Musical and non-musical involvement in daily life: the case of absorption

Ruth Herbert,
Associate Lecturer in Music, Open University (S.E), UK.

Dr. Ruth Herbert
C/o Arts Faculty Manager
The Open University (South-East)
St. James's House
150 London Road
East Grinstead
RH19 1HG
UK
Email: r.g.herbert@open.ac.uk
Tel: +44 (0)1732 353944

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ABSTRACT

The construct of absorption (effortless engagement) has been the subject of a small number of discipline-specific studies of involvement, including music. This paper reports the results of an empirical project that compared psychological qualities of absorption in everyday music listening scenarios with characteristics of non-music-related involvement. Absorption was located in 'real-world' settings, and experiences across different activities in a variety of contexts tapped as soon as possible after they occurred. The inquiry was designed to test two assumptions that have underpinned previous absorption research: first that certain activities are inherently particularly absorbing; second that absorption is best conceptualized as primarily a trait as opposed to state.

20 participants kept diaries for two weeks, recording descriptions of involving experiences of any kind. Eight weeks after submitting descriptive reports they completed the Modified Tellegen Absorption Scale (Jamieson, 2005). Diaries indicated that different activities shared a subset of involving features, and confirmed the importance of multi-sensory perception and the imaginative faculty to absorbed experiences. Music may be a particularly effective agent in the facilitation of absorption because it affords multiple potential entry points to involvement (acoustic attributes, source specification, entrainment, emotion, fusion of modalities) and because its semantic malleability makes it adaptable to a variety of circumstances. The MODTAS provided insufficient evidence for establishing correlations between state and trait absorption. It is argued that state and trait divisions are constructs that are inherently problematic.

Key words: everyday listening, trance, absorption, phenomenology

Introduction

Absorption has been defined as 'an effortless, non-volitional quality of deep involvement with the objects of consciousness' (Jamieson, 2005: 120), as opposed to

attentional engagement that is goal-directed and effortful. The psychiatrist Josephine Hilgard's investigation of the associated construct of imaginative involvement (1970, 1974, 1979) which she linked with a tendency to become involved with some, but not other pastimes, was an important catalyst for the creation of the Tellegen Absorption scale (Tellegen & Atkinson, 1974). Using that measurement tool, studies across a range of disciplines have correlated high levels of absorption with a selective yet diverse range of activities: these include religion (Levin, Wickramasekera and Hirschberg, 1998) nature (Kaplan, 1995; Brown and Katcher, 1997) dancing (Bachner-Melman et al., 2005) reading (Nell, 1988) and art appreciation (Combs et al., 1988). Although some published studies claim that certain activities are inherently more absorbing than others, this is a misguided assumption. To hypothesize a hierarchy of activities possessing greater or lesser degrees of immanent fascination would be to ignore the contribution of the individual experiencer to sense-making. Yet, given that a diverse range of activities encourage the process of absorption, it is still legitimate to ask what (if anything) might be specific to the interaction between listener and music, not least because such an enquiry has the potential to yield insights that relate to broader questions of musical meaning and effect.

The study described in this paper constitutes the final stage of a three-stage predominantly qualitative empirical inquiry carried out between 2005 and 2007, designed to explore varieties and qualities of everyday music listening experiences and the range of consciousness these encompass. The over-arching aim of the three studies was to document the psychological processes present in everyday experiences of listening to music and so to assemble the basis of a phenomenology of everyday listening (experience as subjectively perceived), that would in time complement existing research pertaining to strong experiences with and of music – particularly as evidenced by Gabrielsson and Lindstrom Wik's (2003) descriptive system for strong experiences with and of music. In stages one and two of the

research, participants completed semi-structured interviews focusing on their use of music, listening experiences and listening habits and the transcripts were subjected to Interpretative Phenomenological Analysis. They subsequently kept a two-week diary, recording recent, detailed free descriptions of music listening episodes. The detailed results from these first two stages of the inquiry are documented elsewhere (Herbert, 2009, Herbert, forthcoming), but in broad outline indicated that everyday listening experiences, in common with strong experiences, featured changes in attentional focus, arousal, sensory awareness, experience of time, thought processes and sense of self. In particular, reports indicated the prevalence of low arousal absorption in conjunction with music listening. In order to avoid the danger of arguing in isolation for the 'specialness' of music in terms of its capacity to afford absorption, it was next essential to broaden the scope of the inquiry i.e. to design a cross-disciplinary study to compare characteristics of musical and non-musical involvement.

