part of music classification, medium, is organized, and also shows how considering part of medium using faceted classification ideas aids understanding of classifying this complex part of music.

2.1. Introducing the musical medium model

Model 1 (Figure 62) shows the music medium facet. One novel feature of the model is that it presents medium as a combination of two parts which operate in quite different ways. In the first part, there are two hierarchical divisions to be followed in succession, for “sonority type” and “number type”. The unusual step is that at this point, the mechanisms of the model change. Instead of more hierarchies of characteristics of division with the model presenting possible foci, the second part of the model contains a single system showing the interactions between various sub-facets of medium.

²⁰⁰ Note that RQ4 is not directly addressed in this chapter (Chapter 10). Information about music classification in the music domain is presented in Chapters 4 to 9. Furthermore, information about music domain classification is vital for Model 5, thus RQ4 is indirectly involved in Model 5 as the model could not have been created without answering RQ4 in Chapters 4 to 9.

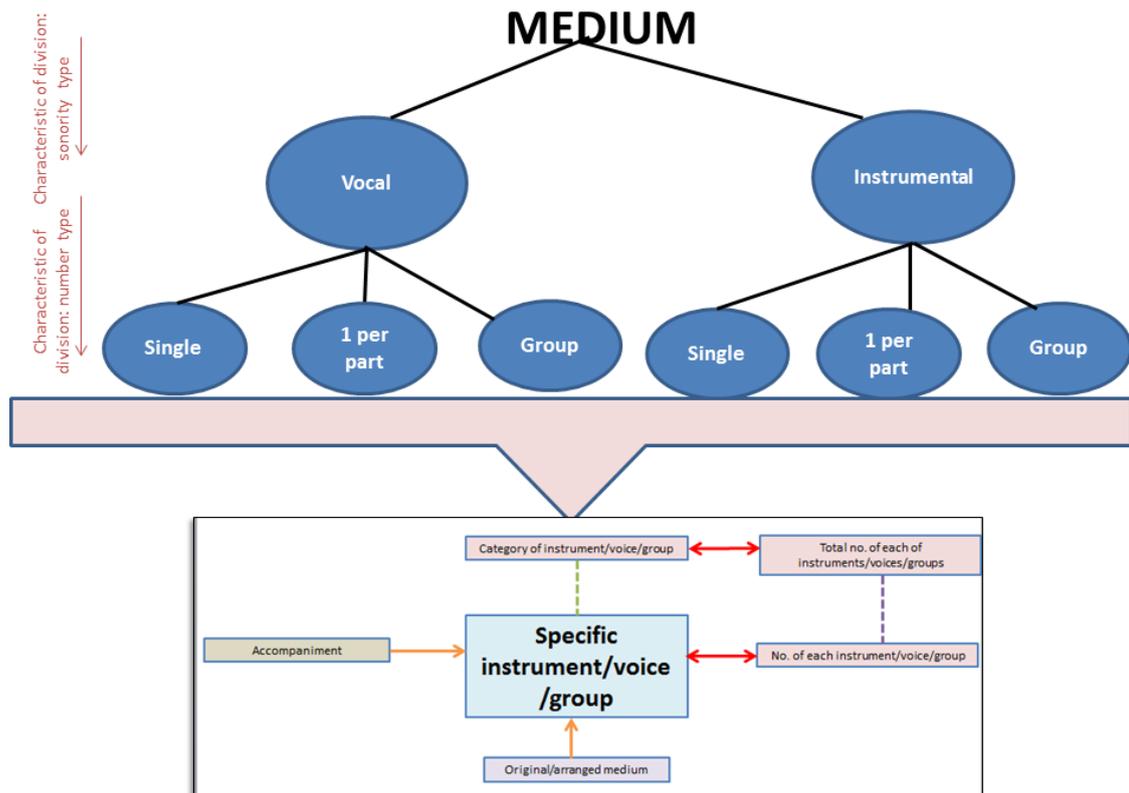


Figure 62. Model 1: musical medium

Model 1 allows an openness of order for this (second) part of the model: this reflects how the citation orders of LIS classification schemes offered no definitive order to the elements presented in the schemes, nor was every element present in every scheme examined or indeed relevant to every musical work. Furthermore, orders and notations are not important unless part of a practical classification. If this model were to be in the future adapted as a practical classification, then an order for the elements in the lower part of the model would need to be specified.

2.2. First part of model

Musical medium is first split by a characteristic of division relating to type of sonority, providing vocal and instrumental categories. (Note that the term “sonority”, which is used to describe the characteristic of division, is not ideal; however, as no better term is apparent, it is used in this chapter to represent the quality which is being divided in the vocal/instrumental categorization.) The thesis has shown how this division is one of most important categorizations for notated Western art music; part of Model 1’s originality is emphasising and visualizing the importance of this division. From each of these foci, the next characteristic of division splits the facet by the number type. This is

a broad term for a characteristic of division which results in the following foci: a single instrument or voice (“single”); multiple voices or instruments but with only one musician per part (“1 per part”); then groups which have more than one musician per part (“group”). Again, while present in most LIS classification schemes analysed for this thesis, this “number type” it is seldom discussed in these terms, hence demonstrating the novelty of the model presented.

There are a number of interesting points about these first two characteristics of division. The vocal/instrument divide was demonstrated in Chapter 5 to be the most fundamental divide within musical medium, and this was expressed by its position in LIS classification schemes – though, less definitive within the music domain conceptions of music classification. However, Chapter 5 also showed how the real universe of Western art music produced many examples of types of musical works and individual musical works which did not fit neatly into the binary categorization of vocal/instrumental. This is partly explored and countenanced in Model 3, which introduces a third focus to the vocal/instrumental categorization: “vocinstrumental”. While it might be expected that the number type might be directly followed by specific numbers of instruments/voices/numbers within ensembles/groups, actually the analysis in Chapter 6, Section 1.2 showed how further details about numbers did not necessarily follow on from any number-type division. So, Model 1 highlights how size information might be treated in two different ways within music classification.

2.3. Second part of model

In the second part of the model, things get a little more interesting – see a detail of the Model, in Figure 63. Instead of an absolute order found in the classification schemes, there are a series of extra sub-facets (or facets). This “loop” is part of the novelty of the model, which shows why traditional LIS classification schemes for music struggle with representing this aspect of musical medium (see for example discussions in Chapter 6). It should be noted that this part of the model lists the facets rather than the foci that form the top part of the model. One explanation is that due to the limited number of possible foci in the first part of the model, it was relatively straightforward to include foci, which would not be possible for the second part of the model. To aid understanding of the second part of this model, Figure 64 shows a detail from the second part of the model adding in example foci.

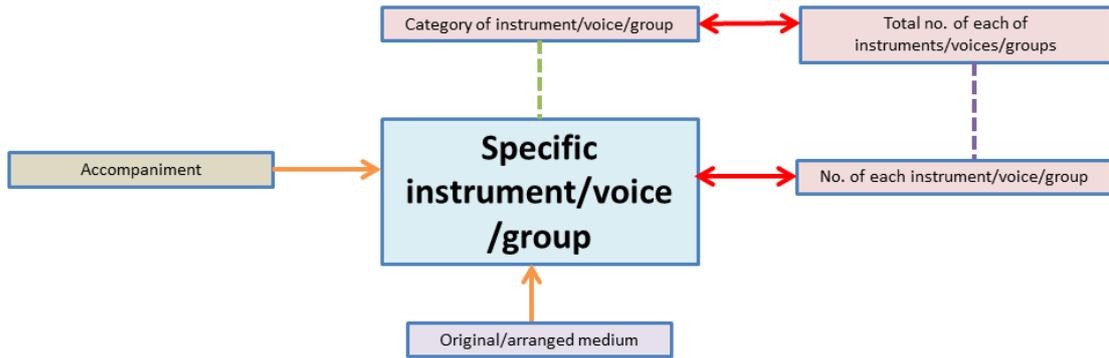


Figure 63. Model 1: detail from medium facet

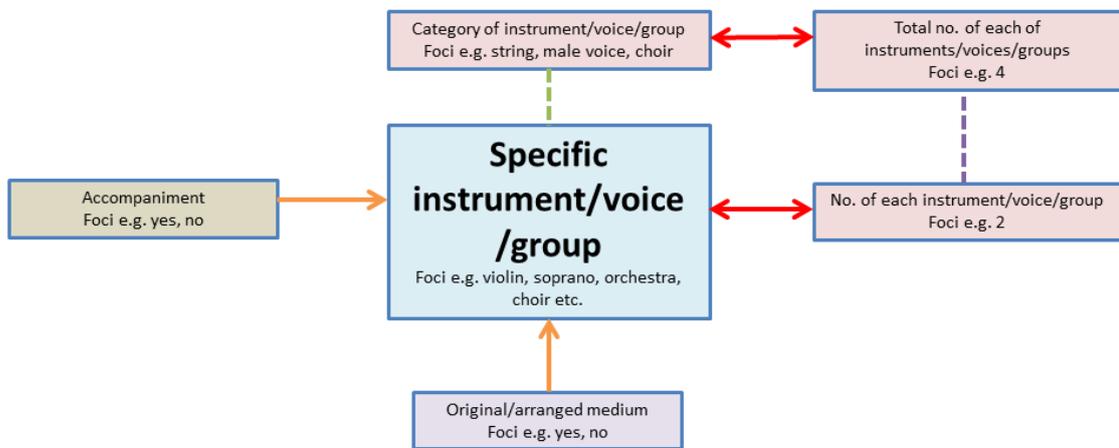


Figure 64. Model 1: detail from medium facet with example foci

The second part of the model can be “started” at any point. The specific instrument/voice/group is at the centre, as this is the only compulsory element, although this element does not necessarily appear first. For all ensembles and some groups the “loop” involving numbers will be necessary. The number of individual instruments/voices/groups is attached to the type of instrument/voice/group: for instance, 2 flutes, or an oboe, bassoon and piano, or two choirs. It must be noted that any individual aspect can be repeated in order to express different parts of a medium. In fact, this repetition is one of the unique qualities of this classification model. For instance, in ensembles, there will be multiple occurrences of the “specific instrument/voice/group” sub-facet, each with corresponding “no. of each instrument/voice/group”. Furthermore, this specific instrument/voice/group could get repeated relating to different outlying sub-facets: for instance, when classifying a work for flute with piano accompaniment, the same set of foci from “specific instrument/voice/group” will be presented for both the flute and piano aspects, it just that “piano” will be attached to the “accompaniment” sub-facet, while “flute” will not.

However, as discussed in Chapter 6, Section 2, it is not enough to just list the constituents of a group: therefore, the total number and overall category are also important parts of the medium model. The types of connections between these sub-facets are significant. In the case of “specific instrument/voice/group” and “no. of each instrument/voice/group”, the number-of-thing and type-of-thing connection is expressed by a double-headed arrow, showing that these two sub-facets are interconnected. However, the other pairs of relationships are different. The relationship between total no. of instruments/voices/groups and no. of instrument/voice/group is a type of parent-child relationship, one which could be described as whole-part – see Chapter 6, Section 2.3.3. This relationship is represented by a dotted line in Model 1 (Figure 65). Similarly, the relationship between the specific instrument/voice/group and the category of instrument/voice/group is also a parent-child relationship, but could more accurately be described as genus-species – see Chapter 6, Section 2.3.3. Again, this relationship is represented by a dotted line in Model 1. In other words, the dotted lines represent two sets of familial relationships, whereas the two-headed arrows represent two sets of associative connections between type-of-thing and number-of-that-thing. (Note that each member of this quartet is only connected to two out of the three other members.)

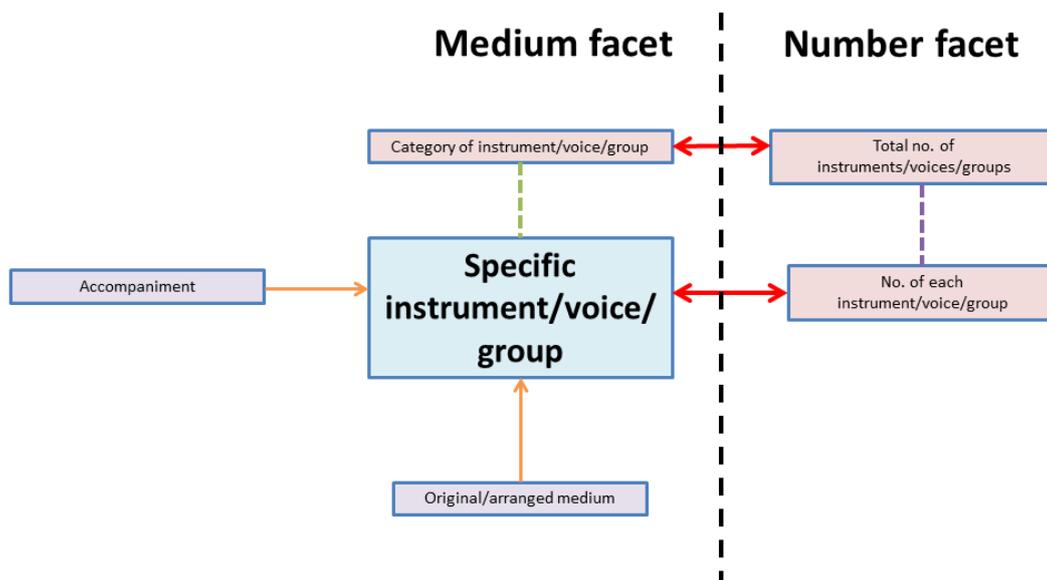


Figure 65. Model 1: detail from medium facet showing number as a separate facet

This loop also aids a particular issue seen in the examples of “extreme mediums”, discussed in Chapter 6, Section 5: groups of vocal soloists. The three example schemes illustrated issues with including information about the total number of soloists and the

number of soloists of each vocal type; for instance, Mahler's Symphony No. 8 proved particularly challenging in this respect. So, in Model 1, multiple soloists can be represented in the same way as if they were individual instruments, meaning that all the solo voices are represented but there is also information about the total number of soloists. Mahler's Symphony No. 8 includes 3 sopranos, 2 altos, 1 tenor, 1 baritone and 1 bass. These would be represented as follows in Model 1:

Specific instrument/voice/group = soprano; no. = 3

Specific instrument/voice/group = alto; no. = 2

Specific instrument/voice/group = tenor; no. = 1

Specific instrument/voice/group = baritone; no. = 1

Specific instrument/voice/group = bass; no. = 1

Total no. of each of instruments/voices/groups = 8

Category of instrument/voice/group = voices (solo).

Thus, each useful piece of information is represented using Model 1.

2.4. Issues relating to groups and parts

One novel feature of Model 1 is that it includes groups in the provision of classification for multiple things and types of things. So, the centre of the second part of the model is "Specific instrument/voice/group", thus treating a group as an individual unit. Examples of a group include orchestra, string orchestra, male voice choir, wind band, and so on. In Chapter 6, Section 2, the discussions about number-of-things and types-of-things were specifically discussing ensembles, such as a string quartet or piano duet. However, in Chapter 6, Section 5, extreme mediums were explored, where musical exemplars were discussed which featured multiple choirs and orchestras reinforced with bands. It was found that these example musical works generally "broke" the three example classification schemes, and one of the reasons for this was the lack of facility for dealing with multiple groups. Thus, Model 1's inclusion of "groups" is in one part a solution to the problems identified in Chapter 6.

The example of Mahler's Symphony No. 3 discussed in Chapter 6, Section 5, can be used as an example of how Model 1 helps to solve the problem presented by combinations of

groups. Mahler's Symphony No. 3 includes a female-voice choir and a children's choir, so the loop in Model 1 would be used as follows:

Specific instrument/voice/group = children's choir; no. = 1

Specific instrument/voice/group = women's choir; no. = 1

Total no. of each of instruments/voices/groups = 2

Category of instrument/voice/group = choir;

All of these values make sense individually, and also in combination, showing the value of this part of the model for groups.

However, the relationship between "specific instrument/voice/group" and "category of instrument/voice/group" can bring difficulties. The "female choir" is considered a "specific instrument/voice/group" using this model; yet "female choir" is also itself a combination of a particular group (choir) and a particular voice (female), which could be seen as questioning the ideal of unbreakable-ness for all foci within a facet. There is also potentially an issue with "standard" groups such as an orchestra or a mixed-voice choir. An orchestra would be both the "specific instrument/voice/group" and also the "category of instrument/voice/group"; similarly, a mixed-voice choir may be identified as just being a "standard" choir without need for the mixed-voice suffix, meaning again the "specific instrument/voice/group" and the "category of instrument/voice/group" would be both have a value of "choir". However, this is not a particularly significant issue. Overall, the benefits of including groups in Model 1 far outweigh both of these issues.

One of the "blips" of Model 1 is the treatment of "parts" within vocal music. This is caused by the overlay of a model for the medium of musical groups on to a system of modelling the classification of ensembles. "Parts" are usually used as a way of counting the number of different musical lines appearing in a piece of vocal music, with each line typically taken by a group of singers within the overall vocal group who might all share the same voice type. In some circumstances the term is also used within instrumental music. Information about "parts" can in certain circumstances be used to identify and classify works of Western art music; however, including parts in Model 1 would lead to some confusion. To start, the foci of "soprano" – a type of voice – could refer to a specific voice, as it is used in Model 1, but also is used as a term for a particular part in a

choir with multiple people with similar voices singing a single “soprano part”. Furthermore, multiple choirs cause more confusion concerning parts, as the medium for the (massed) voices might be expressed in two ways: the number of and type of choir, or, the number of overall choir parts. In addition, if “parts” were added to “specific voice/instrument/group”, this causes some complications with the genus-species relationship between “category of voice/instrument/group” and “specific voice/instrument/group”; for, what would be the “genus” of a choir part? Therefore, Model 1 has ignored “parts” as a method of classifying music; perhaps future research could add this confusing yet occasionally useful element to the classification of musical medium as codified in Model 1.

2.5. Accompaniment and arrangement

The accompaniment and arrangement parts of the loop work in different ways from the connections between “specific instrument/voice/group” and “no. of each voice/instrument/group”. Looking at each individually is easiest, so accompaniment shall be considered first. While both “specific instrument/voice/group” and “no. of each instrument/voice/group” have foci, when an accompaniment is specified, the “accompaniment” sub-facet has no value, it just links to the value expressed in “specific instrument/voice/group”. For instance, a work for flute with piano accompaniment will have “piano” as the correct foci for the “specific instrument/voice/group”, but there will be no value as such in the “accompaniment” facet. The accompaniment sub-facet acts more as a switch. To indicate this relationship in Model 1 (see Figures 62, 63 and 64), the accompaniment sub-facet is linked to “specific instrument/voice/group” using a single-headed arrow and is a different colour from some of the other relationships indicated in this model. There is a further complication with accompaniment. While in some cases, the accompaniment sub-facet is linked to “specific instrument/voice/group”, in other cases, LIS classifications demonstrated that they were only (or, separately) interested in a binary marker of accompanied/not accompanied. For example, at one point in the citation order, unaccompanied choir works could be separated from the choir works with accompanying piano, orchestra, jazz band, and so on; however, whether it was a piano, orchestra, jazz band, and so on, might not be included at all, or might be included much further along in the citation order. So, another reason for differentiating the relationships involving accompaniment using colour and arrow-direction, is that accompaniment can represent two types of relationship: an independent sub-facet with a binary yes/no focus, or something with no

focus of its own but is instead an instruction to add another sub-facet (specific instrument/voice/group). Sometimes, only one of these is used, sometimes both. In some cases, both will be used together in one action, in other cases both relationships are used but at different points in the classification.

A similar situation transpires for original/arranged medium. Sometimes there is a binary focus of arranged/not-arranged, while other schemes have chosen to specify the medium of the original/arrangement. Particular care is needed for this sub-facet compared to accompaniment: for the question of whether to classify the original or the arranged medium has been answered at a different point, usually within the rules of citation order encompassing all music; whether it is “original” or “arranged” will be specified by the classification scheme. So, this section has shown that Model 1 includes multiple and complex information about accompaniments and arrangements, and how these sub-facets work in somewhat different ways from the other parts of medium.

2.6. Other issues

Model 1 also indicates a number of issues concerning medium. The first is the question of what can be legitimately included in a model of the medium facet. The “number of instruments/voices/groups” and “total number of each of instruments/voices/groups” are strictly numbers, rather than sub-facets of medium. (The issues relating to numbers-of-things and types-of-things were discussed in detail in Chapter 6, Section 2.) The separation is shown in Figure 65, which draws a line between the medium sub-facets and non-medium sub-facets which exist within medium. This element of non-medium-ness is also represented and discussed in Model 3, in particular Section 4.2. So, the presence of non-medium sub-facets is another complexity of classifying music, adding to a picture of music’s non-faceted-ness.

The relationships between vocal and instrumental across both parts of the model also need further elucidation. For example, a work for soprano soloist and orchestra might be classified as instrumental *or* vocal in the top part of the diagram – see Chapter 5 for further discussion of these frequently blurred boundaries; however, whatever the outcome of the instrumental/vocal designation, in the second part of the model, both “soprano” and “orchestra” can be represented even though they are from different sides of the vocal/instrumental divide. Thus, in some respect, Model 1 both honours the traditional LIS partition between vocal and instrumental music in the first part of the

model, then brings together elements from both parts of the divide in the second part of the model, when the universe of Western art music requires this.

A final question concerns whether the elements represented in Model 1 are sub-facets of medium or facets in their own right. Chapter 4 concluded that in faceted classification terms there is little practical difference in whether an element is a sub-facet or a facet; the biggest difference being that as separate facets, the various parts of medium could be separated from each other by other, non-medium-related facets such as form or place. Indeed, it was shown in places in the thesis that the categorization of sonority, the vocal/instrumental division, indeed can be separated from the rest of medium. However, a close analysis in Chapter 6 of other elements related to medium such as arrangement and accompaniment revealed that they are unlikely to benefit from the independent existence of being a facet in their own right. Therefore, Model 1 is based around a medium being perceived as a single facet, but it is acknowledged that some of the sub-facets represented in Model 1 may in some LIS schemes function as facets in their own right.

2.7. Conclusion: a model of musical medium

Model 1 helps to answer RQ1, by positing a model partially based on the analysis of LIS classification schemes for music, as discussed in Chapters 5 and 6. However, Model 1 does not entirely represent LIS classification of music as it stands within LIS, as it also serves as an analytical tool, aiding understanding of how music classification works at a theoretical level and perhaps would be ideally classified; so, it also helps to answer RQ2. Above everything else, Model 1 shows *how* musical medium is complex, helping to explain why notated Western art music is complicated to classify in real life. The model utilizes classification theories such as faceted classification, both in its strict hierarchies in the first part of the model and as ways of subdividing elements in the second part. However, Model 1 is also innovative in its representation of music classification: using one system to classify instruments, voices, ensembles, groups, and so on, is novel, and suggests a unified way of understanding music classification. Another novelty is the use of two different methods of classification within the same facet, utilising both a hierarchical system and “loop”. The possibility to repeat elements as many times as needed solves one of the issues presented by existing LIS classification schemes and helps the classification to represent multilayer information about a piece of notated Western art music. Not only do these innovations seen in Model 1 lead to further

understanding of how music classification works at a fundamental level, but they also potentially contribute new ways of analysing classification generally. Thus, Model 1 also helps answer RQ3, showing how the classification of notated Western art music can aid classification more generally.

3. Model 2: adding “Vocinstrumental” to medium

The first part of Model 1 is based around a strict binary divide into music which is vocal or instrumental. However, as Chapter 5 attests, the reality of classifying musical works demonstrates much blurring of this boundary. Therefore, Model 2 presents an alternative version of Model 1 which represents a more graduated approach to the vocal and instrumental categorization. It adds an extra focus to the first characteristic of division (by sonority): “vocinstrumental”. This is shown in Figure 66.

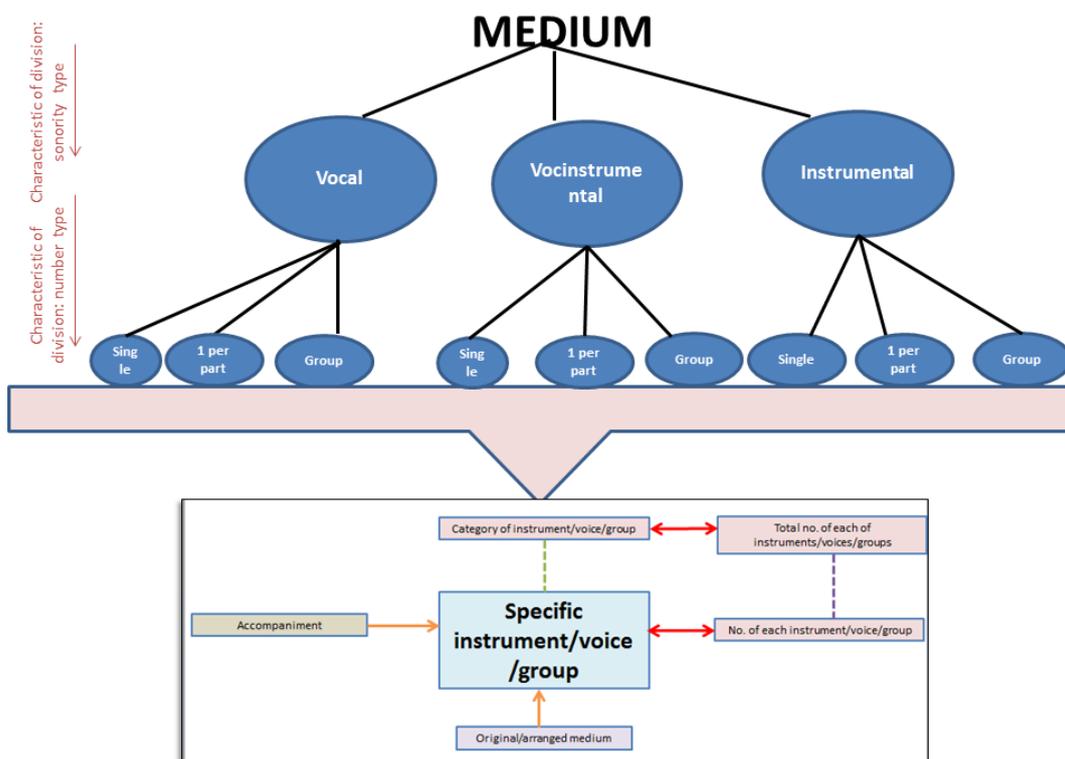


Figure 66. Model 2: vocinstrumental

The newly-created portmanteau term of “vocinstrumental” — devised from combining “vocal” and “instrumental” — was created especially for this thesis. It was mooted in Chapter 5 as a possible solution to the fuzziness involved with categorizing musical mediums, acting as a holding space for the medium of musical works which do not fulfil the rigorous categorization into vocal and instrumental. It should be noted that the

“vocinstrumental” focus is not a layout seen in existing LIS classification schemes; instead it is an innovative solution to the issues discussed in Chapter 5 and a new way of modelling music. Devising a new category at such a fundamental level of music classification is novel in both contents and action; while this thesis has shown how some LIS schemes have unique foci, the vocinstrumental category stands apart from these instances. Its novelty lies in grouping together at conceptual level types of musical work which are not usually considered to have shared characteristics. Furthermore, Chapter 5 explored how the binary vocal/instrumental categorization was a core part of LIS conceptions of music classification; vocinstrumental rips this binary categorization apart. So, while suggesting a new category is not novel per se within general knowledge organization (KO,) within LIS classification of notated Western art music, the particular category of vocinstrumental challenges the tenets of traditional structures to classify music.