Before discussing this comparative study, I will offer a preliminary outline of the concept of absorption, followed by an appraisal of existing studies of absorption and music, in order to provide an explicatory framework within which to site the research.

Absorption

The construct of absorption does not describe periods of concentrated, logical, rational, analytical focus (although these may fully occupy attention), but refers to a particular mode of engagement – one that is less pragmatic, often spontaneous, and unconcerned with task completion per se. The term is best understood as a useful holistic 'wrapper' or shorthand for the overall subjective 'feel' of certain types of experience arising from the interaction of a number of psychological processes.

Conceptualizations of absorption within existing literature are unclear. Roche and McConkey's observation (1990: 92) that 'some confusion exists as to whether absorption

refers to a trait of the individual, a state of the individual, or both' still holds true nearly twenty years later. Having initially defined it as a trait, the personality theorist Auke Tellegen was later concerned to stress the interaction between circumstance and individual pre-disposition (Tellegen, 1981). Considered as a trait, absorption has often been linked to the capacity to be formally hypnotized, although studies only reveal a modest correlation between the two (Roche and McConkey, 1990: 94). Absorption has also been equated with open-ness to experience – identified as one of five traits of personality by Costa and McCrae (1983, 1985), whilst several studies have related it to capacities for fantasy prone-ness and creation of mental imagery (Lynn and Rhue, (1986, 1987, 1988). A particularly interesting correlation has emerged between absorption and synaesthesia (Rader and Tellegen, 1981; 1987), indicating that absorbing experiences may involve a cross-modal integration of experience that is especially engaging. In terms of individual experience, Pekala et al (1985) have shown that absorption correlates with changes in attentional focus, awareness, production of mental imagery and subjective experience of time.

The construct of absorption shares similarities with many other conceptualisations of experience, such as Hilgard's study of imaginative involvement (1979), already mentioned. Equally relevant is Csikszentmihalyi's notion of Flow (1990; 1997). Flow is a metaphor describing 'the state in which people are so involved in an activity that nothing else seems to matter (1990: 5). It is a particularly effective term because of its dynamic quality, illustrating a clear concern with consciousness as process. In a study of so-called 'ecstatic' secular everyday experiences, (1961; 1980), the journalist (and committed atheist) Marghanita Laski identified two types of experience which appear to accord with the concept of absorption. 'Intensity experiences' related to nature and art (particularly music), and were defined as strongly emotional and highly arousing, whilst 'withdrawal experiences' (such as contemplative prayer) were 'attained gradually rather than suddenly' and described by words

implying ‘down-ness, darkness, floating, dissolving, liquefaction’ (1980:15). In a similar vein, Maslow wrote of ‘peak’ and ‘plateau’ experiences (1971), using the term ‘B-cognition’ (B meaning ‘being’) to describe total absorption, and again emphasizing the widespread reported use of music (this time including dancing) in triggering strongly absorbing episodes.

Previous studies of music and absorption

A small number of studies of musical involvement have taken the construct of absorption as their starting point, typically assessing its presence via questionnaire and written reports describing participant listening response to short items of music pre-selected by researchers. Rhodes et al. (1988) argued that pronounced experiential involvement when listening to music correlated with high levels of trait absorption, and that such a relationship was strongest in the case of classical music (listeners heard four styles of music). As part of a study exploring correlations between degree of imaginative absorption and hypnotic susceptibility, Snodgrass and Lynn (1989) invited participants to listen to pre-selected excerpts of classical music, concluding that music involvement could be definitely included ‘as part of the domain of imaginative involvement related to hypnotizability’ (1989: 50). The primacy that both these studies accord to western classical music in terms of its capacity to afford involvement is highly questionable, suggestive of a belief in absorption as a process induced by stimulus properties of a specific type of music - e.g. classical music’s ‘greater complexity’ (Rhodes et al. 1988: 737) - rather than emerging from an interaction between stimulus and perceiver that would inevitably be shaped by personal preference. Because of this, the authors’ broader conclusions concerning relationships between capacity for absorption, hypnotisability and musical involvement, although interesting, must remain hypothetical.

Taking their cue from Snodgrass and Lynn, Nagy and Szabo developed a twenty-nine item scale of musical involvement (M.I.S.) which was used in conjunction with open-ended essays concerning the meaning of music (both applied to retrospective recall of experience) to establish differences within music-listening experiences (Nagy and Szabo, 2002; 2003) Individual questionnaire items drew on a range of literature, including the TAS (Tellegen and Atkinson, 1974), J.R. Hilgard's work (1974; 1979) and Csikszentmihalyi's description of 'Flow' experiences (1997). An obvious limitation however, was that the M.I.S. required participants to recall 'listening to a musical piece that has a great effect on you' thus assuming that *high* involvement in music equated with *strong* emotional involvement, and that high involvers would always be likely to listen in this way. Once established, this supposition led to some arguable conclusions, namely that high involvers 'usually listen to music when doing nothing meanwhile' (2002: 508), whereas relaxation and 'more frequent thoughts' were linked with low involvement. For the authors, this was inevitable, given their qualifying statement that 'This can be understood if we think that you can be deeply involved in an activity only if you pay full attention'(2002: 508) – a notion which will be called into question by the empirical data of the current inquiry.

A recent study (Kreutz et al., 2008) examined the influence of individual preferences and absorption on the induction of emotion via music. Ninety-nine adults listened to 25 pre-selected excerpts of classical music chosen to represent happiness, sadness, fear, anger and peace. Absorption was found to correlate with 'induced activation and global intensity of emotions' (2008: 119), although the authors noted that 'the mode of presentation in this study – namely the short duration of the musical pieces, the interruption by the rating phases and the continuous change between different emotions – may not have permitted strong absorption in the music' (2008: 119). This somewhat contradicted their initial hypothesis that 'participants scoring high on absorption [having completed the TAS] should be less

disturbed…because of their ability to forget their surroundings' (2008: 105). Other branches of research have focused on different aspects of musical engagement. In a questionnaire study, Thompson (2007), found that listeners identified engagement as the single most important determinant of their enjoyment of live music performances, recommending that future studies 'unpack' what is clearly a multi-faceted construct. Greasley and Lamont (2006, 2009) have devised a scale to assess levels of engagement with music, and have mapped the different ways in which 'low' and 'high' engagers use and experience music via a variety of methods, including interviews, questionnaires (including open responses), and Experience Sampling Methodology (ESM). For low engagers, music's capacity to trigger memories and associations was more important than sonic attributes or style (2006: 964), they owned less music than high engagers, were less likely to listen to self-chosen music, and more likely to use music to pass the time (2009: 172). High engagers listened to (mostly self-chosen) music for up to 40 hours a week, and were more likely to use it in a targeted way (2009: 173). Amongst the functions of music identified in Greasley and Lamont's 2006 interview study, the use of music to serve a 'transcendental function', in which participants 'described 'going off' into their own world' (2006: 965), is of particular relevance to the present study. musical preference trait absorption could apply to musical engagement openness is positively correlated with an interest in the arts

To date, Gabrielsson and Lindstrom-Wik's research regarding strong experiences of music (2003) is the only study to refer to instances of absorption involving interaction with music in real-world scenarios. Content analysis of circa 900 free descriptions of listening experiences enabled the authors to construct a seven category descriptive system for strong experiences of music (SEM), which has been utilized to articulate the phenomenology of musical experience in a range of settings. Absorption is included as a sub-heading of cognition (category 4) titled 'changed attitude' (2003: 212).