3.1. Vocinstrumental and choral symphonies

Chapter 5, Section 6 demonstrated how works such as choral symphonies, which are usually not vocally-led but include voices, are particularly problematic in LIS classification schemes. They are not vocal with orchestral accompaniment, yet schemes rarely have a place for primarily instrumental works which include voices. So, would having a category of vocinstrumental help the choral symphony classification woes? At a simple level, the vocinstrumental category helps to classify these works as it provides a space where voices and instruments are both included in the medium, but neither one inevitably dominates – thus bypassing the idea of accompaniment entirely, which feeds off differing levels of importance attached to different parts of the medium. So clear choral symphonies would live in the vocinstrumental category, such as Beethoven’s Symphony No. 9, as would choral symphony-esque works such as Berlioz’ *Roméo et Juliette*. This would be a departure from the normal LIS classification of these works, which as Chapter 5, Section 6 showed, means classifiers usually have to decide between not mentioning voices at all (in part, so as to still be permitted to use the genre of symphony) or uneasily classing such works as vocal music even when voices feature in only part of the works. Thus, Model 2 is a solution to classifying a particularly problematic type of musical work.

3.2. Vocinstrumental and the taxonomy of vocal/instrumental categorization issues

Another set of issues identified in Chapter 5, Section 5, concerned a set of situations with complicated mediums, presented in the form of a taxonomy. Examples from this taxonomy included works which are instrumental parts of vocal wholes, instrumental reductions of works which were originally vocal, and so on. At first glance, these works are ripe for placement in Model 2's vocinstrumental category, as these works are by virtue of being in this taxonomy, works which blur the vocal/instrumental categorization. However, situating such works as vocinstrumental would also mean opening up a new dimension to this category: the medium of a work's *past*. So, the vocinstrumental category would also include works which are in one particular category of sonority, but might be extracts from, or in some other way connected to works which have a different sonority. For example, an instrumental overture which is in itself entirely instrumental might be placed as vocinstrumental if the overture was originally part of a (vocal) opera. To embrace works in Chapter 5's taxonomy as belonging to Model 2's vocinstrumental category requires classifying the *past* of a musical work, not just its present.

As an extension to these ideas, the use of the vocinstrumental category is debateable for specific genres which use one type of sonority but originate in another. Chapter 5, Section 5, used the example of a subgenre of *songs without words* – instrumental works, but with the form/genre based on songs (vocal). To answer the question requires solidifying exactly what is being classified. In this case, vocinstrumental appears inappropriate, as the medium of the work in hand is unequivocally instrumental. So, the vocinstrumental category is designed for individual works which may originate in a different part of the sonority spectrum, such as the instrumental overture to the vocal opera, rather than works of a genre which exists to deliberately provoke the sonority categorizations.

3.3. Vocinstrumental and accompaniment

However, the vocinstrumental category also presents a potential obstacle: the boundary between vocinstrumental and vocal-with-instrumental-accompaniment. There is a question about whether an instrumental accompaniment makes an otherwise vocal work into "vocinstrumental". In terms of the mechanics of the model, in the second part of the model an accompaniment can be easily added to any of the combinations of

sonority type and number type, using the same mechanism discussed in Model 1, in particular discussed in Section 2.5. However, the philosophical underpinnings of the instrumental accompaniment question are more complex. For example, a work for soprano accompanied by piano could fit into the “vocal, single” category if the piano accompaniment is *not* counted as part of the sonority, but would be “vocinstrumental, 1-per-part” if the accompaniment is counted in the designation of sonority. The presence of the “vocinstrumental” category only provides a space for an alternative to considering such works as inevitably vocal-with-instrumental-accompaniment; what this category does not do in itself is give the criteria for when the vocinstrumental category should be assigned.

If vocinstrumental is taken to mean all music involving voices and instruments, then this leaves issues for choral music: the medium of “choir” would be scattered at the highest characteristic of division, as music for choir which has a piano accompaniment, say, would be in vocinstrumental while similar music for the same choir but intended to be sung without any piano accompaniment would be in the vocal category. (This could be considered problematic in a musical world which considers “choral music” to be a particular type of music.) With such a meaning of vocinstrumental, the vocinstrumental category would be very populous, while the vocal category would become very sparse.

Conversely, there are issues if instrumental accompaniments are permitted in the vocal class. For example, deciding whether the piano part to a song by Schubert is an accompaniment or the song is in fact a duet, would not only be subjective and likely to lead to inconsistencies, but would also see groups of similar works scattered at the highest characteristic of division. At the very least, explicit instructions would be needed to allow classifiers to distinguish between the accompanied (vocal) and the vocinstrumental. So, having a vocinstrumental category, while helpful in a number of ways such as providing a suitable home for choral symphonies and works with blurred mediums, also brings with it new complications. However, although Model 2 is not perfect, this could be seen as a reflection of the complexity of music.

3.3. Conclusion: vocinstrumental as a new category

Model 2 presents an addition to Model 1: an extra type of sonority called “vocinstrumental”. This category is presented as a novel category, and a solution to some of the issues presented in Chapter 5. This model mostly addresses RQ2, as it uses an extra foci in the facet of “type of sonority” to illustrate how music is *actually*

structured; rather than reflecting what is found in existing LIS classification schemes, this new category proposes a novel way of structuring music classification in the future. The vocinstrumental category is a solution to two issues discussed in Chapter 5. First, it is a home for musical works which feature voices and instruments, where the instruments perform more than just an accompaniment role. Second, a vocinstrumental class can also be used to house those works which for many reasons can be considered to have both vocal and instrumental parents.

However, just having a vocinstrumental category does not instantaneously resolve issues relating to the vocal/instrumental categorization. There is still a question of defining the category, which becomes particularly pertinent when deciding the border between vocinstrumental and vocal-accompanied-by-instruments. The discussion of Model 2 showed that there are multiple, imperfect ways of defining vocinstrumental which could create a larger or smaller percentage of musical works falling into this medium category. Nevertheless, Model 2 presents an original way of structuring music classification which offers one solution to the perennial issues surrounding the vocal/instrumental categorization of music.

4. Model 3: dependency between facets

In an idealized faceted system, each facet acts independently. In other words, the foci in one facet do not affect the choice, position or any other characteristics of the foci in another facet. The research chapters in this thesis (Chapters 4 to 9) highlighted that various aspects of music classification show dependency from one facet to another; in particular, the dependency between medium and form/genre was discussed throughout Chapter 4 and is deconstructed in detail in Chapter 9, Section 7. Analysis of the various dependencies between facets elucidates the structure of music classification, as well as asking important questions about “dependency” and how interconnectedness between facets is realized. A model of the connections between facets, including dependencies from one facet to another are shown in Figure 67. This model is based on the analysis of music classification seen in Chapters 4 to 9, and helps to answer RQ2 as it uses an idea from faceted classification to increase understanding of what is actually happening when music is being classified; however, it is not a model of any one individual classification scheme for music, nor a model of the amalgamation of various LIS schemes for music. Rather, the novelty lies in modelling and plotting these connections in the first place, in the pursuit of understanding music classification. By identifying

dependency between facets, and with the knowledge that dependency is possible but unideal in faceted systems (see Chapter 4, Section 2.5) it is thus possible to understand why music classification is problematic.

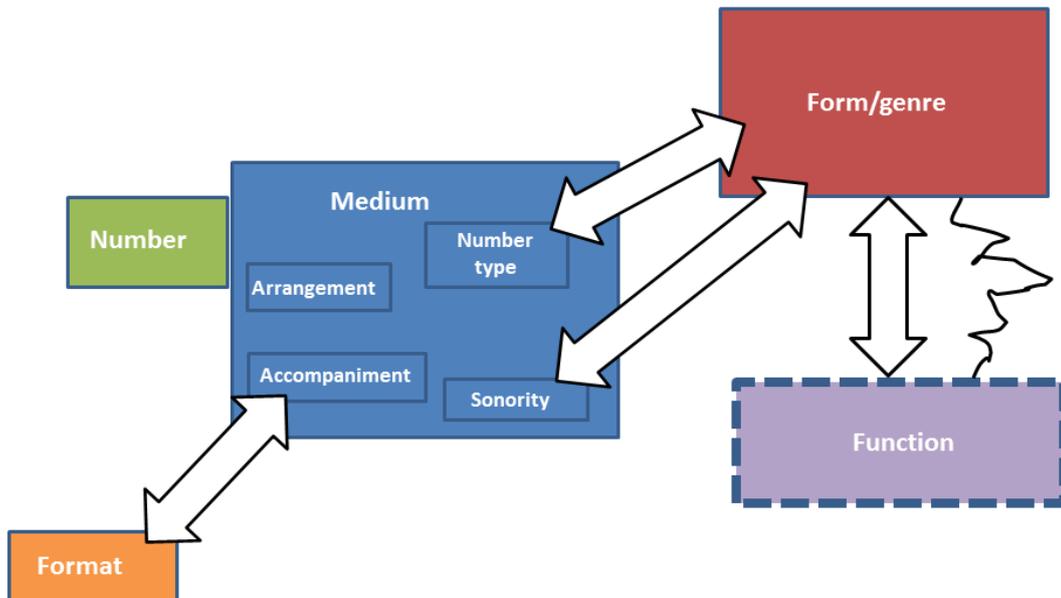


Figure 67. Model 3: relationships between facets

4.1. Medium and form/genre

Throughout the thesis, the medium of a musical work was shown to be tied to its form/genre (and vice versa). Interestingly, these connections generally were seen in two parts of medium (vocal/instrumental categorization and broad number, see Chapter 8, Section 7.1 and 7.2) rather than medium as a whole, showing how the dependency of one sub-facet (for example, vocal/instrumental categorization) on a different facet (form/genre), can destroy the independent nature of the parental facet (medium).

The research chapters showed repeatedly that the sonority of a musical work, in other words the categorization into vocal and instrumental, is closely related to the form/genre of that work. For example, classification scheme analysis revealed that in most cases, every form/genre was associated with a vocal/instrumental category. For example, sonatas could be selected as a form/genre only if instrumental had been selected as part of medium; or, oratorios could only be selected as the form/genre if vocal had been selected as the category of medium.

There are other, more nuanced ways that the vocal/instrumental categorization is linked to form/genre. In Chapter 7, Section 4.2, the saxophone provided an example where the form/genre associated with a particular medium arguably influences its classification as a medium; the jazz genres associated with the saxophone could be the reason why LIS schemes frequently categorize this instrument as “other”. There is a question here about whether this type of relationship can be considered traditional dependency, as the dependency is within the concepts rather than within a particular classification scheme. However, while some theorists such as Satija (1984) and Frické (2012) discuss the principles of dependency and orthogonal facets (as described in Chapter 4, Section 2.5), discussions about these topics are not abundant in the KO literature; in particular, questions about the boundaries of dependency and orthogonal facets do not appear to be addressed. This has an impact on discussions about dependency in music classification: there is no blueprint to refer to when considering whether saxophone’s relationship to foci in another facet can be considered dependency or not. In fact, it could be argued that by interrogating these concepts of dependency and orthogonality for music, music classification is actually stretching the *general* knowledge we have about these important concepts in LIS faceted classification theory – thus addressing RQ3.

While the most prolific dependency identified, the connection between form/genre and sonority was not the only dependency between a sub-facet of medium and the form/genre facet. The analysis revealed that the broad number categorization also had a connection to the form/genre facet, albeit less pronounced. This is discussed in detail in Chapter 8, Section 7.2. For example, certain number types such as “group” would be associated with certain forms/genres; for example, the medium of orchestra is permitted with the form/genre of symphony, but not usually with sonata.

4.2. Medium and number-of-thing

As discussed in earlier sections, (two types of) number-of-thing appears in the musical medium – see Figure 62, 63 and 65; for example, the two in “flute duet” or the four in a “string quartet”, and so on. If considering number to be a separate facet as visualized in Figure 65, then the relationship between number and medium is very close. So, Figure 67 (Model 3) indicates this relationship by placing the rectangles which represent both these facets next to each other. The number facet has no meaning unless utilized with

the medium facet, hence the visualization of the relationship between these facets in this manner.

4.3. Accompaniment and format

Another relationship concerns the accompaniment sub-facet and the facet of format. (Format has not received much attention in this thesis, but is discussed in Chapter 4, Section 3.4.) Certain foci in the format facet will represent certain accompaniments: for instance, the “vocal score” format refers to vocal parts with piano accompaniment, rather than orchestral or any other type of accompaniment. So, if say piano accompaniment is selected, certain formats are not available for usage, such as miniature score or full score.

4.4. Form/genre and function

Form/genre and function are also dependent facets. For example, the form/genre of opera will have a function of dramatic, and the form/genre of mass will have the function of liturgical (even if some individual masses do not have this function) and not of dramatic. Furthermore, as discussed in Chapter 9, whether function is a facet or not depends on the form/genre, hence the label of “quasi-facet” for function. Therefore, the relationship between function and form/genre is not just dependent in terms of each facet’s foci, but the essence of one of the facets (function) is dependent on the foci selected in the other (form/genre). This could be labelled a dynamic relationship between the facets, and this dynamic quality is indicated by a wiggly line in Model 3 (Figure 67). The idea of dynamic relationships between facets is a novel idea: the relationship between dependent facets is not discussed in detail in faceted classification discourse. Or taking this further, the relationship between function and form/genre could be described as a “meta-dependency”; in other words, it is not just the foci from one facet which are dependent on the foci from another facet, but the position of one element as a facet at all alters depending on the focus in another facet. The concepts of dynamic relationships between facets and “meta-dependency” are not just important to enhancing our understanding of music classification; they also show how understanding music classification can advance our thinking in classification generally. Furthermore, while of potential interest to those engaged with the development of LIS faceted classification theories, enhancing understanding of faceting is a vital part of other domains such as information architecture. Therefore, the findings from this thesis and Model 3 in particular have the potential to be of interest to a variety of researchers and

practitioners engaged with facets and faceting, and in this regard also help to show why understanding music classification is beneficial to furthering the development of classification theory more generally, thus helping to answer RQ3.

4.5. Function and medium

Chapter 9 discussed some ways in which parts of medium, in particular the vocal/instrumental categorization directed elements of function. However, in some cases – for example, dramatic/non-dramatic and vocal/instrumental categorization – it merely made some results more likely than others, rather than precluded certain combinations of medium sub-facets and/or foci. In addition, due to the slippery nature of function as a facet, it is not clear whether function would be considered dependent on medium, or medium on function. Therefore, while there might be some connection between function and medium (see discussion in Chapter 9, Section 4.1 and 5.6) it has not been considered a dependent relationship and thus no dependency is included in the visualisation of Model 3 (Figure 67).

4.6. Dependency and commutability

Finally, there is a question about whether dependency relationships between two facets are commutable or not. So, if facet B is dependent on facet A, then by definition of dependency, should facet A also be dependent on facet B? In traditional faceted classification, the strict order might mean that the question is nonsensical as you only get to facet B once you have been through facet A. In the more fluid model suggested in Figure 67 (Model 3), the question of commutability becomes more pertinent. For example, say that the choice of vocal medium means that only ten specific forms/genres can be selected and one of these forms/genres is opera: in this case, the choice of form/genre is said to be dependent on the choice of medium. However, if the focus from the form/genre facet is chosen first, then what is the outcome? The choice of opera in the form/genre facet leads you to a particular categorization of sonority: vocal. Thus, in this example the dependency *is* commutable: form/genre is dependent on medium, but choice of medium is dependent on form/genre.

4.7. Conclusion: music classification as dependency

Model 3 has shown how far from being a series of independent facets, the classification of notated Western art music is in fact a series of interdependent facets. Due to the goal set by Frické, Satija (and others) of a classification scheme having independent or orthogonal facets, this model identifies and explores a key part of music classification.

Model 3 is vital as it not only helps to build up a picture of what music classification is (at least for notated Western art music), but more importantly, why it is inevitably complex and difficult. One answer to the question of why music is seen as being difficult to classify could be explained using Model 3 alone: the web of dependence between music's facets, including the strength of dependency between the medium and form/genre facets.

5. Model 4: simultaneous faceted and genre system

Chapter 8 demonstrated that form/genre as a facet presented a number of complexities. While "form" by itself does not completely encapsulate this element of the musical works, introducing "genre" brought conceptual problems as "genre" is fed by other facets such as medium and function. Furthermore, analysis of specific issues concerning the classification of forms/genres, such as string quartets, revealed that LIS schemes echo these musicological and conceptual problems with the form/genre facet. Therefore, Model 4 is presented (Figure 68), which separates out the faceted treatment of form from the interconnected-ness of genre, representing form and genre as two separate but connected categories.

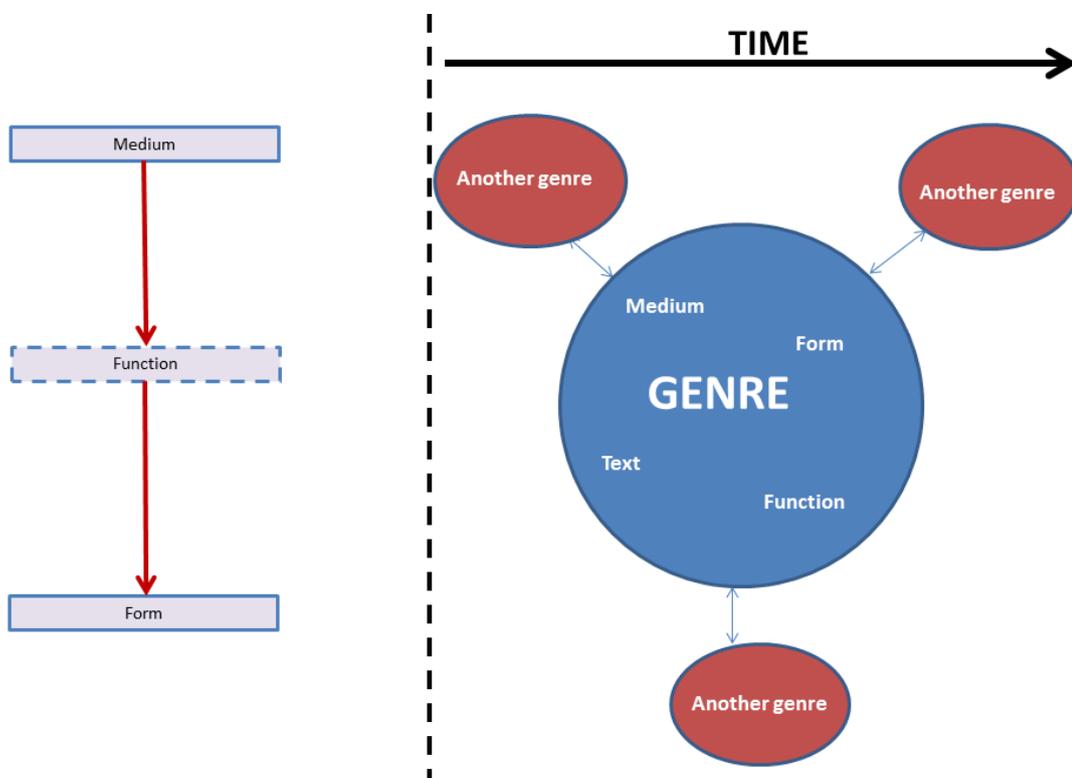


Figure 68. Model 4: simultaneous music classification

The left-hand side of the model (Figure 68) shows a simplified version of the system of characteristic of divisions discussed throughout this thesis. The new aspect in the left-hand side of this model is to name the facet “form” rather than “form/genre”, for reasons which will become clear in this section. The innovative part of Model 4 is to simultaneously model a genre classification system alongside this more traditional faceted structure. The genre-centred approach appears on the right-hand side of the figure, and shows how “genre” is the interactions between a number of aspects, both those which make up an individual genre and interactions with other genres. However, the right-hand side of the model taken alone would not represent music classification, according to the research presented in Chapters 4 to 7 of this thesis, as it does not suitably represent the pre-eminence of medium. Therefore, this model represents music classification as both visualisations working simultaneously. To this end, it is important to note that aspects of music such as medium, form and function appear on both sides of the model. For example, medium acts as both the first facet in a hierarchical system of characteristics of division, yet is also a critical part of the genre category. To classify a musical work, Model 4 proposes that both viewpoints of musical knowledge are needed to be employed. This is a novel assumption. Model 4 helps to answer RQ2 as faceted classification and genre theories are used to build this model and to understand music classification; however, RQ3 is also evoked, as Model 4 suggests a novel contribution that could potentially be adapted for use in other parts of classification theory, outside of notated Western art music.

5.1. The constituents of genre: medium, form, function and text

Genre is shown as consisting of four aspects: medium, form, text and function. The analysis in Chapter 8 (Forms/genres) justifies and explains the choice of these particular aspects. However, it is important to briefly revisit the discussions about genre which took place in Chapter 8, to draw the relevant points together in order to elucidate why these four aspects have been selected as the essential qualities of genre. To start, these four qualities of genre are suggested by Dahlhaus (1987, p. 38) as making up his conception of genre – see Chapter 8, Section 2.4. Furthermore, other parts of Chapter 8 discuss how each of these particular elements has the parent category of genre. Medium’s relationship to genre is especially prominent; for example, the Grove entry for “genre” (Samson 2015) defines genre using “instrumentation” – a near synonym for medium – and Dahlhaus (1987, p. 38) suggests that genre is the expected connection between form and medium (both points discussed in more detail in Chapter 8, Section

2.4.). More pertinently, Chapter 8, Section 5 investigated string quartets as an example of genre-as-medium. This type of “silent genre” struggles to be represented in a traditional, hierarchical representation of music classification as seen on the left-hand side of Model 4; however, it would fit into the right-hand side of Model 4. Chapter 8, Section 2.1 showed how general genre theorists Tereszkievicz (2014) and Frow (2006) include form as part of genre, and Tereszkievicz also includes function.²⁰¹ The relationship of text to genre has been discussed in less explicit ways through the course of this thesis: for example, “text” is part of the dividing line between secular and sacred (as discussed obliquely in Chapter 9, Section 5) as a function, which in turn is part of form/genre (see above).

5.2. Genres and the temporal frame

However, Model 4 also shows how the category of genre is not just medium, form, text and function, all added together. The “time arrow” demonstrates how genres are situated in time, and that temporal factors have an influence on genre as a category. One way the temporal frame manifests itself is genres being intrinsically linked to the history of that genre. For example, Chapter 8, Section 6 discussed how the concept of “symphony” could not be adequately described just by adding together its medium and its form; the difference between a symphony and an “orchestral sonata” was “genre”, and “genre” included aspects such as the history of the genre of the symphony. Therefore, Model 4 (Figure 68) shows how classification using a genre/time representation provides more detailed classification than a medium/function/form hierarchical system by itself. The “time arrow” also visualizes the changing nature of genre itself and its ebb and flow over a temporal plane. For example, Dahlhaus (1987, p. 33) articulates the defining features of musical genre were likely to be function, text and texture pre-1600, yet after 1600 genre was most often defined by its medium and form. (“Texture” is briefly defined in Chapter 8, Section 2.3.) Finally, the “time arrow” could also be seen as allowing a representation of the temporal arc of genre itself as a categorization method within music. Chapter 8 showed how from a music perspective, the use of genres to categorize the creation of musical works declined steeply in the 20th century; so, it is not just the makeup of the category of genre which changes over time, but the usefulness of the category “genre” itself. This simultaneous diagram depicts

²⁰¹ Function is given as the second facet in the left-hand side of Model 4. This is representative of one possible order of the facets, and function could have been situated in any of the positions. Order of facets is not an important part of this model so function’s position in the citation order is not discussed further.

time, but does not show the internal and external changes to genre. However, the presence of the left-hand system is useful, as when the right-hand genre categorization wanes, there is still a system of classification in place.

Model 4 also represents the relationships between different genre categories. It shows how one genre influences another, and hence the categorization “genre” cannot be fully defined without reference to other genres. This has implications for classifying musical works using genre, as it creates a complicated, dependent system where foci cannot be described without reference to other foci within the same category. The time aspect combined with the other genres, illustrates how some relationships between genres are evolutionary.

5.3. Adding “subject”

There is a question about whether Model 4 encompasses all sorts of Western art music. In Chapter 8, Section 5, the categorization of opera was discussed, which discussed how one musicologist (Campana 2012) suggested that the distinguishing features between types of operas were formal qualities, subject, medium and historical aspects. (The latter refers to different types of operas existing in different time periods.) Three of these are already considered constituent parts of genre in Model 4, but “subject” is not. Furthermore, there is LIS precedent for considering “subject” as an important part of classifying opera genres: in Chapter 8, Section 5, analysis of LIS classification schemes revealed relatively little division into genres, apart from a basic division into types of opera which were dramatic as opposed to types of opera which were comic. This basic categorization could be considered a type of subject, again suggesting that subject would be a useful addition to Model 4 for classifying operatic works.

So, Figure 69 shows Model 4 adding “subject” as an additional part of genre. However, the addition of “subject” to Model 4, asks some important questions. First, should Figure 69 be used as a replacement for Figure 68, so that Model 4 includes opera as well as other types of music in its original version? (Note that no omissions have been made to Figure 69 to remove types of information which are irrelevant to opera, lending weight to Figure 69 being a universal model.) However, this leads on to a second question: while the extension of adding subject helps to cover opera, what about any other genres which have specialized makeup? For, opera was selected in Chapter 8 as one example of an interesting genre. So the examples in Chapter 8 are not exhaustive, and another (un-investigated) genre of Western art music might require a different aspect again. So,

Figure 69 is not *necessarily* universal. Third, there is also a question about subgenres, and where they fit in the classification model, especially when the boundaries between genres and subgenres can be blurred. To cover this, subgenre has been added to each mention of genre in Model 4 – as seen in Figure 69.

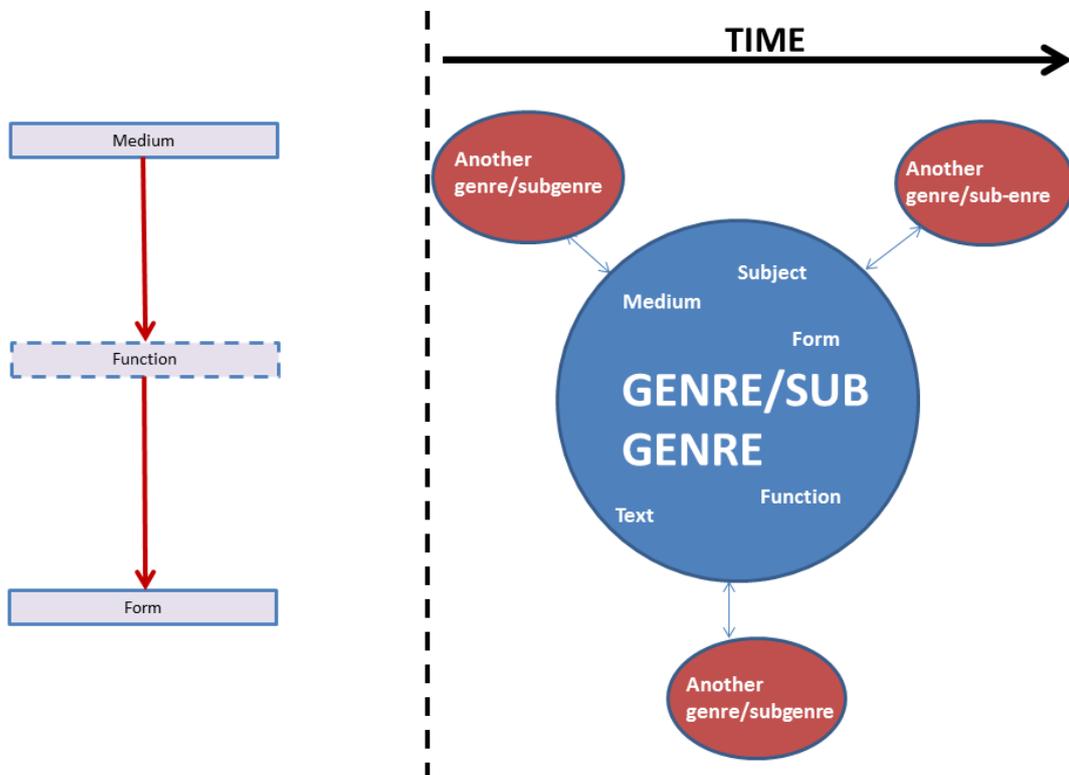


Figure 69. Model 4: simultaneous music classification, with extensions for opera

5.4. Conclusion: simultaneous model as possible solution to dependency

Finally, there is a question about whether Model 4 could in some ways be considered a solution to some of the problems represented in Model 3, which showed how music was (problematically) a series of dependent facets. If music contains dependent facets (as visualized in Model 3), then will the genre categorization represented in Model 4 bypass the impact of these dependencies? In short, the answer is “no”. On the left-hand side of Figure 69, form is still dependent on medium – for example, a vocal medium will be associated with vocal forms, as dependency is not just a “genre” issue. Additionally, the category of format (not shown in Model 4), which is generally not closely related to genre, is still related to part of medium; this means that even if Model 4 could solve the dependency issues between medium/form/genre/function (it cannot), there would still

be dependency between other facets. However, Model 4 does provide an alternative way of considering the dependencies between form/genre and function, and form/genre and medium; function and medium are both contained *within* genre, so some of the dependency involved with classifying music has been reimagined as constitution instead. Therefore, Model 3 and Model 4 independently represent different models of music classification, both showing innovative but separate ways of representing the complexities of classifying Western art music.

6. Model 5: the relationship between classification of music in the LIS and music domains

Models 1 to 4 considered the classification of music entirely within the LIS domain; Model 5 is concerned with the relationship(s) between music classification in the LIS and music domains. Therefore, this model addresses RQ5, which asks about the accord and discords between classification in both domain and the influence of classification in the music domain to the LIS domain. Model 5 illustrates which aspects of music classification demonstrate such relationships, and how the relationship between classifications in both domains could be modelled. Furthermore, Model 5 will also contribute to the general body of knowledge about domain classification by proposing additions to the existing frameworks which compare LIS and domain classifications (therefore also addressing RQ3). Different types of relationships are discussed in Sections 6.1 to 6.3, and then in Section 6.4 these relationships are combined, presenting an overall model of the relationship between classification in the music and LIS domains.

6.1. Accords and discords

Throughout the thesis, comparisons were made between how topics appeared in the music and LIS domains. Sometimes, the classification of a particular aspect was found to be the same or similar in the LIS and music domains, and in this thesis this type of relationship is called an “accord”; on other occasions, a particular aspect showed dissimilar treatment in the LIS and music domains, and in this thesis this type of relationship is called a “discord”. Note that although KO discourse includes examples of how an LIS classification may follow or not follow the classification of that topic within a domain – for example, Blake’s (2011) discussion of zoological classification – this thesis’ choice of separating relationships out specifically into accords and discords, as seen in RQ5, is a new way of structuring this type of discussion. So, Figure 70 lists the accords

and discords identified in the thesis. Note that the order of the accords and discords is the approximate order they were discussed during the thesis, rather than any ordering based on importance. Also, the thesis used specific examples of types of Western art music to illustrate certain points; this explains why for instance opera features in Figure 70, as it was used as an example in Chapter 8, but piano sonatas, which are not used as a major example in the thesis, do not. In other words, there may be an accord or discord between the classification of piano sonatas in the LIS and music domain but as the classification of these works were not specifically discussed in the thesis, they will not appear in this model. Therefore, Figure 70 is by no means exhaustive. Finally, by necessity, Figure 70 summarises often nuanced discussion about the relationship between the domains into a single caption for each topic.

Accords	Discords
Three main facets of music: medium (or, “Sound-medium”), form (/genre) and function/purpose	Importance and nature of the vocal/instrumental categorization
Medium is considered a building block/facet of music	Assigned genre and instrumental/vocal assignation of specific choral symphonies
Difficulties of classifying specific choral symphonies and separating out form/genre from medium	Performers’ preference for classification of arrangements
Confusion in terminology for arrangements/transcriptions	Current organological and current LIS broad categories of instruments
Arrangement primarily an instrumental concern	Current organological and current LIS classification of keyboard instruments
Early organological and current LIS broad categories of instruments	Current organological and current LIS classification of percussion instruments
Early organological and current LIS classification of keyboard instruments	Current organological and current LIS division into bowed and plucked string instruments
Early organological and current LIS classification of percussion instruments	The extent of opera categorization into subgenres

Utilisation of Hornbostel and Sachs taxonomy of instrument classification	Importance of categorization into “autonomous” and “functional” music
Early organological and current LIS division into bowed and plucked string instruments	
Confusion over types of opera	
String quartet as part medium, form and genre	
Function is an important categorization/facet of music	
Three important types of function: dramatic, religious/church and concert	
Dramatic function often overtaken by medium	
Important sacred/secular division	

Figure 70. Model 5: list of accords and discords of classifying music in the LIS and music domains

A few clarifications are needed. First, “current” for organological and LIS classifications of instruments really means from the early 20th century onwards; this is really an oxymoron for LIS classification, as it has been discussed in Chapter 2, Section 2.1, discussions and specific schemes for LIS music classification only started in the late 19th early 20th centuries. However, the “current” is there to emphasise the contrast for the “accords” section with the “early” organological thought.

Some salient points can be elicited from this table. It seems that at a broad level, in the types of facets, there is elision between the music and LIS domains. So, the elemental building blocks of music are considered to be the same in the LIS and music domains. It is also noted that function seems particularly well aligned between LIS and music domains. The discord placed at the broadest level of classification is probably the differing perceptions of vocal/instrumental classification; as Model 1 shows, this categorization in LIS is one of the first divisions of medium so significant discord for this aspect of classification is especially noteworthy. Other discords, such as opera’s sub-categorization could be due to the music domain’s classification frequently working at a more detailed level than LIS; in other words, LIS classification might not be interested in subgenres of opera as it is too detailed for LIS classification schemes, rather than this difference been accounted to a conceptual decision about the importance of opera subgenres in LIS.

However, accords and discords alone do not provide a complete picture of the relationships between both the LIS and music domains. In this section, only the result of the classification was considered: for every aspect of music discussed in the thesis, a precis was made of whether they matched or did not match. Next, the *process* which leads to this matching (or not) needs to be considered. One part of this process is the idea of influence.

6.2. Influence

RQ5 also asks how the music domain influences the classification of music within the LIS domain. Within the confines of the topics covered in this thesis, an answer (at least partially) has been found. Unlike establishing commonality or its antonym, in practice, establishing that the classification in a domain has influenced LIS classification is difficult. For example, Figure 70 showed how both the music and LIS domains presented music's essence made up of three building blocks or facets: medium, form/genre and purpose. However, after the literature and conceptual analysis carried out in this thesis, it cannot be said with certainty whether the LIS facets were directly influenced by the classification in the music domain. The LIS scholars and scheme creators consulted in this thesis, did not directly refer to the musical philosophical literature which discusses these building blocks; so rather than influence, an alternative explanation for the accord could be that music is essentially divided into these blocks, and the LIS domain came to the same conclusion as the music domain independently.

Nevertheless, there are some aspects of music classification where influence is easier to establish: where accords are related to specific music-domain classification schemes. For instance, Chapter 7 showed how the use of *Hornbostel and Sachs Classification* and its influence can be tracked within the LIS domain. Thus, in these cases, influence of the music domain on the LIS domain can be "proved".

6.3. Bifurcation

However, Figure 70 also suggested that there is an additional relationship between the classifications in the two domains. Note how some relationships, such as broad categories of instruments, were accords at one point in time and then became discords in another time period. This could be labelled as "bifurcation", a type of relationship between classification in LIS and the domain. Using "bifurcation" to understand the relationship between the LIS and domain classification is an original contribution to KO, as this idea is not usually addressed in KO discourse. (Details about these relationships

can be found in Chapter 7, especially in Section 3.2.3 and Section 6.) As well as an extra type of relationship, bifurcation also highlights a temporal aspect to these domain/LIS relationships. Actually, bifurcation is not alone in having a temporal element: by definition, “influence” also has to exist in a temporal plane. (The temporal frame is discussed as part of ideas relating to the reception of classification schemes, see Chapter 7 and Lee (2015), reproduced in Appendix B3.)

6.4. Conclusion: combining the relationships

Model 5 considers the relationships between classification of various aspects of the domains and how these different types of relationships intertwine. Part of this model’s originality is to consider the types of relationships at all, as the *nature* of the relationships between LIS and domain classifications is mentioned infrequently in KO discourse and this model goes further than existing discussions in categorising and labelling the various, intertwined relationships. Figure 71 visualizes these groups of relationships. Accords and discords are shown on opposite sides of the diagram. “Bifurcation” is shown as split between accord and discord, because at different times this relationship exists as both. “Influence” is shown as a subset of “accord”: influence is not an accord as such, but a process which *creates* an accord. Moreover, in theory “influence” could manifest itself as a discord; however, as no such influences could be proven for LIS classification of music in this thesis, this possibility is not represented on this diagram. Note that there is a difference in the total number of listed relationships, for instance there are more accords than bifurcations; however, this is not considered to be particularly important, as it can be seen that some of the listed relationships are more far-reaching and significant than others, so a quantitative comparison would not be useful.

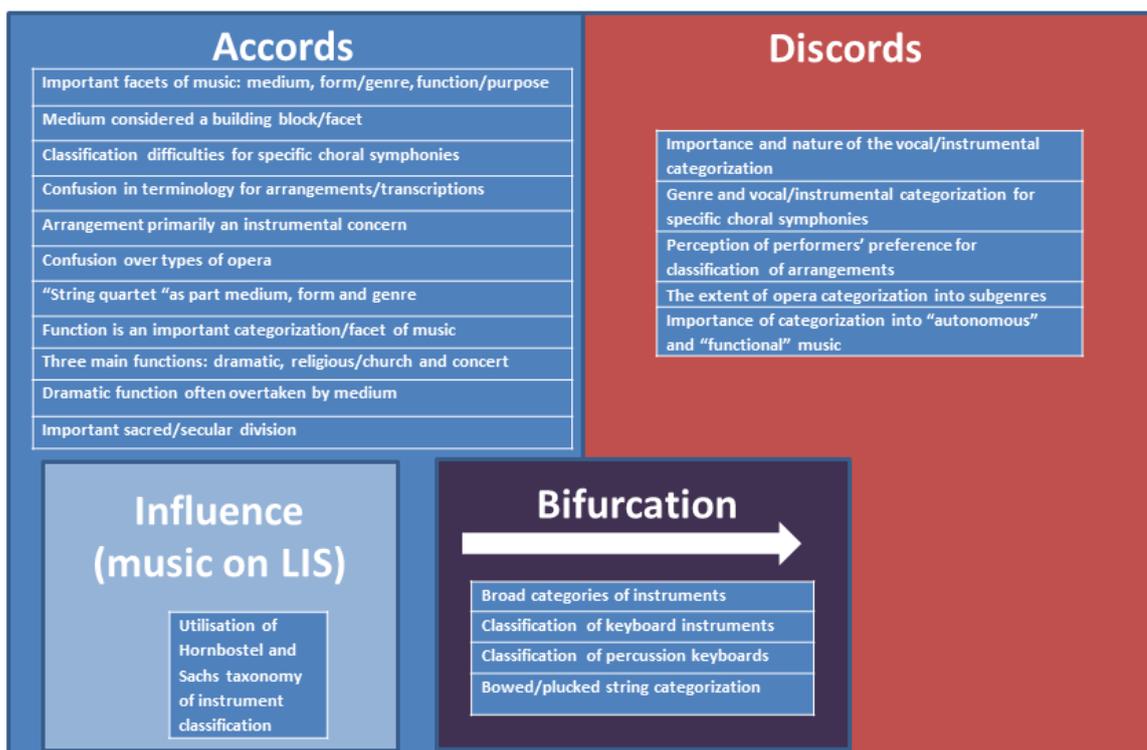


Figure 71. Model 5: relationships between music classification in the LIS and music domains

Model 5 also highlights that the relationship between music classification in the LIS and music domains is not static, as relationships of specific topics between the music/LIS domains can change over time. So, as well as showing how music classification functions in a dual domain/LIS framework, this model also asks questions about that process of comparison. First, a much richer picture emerges than a straightforward one-directional influence from music to LIS domains, which was indicated in some KO discourse. Second, this model points towards interesting future work which examines the types of relationship between domain/LIS classifications in more detail.

In Figure 72, an attempt is made to summarise the relationship between the LIS and music domains, using an alternative visualisation to that shown in Figure 71. Again, this is a novel way of describing and visualising relationships between LIS and domain classifications. Instead of the unit being specific relationships as seen in Figure 71, this visualisation shows the domains themselves. Model 5 illuminates the complexities of considering these types of comparisons, and more than anything else, how the relationship between the classification of Western art music in the music and LIS domains cannot be summarised by a single relationship. So, to answer RQ5, the individual accords, discords and influences are summarised in Figure 71 and discussed in Sections 6.1 and 6.2 (and 6.3); however, if asking more broadly, this thesis has shown

that the relationship between classification of music in the LIS and music domains is a complex amalgam of accord, discord, influence, bifurcation, and perhaps other types of relationship.

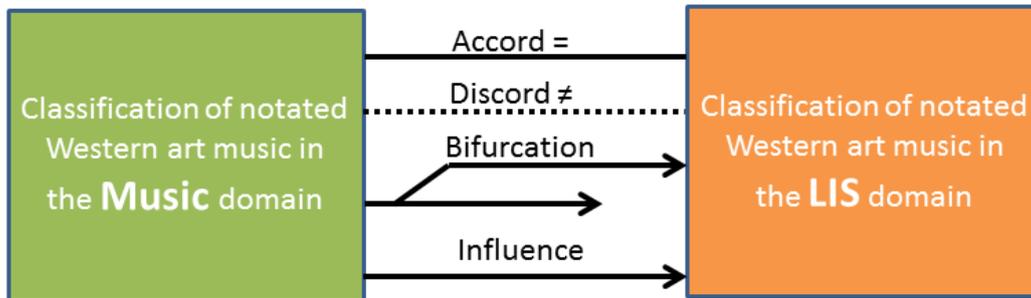


Figure 72. Model 5: a summary of the relationship between classification in the music and LIS domains

The complexity of the relationships between the LIS and domain classifications is of interest beyond discussions about music classification, and thus also helps to answer RQ3; it adds to the current discourse in general KO about the interplay between domain classifications and LIS classifications. While existing KO discourse emphasises the importance of discussing domain classifications, and some authors, such as Hjørland and Nicolaisen (2004) and Mai (2011), describe the relationship between domain and LIS classification in broad terms – for more details, see Chapter 1, Section 4.2 – this thesis has forged new ground by attempting to explore in more detail the *nature* of the relationship between a domain classification and its LIS companion. While this thesis covers a particular area of music, future research could take the skeleton relationship structure of accord, discord, influence, bifurcation, and see whether it can be successfully applied to classification in LIS and other domains, such as biology, chemistry, art, and so on. Therefore, music classification could potentially provide the key to new research in domain classifications.

Chapter 11. Conclusion

1. Summary and response to research questions

In the course of this thesis, the complex and multi-layered nature of the classification of notated Western art music has been illuminated. In the Introduction (Chapter 1), the intractable nature of music classification was elucidated. Over the last 100 years, there have been significant practical concerns about organizing collections of notated Western art music, as evidenced in the number of special classification schemes for music and professional music librarianship literature. Yet, little has been written from a theoretical perspective. This thesis analysed the classification of notated Western art music, from a theoretical perspective, articulating why conceptually music classification is tricky. Furthermore, it modelled both the actual workings of library and information science (LIS) classification of music and provided novel frameworks for considering the classification of Western art music in the future.

1.1. The LIS classification of notated Western art music (RQ1, RQ2)

While the most important facets of music were identified in Chapter 4 – medium, form/genre and function – the nature of these facets were explored and narrated over the course of five subsequent chapters. The complexities of classifying music were found to be multitudinous. As these chapters unfolded, answers to the research questions “How is notated Western art music organized in LIS?” (RQ1) and “How can knowledge organization theories from LIS, such as faceted classification, be used to understand the knowledge organization of notated Western art music?” (RQ2) were revealed.

First, the medium facet, at the heart of the classification of Western art music, is an extremely complex entity, made up of many elements all interacting with each other in a convoluted series of relationships. This was described in detail in Chapter 6 and demonstrated in Model 1. Moreover, complications are also wrought by the fundamental division of the medium facet in most LIS classification systems into a binary vocal/instrumental division – yet, the medium of Western art music is liable to behave in less binary ways. This was discussed in Chapter 5 and a possible solution demonstrated in Model 2, with the introduction of a novel category, “vocinstrumental”. Second, the clear-cut nature of a medium and form/genre system (with or without function), on

which much LIS music classification is based, arguably is built upon some shaky theoretical foundations. To start, the thesis was saturated with examples of how the facets of music are far from independent (summarised in Model 3), in particular the dependence between the medium and form/genre facets. This leads to the question, is there even such a thing as a medium facet, for it is so often subsumed into other elements of music classification? In addition, the quasi-facet nature of function also helps to muddy the waters, not least its seemingly dynamic relationship with the form/genre facet (discussed in Chapter 9 and in Model 3). Third, the nature of the form/genre facet and whether it is even best considered in faceted terms is unclear. The undulating nature of the classificatory concept of “form/genre” was explored in Chapter 8 and a new way of considering the form/genre aspects of music classification were postulated in Model 4. So, this thesis has explained how notated Western art music is organized in LIS, using faceted classification theories to help to understand what is taking place. Furthermore, faceted classification was used as a springboard to rethink the mechanisms of music classification.

1.2. Music knowledge organization and general knowledge organization (RQ3)

This thesis also answered the research question “How does the classification of notated Western art music interact with and enhance our understanding of general classification?” (RQ3). It discussed where music classification contributed to the general historical development of classification, such as the prevalence of music amongst milestones in the development of faceted classification (such as BCM, the *Phoenix Schedule of Dewey Decimal Classification* (DDC), and so on). More significantly, in order to properly dissect and explore music classification, novel frameworks and methodologies were proposed which offer new directions for broader knowledge organization (KO). To start, the thesis provided a very detailed analysis of the classification of a single subject, which in itself is unusual. This thesis introduced new methodologies and theoretical frameworks for analysing classification schemes, and by extension, other knowledge organization systems. For example, it introduced stress-testing (Chapter 6, Section 5), reception-infused analysis (Chapter 7, Section 5), plotting the webs of connections between classification schemes (Chapter 7, Section 5) and the multiplane approach (Chapter 4, Section 5). Novel classification concepts were suggested in the course of discussions, such as the idea of dynamic facets (Model 3) and the idea of a simultaneous classification model (Model 4). These ideas could be applied

to other situations and subjects beyond music, thus this thesis contributes to the general development of KO.

1.3. The relationship between music classification in the music and LIS domains (RQ4, RQ5)

The research question “What classification structures are inherent in the music domain’s classification of Western art music?” (RQ4) was posed in this thesis and answers pertaining to the specific aspects of music addressed in this thesis were found. For instance, the basic structure of three important building blocks was revealed— medium, function and form/genre; for example, the development of four categories of musical instruments was discussed, as found in *Hornbostel and Sachs Classification*. As well as ascertaining the classifications within the music domain, RQ5 also asked about the connections between classification in the music and LIS domains: “What are the accords and discords between the classification of notated Western art music in the LIS and music domains, and how does its classification in the music domain influence the classification of notated Western art music in the LIS domain?”. Accords such as the main facets of music and the importance of the sacred/secular division were counterbalanced with discords such as the importance attached to the vocal/instrumental and autonomous/functional categorizations (see Model 5, which includes a full list – Chapter 10, Section 6). However, accords and discords were not the only relationships found between classifications in both domains. So, one answer to RQ5 is (at least) accords, discords, bifurcation and influence, in various measures. (For a full explanation of these types of relationships, see Chapter 10, Section 6.) While there is much interest amongst certain KO scholars about domain classifications, the types of relationship between the domain and LIS classification has received little analysis in existing KO discourse. So, this thesis not only explores the domain question for the specific subject of notated Western art music, and in doing so responds to the rallying cry for more exploration of domain classifications, it also goes much further: Model 5 contributes to our understanding of domain classification by exploring the *types* of relationships between classification of a subject in the domain and in LIS. Therefore, the implications of Model 5 extend beyond the classification of a particular type of music.

2. Research limitations

However, the research was also limited in a number of ways. The most significant of these were the limitations of time imposed by a doctoral study. To start, not every facet or part of the facets could be studied in the time available. Crucially, although the initial project aimed to also study music literature as well as music scores, once research was underway, it became clear that there would not be space within the doctoral research to explore both of these, thus the study was limited to music itself. Another temporal limitation was imposed by the quantity of schemes that could be analysed in detail; while ideally the 18 schemes would have all been analysed in detail, a compromise was formed. Three schemes received in-depth analysis (BCM, Flexible and Dickinson), and this was supplemented with broad analysis of another 15 schemes (with occasional additions of extra editions of some of these schemes) and use of Elliker (1994) as a secondary source (in Chapter 4).

A significant limitation to responding to RQ4 and RQ5 was imposed by the lack of explicit classification schemes from the music domain, especially any which classified music at a similar level of detail as the LIS classification schemes. Consequently, aside from musical instruments, few direct parallels between classification schemes in the LIS and music domains were found; so, classification schemes in the music domain, if found at all, were usually at a finer level of detail than their LIS equivalents, so comparisons with the corresponding area of an LIS classification scheme for music could not be made. This limited the types and nature of comparisons, as well as potentially affecting Model 5 which considered the interactions between classifications in both domains. Another limitation was presented by the author's background outside of computer science, impacting upon the ability to make comparisons with research in the computer science sub-discipline of music information retrieval. While not a focus of the thesis, the lack of background knowledge about music classification in music information retrieval meant a potentially interesting – although not critical – line of comparison was not followed up within this thesis.