In sum, laboratory studies of absorption and music are problematic because they are divorced from the contexts of individual, subjective involvement and employ stimuli pre-selected by researchers, thus severing interaction between experiencer and real-world, self-chosen environments, whilst the use of questionnaires tends to emphasize absorption as a trait rather than state, and cannot capture experiences soon after they occur. In addition, no inquiry to date has been cross-disciplinary in focus, preventing comparison of the interaction between perceiver, environment and properties of different stimuli. Previous research highlighted the need for an empirical inquiry that could:

- Compare the varieties and qualities of everyday absorbed experiences, with and without music.
- Assess what interactions (if any) between stimulus and perceiver are particular to music i.e. what is music contributing?
- Explore connections between state and trait absorption.

It was these considerations that shaped the conceptual and methodological aspects of the research described below.

The present study

METHOD

Participants

Data was drawn from the written experiences of twenty unpaid volunteers, (eight males, twelve females) ranging from eighteen to seventy one years of age. The intention was to recruit articulate people who could give qualitative insight regarding the subjective feel of 'real-world' involving experiences. Participants were located through purposive sampling, involving an initial informal interview. In accordance with the aim of accessing as many involving activities as possible there was no requirement that all participants had to declare a high involvement in music, although seven did so. Participants' professions (see appendix 2)

provided some indications of expected specific high involvement e.g. visual involvement (artist, art and design lecturer) or imaginative involvement (author, storyteller).

Material

Participants logged involving musical and non-musical experiences for a period of two weeks, in conjunction with completion of formal experience response sheets which asked for detail to do with time of day, level of tiredness, general mood, what participants had been doing prior to the described episode and how they felt before and after it.[1] Prior to beginning the diary, each participant was given an information and instructions sheet for use when compiling written reports. Participants were encouraged to provide as much written detail as possible. It was hoped that episodes recorded would include those involving music, music and another activity and non-musical activities. After a substantial period of time had elapsed (eight weeks) participants completed the Modified Tellegen Absorption Scale (Jamieson, 2005) to assess links between trait and state absorption. The MODTAS, rather than the original TAS (Tellegen and Atkinson, 1974) was selected because it includes a Likert scaled response relating to frequency of experience (as opposed to the original dichotomous version which merely required the responses "true" or "false").

The scale was given the more neutral-sounding title 'Personal Attitudes and Experiences' and its completion was purposely separated in time from the previous log submissions in order to minimize context effect i.e. the possibility of alteration in responses due to expectancies set up by participation in the project (so called 'response expectancy' (Braffman and Kirsch, 2001; Council, Kirsch and Hafner, 1986). The full questionnaire is given in appendix 1.

Reflective report contents

All participants opted to record their experiences in written, rather than oral form. The experience response sheets indicated how much time had elapsed before episodes were recorded, and showed that the majority were documented the same day, varying from immediately to several hours afterwards. The number of episodes recorded by individuals varied from three to twenty-eight, with the total word count of journals varying from c.1000 to c. 6,400 words. Four episodes featured attendance at live events (concerts and sport). Following Sloboda et al. (2001) the total 151 episodes were initially divided by the experiencer's declared main activity into personal (*maintenance, travel and states of being*), leisure (*music listening, leisure-passive, leisure- active*) and *work* categories. Thirty-eight episodes involved travel, 29 involved active leisure, 24 involved passive leisure, 18 involved personal maintenance, 18 involved work, seven involved states of being, and seven involved listening to music (as prime activity).

Travel comprised journeys via train, car and on foot; *active leisure* activities were: gardening, drawing, painting, exercise, playing an instrument, playing cards, imagining own story-in-head; *passive leisure* activities were: looking at art, looking at surroundings, smoking, lying in bed, watching live sport, watching TV, drinking alcohol, reading, listening to story; *personal maintenance* activities were taking a bath, cooking, chopping wood, washing up, DIY, getting petrol; *work activities* were: doing accounts, carrying out hypnotherapy session, proofing and laying out manuscript, constructing sound-track for film, carrying out reflexology session, doing a mail-out, performing (telling a story), writing, painting; *states of being* were sitting and staring, dreaming, day-dreaming and emotional shifts such as extreme feelings of love or anger.