3. Future research

The thesis has suggested much profitable future research and potential projects. First, the results from this thesis could be shared with those who organize Western art music in other spheres. For instance, sharing the findings with those working with music

information, such as members of the music information retrieval community could provide fruitful future collaborations. It would be insightful to see whether the models developed as part of this thesis could be applied to music-as-sound; considering any variations between the models developed for Western art music as notated music and their usage or adaptation for music-as-sound would not only expand the reach of the research, but also ask interesting questions about the nature of music information. Second, discussing this research with those who design retrieval tools for Western art music – both notated music and music-as-sound – could be fascinating, and help to share some of the findings of this doctoral research. Possible initial companies to contact would be IMSLP and Naxos Music Library. Third, the analysis of music classification could be fruitfully extended. Consideration of notated, non-art music could be considered in a future project, such as a considering notated, folk music.

Another strand of future research would involve extending this study to other arts: for example, exploring whether the phenomenon discussed, analysed and presented as part of this research project concerning music, would be applicable to other arts, such as fine art and literature. Significantly, this thesis also offered up many new directions and methodologies about classification more generally, and future research could explore these in more detail. For instance, the multiplane approach was considered for one aspect of two particular classification schemes: extending this to more examples could yield a more developed method. Similarly, although the conceptual discussion of reception-based analysis of classification schemes was the focus of two papers originating in this thesis, they still both used music classification when examples were needed. Future research could see more examples added to discussions of these theoretical ideas, in particular from other types of knowledge organization systems, as well as an exploration of related topics. For instance, analysing the relationship between different knowledge organization systems as intertextuality would be one fascinating line of enquiry to explore in the future. Finally, extensions could also be made beyond classification. This thesis asked essential questions about the nature of music, in its desire to chart its classification. Thus, this research could be used as part of more general research about what is the music information in notated Western art music.

To conclude, music classification is complex and seemingly full of contradictions. Music is apparently ripe for faceted classification treatment, yet its facets are dependent on

each other. The facets of music are easy to list, yet facets (for instance, form/genre, function) and sub-facets (for instance, arrangement) are difficult to name. LIS classifications of music “should” be based on those found in the music domain, yet the many discords, the bifurcation and the way that sometimes music classification is based on LIS classification (for example *Hornbostel and Sach Classification’s* choice of DDC’s system of notation) all illustrate that music does not always follow these expectations. Put simply, there is a very good reason why the 20th century saw irritated librarians creating piles of new schemes for music and complaining about the failings of existing schemes. This thesis used a theoretical approach to understand why music is difficult to classify, in particular appropriating faceting theory to help understand what is happening when notated Western art music is being classified. Answers have been found, even if there are many of them: highlights include dependency between facets, an especially complex medium facet, a form/genre facet with an identity crisis, and a function facet which keeps changing its mind about whether it is even a facet or not. Music classification may be complex, but at last, some of its mysteries have been elucidated.

Appendix A: The classification of Beethoven's Symphony No. 9 and Berlioz' *Roméo et Juliette* using Dickinson

Dickinson classification of Beethoven's Symphony No. 9

- Call Beethoven "B32", Beethoven's symphony "s9" and the editor "E"
 - Combination 1 [loan and performance libraries]:
 - Choral symphony: 81306 / B32 / s9 E
 - Combination 2 [reference and musicology libraries]
 - Same results as Combination 1
 - Combination 2a [reference and musicology libraries]
 - Choral symphony: 813 / B3206 / s9 E
 - Combination 2 b [reference and musicology libraries]:
 - Choral symphony: 8 B32 / 1306 / s9 E
 - Combination 3 [general or small library]:
 - Choral symphony: 81 / B32s9
 - Combination 4 [general or small library]:
 - Same results as Combination 3

Dickinson classification of Berlioz' *Roméo et Juliette*

- Call Berlioz "B72", *Roméo and Juliette* "r" and the editor "B"
 - Combination 1 [loan and performance libraries]:
 - Choral symphony: 81306 / B72 / r B
 - Orchestral work with incidental chorus: 66 / B72 / r B
 - Combination 2 [reference and musicology libraries]:
 - Same results as Combination 1
 - Combination 2a [reference and musicology libraries]:
 - Choral symphony: 813 / B7206 / r B
 - Orchestral work with incidental chorus: same results as 1
 - Combination 2 b [reference and musicology libraries]:
 - Choral symphony: 8 B72 / 1306 / r B
 - Orchestral work with incidental chorus: 6 B72 / 6 / r B
 - Combination 3 [general or small library]:
 - Choral symphony: 81 / B72r
 - Orchestral work with incidental chorus: 66 / B72 r
 - Combination 4 [general or small library]:
 - Same results as Combination 3

Appendix B: published papers relating to the thesis

The papers reproduced in this appendix reflect the style and formatting required for their particular publication, so are not necessarily consistent with each other or the rest of the thesis. In addition, they incorporate any changes made after peer review. References for each paper are included with the paper and are not incorporated into the main reference list for the thesis (though there is obviously much overlap).

Appendix B1: Faceted music: towards a model of music classification (2012)

Lee, D. 2012, "Faceted music: towards a model of music classification", *Facets of knowledge organization: proceedings of the ISKO second biennial conference, 4-5 July 2011, London, U.K.*, eds. A. Gilchrist & J. Vernau, Emerald, Bingley, pp. 339-351.

This paper was given at the ISKO UK conference in 2011 and published in the conference's proceedings in 2012.

Appendix B2: Webs of 'Wirkung': modelling the interconnectedness of classification schemes (2014)

Lee, D. 2014, "Webs of 'Wirkung': modelling the interconnectedness of classification schemes", in *Knowledge organization in the 21st century: between historical patterns and future prospects: proceedings of the thirteenth International ISKO conference, 19-22 May 2014, Krakow, Poland*, ed. W. Babik, Ergon Verlag, Würzburg, pp. 200-207.

This paper was given at the international ISKO conference in 2014 and published in the conference's proceedings.

Appendix B3: Consumption, criticism and Wirkung: reception-infused analysis of classification schemes (2015)

Lee, D. 2015, "Consumption, criticism and Wirkung: reception-infused analysis of classification schemes", *Knowledge Organization*, vol. 42, no. 7, pp. 508-521.

This paper was published in Knowledge Organization in 2015.

Appendix B4: Conceptions of knowledge about classification schemes: a multiplane approach (2016)

Lee, D. 2016, "Conceptions of knowledge about classification schemes: a multiplane approach", *Information Research*, forthcoming.

This paper was given at the COLIS conference in 2016, and will be published shortly in Information Research.

Appendix B1: Faceted music: towards a model of music classification (2012)

Faceted music: towards a model of music classification

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Abstract

The organization of music is a subject that has fascinated classification researchers and librarians alike for over a hundred years. This paper identifies five key methodological approaches undertaken by commentators on music knowledge organization, which demonstrate different interdependent relationships between musicology and classification.

Five significant themes form the main body of this paper, and these themes underpin the corpus of music classification literature. The first theme concerns the question of whether classification should divide music materials into their constituent formats. This division sets conceptual against practical. The second theme looks at facets in music classification. "Medium" and "form" are considered to be the most important facets for music scores; "composers" are an important facet for music literature. The third theme considers the poor treatment of "other" musics in knowledge organization, and notes some possible explanations. The fourth theme investigates the relationship between the classification and retrieval of music materials. This section highlights the differing needs of users and suggests how the classification of music materials is adapted accordingly. The fifth theme discusses pre-existing music classification schemes, with the large number of home-grown and special schemes highlighted.

The paper concludes that the five identified themes point towards a model of music classification. However, the model is not just concerned with facets, musics and formats; it is also based upon the relationships between various sets of protagonists, such as the librarian and the musicologist, the musicologist and the performer. Through studying these protagonists, the traditional boundaries of musicology, music librarianship and knowledge organization will be crossed.

Introduction

The classification of music has a long history of fascinating those interested in practical and theoretical aspects of classification.²⁰² With a diversity of topics such as faceted classification and format versus contents, it is unsurprising that knowledge organization literature devoted to the arrangement of music materials is voluminous. However, the more music classification is examined the more questions are raised. For instance, what drove music librarians to seek a unified classification scheme for music? Why was music, in particular scores and sheet music, so ripe for faceted treatment? This paper uses highlights from a literature review of music classification to identify main trends and topics within music classification – music classification “themes”.²⁰³ The ensuing discussion will not attempt to necessarily answer these or other questions, but will instead shine a light upon particular areas of music classification literature that form the thematic base of a classification model.

The paper begins with an outline of five different types of methodology evident in music classification literature. Each methodology demonstrates a different relationship between classification and musicology, becoming ever more symbiotic as the sequence progresses. Next, five of the main themes in music classification literature will be discussed: the score/literature divide, facets of music classification, treatment of “other” musics, music classification and retrieval, and finally, music classification codified by classification schemes.²⁰⁴ Through these methodologies and themes, a plan for a music classification model will emerge.

202 This paper focuses specifically on classification, rather than general subject access. However, the topic of the paper is not limited to classification in the physical world; the findings are equally relevant to online classification, for instance browsing classmarks or shelf-listings.

203 The discussion is primarily concerned with printed items such as scores, sheet music and books. Though the arrangement of sound recordings is a matter discussed frequently in classification literature, as the quantity of literature on arranging sound recordings is large and frequently distinctive from the literature on the arrangement of other types of music materials, it is not the focus of this paper.

204 This paper only deals with five specific themes: many more ideas were encountered in the literature which there is not space to cover in this paper. Only literature on the principles of music classification and secondary literature on specific classification schemes – such as descriptions and analyses of schemes, or classification scheme prefaces which include theoretical discussion – are considered. The primary sources, i.e. the classification schemes themselves, have not been systematically analysed at this stage in the project. Classification inherent within musicology, such as organological classification or periodic classification are also not covered, as these will form a future independent section of the overall research project.

Methodologies

Analysis of music classification literature demonstrates that five main methodological approaches are used by authors. A typical “classification scheme as textual study” will be in tripartite form: highlights of the history of the scheme, description of the scheme, then a discussion about issues with the scheme which may be accompanied by suggested improvements. In this methodology, classification is discussed through the prism of an exemplified scheme.²⁰⁵ The “project approach” focuses on classification practices in a specific library and frequently takes a narrative approach: examination of the problem, discussion about why existing schemes/practices are not suitable, description of the process of finding a solution, implementation and then a reflective evaluation.²⁰⁶ Again, the issue of classification is discussed through the lens of a practical problem, which involves the arrangement of real-life items. These two methodologies are by far the most frequently used, and both involve real-life schemes and/or real-life libraries.

The other three methodologies are conceptual and used less frequently. A number of authors use a “classification from a discipline source” methodology. This method uses the structure of musicology as encoded in a particular music literature source or type of source as the basis of the music classification discussion. Sources used by authors include bibliographies (see for example Goldthwaite (1948)), textbooks (see for example Abrahamsen (2003)) and diagrams within textbooks (see for example Line (1962)). This methodology is closely related to the “domain analysis” methodology, which considers classification within the context of the discipline. For the knowledge organization of music, the “domain analysis” methodology places the organization of music within the discipline of musicology and allied subjects (Abrahamsen's paper (2003) is the major example). The final methodology, “technique from discipline to analyse classification”, uses methods from the domain of musicology to analyse music classification.²⁰⁷ Elliker's (1994) use of Schenkarian analysis to interrogate a significant number of music classification schemes demonstrates an interesting relationship between classification and musicology.²⁰⁸ In previous methodologies the structure of musicology is used to investigate and/or create classification; however, Elliker (1994) uses a musicological method to analyse the classification. It is truly a dyadic approach.

205 Sometimes the tripartite approach is taken repeatedly: a chapter or article contains a succession of sections, where each section discusses a different classification scheme and is in tripartite form.

206 An example is Marsh's (2002) article describing the adaptation of the ANSCR system of arranging sound records at the Leeds College of Music.

207 “Musicology” is used here in the broadest sense of the word, encompassing historical musicology, music theory/analysis, ethnomusicology and all related subjects.

208 Schenkarian analysis – a ubiquitous twentieth-century music analysis method of great significance – separates musical works into foreground, middle ground and background, demonstrating the overall structure of a work across a sea of notes.

Theme 1: scores and literature

The potential division of music library materials into literature and scores is fundamental to music classification discourse.²⁰⁹ For instance, Jones (1979) describes separating literature and scores as a “basic distinction” (pp. 95 & 96) Benton (1976) describes literature and scores as “principal categories” (pp. 55 & 56). The lack of division between literature and scores in older versions of Dewey Decimal Classification (DDC) is cited by commentators as one of its fundamental flaws (see for example Wursten (1990 p. 8)). Furthermore, as well as being highly significant, any separation between literature and scores must also be the first division applied (Nettl, 1960 p. 12).²¹⁰

The literature/scores debate introduces a number of important ideas about music classification. For instance, dividing literature and scores can place practical considerations in direct opposition to conceptual ones. Redfern (1978 p. 17) argues that literature should be shelved alongside scores; however, for practical purposes, separating literature and scores by format is preferable. The literature/scores debate also highlights the separation of format from contents. Pethes (1967) provides a particularly illuminating visual representation of this concept, suggesting that “outward appearance” (p. 3) adds a third dimension to the two-dimensional instrumentation/form representation of music classification.²¹¹

Once the decision has been made to separate literature and scores, there are two different ways to enact the division.²¹² In the first method, literature and scores share the same set of notations; however, a symbol preceding the notation – or similar device – is used to differentiate the literature and the scores. For example, this type of division is used in later editions of DDC.²¹³ On a conceptual basis, this method treats the organization of knowledge within the

209 There are various different terms for “literature” and “scores”. For the purposes of this work, “scores” means all items which are fundamentally in musical notation; “literature” is used to mean works which are primarily in written language, where the subject of the work is music.

210 The classification of music is sometimes compared to that of the other arts, especially language-literature (i.e. literature about written-language literature) and art (see for instance (Nettl, 1960) and (Mullally, 1976)).

211 “Instrumentation” is equivalent to “medium” – a facet that is discussed in more detail below. It is not clear whether Pethes is specifically describing the literature/scores debate or music classification more generally. Nevertheless, the principle is the same.

212 However, it is not always easy to make the distinction between literature and scores: there are certain hybrid items which could potentially live amongst both sequences. Examples include critical editions, study editions and critical series.

213 Wursten (1990 pp. 8 & 9) provides a useful summary of how format prefixes have been used in various editions of DDC.

literature and scores as identical; the addition of a symbol separates the items physically on the shelves. The other method involves two completely different sets of notations for literature and scores. These sets of notations will often be successive – for instance, the McColvin scheme (McColvin & Dove, 1965) – whereby there is one sequence of notations for scores directly followed by a set of notations for literature, or vice versa. Conceptually, this method suggests that the classification of literature and scores are two separate parts of one whole, and it certainly allows for more radical differences in the intellectual organization of the two types of materials.

Commentators highlight various advantages and disadvantages of both systems. For example, the first method allows for a mnemonic relationship between the notations for literature and their corresponding scores (Sweeney, 1976 p. 4). However, this method necessitates using the same facets for literature and scores. For instance,

when conducting an initial facet analysis of music items, Redfern (1978 p. 17) identifies differences between the score facets and literature facets; therefore, using the same set of notations for both sets of facets could be problematic. However, a partial solution can be found by applying different citation orders for literature and scores, and this is the solution adopted by Sweeney and Clews in the DDC phoenix schedule (Sweeney, 1976 p. 5) and later 20th edition of DDC (DDC20).²¹⁴

The literature/scores divide is the most prolific of the format-based discussions in music classification literature; however, there are also other format-based topics, such as classifying different types of scores or issues concerning sound-recordings. Though there are multitudinous varieties of music formats to integrate into a library's organization, their placement is based around the same debates as the literature and scores divide: practical versus conceptual, content versus format.

Theme 2: facets

While many different aspects of literature and scores could be used as classification devices for arrangement, most music classification commentary focuses on a few select facets.²¹⁵ The importance of faceted classification in the

214 Citation order for scores: Executant – forms – character. Citation order for literature: composer – executant – forms – character – techniques – elements – theory – standard subdivision (Sweeney, 1976 p. 5).

215 Some commentators also discuss faceted classification ideas such as distributed relatives, order of facets and order within facets – though they rarely use faceted

history of music classification should not be ignored: the British Catalogue of Music (BCM) classification was the first published fully faceted scheme in Great Britain (Redfern, 1978 p. 24) and also formed the basis of the DDC phoenix schedule (Sweeney, 1976 p. 4). Literature and scores inspire different debates within the music classification commentary: “medium” and “form” are the main points of interest for scores while “composer” is frequently discussed in conjunction with literature.

“Medium” and “form” are the most commonly used facets for arranging scores according to commentators.²¹⁶ However, there is some debate over the order of these two facets. Commentators such as Line (1952) and Bryant (1985 p. 141) state that “medium” is the first characteristic used in most classification schemes, with “form” the second.²¹⁷ However, Elliker's (1994) Schenkarian analysis study of a large number of different classification schemes concludes that there are two main types of organization for scores: “form” then “medium”, or, “medium” then “form”.

Commentators discuss various different ideas as to why “medium” and “form” are the most prevalent facets. Nettl (1960 p. 12) suggests that “medium” is the simplest facet to manage: the classifier does not need much musical expertise to decipher that the music is for one instrument or another. Line (1962 p. 352) suggests that different mediums are easier to distinguish from each other than different forms. Smiraglia (2006 p. 7) takes a more conceptual approach when discussing the representation of music scores in a subject catalogue: “form” and “medium” have to be used to *arrange* music as “form” and “medium” *are* music. Though discussing music in subject catalogues, Smiraglia's argument is equally applicable to music classification.

“Composer” is an important facet in the classification of music literature.²¹⁸ Commentators such as Redfern (1991 p. 22) argue that the first facet for music

classification terminology for their discussions. However, space does not allow for discussions of these concepts.

216 “Genre” is another facet which is discussed by a number of music classification commentators but suffers from difficulties. What is meant by “genre” is often not defined in music classification literature; its meaning and use depends on the type of music or material being discussed. In addition, popular music genres are frequently at a distance from the classification scheme authors and the “academy” which informs them. It is not easy to distinguish the problems with classifying by “genre” in the abstract, and those caused by the close connection of “genre” to music outside of the “academy”.

217 This paper will use the term “characteristic” as a loose equivalent to the technical faceted classification term “characteristic of division” (also known as “principle of division”).

218 Interestingly, while agreeing that “composer” should be the primary characteristic for literature – a belief backed up by the citation order chosen for the Dewey Decimal Classification (DDC) phoenix schedule – Sweeney (1976 p. 4) suggests that the question is more open than the inevitable choice of “medium” for scores.

literature should be “composer”; the reasons given include that a significant quantity of literature concerns composers (Clews, 1975 p. 8) and the majority of enquiries are composer-based (Redfern, 1991 p. 22). Certainly, “composer” is an element used to judge the usefulness of a classification scheme by critics: Redfern (1991 p. 22) suggests that BCM classification’s lack of a composer facet received serious criticism.

“Medium”, “form” and “composer” are by no means the only facets or facet-related issues discussed in the literature; as well as a full spectrum of other potential music facets, authors also discuss a proposed universal system of music facets.

Theme 3: “other” musics

The treatment of subjects outside the realm of Western, classical art music is an important issue to music classification authors, with the treatment of folk music, jazz and popular music cited by authors as being particularly problematic. There are a number of possible factors as to why the classification of “other” musics are, and have been, so problematic.

The rapid change of musical genres within popular music and the ability of classification to keep up with these changes, is a possible explanation. Nero (2006) states that popular music genres in Trinidad and Tobago reflect the “dynamic cultural environment” (p. 122) of the country, and that classification schemes need to be equally dynamic if they are to truly reflect the music they cover. In other words, traditional classification schemes cannot keep up with a music that has constantly evolving genres.

Inskip et al. (Inskip, MacFarlane, & Rafferty, 2008 p. 690) deduce that issues with the classification of popular music are not just in the contents of traditional classification schemes but are also inherent within the structure; this is due to traditional classification schemes being written before popular music became embedded within musicology. Therefore, from the outset, schemes were not designed with the special requirements of popular music in mind. Langridge (1967) uses the same argument when discussing the treatment of jazz within classification schemes, using the example of performers and jazz. Western art music places a high value on the composer, and this is reflected in music classification schemes; Langridge (1967 p. 4) argues that a scheme such as

BCM classification fails for jazz, as it does not recognize that the jazz performer is equivalent to the Western art music composer.²¹⁹

Unsympathetic treatment of materials concerning non-Western art musics have consequential effects on the library, most notably on the retrieval of these items. For instance, in the case cited by Langridge (1967), the failure to recognise the importance of the performer in the arrangement of jazz materials has resulted in unwanted separations of materials which naturally belong together (Langridge, 1967 p. 4). Another consequence of ineffective classification for “other” musics, is that frequently they are only represented by a few broad categories in classification schemes. Abrahamsen (2003 p. 159) cites the Copenhagen public library as an example where the broad genre headings make retrieval of popular music difficult. Nero (2006 p. 124) found that the lack of specificity in the classification of popular genres in DDC led to varied localized practice amongst Trinidad and Tobago libraries; in the absence of prescribed specific numbers for various important genres, librarians created their own. All these consequences result in poorer retrieval of “other” musics materials.

Theme 4: classification and retrieval

At the heart of classification is retrieval, and music is no exception. Smiraglia (2006 p. 7), describes retrieval-based classification as one of the key themes of twentieth-century literature in the bibliographic control of music. However, the relationship between classification and users is not necessarily positive: Redfern (1978 p. 11) suggests that far from increasing access, some schemes can make materials more difficult to find, such as the “obscure slots” for jazz and popular music.

Inskip et al. (Inskip et al., 2008 p. 689) suggest that different readers will have different information needs and will therefore use a collection of music materials in different ways. Commentators discuss these differences by categorizing the needs of different types of music library users. However, it can be seen that commentators don't necessarily agree on these divisions, or the best classification for each group.

219 However, one generation's “other” can be viewed as another generation's mainstream. Langridge's (1967) article on the classification of jazz can be contrasted with Nero's (2006) article written over 35 years later, which contrasts the detailed coverage of jazz in DDC with the unhelpfully scant treatment of significant new genres. It is inevitable that as yesterday's new genre becomes part of today's mainstream, the treatment of that genre in classification schemes will improve.

McColvin and Dove (1965 p. 48) pit the “listener” against the “user”, where a “user” is defined as someone who plays an instrument or is interested in a particular type of music.²²⁰ The author(s) suggest that libraries should be arranged with the users in mind; listeners have alternative means of access (McColvin & Dove, 1965 p. 48). This is an interesting division as it separates the readers by consumption method.²²¹ However, there is a further implication to this division: the “serious” musician or researcher versus the leisure-user. Authors such as Buth (1974 p. 427) also imply this serious/leisure model, dividing music-library users into the “researcher/scholar” (she uses these terms seemingly interchangeably) and the “browser”. Each has different classification needs (Buth, 1974 p. 441). Interestingly, there is no consideration that a researcher could be a leisure user for some tasks and vice versa.

A number of authors comment on the differing needs of the musicologist/researcher and the performer, and Line is particularly vocal in this discussion. In his 1952 article, Line (1952) gives an even-handed account of the dichotomous retrieval needs of performers and scholars. “Medium” is a particularly useful arrangement to performers, while scholars tend to find “form” more useful (Line, 1952). However, ten years later, Line (1962) argues that the arrangement of scores is better considered through the eyes of a historian rather than a performer, largely based on problems with using “medium” as the most important division. For instance, the performer's desire for arrangements of works to be filed by the medium of the arrangement means that works will be split between two different “mediums”; problems with “medium” are compounded with pre-classical works as “medium” is an unreliable dividing factor (Line, 1962 p. 353).²²²

220 It is not possible to confirm who of Dove and McColvin are responsible for each individual section of the revised McColvin classification schedules. It is likely that the comments and prose are exclusively by Dove, as McColvin is referred to in the third person. However, this is not confirmed.

221 Sadly, the author does not elaborate on whether the “listener” is exclusively seeking sound recordings, or is also seeking printed materials that would accompany a committed listener, such as scores to follow the recordings and/or biographies of the composers.

222 Redfern (1978 pp. 13 & 14) goes further than the above authors by identifying six types of users and their varying classification and retrieval needs: musicologists/researchers (known-item retrieval or arrangement by “composer” or “history”), instrumentalists (arrangement by “medium” or “form”), music teachers (arrangement by “difficulty” and/or “medium”), groups of players and singers (depends on number in group, but could be arrangement by “size of ensemble”); general readers/students (various arrangements); sound recording users (arrangement by “composer”, “artist” or “orchestra”). The list is interesting as it notes the prevailing approach of separating the classification needs of the performer and the musicologist, and the musicologist and the “casual” user – even though in the case of the musicologist, Redfern does not necessarily agree with other authors about the “best” classification for this group of users. There are a number of other interesting ideas from this list as well. For instance, the suggestion that certain types of users prefer known-item retrieval; the “serious researchers” know what they want while the other users browse.

Theme 5: classification schemes

Classification systems used in one-subject libraries can fall into one of three categories: a section of a general scheme, a special scheme for that subject or a home-grown scheme designed for an individual library.²²³

What is immediately apparent from music classification literature is the sheer volume of special and home-grown classification schemes for music. Some of the more prominent of the special schemes include BCM classification, Dickinson classification and McColvin classification; however, the literature reveals dozens more. The quantity of special schemes and home-grown solutions suggests two interlinked issues: first, music is fundamentally difficult to classify, probably related to issues such as multiple formats or the “subject-less” music score; second, existing schemes are inadequate, a view shared by authors such as Clews (1975 p. 7) and Olding (1954 p. 13). After surveying the inadequacies of existing schemes, creating your own could be the next logical step.

By far the most prolific music classification scheme discussed in the music classification discourse is a general scheme: DDC. The discussion often pivots around the inadequacies of the music schedules in pre-DDC20 editions of DDC, the publication of the DDC phoenix schedule for music (1980) and the eventual incorporation of the phoenix schedule into DDC20 (1989).²²⁴ Unsurprisingly, the concerns of authors writing about DDC are representative of all music classification literature; for instance, commentators discuss the literature/scores issue and appraise various “solutions” to the problem of “other” musics.

Conclusion

Music classification literature identifies five important themes which must inform any music classification model. First, the inclusion of various types of music materials within a classification system bring a three-dimensional approach to music classification, where format is the third dimension. Second, the ubiquitous use of “medium”/“form” as the first facet in score classification, coupled with the less commonly used “composer” as the first facet of literature, suggest a useful starting point for exploration of the other two dimensions. Third, the treatment of “other” musics demonstrates issues with boundaries, within both music classification and musicological discourse. Fourth, retrieval is an important part of music classification, and different types of readers demonstrate different classification needs. Fifth, existing classification schemes – whether general or special, used in multiple libraries or home-grown – exemplify the theoretical discussions of the other four themes.

223 Notwithstanding the possibility that different classification schemes may be used for different formats or sections of the library.

224 Of course, the publication of the DDC phoenix schedule was specifically designed to enable librarians to test and respond to the schedule before it was fully integrated into DDC (Humphry, 1980 vii). This could be one explanation for the high volume of literature concerning the schedule.

Furthermore, an interesting pattern emerges from consideration of the five methodologies and themes in music classification: sets of protagonists. The librarian and the musicologist are frequently aligned. For example, methodologies which borrow musicological ideas and implant them into classification or vice versa bring together the musicologist and librarian in various ways; the concerns of classification authors about format versus content echo musicological questions about defining what music is. Conversely, the performer and musicologist are usually described as opponents. The differing retrieval needs of both groups is a prominent example. This intricate web of connections between the various protagonists must also inform a music classification model. Therefore, a music classification model must accommodate various facets, musics and formats on one hand, and a diverse set of protagonists on the other. Or in other words, we are working towards a model of music classification which crosses the traditional boundaries of musicology, music librarianship and knowledge organization.

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Appendix B2: Webs of ‘Wirkung’: modelling the interconnectedness of classification schemes (2014)

Deborah Lee

Webs of “Wirkung”: modelling the interconnectedness of classification schemes

Abstract

This paper explores relationships between different classification schemes. It suggests how these relationships could be considered part of the reception of a scheme, in particular as an aspect of its “Wirkung”. Both intra-domain and inter-domain scheme relationships are examined, and are combined with pre-existing research on intra-scheme relationships. A model is posited which maps inter-scheme relationships, showing some of the complexities evoked in analysing the connections between classification schemes. Musical instrument (organology) classification is used as examples throughout the paper, to illustrate the ideas being discussed.

1. Introduction

Classification schemes rarely exist in a vacuum; for instance, they cannot escape the shadow of other schemes which arrange the same knowledge, nor separate themselves entirely from general trends in knowledge organisation.²²⁵ This paper explores how seemingly discrete classification schemes can be interrelated, and is a study of the nature of inter-scheme relationships. The relationship between one scheme and another can be considered as part of the “Wirkung” (effect) of the original scheme – applying terminology and ideas from reception theories to knowledge organization. “Wirkung” is part of the reception of an artwork (Holub, 1984, xii), and in this context describes how one classification scheme influences another.²²⁶ However, this paper will demonstrate that connections between classification schemes are not just restricted to binary form; there are whole sequences of connections between classification schemes, which could be described as a web of “Wirkungs”.

This paper draws upon examples of musical instrument classification; the reason for using musical instruments is that these examples are readily available through the author’s doctoral research, and they suitably illustrate the theoretical points in question. It should be emphasised that the examples of schemes and relationships used in this paper merely illustrate the points being made, rather than prove them; hence, the resulting model of scheme relationships contains only suggestions rather than facts.

First, the paper considers how we know that two classification schemes have a relationship. The next two sections look at relationships between classification schemes in the same domain (intra-domain relationships) and between classification schemes in different domains (inter-domain relationships), using the domains of organology (the study of musical instruments) and information science.²²⁷ Next, attention is turned to considering how inter-scheme relationships coalesce with existing theories about intra-scheme relationships and versions of schemes. Then, ideas posited in the paper are constructed as a prototype model, showing some of the issues and complexities in contemplating the connections between classification schemes – though, this model is very much a work-in-progress. This is followed by a final thought about how studying the connections between classification schemes can demonstrate their meaning and significance.

2. Constructing the classification scheme connection

Establishing whether two classification schemes are connected to each other is an important precursor to analysing any relationship between them. This task is far from simple, and covers a number of ontological issues. It could be argued that the knowledge that two schemes are

²²⁵ The author wishes to thank Prof. David Bawden and Dr Julian Gilbey for their ideas and advice.

²²⁶ The author is currently working on a paper which applies reception theories to classification schemes, as part of her doctoral studies.

²²⁷ For the purposes of this paper, the terms “information science” and “bibliographic schemes” have been used almost interchangeably.

connected is based around two different criteria: whether the connection is implicit or explicit; whether the evidence for the connection is based on primary or secondary sources. Explicit knowledge that a classification scheme is connected to another would usually be found in writings by the author of that scheme, such as a scheme's introduction or article about their scheme.²²⁸ Conversely, a classificationist analysing two different schemes and ascertaining that the similarities are best explained by a relationship between the two schemes, is an example of an implicit connection. Naturally, the most concrete of connections are where one scheme explicitly acknowledges the use of another, rather than relying on the inference and proof evoked by an implicit connection. Where the classificationist finds an implicit or explicit connection between two schemes by analysing the schemes or authorial writings themselves, this could be considered "primary"; relying on another classificationists' account of the connections could be considered "secondary".

So, four perspectives on classification scheme connections are proposed: explicit/primary, implicit/primary, explicit/primary and implicit/secondary. This paper makes use of most of these different perspectives; each example of classification scheme connection given in the paper has been judged by the author to have at least one of these different perspectives. However, space does not permit any discussion of details about which examples are using which type of perspective.

When an implicit connection is present, another question must be asked. If two schemes demonstrate a resemblance to each other, it is important to consider whether the resemblance is caused by one scheme influencing another or whether both schemes are simply reflecting the arrangement of knowledge in that discipline. Therefore, it is possible that two schemes are connected through knowledge alone, through the schemes or by connections between the knowledge and the schemes. The model proposed in this paper is concerned with the nature of scheme relationships; therefore, this paper makes an assumption that in all the examples selected, the schemes are at least to some degree connected, leaving the topic of connected knowledge/connected schemes for potential future research.

3. Keeping it in the domain: the intra-domain, inter-scheme relationship

Analysing the connection between two schemes in the same domain is interesting, as it can map classification practices within that domain. A selection of types of relationships between classification systems are described briefly below, using examples from the organology domain. As much literature about organological classification explicitly discusses the relationships between schemes, this section makes a good use of the "secondary" perspective.

Within organology, the examples are drawn from a particular group of relationships, those between a specific organological scheme, the scheme created by Hornbostel and Sachs (H/S; 1914) and other exemplars of schemes. The reasons for selecting this particular type of relationship are as follows. H/S is pivotal to organological classification in the 20th and 21st centuries. This importance is evident from the literature in a number of ways; for instance the introduction to H/S is reprinted in the seminal music reference text, *The New Grove* (Wachsmann et al., 2013). As well as H/S proving central to organological taxonomy, theorists writing about other organological schemes or the development of organological taxonomy frequently compare schemes to H/S; hence, these accounts provide a useful set of examples of relationships which can be mined for the purposes of illustrating some of the potential types of intra-domain, inter-scheme relationships.

One type of relationship unearthed by this examination of organological classification is based around "extension"; for instance, Galpin added "electroponic instruments" to the four main classes underpinning H/S, which later metamorphoses into "electrophones" in Hood's scheme (Wachsmann et al., 2013). There is also a type of relationship which is concerned with the separation between the intrinsic qualities of a classification scheme (for instance, structure, citation order) and more extrinsic qualities (for instance, notation, format); the relationships between old and new schemes could be labelled "is_written_in_new_format/notation_by". For instance, Hood's scheme uses the contents of H/S, but utilises a different type of notation, based on Labanotation (Hood, 1971). There is a type of relationship which is based around the notion of "fixing" the perceived problems inherent in the existing scheme, where the new scheme is created as a deliberate antithesis to the original one. This could be labelled a "reaction"; an example of

²²⁸ Note that the presence of an explicit connection between two schemes – for instance, where the introduction of one scheme specifically states that it is indebted to another – does not mean that the schemes themselves necessarily reflect that connection; sometimes, authors' intentions do not follow through in actions. Also, there are possible motives for an author to hide connections to an existing scheme; for instance, the example of Mahillon's scheme (Jairabhoj, 1990).

this phenomenon is found in Sakuri's scheme. Dournon (1992, 252) suggests that Sakuri shows its disagreement with the fundamental structure of H/S by increasing the number of main classes from four to seven. The idea of one scheme being a reaction to another scheme draws deeply from the reception studies paradigm; scholarly criticism of a scheme, part of the "Rezeption" of a scheme, causes a new scheme to be created. Thus, classification schemes become an act of "Wirkung", as a direct result of the "Rezeption" of the original scheme.²²⁹

4. Crossing domains: introducing the inter-domain, inter-scheme relationship

Classification schemes from one domain can also have relationships with schemes from other domains. So, in this section, the singularly important H/S will be used as an example from the organology domain, and its infiltration into various bibliographic classification schemes will be examined.

An analysis of the relationships between H/S and bibliographic schemes reveals that the relationships do not fit easily into the types described in section 3. Instead, the schemes in the information science domain seem to use *specific elements* of H/S; in other words, the relationship between schemes appears to act below the level of scheme-to-scheme relationship, at the level of a scheme's "properties". So, the following examples illustrate how some of the constituent parts of H/S are recycled in other schemes, and the interconnections between music and information science schemes. However, it is important to note that sometimes the property of the original scheme is only shared in part of the instrument schedules of the borrowing scheme.

Domain-specific schemes can be contributors to new terminology. For example, H/S created its own terminology for the main classes of instruments, which has proven invaluable for tracking H/S's influence on other schemes and the prolificacy of H/S's connections. For example, the original edition of Bliss (Bliss, 1953) and the 15th edition of Dewey Decimal Classification (DDC; Dewey, 1951) both include terminology from H/S; what is interesting about these particular examples is that the connection to H/S does not extend to structure, it is based on terminology alone.

One of the defining features of H/S (and before this, also in Mahillon's scheme) is that the first characteristic of division is based on how the sound of the instrument is produced (Hornbostel and Sachs, 1914); it is interesting to track how bibliographic schemes follow this primary structural element. For example, the 3rd edition of Universal Decimal Classification (UDC; British Standards Institution, 2006) uses the four main classes of H/S, albeit in a different order.

Notation is another "borrowable" property. Hornbostel and Sachs (1914) utilised DDC's notation principles, using a "European" version of DDC – the original /forerunner to UDC – in their scheme (Gnoli, 2006, 143). Interestingly, in this example it is H/S which borrows a property from another scheme, and becomes part of that scheme's "Wirkung", rather than vice versa. So, there is a connection between H/S and (a version of) DDC through the property of notation, which becomes even more complex when versions of classification schemes are introduced.²³⁰ Other shared characteristics encountered when examining properties include, structure within classes and contents; alas, space does not permit further comment or examples.

5. Temporal connections: combining inter-scheme and intra-scheme relationships

Classification schemes themselves are not by nature stable entities; for instance, as time passes, a successful scheme might see new "versions" and "editions". We could label the relationship between one scheme and another version of the same scheme as an "intra-scheme relationship", and classification scholars have already provided much insight into these types of relationship.²³¹ While at first glance, intra-scheme relationships and issues concerning editions of schemes might seem irrelevant to the inter-scheme focus of this paper, inevitably questions about which "version" of a scheme is included in an inter-scheme relationship arise, and thus temporal, intra-scheme aspects become important.

²²⁹ As discussed, creating a new scheme is often a two-part process: finding fault with the status quo via criticism of existing schemes, and then attempting to create a solution to the problem by creating a new scheme which "solves" the perceived defect of the existing schemes. Kartomi (2000, 308) suggests that in the 1990s, after many schemes were created to countenance perceived errors in H/S, scholars started to realize that in the real world of actual instruments, a "perfect" classification scheme is no more than a mirage.

²³⁰ There is no space to discuss the exact connection between DDC and this early version of UDC. Instead, the assumption of a general "adaptation" relationship has been made.

²³¹ For instance, Žumer, et al. (2012) explore the relationships between specific editions of classification schemes and the collective of all possible editions of that scheme, using the FRBR model; Tennis (2010) discusses the idea of different versions or states of the same scheme, and "scheme versioning".

An example of the conflation between intra-scheme and inter-scheme relationships can be seen in the interconnectedness of H/S and DDC. As discussed above, various editions of DDC have utilised elements of H/S, such as terminology (DDC15) and structure (Phoenix schedule; Dewey et al., 1980)²³²; therefore, there is a connection between H/S and DDC, which coexists with the connections between these various editions of DDC. Furthermore, H/S was itself influenced by DDC, through the element of notation – see section 4. Therefore, we have a web of connections between these two schemes (or families of schemes): an early version of DDC influences H/S; H/S then influences DDC15 and the DDC Phoenix schedule. However, it could be argued that there is also a potential intra-scheme relationships between UDC1 and DDC, and DDC15 and DDC Phoenix schedule are to some degree reactions to earlier editions of DDC. This analysis suggests that time is an important element, as the temporal frame is necessary to understand how one scheme (DDC) can be influenced by another scheme (H/S) which itself was influenced by the original scheme (DDC), without creating a paradox. Indeed, the web of classification schemes can prove very elaborate.

6. A model of interconnected classification schemes

The discussion and examples above have illustrated the variety and depth of connections between classification schemes. Though by no means any sort of representative sample, the examples of musical instrument classifications suggested that there were two main types of connections. These can be superimposed into a quasi-entity-relationship framework, where the classification schemes are considered as entities. So, one type of relationship connects one entity with another, and is shown in figure 1. Another type of connection exists between properties of the classification schemes, rather than between the classification schemes themselves – see figure 2. In some cases, the property is only shared by part of the instrument schedules in the subsequent scheme, hence the label “is_partially_used_by”. There is a question about the relationship between both sets of connections; it is interesting, and needs further research. The frameworks appear to be linked to some degree, but as it is possible to describe the presence of linked properties at entity level using the relationship type “lends_its_properties_to” (see figure 1), this suggests they are not mutually exclusive.²³³

The next stage is to consider how some of the examples in sections 3 to 5 can be used to demonstrate the model in action. For example, it is possible to model the connections between H/S and UDC (3rd edition). If this was represented pictorially, only the properties which are shared would be indicated: main class structure and terminology. Therefore, if connections between a series of different schemes were mapped, it would be possible to see how many and which properties were shared for different pairs of schemes; this in turn would enable useful analysis of the population of schemes for specific subject areas.

The final example incorporates a number of different factors; it plots (some of) the relationships between H/S and various editions of DDC – see figure 3.²³⁴ As discussed above, this is a complex example which is not only inter-domain, but also involves some intra-scheme relationships. Differentiating between planes now become important. Different versions of the same scheme (intra-scheme) are positioned within the same horizontal plane, and so “scheme versioning” (Tennis, 2010) takes place along the vertical axis. This example demonstrates how the model can successfully show relationships between more than two entities, and can be used to transverse different versions, schemes and domains. The resulting map of connections is complex. It shows how one particular property of a scheme, such as terminology, might get recycled a number of times. It also shows how the effect of an individual scheme can resonate through a series of other schemes, or in other words, create a chain of “Wirkungs”.

7. A thought about intangible connections and the reception of schemes

Hitherto, this paper has focused on tangible connections between classification schemes – for instance, terminology or notation. However, there are also “intangible connections”, where an

²³² In this paper, “Phoenix schedule” is used to note the *music* Phoenix schedule, while acknowledging that Phoenix schedules for other subjects were also created.

²³³ It is interesting to note that, though by no means any sort of representative sample, the examples of musical instrument classification in sections 2 and 3 suggest that the intra-domain connection is more likely to be between entities, whereas the inter-domain connection is more likely to be reliant on properties of the entity. Therefore, while the model does not differentiate between intra-domain and inter-domain divisions, this potential trend is worthy of exploration in future research.

²³⁴ Some relationships, especially those related only by proxy to H/S or DDC have been omitted, such as Mahillon’s alleged basis in various Indian classification schemes (see for instance, Jairazbhoy, 1990) and subsequent editions of UDC. “DDC1+” represents all the early editions of DDC which influenced UDC1.

idea such as the reputation or purpose of a classification scheme are utilised by another. Studying the relationship between two schemes, brings insights into the original scheme, especially its reception; or, the act of “borrowing” illuminates both the “borrower” and the “borrowed”. Thus, studying the connections between classification schemes enhances understanding of what the schemes signify.

An example of this phenomenon is taken from H/S and DDC. The Phoenix authors explicitly discuss adopting elements from H/S, alongside their statement that the Phoenix schedule aims to have a “value-free basis” (Dewey et al., 1980, xxii).²³⁵ This reflects on the Phoenix schedule, but also attaches meaning to H/S. The authors’ writings infer that H/S is viewed as the model of a culture-neutral scheme, and by being described and used in this way, this “essence” of cultural neutrality attached to H/S exists even in separation from the original scheme, even beyond the boundaries of organology and into another domain. So, while an analysis of H/S alone would reveal that it *is* culture-neutral (to a large degree), analysing the connections between H/S and other schemes is useful because it reveals that H/S is (also) *received as* culture-neutral.

8. Concluding thoughts

Examining the relationships between classification schemes has revealed some interesting insights. It appears that relationships can be described using a scheme-to-scheme model or property-to-property model. These connections can prove complex, especially once older versions of schemes and intra-scheme relationships are also taken into account. This model is just the first step towards mapping scheme relationships, and there appears to be potential for much extension, re-working and adding nuance to this basic structure. Future research could include applying this type of analysis to other types of KOS; in addition, there is potential in exploring the links between scheme relationship analysis and theories of “intertextuality”. Overall, this paper demonstrates that studying the influence of one scheme on another not only unlocks interesting information about the specific schemes in question, but asks ontological questions about the nature of classification schemes more generally. It also illustrates the correlations between scheme inter-connectedness and reception. Classification schemes appear to live in a dense web of “Wirkungs”.

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²³⁵ The practical intention was to make it easier to classify concepts of non-Western instruments in DDC, which Clews (co-author of scheme) suggests was usually a problem in music classifications (Clews, 1975, 7).

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Figure 1. Classification scheme connections as scheme-to-scheme relationships

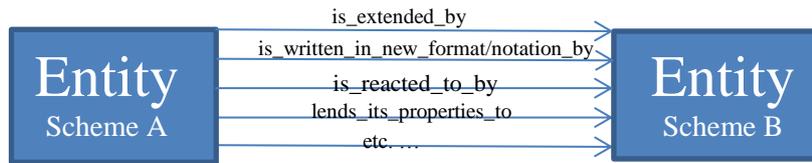


Figure 2. Classification scheme connections as property-to-property relationships

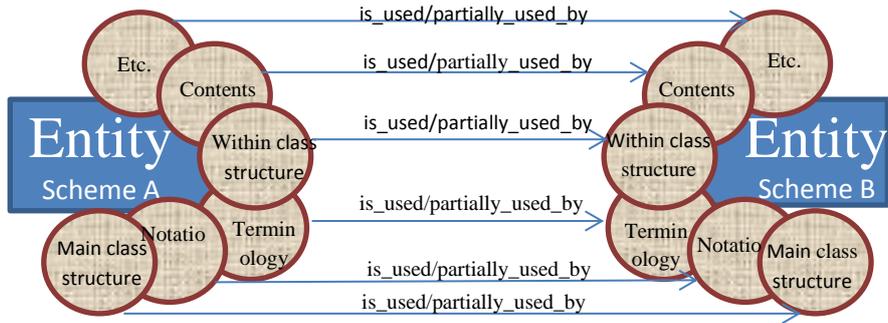
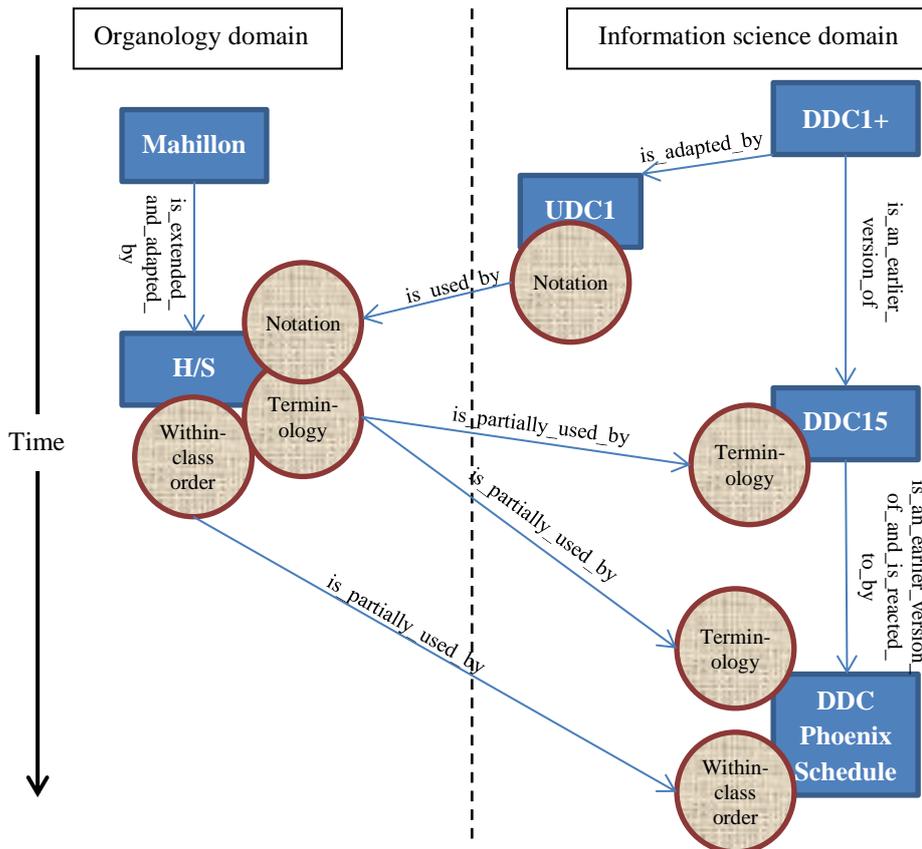


Figure 3. A selection of connections between H/S and some editions of DDC [Not to scale]



Consumption, criticism and Wirkung: reception-infused analysis of classification schemes

1. Introduction

Many a written word has been devoted to discussing and analysing classification schemes; however, formal theories of classification scheme analysis or discussions about the boundaries and criteria of the analysis are relatively rare.²³⁶ Furthermore, discussions concerning the analysis of schemes by those studying, selecting or classifying with them, usually focus on the scheme-as-tool, presenting a description of the classification scheme and a criticism of its ability to perform specific tasks. This article proposes an additional component to the analysis. It asks what happens if the focus shifts from analysing what the scheme can do, to dissecting how the scheme is received. Considering reception ideas is a novel approach to classification scheme discourse, and some preliminary explorations of this approach to analysis are outlined in this article.

The idea of how a text or artwork is received is significant in a number of domains, including Classics, Literary Theory and Musicology; therefore, this article starts with a brief overview of the general concept of reception and touches upon the ambiguous set of theories loosely categorised as reception theory. This is followed by a discussion about the embedment of classification scheme reception within recent developments

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and new directions of knowledge organization. The article utilises a small selection of schemes to illuminate various ideas, and before the analytical techniques are introduced, the selected example schemes are briefly introduced and their selection is justified. The main part of this article outlines how three ideas from various discourses on reception could be reworked as analytical techniques for classification schemes: consumption, criticism and influence (Wirkung). It should be noted that these three ideas are only part of the cornucopia of reception ideas, and do not necessarily constitute the complete artillery of reception theories. They have been selected because they offer interesting perspectives on classification schemes. Each of the three techniques is described in general terms, presenting both a brief outline of its pedigree within other domains followed by its potential for classification-scheme analysis. Therefore, this article will demonstrate that expanding the analysis of classification schemes to include how the scheme is received by those studying, selecting or classifying with it, can greatly enrich our understanding of classification scheme analysis as a technique, the classification schemes under examination and ultimately knowledge organization itself.

2. Conceptual background

2.1. Introducing the idea of reception and reception theory(ies)

A proposal of reception-infused analysis needs a short consideration of what is meant by the term “reception”. The Oxford English Dictionary (OED) gives many possible meanings; the definition of “reception” we are interested in is defined as “The action of receiving, or fact of being received, in a certain manner” and is most often seen with a “qualifying adjective” (OED Online 2015c). This definition is informative in many ways.

First, a number of the different meanings of reception within the OED are defined using variants of the verb “to receive”; thus reception is about receiving. The combination of the term “certain manner” and the likelihood of a qualifying adjective (OED Online 2015) hint of reception’s association with value judgement; so “reception” is not a statement by itself, but only takes on meaning through the manner being described and/or the adjective used. However, we also need to consider definitions of “to receive”. The most relevant definition within OED defines it as “to take, accept, regard, hear, etc. in a specified manner or with a specified expression of feeling; to accord such a reception” (OED Online 2015b). Again, the idea that this type of receiving is not concerned with the act of acceptance of the object itself, but the manner of this acceptance, is espoused. The definition also shows a symbiotic relationship between “reception” and the verb “to receive”, highlighting that discussions about the reception of something can be realigned as discussions about how that something is received. Therefore, for the purposes of this article “reception” will be defined in terms of classification schemes in the following way: the manner in which the classification scheme is regarded and accepted, amongst the communities which have an interest in it.