A significant proportion (63.5%) of episodes featured a repetitive or automatically carried out task, e.g. chopping wood, washing up, DIY, gardening, exercise, carrying out reflexology session/mail-out/proofing, driving, which although stated as the 'main activity'

did not consistently accord with what actually constituted the participants' perceived central focus/involvement. Music or sound formed a contributing element to 83 (55%) of experiences overall. Music was actually heard in 47 (31%) experiences, imagined in six (4%), and five episodes (3%) centred on playing a musical instrument. 25 (16.5%) of experiences featured sound, ranging from an accompanying background 'hum' e.g. the distant sound of the T.V or audio static/white noise to sounds with a clearly identifiable source e.g. seagulls, or spoken word (perceived with or without its intrinsic semantic content). A second categorization of episodes was arrived at via the themes (discussed below) that had emerged directly from reflective report material.

MODTAS RESULTS AND DISCUSSION

MODTAS total scores could potentially range from 0 to 136. The actual range was from 41 to 111. No population norms are available for the original Tellegen absorption scale (TAS), but use of the five-point Likert version (rather than dichotomous version) of the original TAS with large college samples (N = 738) has yielded an average score of c. 80 (Glisky et al., 1991, studies 2 and 3). This compares with Jamieson's MODTAS mean of 65.35 (based on a smaller sample of 352), with scores ranging from 14 to 122 (Jamieson, 2005:124). In the current study the overall mean of the sample (N = 20) was 75.75. Figure 1 sets out the item response distribution for the questionnaire and offers a comparison of individual question mean scores with those of Jamieson (2005). Figure 2 shows individual aggregate scores for the questionnaire.

(Tables 1 and 2 follow here)

On average, participants in this study reported higher levels of trait absorption (M = 2.19, SE= .09) than those in Jamieson's study (M = 1.92, SE = .08). An independent samples t-test revealed a statistically significant difference between the scores of the two groups ($t(66)$ =

2.18, p = .03). It is possible to infer that this difference is due to dissimilarities in age range and diversity of cultural and professional background in comparative project participant profiles: although Jamieson's participant sample was far larger, it was made up entirely of first year undergraduate psychology students. Additionally, the questionnaire in this study (unlike that of Jamieson) was not completed in a classroom setting, but at leisure in their own homes, and participant responses may have been primed because they had previously (albeit over two months before) been asked to record examples of involving experiences.

REFLECTIVE REPORTS: RESULTS AND DISCUSSION

All documented experiential episodes were subjected to Interpretative Phenomenological Analysis (henceforth IPA) in order to identify experiential reactions and gather emergent themes (see Smith, 2003: 51-80 for an explanation of IPA). Participant checking was subsequently employed to assess whether material had been accurately represented and plausibly interpreted. Absorbing experiences were first divided into three groups for ease of comparison: those involving a primarily *external* attentional focus, those involving a primarily *internal* attentional focus, and those involving a *fluctuating* attentional focus. Cross-comparison of reports revealed three super-ordinate thematic categories of absorbed experience, each characterised by a set of associated criteria (i.e. emergent themes) not all of which will necessarily be present in any single episode. Of course, any partitioning of conscious experience is inevitably problematic because it has the effect of dividing up or fragmenting what is a dynamic process and so runs the risk of manufacturing apparently static states. I should therefore emphasize that the categories listed below are necessarily overlapping, not mutually exclusive. The super-ordinate thematic categories and emergent themes are as follows:

1. Reduction of density of thought or internal dialogue (attentional focus external, internal or fluctuating):
    - relaxation of critical faculties
    - decreased activation
    - altered sense of experience or self
2. Change in sensory awareness (attentional focus external or fluctuating):
    - enhanced sensory awareness
    - sharpened awareness and increased activation (alertness, arousal)
    - multi-sensory experience
    - blending (stimuli perceived to interact with/affect each other)
    - changes in awareness span (narrowed, broadened, equanimous)
    - altered sense of experience or self
3. Imaginative involvement (attentional focus internal or fluctuating):
    - imagery
    - association, daydreaming and reminiscence
    - altered sense of experience or self

Each super-ordinate category will now be summarized, prefaced by illustration of contrasting examples of musical and non-musical involvement from participant reports.