The idea of theorising the reception of texts and artworks already occurs in a multitude of different domains and techniques. However, there is no single reception theory, only reception theories; while there is an English term “reception theory”, it is an umbrella term (Holub 1984). Furthermore, while there is (arguably) a concept of reception theory within Literary Theory – it developed as a set of formal theories, originating in Germany in the 1960s, propagated by theorists such as Jaus, Iser and Gadamer (Holub 1984) – its progression and development has been neither smooth nor linear. For instance, Everist (1999) comments that even in the 1990s, reception theory had no confirmed place within the canon of literary theories. In addition, the idea of reception theory has very different nuances depending on the disciplinary sphere being inhabited. For example,

Hardwick (2003) suggests that reception theory in Classics is concerned with adaptations of texts and the rewriting of Classical texts over time and for future generations; Roberts (2011) describes Biblical reception as the usage and re-usage in culture and civilisation of the Christian-Judaic Bible(s). Therefore, to circumnavigate any issues associated with this multi-domain set of amorphous and fluctuating theories, this article will borrow categorisations, ideas and perspectives from reception theories as appropriate to their potential for application to classification schemes, rather than adopting any particular structure or model of reception theory(ies) wholesale. Thus, what is presented below is a window into how reception ideas could be used to analyse classification schemes: a reception-infused analysis of classification schemes.

2.2. Grounding and precedence within knowledge organization

All three types of analysis presented in this article are dependent upon a key conceptual assumption: classification schemes have aesthetic value. The link between aesthetics and reception theories is often implied, but there are some important theories which directly link the two. For example, Jauss' seminal theory of reception, "Rezeptionsästhetik", translated as "An aesthetic of reception" (Jauss 1982) or "The aesthetics of reception" (Holub 1984, 57), includes reference to aesthetics in its name. Furthermore, "Rezeptionsästhetik" includes the notion that the first reception of any artwork must include a comparison of the new work's aesthetic value with the aesthetic value of existing works (Holub 1984). So, establishing whether a classification scheme can be considered to have aesthetic value is vital.

Exploring aesthetics and classification schemes and other KOS is foreshadowed by Tennis' call to arms that classification should be a "living work of art, crafted and re-crafted by aesthetically engaged artisans" (2010, 226-227), and is developed fully by

Ojennus and Tennis in two papers which model aesthetic frameworks of KOS (2013a; 2013b). These papers (Ojennus and Tennis 2013a; Ojennus and Tennis 2013b) establish a framework to assess the aesthetic value of an information organization framework (IOF) – although an IOF is perceptibly different from a KOS, these differences are temporarily ignored in order to employ the ideas within Ojennus and Tennis’ work; Ojennus and Tennis (2013a; 2013b) utilise and develop a set of philosophic aesthetic properties for application to IOFs, whereupon an aesthetic framework is presented and tested. Ojennus and Tennis (2013a, 811), suggest that existing KO discourse and studies of KOS include an “aesthetic lens”, which they describe as “making judgements based on a conceptualization of what is a beautiful indexing language, metadata scheme or ontology” (Ojennus and Tennis 2013a, 811). This idea of aesthetic value relating to the judgement of beauty is enhanced by Ojennus and Tennis’s description of other values associated with IOFs such as economic factors and ease-of-use (2013a); therefore we could also think of aesthetic values of a KOS as those values which are left when practical concerns, financial issues, and so on, are taken care of. So, we have an idea of what aesthetic value might mean in reference to a KOS, and Ojennus and Tennis’ work (2013a; 2013b) validates the assumption that classification schemes have aesthetic value through both their delineation of aesthetic value explicitly for IOFs and their successful creation of an aesthetic framework.

Another important theoretical assumption for all three reception-infused analysis techniques, is an acceptance that a scheme exists in a temporal frame; in other words, the scheme is born, adapts and will eventually possibly die, all of which can only take place along a temporal axis. Therefore, parts of this paper heavily rely upon work by Tennis on temporal matters; for instance, Tennis (2010) discusses how time is an important element in the development of classification schemes, including the need to understand that there are different categories of temporal change and the difference

between “versions” and “states” of classification schemes. The reason that temporal matters are so important is that in order to consider some aspects of the reception of a classification scheme fully, we need to consider what happens to the scheme after its creation. This is only possible if the scheme is considered to exist at times other than just at the point of its “birth”, and that those later states may have evolved from the original scheme.

3. Selection of example schemes

It is difficult to contemplate a reception-infused analysis of classification schemes entirely in the abstract. Thus, it is sensible to draw upon examples from real-life classification schemes; as the universe of classification schemes is large, drawing upon a small, pre-determined set of schemes is useful. One option is to use examples of longstanding general schemes, such as Dewey Decimal Classification (DDC) or Library of Congress Classification, as these are the most likely to provide a good quantity of reception documents. However, these types of schemes will prove messy for the purposes of this article. For instance, schemes such as DDC provoke issues concerning editions, for the reception of one edition of DDC will not necessarily be the same as for another; there are also potential extraneous factors surrounding bigger schemes, such as separating out how Melvil-Dewey-as-a-librarian is received from DDC-as-a-classification-scheme. Therefore, while reception-infused analysis of longstanding schemes such as DDC would be highly illuminating as a future research project and could contribute a new perspective to research into these classification schemes, in order to introduce the analysis method in a contained fashion, they will not be chosen as examples for this article. Selecting general schemes which do not have multiple editions and a high profile is also problematic, as in some respects the examples would only represent so-called non-successful schemes. Therefore, this paper will use as

examples special schemes which are limited due to covering a single subject and have also proven to be relatively small-scale in their reach – thus for the benefit of this article, the schemes chosen are somewhat “containable”.

The schemes used are as follows: British Catalogue of Music classification (BCM; 1960), Dickinson classification (Dickinson; 1938) and Flexible classification (Flexible; 1967). These are all special schemes covering the music domain. The domain of music is selected for a number of reasons: it is the research area of the author and some of the theoretical ideas developed in the article were suggested through analysing these particular schemes in the first instance. BCM was created by E.J. Coates in 1958, a member of the UK-based Classification Research Group, and was originally designed for a classified catalogue of music. It was published as a stand-alone scheme in 1960. Dickinson was created by George Dickinson in the United States, and was designed in the 1920s to arrange the university music library that the scheme’s author oversaw. Dickinson was first published as a scheme in 1938, and was adapted for use in other American music libraries. Flexible was devised by Iván Pethes, who was based in Hungary, and his scheme was written as part of work for the IAML (International Association of Music Libraries, Archives and Documentation Centres) Cataloguing and Classification committee, as a “universal” classification scheme for music. It was published in a pre-print in 1967. Insights from a reception-infused analysis of these three schemes will be used as examples.

4. Consumption: analysing uptake and usage of classification schemes

Part of the family of reception theories is the idea of studying how a work has been consumed – see for instance, Everist (1999), who dedicates the first category in his

seminal article on reception theory to consumption. This idea could be translated to classification schemes. So, analysing the consumption of classification schemes would involve considering how and how much a classification scheme is actually used.

The reasons for aspiring to understand the consumption of classification schemes are manifold. For example, information about how many and which types of libraries are using a particular classification scheme could be useful to those libraries considering adopting a new classification scheme. There is also a more theoretical interest in the ebb and flow of a scheme's usage, as it could reflect general concerns in knowledge organization or general librarianship. For instance, a high-usage of a proudly faceted scheme, might add to our knowledge about the popularity of faceted classification; a decline in usage of various non-standard schemes might allude to the impact of shelf-ready materials; a decline in usage of special schemes might reflect the changing nature and fortunes of specialist libraries. Consumption is also useful as it exposes prosaic matters; for while we will see in later sections that consumption is interlinked to criticism and *Wirkung*, consumption can also reflect and be driven by practical concerns such as cost of accessing schemes, logistics of reclassification, and so on.

(Consumption's link to practical matters is telling from an aesthetics perspective; in section 2.2, "aesthetic value" was presented as the negation of practical concerns, and thus we could view consumption as having both aesthetic and non-aesthetic values.) It is clear that understanding consumption could provide useful input for practical decisions, understanding knowledge organization and towards more widespread trends and changes within librarianship.

4.1. Consumption criteria

Consumption can be broken down in a number of different ways, which illustrate the richness of considering how a scheme is used: temporal factors, geographic factors and

intent. Temporal consumption focuses on how the frequency and ways in which a scheme is used changes over time. Dickinson exemplifies how useful information can be extracted using this method. Dickinson is simpler to extract consumption information from than most schemes, as its usage has been followed and described in detail by the music librarianship scholar Carol Jane Bradley – in particular, in Bradley’s historical description of music cataloguing and classification in the USA (Bradley 2003). According to Bradley (2003) the scheme first published in 1938 gained more users in the 1950s and 1960s, which Bradley attributes to the upsurge in academic music libraries. The use of Dickinson continued in the 1970s and in a 1972 article Bradley even describes the scheme as “newly popular” (Bradley 1972, 21). She gives some suggestions for possible reasons why this might be the case, which range from the practical to the strategic (Bradley 1972). Colloquial information such as conversations with music librarians, suggest a wane in usage of Dickinson in the latter decades of the 20th century: the reasons given include higher usage of standard classification schemes – which itself can be at least partly attributed to the rise of shared cataloguing and shelf-ready stock – and a general trend for music libraries to merge with general academic libraries. (While it is methodological unideal to rely on informal conversations for information about the consumption of Dickinson and other schemes, this emphasises the lack of authoritative consumption data.) This brief example of a particular scheme’s consumption highlights how temporal consumption can reveal interesting information, such as the links between the popularity of sectors of libraries and specific classification schemes which are housed within those sectors. While this analysis approach can provide rich information about a specific scheme, it can also reveal more general classification trends such as the move towards standardisation of classification schemes.

Another reception-infused analysis method is the geographic dimension of consumption. Again, Dickinson provides ideas about what an examination of this

phenomenon might yield. Dickinson is noteworthy as it appears that the geographic spread has been kept reasonably contained, chiefly limited to a small region within the U.S. – see for instance Bradley’s (2003) list of adopters of the scheme in the 1950s and 1960s, as well as McKnight’s (2002) indication of a North-East United States web of Dickinson users. One possible hypothesis that could be drawn from the Dickinson example is that the geographic consumption of a classification scheme is linked to its place of birth; in other words, the use of a scheme in one geographic location increases the likelihood that it will also be adopted by another organisation in that geographic area. Future research could test this hypothesis, and if found to be true, could explore how geographic consumption patterns work; for instance, how do person-to-person networks contribute to the selection and consumption of classification schemes, and does the influenced of localised usage change in the digital age?

A final example of the richness of analysing consumption can be seen by comparing the actual consumption of a scheme to its intended consumption. Flexible, devised by Pethes as part of his work for the IAML Cataloguing and Classification committee, provides a striking example . The teleology of the Flexible scheme was to be universal, designed to unite various fractious systems of music classification across the world (Pethes 1967); yet, its real-life consumption appears to be low. It appeared as a pre-print in 1967, with no evidence found so far to suggest that it was ever fully published; while there is evidence that Flexible was adopted by a few Hungarian libraries near the time of its creation (Pethes et al., 1968) and an informal conversation (Agnes Hajdu Barát, personal communication) revealed that the scheme is still used in some Hungarian libraries, its intended universality was not realised in its actual consumption. So, there is a question about whether the intended consumption of a scheme should be used as any sort of marker by which to measure its actual consumption, which also brings in issues concerning “success” and “failure”. For instance, if a scheme is only

intended to be used locally, and is only actually adopted by three to four libraries, should this be considered a success? Or, is the “consumption failure” in the case of the Flexible scheme, more pronounced due to its intentions as a popular and geographically wide-spread scheme? More pertinently, this example also asks generally about high consumption being assumed as a mark of “success”. Perhaps this is not always the case for every scheme, and care is needed in ascertaining who and what defines the “success” of a classification scheme.

4.2. Methodological challenges of consumption

In practice, determining the consumption of a scheme presents a number of methodological challenges. In order to analyse the consumption of a classification scheme, data about the usage of schemes is needed – either existing data, or information collected as part of a specific study of consumption. An example of existing data about classification scheme usage can be found in a 1968 article in the music library journal *Fontes Artis Musicae*; 28 countries were asked about their classification of music, and the responses are presented (Pethes et al., 1968). While the resulting article provides some very interesting reading, it also highlights methodological issues involved with using existing consumption data, such as incompleteness caused by a low response rate (Pethes 1968) and inconsistencies between types of data offered in the responses. Furthermore, literature searches suggest that while some studies of classification scheme consumption have been recorded (such as the example above), this type of data does not appear to have been systematically collected by the knowledge organization community. Even where surveys and similar have been run, they usually only show the usage of schemes at any one given moment, making it difficult to observe long-term patterns of consumption.

Collecting new consumption data also presents the researcher with potential problems. First, any broad study is likely to involve the researcher relying on other people’s

definitions and categorisations of their schemes – particularly problematic at the boundaries between schemes with slight variations from standard practice, adapted schemes and home-grown schemes. Second, it might prove difficult to get information about which edition or version of a scheme is being used at any time. Third, there might be variations in what scheme is officially used by a library and what is used by individual subject areas within the library. Fourth, if a study of changes in consumption over time is needed, this introduces problems with comparing historic and new data, which may not have been collected in the same way. Finally, one of the biggest methodological hurdles in using information about consumption is the extreme difficulty proving negativity. If there is information that a scheme has been used in a particular library, this proves consumption – and it is fairly easy to verify the result with individual libraries, if need be. However, proving that generally libraries do not use a scheme is very difficult, because it involves finding classification information from every possible library in the area under study, sometimes including historic information. Hence, stating a scheme has high consumption might be straight-forward, but declaring low consumption is more problematic.

This article circumnavigates some of these issues in the following ways. While there is a dearth of systematically-collected data about the three example schemes, this article uses secondary sources which describe usage of schemes, such as academic articles describing the history and comments about the schemes. However the incompleteness and subjective nature of this method is fully acknowledged; if consumption were to be analysed in future as part of knowledge organization research, then this could prompt the establishment of systems to regularly collect data about scheme usage.

Nevertheless, the chasm identified is important: doing consumption-led analysis highlights what we don't know about classification schemes.

5. Criticism: critical reception and scholarly response to classification schemes

Another important part of considering how a classification has been received is to analyse the criticism of that scheme. The OED definition of the relevant meaning of criticism is “the art of estimating the qualities and character of literary or artistic work ...” (OED Online 2015a, definition 2a); the first usage listed, from 1677, describes criticism as “judging well” (OED Online 2015a, definition 2a), further emphasising criticism as a considered evaluation, rather than the negative connotations of the word present in alternative meanings in OED and perhaps in more colloquial use. The term “criticism” has been used in a number of different domains. For instance, in studies of literature, criticism is a major part of the study of literature. Literary criticism has a long history (Habib 2011); yet, even with this pedigree – and moreover, because of it – to define criticism within the context of the study of literature is described by Day (2008, 2) as “impossible”. So, the purpose of this section is to see how the idea of criticism could be applied to works which examine and make value judgements about classification schemes. There are different types of criticism. For example, for music, Everist (1999) divides his construct of criticism into performance history, critical reception and scholarly/theoretical responses to music. We can borrow the latter two for analysing classification schemes. “Critical reception” in music could translate to professional evaluations of schemes, such as a librarian’s evaluation of a new scheme or new edition of a scheme, or perhaps a comparative criticism of multiple schemes when deciding which scheme to implement in their library; “scholarly/theoretical response to music” could translate as a scholarly account of a particular scheme or perhaps a systematic study of ethical issues within a particular scheme or groups of scheme. However, for the purposes of this paper, any divisions between these purposes of criticism will be gently ignored, and these types of criticism treated together. This bypasses any need for

differentiating between the two types within this article, which would lead to an interesting discussion but down a diversionary path.

The ideas about criticism discussed in this article are inclusive of different possible types of intent and focus. Possible types include the following: critical accounts of a single scheme or a small group of schemes (i.e. scheme-focussed); analyses of classification of a particular subject, within discussions about individual schemes (i.e. subject-focussed); analyses of particular issues, such as problems with the way gender is treated in general classification schemes, which cross multiple schemes and subjects (i.e. issue-focussed). A summary of these three types of criticism can be seen in Table 1. (The use of three individual special schemes and their shared topic of music in this article mean that while the ideas proposed aim to cover all types of criticism, the examples of criticism used are taken from scheme-focussed and subject-focussed criticism.) Furthermore, it is important to distinguish an individual work of criticism, such as one journal article, from the body of criticism about a specific scheme/subject/topic.

Type of criticism	No. of schemes	No. of subjects
Scheme-focussed	1 (or a few)	1 or many
Subject-focussed	Many	1
Issue-focussed	1 or many	Many

Table 1. Foci of criticism

Studying critical responses to classification schemes is profitable, for this type of analysis shows us how particular schemes are valued. For instance, researching whether a new classification scheme is discussed in relevant professional/scholarly journals can help to tell us about the position of this scheme within professional/scholarly circles; the

contents of a critical discussion or review of a scheme can tell us much about the scheme itself as well as contextual information about the library Zeitgeist of the time of the review. Studying a scheme's criticism allows us to see the importance of a scheme, both at its first dissemination and over the period of the scheme's lifetime. When analysing schemes we are usually producing our own act of criticism, but if we add to our own analysis a study of other people's criticism, this provides much useful contextual information to our own analysis. The result will be a fuller and richer account of the scheme. So, to fully analyse a scheme, we also need to analyse existing criticism.

5.1. Criticism criteria

There are a number of important criteria when analysing the criticism of classification schemes; for, it is not enough just to accept the contents of the criticism, but also to ask questions about the criticism and the critic. The first criterion is the number of voices represented within the body of criticism: single versus multiple critics. It is also important to question these voices by considering the relationship between the author of the criticism and the scheme itself, assessing the objectivity and motivation of the review. The Dickinson scheme provides a case-study where a body of criticism is dominated by one author. Descriptions, criticism and information about the Dickinson scheme are chiefly written by one author, the well-respected music librarianship scholar Carol Jane Bradley. It can be argued that Bradley also had an agenda concerning Dickinson; her position as author of a user manual for the scheme and facilitator of its reprinting are just two activities which lead to a possible label of Bradley as "Dickinson champion". This does not devalue Bradley's contributions in any way; instead, it asks important questions about how we read Bradley's criticism, both in its own right and when compared to criticism by the (few) other critics who discuss this scheme (for instance, Redfern (1978), Buth (1974) and McKnight (2002)). Therefore, it is clear that

any study of scholarly and critical reception needs to consider the diffusion of the authors and the motives behind their criticism.

A second criterion analyses whether an individual work of criticism is absolute (discussing qualities of the specific scheme itself) or relative (discussing qualities of the scheme in comparison to other schemes). For instance, Redfern (1978, 33) describes BCM as “the finest classification of music in print”; this criticism positions BCM in relation to other classification schemes for music. A variation on this criterion is the scheme’s relativity not to other schemes, but potential users. For instance, Clews – another of the DDC Phoenix schedule creators – goes as far as to suggest that there is a consensus amongst music libraries in Great Britain:

“This [BCM] has been widely acclaimed by British music librarians as the best available scheme for music.” (Clews 1975, 9)

A third criterion of criticism concerns temporal factors of both an individual work of criticism and a body of criticism. Any individual piece of criticism is written at a specific point in a temporal plane, which stretches from the first dissemination of the scheme into the present, and then the future – see Figure 1. On a theoretical level, criticism cannot exist at “time zero”, the moment when the scheme was created, so there is always some quantity of time between a scheme’s dissemination and the immediate criticism – see Figure 1. (It is best to discount examples where criticism is produced about a preprint or draft of a scheme, so technically criticism exists before the first official version of the scheme; instead consider these drafts as “time zero”.) There are various reasons which prompt scheme criticism to be created, and the reason for creation of the criticism will often reflect where that criticism is located on the time axis. For example, criticism produced as a quasi-book review, discussing a scheme whose importance is such that a journal requires comment from the community, is more likely

to be immediate criticism; conversely, for at least some of the schemes discussed, a theoretical comparison of special schemes in a particular subject is more likely to be later criticism. Furthermore, it is important to consider the temporal placement of the reader of the criticism, as this might have an impact on how the criticism is read: standing in the present, there is a longer distance to immediate criticisms than there is to later criticisms – as shown in Figure 1 – which means a longer distance to the concerns, issues and classification Zeitgeist in which the criticism was written. It is noteworthy that sometimes the authors of the criticism acknowledge and reflect upon temporal elements of criticism, as seen in Buth's (1974) aside that her discussion is dependent on the time in which it was written.

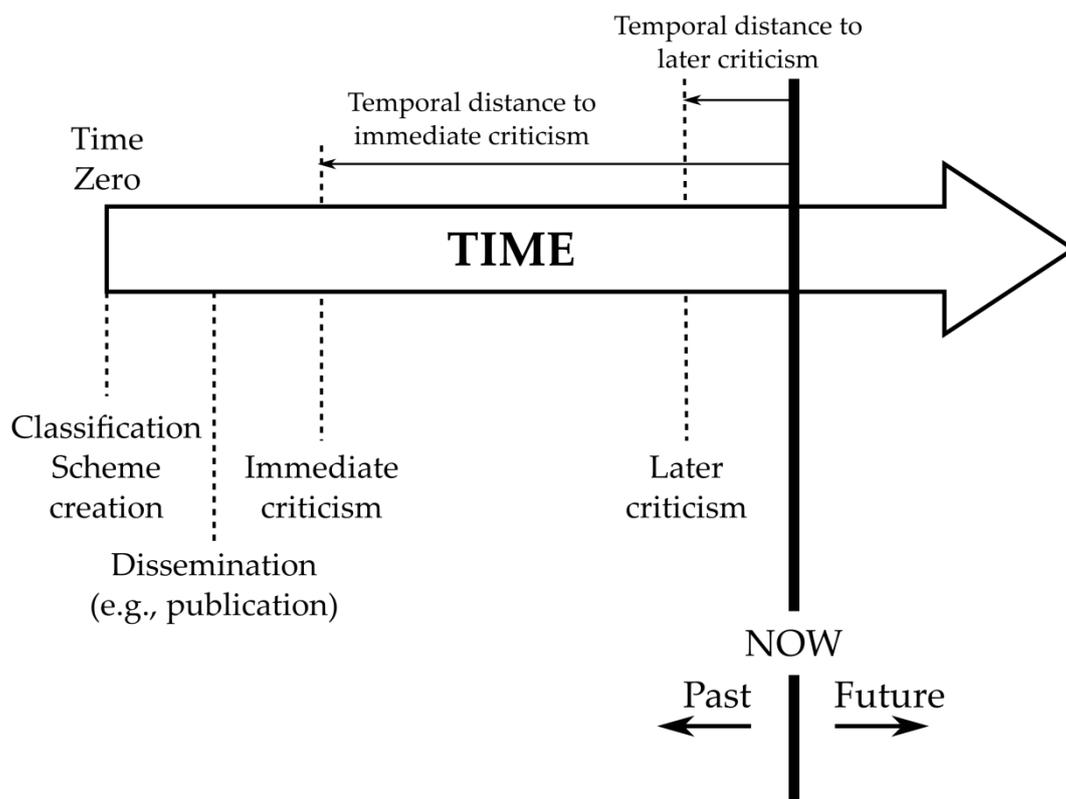


Figure 1. Criticism in relation to time

5.2. Criticism assumptions and questions

There are a number of assumptions and insightful questions necessitated by construing opinions about classification schemes as criticism. The first is neatly highlighted by the OED definition; it says that criticism is something which is done to a “literary or artistic work” (OED Online 2015a, definition 2a). Therefore, the application of criticism to classification schemes is dependent on the ideas discussed in section 2.2 of this article, which posits that classification schemes have aesthetic value, which in turn leads to their potential categorisation as artistic or literary works. (The preceding statement relies upon an oversimplification of the relationship between being an “artwork” and having “aesthetic value” – see Ojennus and Tennis (2013a) for a discussion about this matter; however, as the nature of the relationship between artworks and aesthetic value is outside of the scope of this article, this simplification will nevertheless be adopted.) Another question that needs to be asked concerns the relatively small number of evaluations and considerations of schemes found in, for example, Library and Information Science literature. While documents evaluating classification schemes exist, they are negligible compared to say 2500 years of literary criticism (Habib, 2011) or an overabundance of music criticism (Everist 1999). Does the differential between the numbers of critical documents about classification schemes compared to literary works, affect our designation of these documents as “criticism”? I would argue that the (relatively) small quantity of classification-scheme evaluations does not invalidate their position as criticism as each individual reception document has value, even if the sum of documents on a particular scheme or topic may be unideal for performing certain types of analysis. Another question concerns the intention of critical documents; we need to ask whether accounts of classification schemes can be considered to be criticism when their author may not have considered their writing in this way. However, there is no reason to suggest that the only valid criticism is that which is done consciously as

criticism, as long as the accounts fulfil the criteria of making value judgements and evaluating the scheme in question.

The documentation of criticism ideas evokes some vacillation about the medium of the criticism; as set out above, criticism is a considered value judgement, but it also errs towards certain mediums to deliver that criticism – for instance, it is unlikely that a considered criticism of BCM will appear in the form of a song! Notwithstanding the existence of aural criticisms such as conference presentations, in order to be able to refer to an object, it will be assumed that criticism refers to writing. Finally, not all works written about classification schemes can be considered, on ontological grounds, as criticism. This asks vital questions about what we mean by criticism of classification schemes. For the purposes of this article, works which discuss a classification scheme and offer some value judgement on it will be considered criticism (perhaps a large majority); those which only describe the scheme and the mechanics of its working, yet offer no evaluation of the scheme or discussion on the scheme's value, will be labelled as "description".