1. Absorption marked by reduction in density of thought or internal dialogue

Activities in this category included active or more goal-directed occupations, such as administrative tasks, as well as more apparently passive pursuits, e.g. having a massage, looking and staring, listening to music as a prime focus.

The following is a typical example of external absorption in which music and surroundings blend, serving to reduce critical thought (i.e. thought that is primarily evaluative and analytical in nature), replacing it with a vivid awareness of the moment:

> Riding bike cross-country. Listening to music on headphones (Paulo Nutini). The music was quite slow…a relatively melancholy track which I find quite peaceful. I'd glimpsed that the path ahead was clear and edged forward on seat to look at the ground in the warm sunlight. The constant temperature and the mellow colour of the pebbly ground as it moved under me mesmerised me and I experienced a type of 'freeflow', forgetting that I was the power behind the movement and feeling as though I was hovering and rolling over ground; unaware of space around and above me and any conscious effort at the physical pedalling and existence of solid bike was very blurred. The music seemed to confirm the sense of warmth and fluidity – the tune had a winding/undulating tone - cancelling out the rhythm of the pedalling.
>
> [Gabrielle]

Experience of movement is central to this very short episode (c.10 seconds). The music is perceived to move (winding/undulating), Gabrielle moves forward (pedalling), although she experiences herself as 'hovering' and the ground moving under her. The multi-sensory qualities (visual, aural, kinaesthetic) and the regularity of stimuli (constant temperature, pebbly ground, repetitive pedalling) of the episode seem to contribute to a low-level absorption expressed by a visually narrowed focus that could be termed 'one-pointed'. The absorption in attributes of the surroundings (rather than associations they might give rise to) makes the experience present-centred, reduces thought and suggests an element of what Butler (2004) has termed spontaneous or positive dissociation (present here as the 'forgetting' of self) although not in the sense of cutting off from preoccupations, but rather, of the mind being flooded/occupied by sensation. Music appears to bind together the separate elements of

the experience and is cited as important in confirming a changed sense of self, distancing it from the physical activity ('cancelling out the rhythm of the pedalling'). Gabrielle experiences a momentary disorientation from reality which she terms 'free-flow' that leaves her feeling drowsy (as indicated on her experience response sheet).

It is interesting to compare this experience with an externally absorbing episode that does *not* involve music:

> Sitting/lying back on banana (reclining) chair, staring at things – light and shadow patterns of pine chest and rich red walls, the amazingly crinkled leaves of the fig plant, the blues of pots and plates…no music, just a chance just to sit for a few minutes being absorbed in the moment. [Will]

Once again, the experience is present centred ('in the moment') and involves enhanced sensory awareness – of colour, line and texture – that occupies the mind, stilling extraneous thought. The scene is more static (neither Will nor his surroundings are moving), but the eye journeys around the surroundings, suggesting a flexible and mindful rather than one-pointed attention. The cutting off from current concerns echoes the dissociative quality of Gabrielle's experience, but this time dissociation is not spontaneous, instead actively sought as an escape. The fact that Will states no music was present suggests that on occasion, music would be an unwelcome mediator of experience, precisely because it would provide a barrier to 'direct' perception.

Reduction of density of thought or internal dialogue: Summary

Free descriptions indicated that this category of absorption seemed to be aided by repetitive or monotonous stimuli which were heard (constant beat/figurations/texture, slow rate of change), seen (e.g. pebbly ground) or felt (e.g. constant temperature or touch) or take the form of actions (pedaling, filling envelopes). Thus, movement – of self, of something outside

self (perception of music moving, physical trace of movement on skin or surroundings appearing to 'pass by') was a marked source of fascination.[2] Repetitive, automatic tasks functioned to either still the mind or change relationship with thought ('watched thoughts and emotions flashing by') suggesting a dissociation from self. The resulting suspension of critical faculties encouraged in turn a heightening of the senses, as if the 'volume level' of experience had been temporarily increased (e.g. silence 'roaring', 'vivid' blue of computer screen). This selective attentional focus was either very narrow or more extensive, but in both cases the replacement of critical thought by an awareness primarily of sensation featured a preoccupation with attributes, rather than meaning of stimuli i.e. *perceiving* (e.g. shape, colour, crinkled outline) rather than *conceiving* (a fig tree leaf). Interaction with music showed this perceptual process clearly ('textures, timbres, rhythms for their own sake', 'the sounds themselves, that's what's so relaxing').