5.3. Relationships between criticism and consumption

Considering the relationship between criticism of a classification scheme and its consumption offers a novel perspective, and gives context to the study of both the criticism and the consumption. For example, BCM received much positive critical reception; yet, outside of its original purpose of arranging a specific classified catalogue, BCM appears to have had little use as a system for other classified catalogues or items-on-shelves. For example, the only documented example found so far is at the State Library of Western Australia – see the title of the overall classification scheme for music scores (State Library of Western Australia 2015b), a description of the classification for popular songbooks (State Library of Western Australia 2015c) and the classmarks used in

the catalogue itself (State Library of Western Australia 2015a) – though this must be viewed within the methodological parameters concerning stating a scheme’s non-usage, as discussed in section 4.2. Furthermore, while scholarly sources such as Inskip et al. describe BCM as the “dominant notated western classical music classification scheme in music libraries” (2008, 689), it appears that its dominance is in the critical sphere rather than in practice. This example demonstrates that consumption and positive criticism are not concomitant.

Another idea emerges from the BCM example: the impact of criticism on geographic location of consumption. We saw with the Dickinson example in Section 4.1 that it can be informative to measure geographic consumption of a scheme, and various ideas can be suggested as to why a scheme’s consumption density is much higher in the geographic surroundings of the scheme’s birth. However, in the case of BCM, the one known current consumption of the scheme is geographically far away from the scheme’s birth: London (United Kingdom) to Perth (Australia). Could the impact of criticism have fanned the flames of consumption of this scheme, or is there another, more prosaic reason for BCM’s adoption? There are thought-provoking questions about whether, and to what degree, criticism of a scheme has an impact on its consumption.

An extra snippet to the consumption/criticism relationship occurs when an individual work of criticism specifically addressed where/how the scheme will be used. For example, Long (1972) endorses BCM as the ideal scheme for large libraries; however, as far as we know, Long’s endorsement did not result in any wide-spread adoption of this scheme. So, were Long’s suggestion wrong, and the scheme is not ideal for the purpose she had in mind, or did some unforeseen event change the course of consumption? There is a theoretical question as to whether criticism that merely describing the expected use of a scheme is just passive, “consumption-centric” criticism; or, instead is

this type of criticism an active agent of change, driving the course of consumption of the scheme, and setting up a symbiotic relationship between critical reception and consumption in the process? These two possible types of relationships between a critical work about a scheme and the scheme's consumption are visualised in Figure 2.

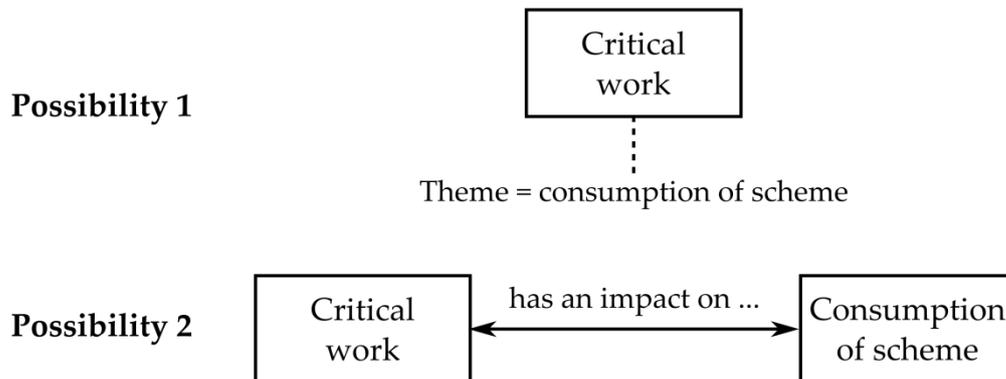


Figure 2. Possible relationships between consumption and criticism

5.4. Methodological challenges of criticism

There are methodological challenges when considering an analysis of a scheme's criticism. While for artworks such as music, there are sometimes methodological issues from the ubiquity of critical reception of a musical work (Everist 1999), the search for criticism of the three example classification schemes reveals an example of the opposite problem: too little criticism. Quantity of criticism about a particular scheme would make a fascinating future line of enquiry, alongside a discussion about whether the quantity of scheme criticism available is itself a component of the criticism. There are methodological questions about how to search for works of criticism; where criticism is an established term within a domain, the coherent use of the term "criticism" will help searching, as will types of criticism appearing as a search-type – see, for instance, the filtering by document type on the music literature abstracting database RILM (Répertoire International de Littérature Musicale), which allows users to search by "review of performance" or "review of recording". This article includes criticism taken

from monographs and articles which discuss music classification generally – for example, Buth (1974), Redfern (1978) and McKnight (2002) – so their hidden, double identity as works of criticism about specific classification schemes may need extra thought to uncover.

One corollary of the relatively small amount of criticism is that to build up a reasonable body of criticism about a specific scheme might involve using criticism written a long time since the scheme's initial publication. For example, the publication of the 20th edition of DDC (DDC20) prompted Redfern's review article (1991) of its music schedules; this was accompanied by some insightful scheme criticism of BCM, a scheme published over thirty years earlier. While it is not problematic per se to use Redfern's criticism when building a picture of BCM's critical reception, it is important from a methodological viewpoint to note this temporal distance – see section 5.1. However, though re-positioning works about classification schemes as criticism might present some methodological challenges, there is manifold richness in the information uncovered once these hurdles are overcome.

6. Wirkung: exploring the influence and effect of classification schemes

A different type of receiving makes up the third reception-infused analysis idea: "Wirkung". The term "Wirkung" is loosely translated by Holub (1984, 1) as "'response' or 'effect'", and is taken from the German concept of "Wirkungsthetik", namely how a work impacts later writers (Holub 1984). In order to avoid confusion with the more prosaic uses of "effect" and "impact," as well as an adherence to the precise meaning of the German original term, this article will use the technical, German term "Wirkung" rather than an English approximation. In other domains such as music, the concept of

Wirkung includes a far-reaching set of practices, as the influence and effect of a musical work can be felt in a number of different ways.

At this juncture it is useful to borrow ideas from another domain to suggest different types of Wirkung. Everist's (1999) different categories of Wirkung for music suggest some intriguing possibilities as to how Wirkung could be used to analyse classification schemes. For instance, Everist's (1999) example of how the nineteenth-century realisations of Mozart's eighteenth-century opera *Don Giovanni* are part of the Wirkung of the (two) original version(s) of the opera, could be reconceived as how different versions of a classification scheme are actually part of the effect of the original scheme; Everist's (1999) argument of how one musical work by Beethoven is actually the Wirkung of a work by Mozart, could transform into discussions about one classification scheme borrowing from another; Everist's (1999) illustration of how the "availability" of a musical work, directly affects the Wirkung of that work, using Sibelius as an example, can metamorphose into classification scheme analysis which considers how the availability of schemes affects how they are received. These ideas about Wirkung, extracted from Everist (1999) and repurposed for analysing classification schemes are not exhaustive, but provide three ideas of Wirkung-as-an-analytical-tool to discuss further.

6.1. Wirkung as intra-scheme connection

Classification schemes existing in different versions is a truism, and there is much existing research discussing versions and versioning of schemes; for instance, Tennis' (2010) typology of "versions" and "states," and work by Žumer, Zeng and Mitchell which uses FRBR to model relationships between KOS (Zeng and Žumer, 2013; Žumer et al., 2012). What a reception-infused approach adds is a novel framework. Considered in the light of Wirkung – in other words, considering a new version of a scheme as part of the impact of the original version of the scheme – reception-infused analysis of versions

of schemes could be considered an “intra-scheme connection”. So, we could superimpose Tennis’ (2010) typology of “versions” and “states” on to ideas of Wirkung, and hypothesise that any change in “version” or “state” of a classification scheme is actually an act of reception.

For example, BCM exists in a single “version,” as it is only published as a separate scheme once. However, it could be argued that BCM has subsequent “states”; the British Library holds an annotated copy of the scheme, which was the working copy of BCM staff (Coates n.d.). While the placement of the annotated copy of BCM on the no-change/new-state/new-version continuum is out of scope for this article, the interest for reception-infused analysis is the lack of definitive new version of BCM. We could ask whether this absence is a mark of its lack of impact, or we could also question whether there is any correlation between lack of subsequent version and the scheme’s very low consumption rate. Conversely, Dickinson enjoyed at least one definitive new “version”, the Columbia-Vassar scheme. Its new version can be viewed as a sign of the scheme’s positive reception: it could be argued that propagating a new version of a scheme – however heavily adapted from the original – suggests some measure of positive reception of the original scheme.

6.2. Wirkung as inter-scheme connection

Another analytical tool involves viewing how one scheme influences another, which can be regarded as an inter-scheme connection. This provides reception-infused information about how the original scheme is perceived, and there are many different types of inter-scheme relationship. For example, the Flexible classification is an adaptation of UDC’s music schedules; therefore, we can perceive part of the Wirkung of UDC to be the Flexible scheme, as Pethes (author of Flexible classification) uses UDC as its base. This type of inter-scheme relationships sees a general classification being

utilised as the basis of a special scheme, and it is interesting to note that this type of relationship is common in music classification. The UDC/Flexible relationships also demonstrates how sometimes the “child” (the Wirkung) scheme can outgrow its “parent” (the original); for instance, Redfern (1978) believes that though not the original purpose of the Flexible scheme, with editing, the Flexible scheme could become the official UDC schedules for music. (The exact relationship between UDC and Flexible is opaque, as different sources give slightly different accounts of Flexible’s intentions in relation to UDC; however, the narrative described above is at the very least one possible version of events, and it serves the purpose of illustrating this particular type of inter-scheme relationship.)

It is particularly valuable to consider the temporal element of inter-scheme connections, as these types of Wirkung might only appear some time after the dissemination of the original scheme. For example, BCM (published 1960) appears to have influenced a major general classification scheme (DDC), but we have to wait over a decade before BCM is used in the Phoenix schedules (Sweeney and Clews, 1980), and even longer for the BCM-influenced section to appear in the final version of a DDC schedule (Dewey 1989). Another type of inter-scheme relationship occurs where the Wirkung jumps the domain boundary; for example, BCM uses some terminology and ideas from an object organisational system from the music domain, the instrument classification system by Hornbostel and Sachs. This type of Wirkung, and the categorisation of intra-domain and inter-domain Wirkungs, is discussed in more detail in Lee (2014).

6.3. Wirkung as publication and dissemination

Publication and availability of the classification schemes are another type of Wirkung. The Dickinson scheme demonstrates how publication can be an insightful analysis tool. The original Dickinson scheme was published with a print run of only 300, which

unsurprisingly meant the scheme was out of print by the 1960s (Bradley 1972). Bradley published a manual of the Dickinson scheme in 1968, which among other things, included a reprint of the original classification (Bradley 1968). The reprinting of the scheme can be taken as part of the scheme's consumption, as it was an event necessitated by a perceived desire for the scheme by librarians. (This makes the assumption that the desire to own a copy of the scheme is a desire to consume the scheme, and while the acquisition rate of the scheme is unlikely to be matched by its consumption – perhaps some libraries bought the scheme for reference – it could be argued that there is some approximate correlation.)

However, Bradley goes further than this; she (Bradley 1972) suggests that this re-publication contributed to the new popularity of Dickinson. So, it is possible to interpret Bradley's comment that not only is the re-publication of Dickinson evidence of the scheme's positive reception and consumption before its re-publication, but the act of (re-)publication alters the future reception of the scheme. Re-publication means more (potential) consumption, but also more opportunities for criticism. One part of the *Wirkung*, alters the course of the future consumption and criticism.

Bradley (1972) gives other reasons for the renewed "interest" in Dickinson, which suggest that the *Wirkung-as-availability* can be realised in more spheres than just the publication of the actual scheme. For instance, she (Bradley 1972) suggests that the availability of her manual which discusses the scheme helped to spread the Dickinson gospel, and we could perceive this as a link to consumption and perhaps even criticism. Furthermore, Bradley (1972) links the availability of microfilms of the Vassar College music catalogue to at least one library's uptake of the Dickinson scheme; in other words, she suggests that seeing the classification scheme "in action", through the conduit of the catalogue/shelf list, prompted further usage of the scheme. So, this is an example

where the Wirkung of a work related to the classification scheme – the catalogue/shelf list – effect change in the consumption of the actual scheme; this series of relationships can be seen in abstract in Figure 3. Thus we can see how intricate and tangled webs of Wirkung, criticism and consumption can be.

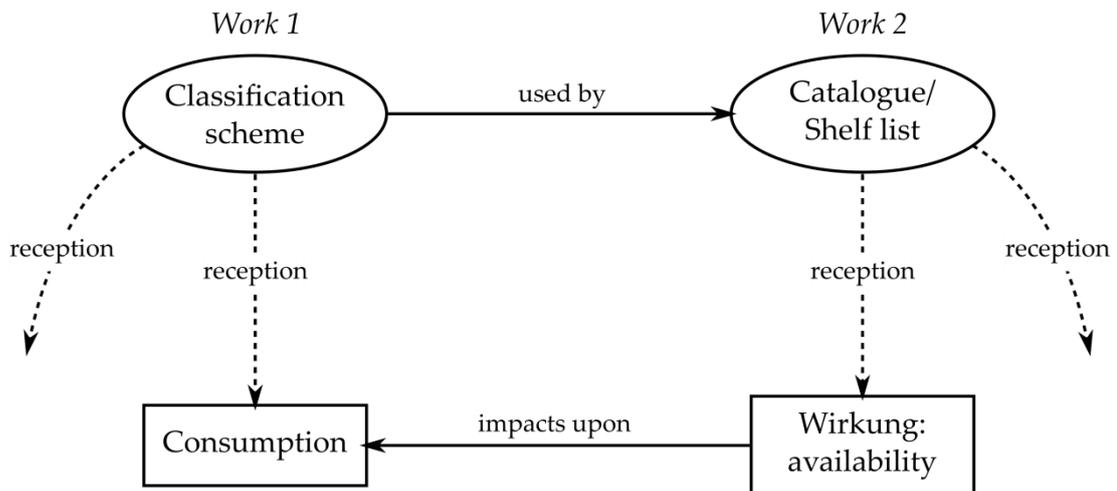


Figure 3. An example of a series of reception relationships

6.4. Relationships between Wirkung, criticism and consumption

We have already seen how one type of Wirkung, publication, can be conjoined with consumption and criticism, and there are other types of link. BCM provides two additional examples. The first of these involves BCM and DDC. The homage to BCM in the DDC music Phoenix schedules/DDC20 onwards is well-documented and can be considered a Wirkung of BCM. However, it is also notable that the birth of the Phoenix schedule inspires much criticism, not just about the Phoenix schedule, but also about BCM. The most important of this criticism is by the Phoenix schedule's authors, Clews and Sweeney, whose criticism of Phoenix – if the criticism of a scheme by its author can be considered criticism – includes a positive evaluation of BCM (Clews 1975; Sweeney 1976). There is a question about whether you could use an existing scheme to produce

a new scheme without a process of reception (either good or bad) on the original scheme. Thus, is the criticism of the borrowed scheme a necessary stage in this type of Wirkung?

The second example of a type of linkage between Wirkung and other types of reception involves BCM's annotations. The annotated copy of BCM held by the British Library (Coates n.d.) includes many updates to the scheme; however, these annotations are not only unpublished, but discourse about the scheme suggests that their existence is mostly unknown. As BCM was designed primarily to organise the British Catalogue of Music, it is reasonable to only distribute the intra-scheme Wirkung "state" (the annotations) internally, if at all; however, the problem occurs because the original BCM was published, making it de-facto a "public scheme", but these annotations and updates are not. This sets up a fascinating set of relationships. First, we could say that BCM is intrinsically an updated scheme, but extrinsically-speaking, it is perceived as a scheme which has not been updated; this disjuncture between intrinsic and extrinsic properties asks some stimulating questions about qualities of classification schemes, and their role in creating and assessing reception. Second, the supposed lack of updates is directly referred to in criticism – see for instance Clews (1975) – which means that (the perceived version of) this aspect of the scheme's Wirkung (lack of new versions) has a negative impact on the scheme's criticism. Furthermore, we could speculate that the (supposed) lack of updates also fuels BCM's low consumption rate, thus linking extrinsic Wirkung with criticism and consumption. Thus, we can start to see the potency of the relationships between criticism, consumption and Wirkung – a relationship foretold by a domain with an established use of reception, music (Everist 1999).

6.5. Methodological challenges of Wirkung

There are methodological hurdles to researching the Wirkung of a classification scheme. Knowing about a Wirkung can be problematic – for instance, finding that one scheme has borrowed from another can often involve serendipity, if not relying on encyclopaedic knowledge of all classification schemes in a domain. Proving connections between schemes – as seen earlier in this section – can be problematic, as this requires the notoriously tricky action of proving intention, or else ascertaining what a specific classification-scheme author or editor knew about different classification schemes at a given point in time. Types of Wirkung that can be ascertained by knowledge about the publication of a scheme or edition of a scheme, should be relatively easy from a methodological perspective. However, sometimes even this information can be obscured: classification schemes and their subsequent editions frequently suffer from low print runs and a sense of the ephemeral, if they are even published at all. These methodological issues mean that there are gaps and limitations in potential Wirkung research, but this does not devalue the richness of the Wirkung analysis which can take place.

7. Conclusion

This article has outlined a novel approach to classification scheme analysis which introduces reception-infused factors. Studying the consumption of a scheme asks questions about classification schemes that are (for the majority of schemes) asked infrequently and generally suffer from a lack of systematic research: charting who uses a scheme or an edition of a scheme. Asking these questions also reveals what we don't know about classification schemes, meaning a difficult but rewarding time ahead for future consumption-based research. If more data were collected, it would be possible to track patterns of usage in a systematic way, drawing hypotheses not only about

individual schemes but of wider issues that consumption represents, such as economic factors, the fate of specialist libraries and the (frequently economic-driven) desire for conformity in classification schemes, and many more.

Introducing the notion of criticism to classification schemes yields some fascinating results, and relies on previous research which position classification schemes as having aesthetic value. Studying the criticism of a classification scheme utilises documents which already exist, but are repurposed to fit a criticism framework. We know that people write about classification schemes, but this approach requires us to think about their writings as criticism – and thus, part of the scheme itself. This reception-analysis approach also sees the criticism of the classification schemes individually, in order to analyse separate elements, but also as a body of criticism, which give an overall account of the value of the scheme. Studying criticism of a scheme relies on notions of value within classification schemes, but asks questions about which values and who decides. A librarian considering which classification scheme to use in their library is likely to have different criteria for establishing a scheme's value from someone writing about that classification scheme from a purely theoretical perspective. Therefore, as criticism happens whatever we label it and theoretical and practical decisions are based upon it, there is a strong case for improving our understanding of the criticism of classification schemes.

Wirkung provides different types of discussion, and opportunities to see how far the tentacles of a classification can stretch, both within the afterlife of the scheme itself and its influence on other schemes. The web of influences can be dense, and cross over special/general classification divides, and even hop across domains. Considering the links between consumption, criticism and Wirkung is also illuminating. For instance, the BCM example shows how positive criticism does not necessarily lead to high

consumption and suggests further hypotheses for future research such as linking the geographic constituent of consumption with the geographic constituent of criticism. Possible links between Wirkung, consumption and criticism suggest that while each of the three types of reception-infused analysis can be studied individually, there is merit in considering all three together, so as to plot and study the links between them.

Possibilities for future research abound. For example, this article has only considered one type of KOS, the classification scheme, so it would be fruitful to investigate how reception-infused analysis could be utilised for another type of KOS, or KOS generally. Using reception-infused analysis on different schemes, different types of schemes (such as general classification schemes) and a wider sample would be very informative, as would including a bigger selection of types of criticism – such as “issue-focussed criticism”, as mentioned in section 5.

To conclude, if we consider the classification schemes to represent classification itself, then adding the extra dimension to classification scheme analysis of these three reception-infused ideas can only be beneficial. Considering these types of reception-infused analysis have provided clues to a potential future paradigm, where ascertaining how the classification scheme has been received becomes one of the tenets of knowledge organisation.

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Appendix B4: Conceptions of knowledge about classification schemes: a multiplane approach (2016)

Title:

Conceptions of knowledge about classification schemes: a multiplane approach

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Keywords:

Classification

Abstract:

Introduction. As knowledge organization systems are an important part of knowledge organization research, gaining deeper understanding of the knowledge organization system is imperative. This paper considers one specific type of knowledge organization system, classification schemes, and asks epistemological questions about our knowledge of them.

Method. An original conceptual model is introduced and explained: the multiplane approach. This model is justified and enhanced using a specific aspect (faceting) of an example classification scheme (Dickinson Classification).

Model. The multiplane approach separates out knowledge about classification schemes into four planes: the scheme itself; authorial description and analysis; external criticism and analysis; context and author background. The model is visualised using a tetrahedron, with a different plane of knowledge at each vertex.

Results and discussion. Analysing Dickinson Classification demonstrates the value in isolating individual planes of knowledge and the importance of interactions between these planes. The multiplane approach unveils important new knowledge through highlighting a contrast between the faceted nature of Dickinson and the lack of faceting theory in the authorial background.

Conclusion. The multiplane approach provides an original way to view classification schemes, which produces new information about the scheme. This conception produces new knowledge about classification schemes, organization of domains, and knowledge organization more generally.

Conceptions of knowledge about classification schemes: a multiplane approach

6. Introduction

Classification schemes and other types of knowledge organization systems are an important part of the study of knowledge organization, so gaining a full understanding of the knowledge organization system is imperative. Knowledge can be gained about any particular knowledge organization system from a wide variety of sources, yet these sources may impart different knowledge about that scheme. Furthermore, each type of source has its own characteristics and ethical dimensions as to how its information was gained; a researcher analysing the facets in a knowledge organization system would, for instance, have a different set of ethical considerations from the authors of the knowledge organization system writing a description of it. However, existing knowledge organization research does not usually contemplate questions about knowledge of knowledge organization systems. Therefore, this paper explores conceptions of knowledge about classification schemes – a particular type of knowledge organization system – asking how we know what we know about a scheme and how we can model this knowledge in order to better understand classification schemes. Thus, the tool to analyse and represent subjects, the classification scheme, is in this paper considered to be the subject.

This paper introduces an original and novel approach to contemplating classification schemes: the multiplane approach. By considering the types of knowledge we have about any individual classification scheme, it will be argued that we can greatly enrich our knowledge of that scheme, and knowledge organization more generally. The paper starts by positioning the classification scheme and laying contextual foundations for the multiplane approach. Next, the multiplane method is introduced and explained as a suggested way of conceptualising knowledge about classification schemes. The next section justifies the multiplane approach by using it to explore knowledge of a specific classification scheme. Finally, the discussion section demonstrates how the multiplane approach could be modelled and the richness that the multiplane approach unlocks pertaining to wider issues within knowledge organization.

7. Contextual foundation

Discussing the classification schemes through a knowledge-based perspective involves a number of theoretical assumptions and concerns. To start, epistemological considerations are an important part of knowledge organization; for instance, in Tennis' (2008) framework of knowledge organization, epistemology is a major category, demonstrating its importance to the study of knowledge organization. While these

types of epistemological discussions do not cover the case in hand of the epistemological dimension of classification-scheme-as-knowledge, they do show how considering the act of knowing classification schemes fits into wider discussion and debates within the knowledge organization community.

An important theoretical assumption for exploring conceptions of classification schemes is that knowledge organization systems have aesthetic values. Ojennus and Tennis (2013a; 2013b) explore the idea of aesthetics within knowledge organization in detail. One way they describe the connection between aesthetics and knowledge organization systems is to suggest that aesthetics is what is left when practical properties are taken away (Ojennus and Tennis, 2013a). While some sources of knowledge about classification schemes could exist in a practical framework alone, the construct of ideas such as classification scheme criticism – see Lee (2015) for details about how works about classification schemes can be read as criticism – and authorial intention are much easier within an aesthetics, rather than purely pragmatic, framework. Thus, this paper assumes a knowledge organization world which has practical and aesthetic qualities.

The third contextual issue involves time. This paper utilises the theoretical underpinnings of a temporal plane for knowledge organization systems, as developed by Tennis (for instance, Tennis (2010)). The questions in this paper are based around what happens once the scheme has been written, rather than about the creation of the scheme. The scheme is considered a *fait accompli*, an artwork/tool in existence about which knowledge is known; thus, this paper models how knowledge is gained about this scheme post-facto, rather than the epistemological considerations utilised at the time of its creation.

8. Introducing planes of knowledge about classification schemes

Knowledge about classification schemes could be considered to be multiplane. The Oxford English Dictionary (Multiplane adj. 2b, 2003) defines multiplane as “...involving or occupying several distinct planes, layers, or levels (not necessarily horizontal)”. This paper is going to consider different types of knowledge about any specific classification scheme as different planes; for example, knowledge gained from the scheme itself is considered to be one plane, whereas writings about the same classification scheme by a third-party scholar or author would be represented by a different plane. (Please note, this paper uses the term “plane” in a non-geometrical way, instead using the term to elucidate an idea of the same type of thing or level. So, the term “plane” is used as a conceptual construct, rather than as an actual, mathematical plane.) Therefore, the total knowledge about a classification scheme could be considered multiplane, where each type of knowledge is considered as a distinct plane and the combination of the planes represents all the knowledge about that scheme.

The reasons for conceptualising knowledge about classification schemes in this way are two-fold. First, the act of differentiating planes of knowledge about classification schemes will provide insights into classification schemes and classification theories; for

instance, delineating knowledge about the scheme itself asks questions about what is meant by *the scheme* and what happens when context is separated from schedule. Second, the separation of the planes allows a multiplane model to be conceived, which enables examination of the interaction between types of knowledge. Four planes are presented in the first instance: the scheme itself; the authors' descriptions and analysis; external analysis and criticism; context and author background. Each of these planes is defined and discussed in more detail, before a multiplane approach is introduced.

3.1. Plane 1: the classification scheme itself

The classification scheme itself (plane 1) is an obvious source for gaining knowledge about a specific classification scheme. The scheme is presented as seen in this plane, as though in a (metaphorical) brown envelope, with no further information about the scheme provided. Examples of information that might be presented in the scheme include the subjects included in the schedules, notation, the citation order, the indexes, and so on. This type of information could be considered internal, as it is thoroughly contained within the scheme.

There are also higher levels of knowledge contained wholly within the scheme itself; for instance, where the scheme sits on a faceted/enumerative continuum and whether the scheme can handle the domain it is intended for and the neatness of the solutions it presents. In these cases, the knowledge formulated in, say, analysing the faceted qualities of the scheme is a combination of knowledge of the scheme itself and general knowledge about faceted classification; for it would be impossible to assess the scheme's faceted nature without any knowledge of faceted classification. Therefore, while this plane might be limited to knowledge of the scheme itself, it is argued that in order to make sense of (and moreover to evaluate) the scheme, there is a tacit understanding that external knowledge about classification is also needed.

Garnering evaluative knowledge of a scheme itself presents methodological complications. For instance, evaluating the faceted-ness of a scheme would necessitate some form of evaluation criteria in order to carry out the evaluation, and these criteria would be by necessity subjective in choice and application. Also, the evaluation would be to some degree representative of the evaluator, opening up epistemological questions about the biases of the person carrying out the evaluation and how this is reflected in the evaluation. The topic of bias is already an important topic in knowledge organization discourse; for example, Mai (2010) suggests that classification theorists have already accepted the idea of inherent bias within a classification system. Therefore, it would be useful to extend these discussions by exploring the bias of those evaluating classification schemes. There are also questions about comparative analysis, and whether our knowledge of any one classification scheme ever be based entirely on just that scheme, or whether it is inevitably informed by our knowledge of other schemes. Pragmatically, even within "the scheme itself", it is not possible to entirely escape previous knowledge and biases.

8.2. Plane 2: authorial description and analysis

This second plane considers the information provided about the scheme by the authors, and how this forms a distinct level of knowledge. Examples of types of authorial description and analysis include author-penned introductions to classification schemes, authorial descriptions of schemes in journals, and so on. The writings can provide valuable information about the scheme, in particular why something is a certain way, including authorial intentions.

One key issue for this plane concerns the position of the author of a classification scheme. This plane could be described as somewhat privileging the concept of the author, contravening the lessening role of an author in a postmodern, post-Barthesian world, where perhaps the readers have overtaken authors in primacy. In addition, the concept of an author of classification scheme has changed over time: the 19th and early 20th-century personal authors of schemes have frequently given way to 21st-century corporate bodies and editorial boards. In short, when classification scheme authorship becomes collective, there is question of whether, and how, plane 2 should evolve. (It should be noted that the overall concept of an author within information organization is multi-layered and complex in its own right – as discussed by Martínez-Ávila et al. (2015) who question what an author is within the context of information organization – before any conflation of author of classification scheme is introduced.)

The format of the authorial introduction and instructions to the scheme is another key issue. For example, an introduction about a classification scheme or a set of instructions for its usage could be viewed as part of the classification scheme itself; this asks questions about what constitutes a classification scheme. Are authorial instructions or an introduction external to the classification scheme, or an essential part of it? Put another way, in FRBR terms, could the manifestation of the classification scheme as a published document be considered an aggregate of a manifestation of the scheme itself *and* a manifestation of the authorial introduction; or is only one work represented, the scheme, whose manifestation happens to include both schedules and introduction? The answer to these questions is not straightforward; the questions, on the other hand, demonstrate that considering planes of knowledge about classification schemes also demand careful consideration of the concept of *the classification scheme*.

8.3. Plane 3: external criticism and analysis

The third plane consists of discourse about the classification scheme, specifically discounting any contributions by the scheme's author(s). Classification schemes garner comment and criticism from practical and theoretical perspectives, and these sources contain information about how the scheme has been interpreted and received. Examples might include reviews of the scheme when first published, professional reviews or comparisons of the scheme from those contemplating adopting a new scheme, theoretical discussions about specific phenomena in schemes, descriptions of various schemes for those learning knowledge organization (for instance, appearing in text books), and so on. This plane is unequivocally external, as these analyses and works of criticism sit firmly outside of the classification scheme in terms of their contents (although like the authorial description and analysis, might occasionally physically sit

within the classification scheme in terms of a single, published unit); re-appropriating McKnight's (2012) useful terminology from subject classification debates, plane 3 positions classification schemes as about-ness rather than is-ness.

This plane is dependent on ideas about criticism of knowledge organization systems, which I discuss in detail as part of my work on reception theories of classification schemes (Lee 2015); criticism of classification schemes borrows from literary theory to describe those responses to a scheme which are critical (in the most general sense of the word). It is also possible to extend plane 3 to include other external reflections of the scheme, such as its impact (Wirkung) on other schemes (Lee 2014; Lee 2015); so, knowledge about an aspect of scheme A can be gained through its regurgitation in scheme B. For third-party descriptions of classifications schemes appearing as part of the scheme, there is potential for the same issue to arise as described in plane 2: whether such descriptions which appear as introductions to classification schemes are counted as the scheme itself or as separate works.

8.4. Plane 4: context and author background

This final plane is concerned with the context of the classification scheme's birth and knowledge about the author. Examples might include the year of the classification scheme's creation, the place of its creation, the reason for its creation, the biography of the author(s) of the scheme with particular emphasis on their experience and knowledge of classification, and so on. This knowledge could be gained from original research (for instance, looking at archival documents relating to a scheme's history) or through secondary accounts which are concerned with the author(s) or the scheme.

This plane presents some interesting theoretical questions. First, there is a questions about whether this is a separate plane or not. Plane 4 could include information which is solely about the author of a scheme, but is not specific to the classification scheme, and this is very different from the other, scheme-focussed planes; so, we could ask whether this is just an extra step removed from the original scheme, or instead, this plane of knowledge has a different type of relationship with the classification scheme. Another query concerns contextual information which is part of the manifestation of the scheme, and thus disseminated on the scheme itself – for instance the date of publication of the scheme or the author(s); whether this is part of plane 1 and/or plane 4 generates further discussion about what constitutes *the classification scheme*.

8.5. Putting the planes together

The four planes could be visualised as four separate ellipses (Figure 1). Hence, the total knowledge about a scheme is the combination of knowledge in each of these planes. This diagram also represents the distance of each of the planes from the scheme itself (plane 1). (Note that the position of plane 4 along an axis of distance from the scheme itself is debateable: as well as the discussions in the section "Plane 4: context and author background", there is also an argument that the positions of plane 3 and plane 4 could be swapped as there are compelling arguments for each of plane 3 and plane 4 to be considered furthest from the scheme itself.) Considering the individual planes revealed that some were concerned with internal knowledge about a scheme (for instance plane

1), while others were concerned with external (for instance plane 3); this internal/external divide is represented in Figure 2. However, discussions about the position of authorial introductions and suchlike showed that the polarity of internal-ness and external-ness could be considered breached by plane 2. Thus the relative position of the internal/external dividing line and plane 2 cannot be considered fixed.

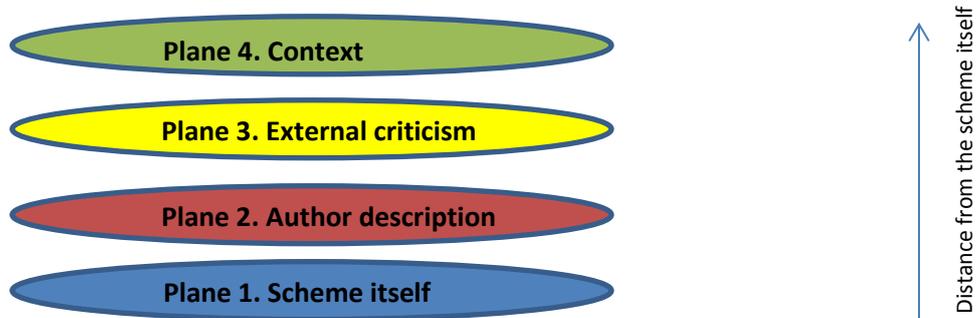


Figure 1: The four planes together, showing distance from the scheme itself

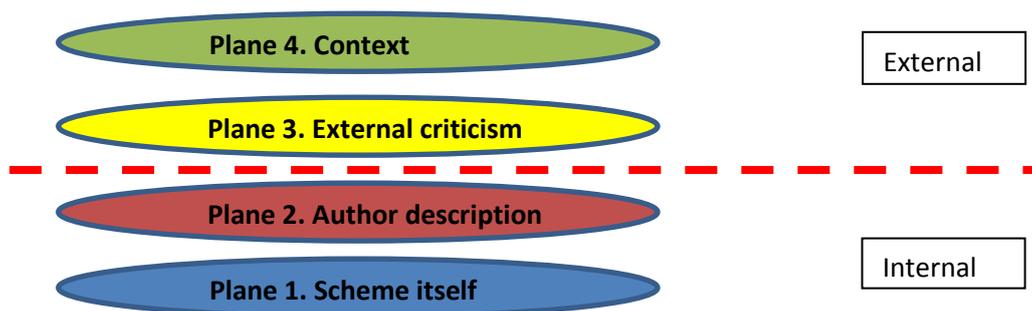


Figure 2: The four planes together, showing the internal/external dualism

9. Multiplane analysis of a specific classification scheme

4.1. Introducing the Dickinson Classification and faceted-ness

To develop and provide justification for the conceptual approach outlined above it is imperative to see how the conceptual model interacts with a real-life classification scheme. As well as examining the individual planes, this example will show how knowledge in different planes can interact with, and possibly contradict, knowledge in other planes. A special scheme has been selected, in order to contain the potential complexities involved with selected longstanding general schemes; in other words, the multiplane approach is presented in the first instance without being encumbered by a scheme which exists in dozens of editions, languages and formats. Dickinson Classification will be used (Dickinson), which is a special scheme for notated music, and the original edition – as opposed to the later, Vassar-Columbia refinement of the scheme. This specific scheme is selected as it demonstrates the validity of the multiplane conceptualisation and unearths otherwise hidden information about Dickinson, and knowledge organization more generally.

For reasons of space, the multiplane method will be used for one specific aspect of the scheme rather than an entire scheme: faceted-ness. Therefore, discussions will focus on faceted-ness. (Please note, the term “faceted-ness” has been adopted to describe the presence of some faceting or faceted qualities in the broadest sense. It was selected to circumnavigate terminological issues inherent with other facet-related terms.) Faceted-ness has a primordial position within a scheme’s structure, so it is an ideal quality to investigate. Furthermore, the faceted-ness of classification schemes is discussed by classification theorists as a way to classify schemes, demonstrating its suitability for this example; for example, Broughton (2004) suggests that there are three basic types of classification structures, which are based on amount of faceting, while Ranganathan presents five levels of faceted classification schemes (summarised by La Barre (2010)). (For reasons of space, formal criteria for assessing the faceted-ness of the scheme are not utilised in the succeeding analysis of Dickinson.)

It is important to note that the analysis of Dickinson presented in the next section is not exhaustive in terms of resources consulted and depth of analysis: the Dickinson example is used to provide a proof of concept and to elicit ideas about how the multiplane approach could be applied to a scheme, rather than providing a full analysis of that scheme. Furthermore, as mentioned in the section “Plane 1: the classification scheme itself”, there is inherent biases when analysing classification schemes; therefore the analysis of each plane of Dickinson presented below is a product of the inevitable subjective nature of analysing classification schemes and the biases of the author of this paper. However, as the purpose of analysing the faceted nature of Dickinson is to elicit more information about the multiplane approach rather than the scheme, the results of the potentially non-exhaustive and subjective analysis of Dickinson are accepted as accurate enough for the purposes of this particular discussion.

9.2. Individual planes

Analysing Dickinson itself (plane 1) reveals that it has the basic tenets of facet analysis: the schedules consist of simple subjects, and these simple subjects are added together to form compound subjects. (In order to examine the structure of this, and other schemes, it is necessary to extract any orders of facets from the introduction and consider them part of the scheme itself, while leaving any associated description for plane 2.) The combination order for subjects is specified in a section entitled “formulae” (Dickinson 1938). Unusually, there is a choice of formula, based on type of library; however, once the choice of formula has been made for a specific library, it is fixed, which means each individual formula acts like a conventional citation order. Looking more closely at the scheme reveals elements of non-faceted-ness. For example, there are a number of compound classmarks listed in the schedules (for instance, keyboard chamber music with plectral instruments); sometimes these are merely written-out notations but are structurally sound from a faceted perspective, while others cannot be broken down into meaningful simple subjects (for instance, bowed string and wind ensembles.) In addition, one facet (CD) could be seen as problematic, as it contains two types of things, musical mediums and formats. Therefore, plane 1 shows Dickinson as a scheme which is itself mostly, if not entirely, faceted.

Plane 2 considers how Dickinson describes the faceting in his scheme, and evidence can be garnered from his introduction to the schedules (Dickinson 1938). He provides a description of the technical and scientific features of the scheme, and this can be read as a statement of intent. Dickinson does not use the vocabulary of faceted classification and no specific mention of facets or faceting are made. However, though he does not use faceted classification terminology, there are a striking number of similarities between his description and common ideas in faceted classification theory. For example, Dickinson suggests his scheme uses the technique of “synthesis”, which means that the scheme consists of “factors capable of assembly” (Dickinson 1938: p. 7). Taken in reverse, this allies itself with a broad description of facet analysis as a method whereby complex subjects are broken down into their most fundamental or elemental concepts – see for example, La Barre (2010), Broughton (2004), Langridge (1992). Furthermore, Dickinson (1938) also discusses the theoretical underpinnings of his categories; though using different terminology, the ideas are very similar to those discussed in faceted classification. For instance, Dickinson identifies a primal need for “scientifically sound categories” (Dickinson 1938: p. 7) and states that “provision must be made for categories covering all the special differentiations characteristic of musical compositions” (Dickinson 1938: p. 7). If “categories” were replaced with “facets”, these statements would not appear out of place.

External descriptions and criticism of the scheme (plane 3) generally do not mention its faceted nature. For example, Bradley, the prolific and in-depth commentator on Dickinson, does not highlight this aspect of the scheme even though she writes about the scheme on multiple occasions (for example, Bradley 1968; Bradley 1972; Bradley 2003); nor is Dickinson’s faceting mentioned by Elliker (1994), in his thorough analysis of multiple music classification schemes. One exception is Redfern (1978) who mentions

faceting but considers the scheme to be both enumerative and faceted. Considering the external description and criticism of Dickinson also highlights an important methodological issue concerning plane 3: the impossibility of ensuring a complete collection of description and criticism for any particular scheme. Therefore, in the case of Dickinson, the meta-analysis for plane 3 is based on reviewing the available and known descriptions and analyses, rather than all the criticism which might have been produced – for more discussion about the methodological issues pertaining to reception documents for classification schemes, see Lee (2015).

Plane 4 elicits some noteworthy contextual information about the scheme and its author. Dickinson was originally a musicologist (Nettl 1960) moving later in his career to the music library where he would, in 1927, create his classification scheme (Bradley 2003). He was not a librarian by training or (initially) by practice, and from Bradley's writings (for example, Bradley 1972; Bradley 2003) we see no evidence of particular interest in classification theories. Furthermore, the seismic changes in classification theories and practices brought about by Ranganathan were unlikely to have been known by Dickinson when developing his scheme in the 1920s: for example, Ranganathan's treatise of faceted classification, the *Prolegomena to Library Classification*, was first published in 1937 (Ranganathan, 1992), while the fully-faceted Colon Classification was first published in 1933 (Ranganathan, 1992). (It is noted that there were proto-faceted systems of classification pre-Ranganathan, which were published before Dickinson created his scheme – for example, Kaiser's 1911 treatise on systematic indexing is considered by some to be the originator of faceted indexing (see a discussion in Dousa (2012)). However, the trajectory of Dickinson's career suggests that it is most likely that these works, like Ranganathan's, were unknown to Dickinson.) Therefore, it is highly likely from the authorial background and general context that Dickinson was created independently from the influence of faceted schemes and theories.

9.3. Multiplane approach

Using the multiplane approach greatly enriches our understanding of Dickinson. Analysing the Dickinson schedules (plane 1) reveals a faceted structure, though the scheme is not fully faceted. Taken in isolation, Dickinson's intrinsic faceted-ness is interesting, but not remarkable. However, the author's description (plane 2) suggests that faceting was designed, yet factors such as terminology in the description point to an unawareness of existing faceting theories; this view is enforced by considering the background of the author and the dates that the scheme was created (plane 4). So, there is a combination of faceted-ness, yet without authorial knowledge of faceting. This demonstrates the importance of knowledge *between* planes, showing the power of the multiplane method.

The external reviews (plane 3) reveal a slightly different portrait of the scheme's faceted-ness: usually unremarked upon or unnoticed, occasionally partially rejected. Put together as a multiplane portrait of the scheme, one explanation for the treatment of faceting (or lack thereof) in Dickinson Classification's criticism is that the authorial background (plane 4) and terminological usage (plane 2) caused a lack of expectation of faceting; in other words, the scheme does not fit into traditional tropes of faceting

history, and therefore it was not *read* as such. An alternative explanation is that any differences in knowledge revealed by plane 3 and the other planes can be attributed to differences in quantifying aspects such as faceted-ness. Either way, it is clear the act of comparing the planes of knowledge is worthwhile.

10. Discussion

The example illustrates how the multiplane approach can provide rich information about classification. Knowledge about the domain can be gleaned from taking a multiplane approach to analysing classification schemes: we could read the gaps between the authorial intentions and the examination of the scheme itself as information about classifying a particular domain. For example, the Dickinson Classification example illustrates how a musicologist who happened to be in charge of establishing and arranging a music collection, independently developed a more-or-less faceted structure; this could suggest that there is something inherent in music which suits and demands faceted treatment.

This application of the multiplane conception of schemes also suggests information about faceted classification generally. As seen above, by comparing knowledge about the scheme itself (plane 1) with authorial information (planes 2 and 4), Dickinson offers some thoughts about the general progression of faceted classification; it could be argued that Dickinson deliberately creates what we might contemporarily describe as a somewhat faceted scheme, without him *knowing* faceting or developing faceted theories. We could call this *faceted-ness before faceting*. The multiplane approach identifies this mismatch between scheme and context, and thus highlights this important knowledge about Dickinson, which is also important within the wider perspective of the history of faceted classification. (Birger Hjørland asked a thoughtful question at the 2016 COLIS conference, suggesting that many people learn and use faceted classification without being taught faceting through knowledge organization education. However, I believe it is possible to accept the idea that faceting is something which is spontaneous as Hjørland hypothesises, and still appreciate that the multiplane approach is helpful for seeing Dickinson as a (minor) example in the history of faceted classification: rather than Dickinson illustrating an anomaly in being faceted without formal knowledge of faceting, the mismatch between the structure of the scheme (plane 1) and the knowledge-level of its author (plane 4) could be considered as another example of this spontaneity in action. It is the multiplane approach, in other words separating out the structure of the actual scheme and the context of its construction, which reveals this.)

The analysis of Dickinson also revealed the importance of the interaction between the planes of knowledge; it is this collision of knowledge, rather than the knowledge in any one individual plane, which reveals aspects such as *faceted-ness-before faceting*. In addition, note that in the Dickinson example, the interesting confluences of knowledge were not just provided by planes which were adjacent in Figure 1, but by various combinations of different planes. So, an amended visualisation is presented. Each of the planes of knowledge is represented as a vertex of the tetrahedron, and this three-

dimensional shape allows each vertex to be directly connected to every other vertex – see Figure 3. (Therefore, the plane used to describe the multiplane approach is not used in the geometrical sense of the word, which is why a conceptual plane has now transfigured into a geometrical vertex.) This visualisation demonstrates how much of the knowledge of classification scheme sits outside any one particular type, instead being in constant flux between the different vertexes of knowledge.

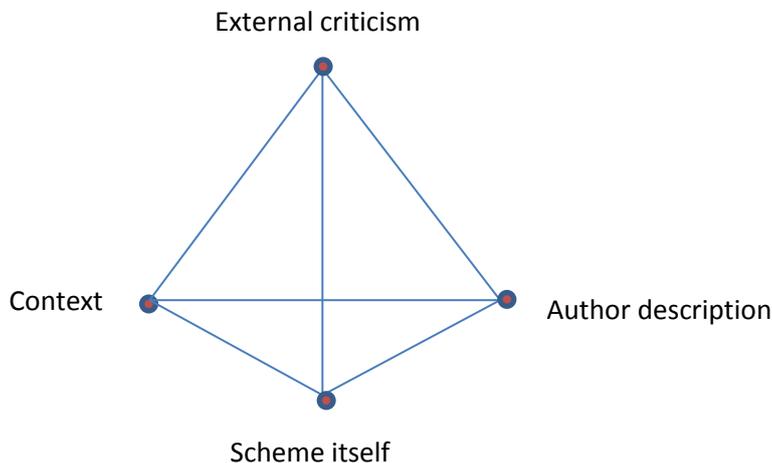


Figure 3. The tetrahedron model of the multiplane approach

While all vertexes are connectable to every other vertex, it is disingenuous to state that for any particular scheme, every vertex and relationship between each vertex will be equal. For example, analysing the planes of knowledge about Dickinson’s facet-ness revealed that there was a strong interaction between the scheme itself, the author’s description and the contextual information; conversely, a meta-analysis of the (available) external criticism reveals no connection between the author’s description and context. Hence, the edges of the tetrahedron can be used for a coarse visualisation of the individual relationships between planes, and their relative strengths. This is demonstrated for Dickinson in Figure 4; the thicker lines represent a strong interaction between the associated vertexes, while the dotted line represents relationships which were not found in the analysis.

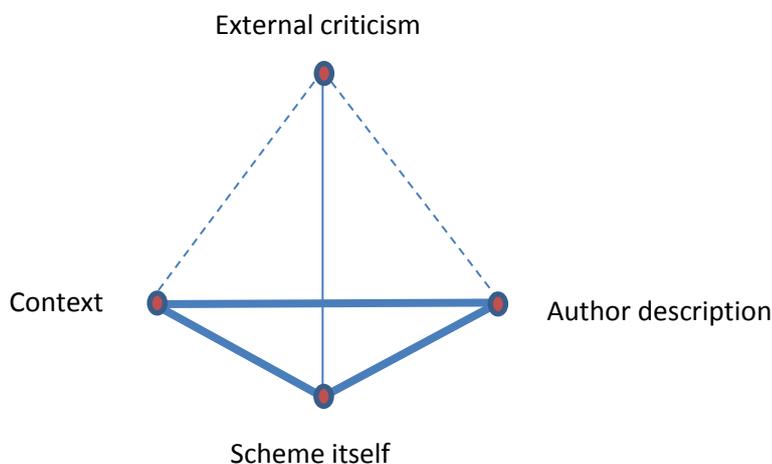


Figure 4. The interactions between planes of knowledge for Dickinson Classification’s faceted-ness

In the tetrahedron model, only the interaction between pairs of planes of knowledge has been shown. Expanding this model to show the interaction between groups of three planes of knowledge could be achieved by shading the relevant face of the tetrahedron, in a representative manner. Each face would represent the interaction between three of the four planes of knowledge. However, this produces complications in its visualisation as it is not possible to show all four combinations of relationships simultaneously. A *non-simultaneous* visualisation would utilise multiple viewpoints of the same tetrahedron, each time showing the tetrahedron from a different perspective thus allowing a different face – with its representation of the relationship between three planes of knowledge – to be shown. Showing the interaction between three or four planes of knowledge simultaneously could be achieved by creating the tetrahedron in three-dimensional space, and filling it with appropriate-coloured putty (this mathematical structure is known as a simplicial complex). Hence, relationships between groups of three or four planes of knowledge can be demonstrated, but are more complex in terms of their visualisation, especially in a two-dimensional conference paper.

There are a number of ways in which this model could be further explored in the future. For example, performing similar analysis with more classification schemes would be invaluable for refining the model. A further development would be to expand this model to conceptualise comparative analysis of multiple schemes; this analysis could be performed along individual planes, or as comparative multiplane analysis. It would also be interesting to investigate whether the multiplane model is effective for other types of knowledge organization system, and to make appropriate modifications.

One expansion for the model could be to consider additional planes of knowledge; for instance, analysis of different example classification schemes or reconceiving the model for other types of knowledge organization system might reveal extra planes of knowledge. While the overall multiplane model would stay the same, the tetrahedron visualisation would need to alter if extra planes of knowledge were added. If only the relationships between two planes of knowledge were represented, then five planes of knowledge could be represented in two dimensions, by a pentagon with all its diagonals shown. However, representing the simultaneous interaction between more than two planes of knowledge when there are five planes of knowledge becomes more complex, as a four-dimensional structure is needed, and extra planes of knowledge would result in extra dimensions. Therefore, in theory the multiplane approach is expandable for extra planes of knowledge, though such expansions could create manifold complexities in the visualisation of these planes.

11. Conclusion

This paper introduces and demonstrates the multiplane approach, which reconceptualises the idea of knowledge about classification schemes. The description of the model showed how unpicking different types of knowledge can unearth valuable information about an individual classification scheme; using the model as a basis for analysing knowledge about an example scheme (Dickinson), justified the premise and

the structure of the multiplane approach. The analysis of Dickinson using the multiplane approach suggests that the interaction between the faceted nature of Dickinson and the authorial intentions is noteworthy, and this (potential) new knowledge about Dickinson deserves further exploration.

The impact of the multiplane approach lies in the first instance in furthering our knowledge about particular schemes, and aiding our understanding of how these schemes function. The multiplane approach also has the potential to have an impact on wider knowledge organization; Dickinson shows how multiplane viewing of a scheme can add to our knowledge of a specific domain (music) and the historical development of faceted classification – so, new knowledge squeezed from existing knowledge of classification schemes. From a theoretical perspective, the multiplane approach runs with the aesthetical gauntlet laid down by theorists such as Ojennus and Tennis (2013a; 2013b); the impact of balancing, say, the analysis of a scheme's functions with the perceptions of a scheme and authorial intention, is a move in the direction of reconfiguring the classification scheme from purely scheme-as-tool to a combination of tool and artwork. The multiplane approach shows that by turning the classification scheme into the subject, our knowledge of classification schemes, and knowledge organization generally, can be greatly enriched.

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