2. Absorption marked by change in sensory awareness

Activities in this category were diverse; from appreciating art or architecture, surroundings or nature to life drawing, cooking, watching live sport, gardening and mundane tasks such as washing up.

Aural stimuli were particularly prevalent during suddenly occurring moments of absorption marked by enhanced sensory awareness. One participant describes two instances where music encourages a swift, sharpened focus. In the first, he is listening to the 3rd string quartet by Philip Glass while driving on the motorway:

> At this precise moment I am sharply aware of the sun gleaming on the damp surface of the road, the crisp clear colours of the cars. [Will]

He likens it to the moment when ‘a person might shake out the water trapped in the ear after swimming …and suddenly hears the sounds around more clearly and loudly’. In this case, the blend between music and surroundings seems to act to turn up the entire ‘volume’ or intensity level of experience. Such experiences occur spontaneously, tend to be fleeting and are difficult to describe, as the second instance indicates (again occurring whilst driving):

> Traffic snarled up around the station and I’m more or less stationary for a minute or two. Become absorbed in a [Bach] sarabande I don’t know – the emotional quality as well as the timbre and texture; the gestalt if you like. I stare at a large hoarding advertising wall tiles and take in nothing about the business, but everything about the pale, almost insipid terracotta tile pattern juxtaposed with a rich dark blue that was part of a logo on the display – the colours and their qualities were the thing.

The stimuli of Bach sarabande and tile advert would seem to be incongruent, and yet provide affordances which blend to provide an unexpected moment of absorption that has nothing to do with semantic understanding i.e. the emphasis is on qualities rather than meanings of what is perceived.

Absorption via a heightened sensory awareness occurred spontaneously and briefly, in quite mundane situations. Liz (an artist) provides an example of this:

> As I slice the first carrot, the rounds fall onto the cutting board and I drink in the vivid orange colour, which always reminds me of summer, and watch the circles fall into a random pattern, some stick together, others roll across the board…I enjoy the sensation of the knife cutting through the crunchy texture and feeling the coldness of the bright circles as I scoop them up and drop them into the metal steamer. Their colour is reflected in the metal and each round makes a lovely banging noise as it hits the metal. [Liz]

The experience is obviously multi-sensory – visual, aural and tactile – the various modalities combining to provide a present-centred, close absorption in shape, colour and texture. With the exception of the associative reference to summer, the episode centres around simple awareness, rather than thoughts and feelings (i.e. the contents of consciousness) and so indicates a dissociation from self via deautomatization of thought, i.e. 'an undoing of the automatic processes that control perception and cognition' (Deikman, 1982: 137). The term deautomatization was first coined by Hartmann (1958) in his discussion of motor behaviour, and, as a concept, was developed by Gill and Brenman (1959) with relation to hypnosis. As Deikman puts it: Emotions, thought, impulses, images and sensations are the *contents* of consciousness…likewise, the body, self-image, and the self-concept are all constructs that we *observe.* But our core sense of personal existence – the "I" – is located in awareness itself, not in its content' (1982: 10). In a wide-ranging discussion of the adaptive value of art, Dissanayake (1988) refers to its "dishabituation" function, meaning that artistic engagement may encourage 'unusual, non-habitual way[s]' of responding (1988: 69).

Changes in sensory awareness: Summary

Absorption featuring changes in sensory awareness demonstrated an attentional focus that was either narrow and one pointed with a close focus awareness (e.g. when weeding), or more flexible and extensive with a contemplative, broad awareness (looking at a temple in the distance), or fluctuating between the two. As with experiences characterized by reduction of thought, critical awareness and lowered arousal, a focus on restricted stimuli, together with repetitive qualities – either of activity (e.g. digging) or of stimulus (circular patterns of an artexed ceiling) – provided an obvious source of involvement via selective, restricted

attention. Regular movement or movement with a slow rate of change, whether seen, (e.g. clouds moving) heard (e.g. music) or felt (being on the train), was also cited by individuals as having the potential to induce an absorbed or dissociative state. Rate of movement (particularly when the perceiver was static on something else that was moving, e.g. a train) had the capacity to temporarily disrupt temporal synchronicity and to encourage restricted mental activity (e.g. counting windows when on a moving train). A substantial number of individuals describing shifts of consciousness featuring changes to sensory awareness reported either an amplification of everyday sounds (including music), or a changed awareness where sounds normally ignored appear amplified, (e.g. the hum of a TV or computer) sometimes to the point where they seem to 'replace' thought, leading to a dissociation from self. Absorbing experiences appear to fall into three sub- categories:

1. A simple awareness of heightened multi-sensory sensation (e.g. vivid colours, textures, sounds, acoustic attributes of music) rather than thoughts or feelings. This was marked by a feeling of seeing things 'afresh' or in a new way, suggesting an element of dissociation from self via deautomatization of thought (Deikman, 1982: 137). Such involvement tended to occur in conjunction with everyday tasks and was often spontaneous.

2. A heightened, multi-sensory awareness, as described above, but also coupled with raised arousal/alertness levels and/or a strongly affective tone, giving a feel of sharpened awareness. This type of experience often involved sound or music in conjunction with vision (e.g. the disorientating sound of seagulls in an unexpected context (central London) prompting a 'figurative slap on the cheek').

3. A multi-layered involvement (external and internal absorption) deriving from a combination of heightened or changed sensory awareness plus an element of mental or imaginative involvement. A large number of diverse experiences fell into this sub-category, such as the combined effect of mental, visual and emotional involvement in a live rugby

match, the combination of mental, motoric and visual involvement present in a life drawing class (involving outwardly and inwardly directed attention, plus alternation between restricted and contemplative awareness) or the use of imaginative involvement to heighten visual experience. Prior knowledge or imagination were crucial in terms of both the construction and intensity of such experiences.

3. Absorption marked by imaginative involvement

Absorption characterized by imaginative involvement was prompted by active, goal-directed occupations such as running, walking; overtly creative pursuits such as writing or telling stories; more apparently passive, but still creative involvements such as listening to stories, listening to music, day dreaming, reading, imagining fiction, plus circumstances such as traveling on a train, or being in a crowded place.

Free descriptions indicated that external experience is frequently supplemented by an internally created reality in daily life. The following experience, involving music as the main focus of attention, is typical:

> On train listen to Shostakovich *Leningrad Symphony*. Always loved this for describing war horror – very filmy to me. Really feel hate and pain inside the music. Stare out of window, book unread, but probably not relating the views to music much. Internal mental images that I was getting were of horror of war from news footage. Lots of slow motion for some reason.[3] Lots of thoughts & pictures about death and destruction mostly, but include frequent images of Shostakovitch's face with square framed bakelite glasses & suit & tie & thinking how his appearance & the music seemed so opposite. [Max]

This listening episode is characterised by a narrowed external focus and relaxation of the critical faculty, resulting in a diminished connection with external reality. Max responds both to musical characteristics and 'extra-musical' associations - what Dibben has termed 'acoustic attributes' and 'source specifications' (Dibben, 2001: 183). The listening is therefore performative, not passive; meaning is actively constructed. The episode also suggests a fluctuation – even contradiction – of experience. Emotional involvement ('really feel hate and pain inside the music') and vivid internal images co-exist with a tangential strand of thought which seems to lead away from the music, concerning Shostakovitch's appearance – this in turn triggering other thoughts about links between a composers' (received) image and the music they produce.

Imaginative involvement is not restricted to experiences featuring a predominantly inward focus. Absorption in daily life often draws on the capacity of music to blend with aspects of surroundings, as well as internal imagery, as in this episode concerning a recording of Mozart's *Andante and Variations in G* (for two pianos) heard in the car:

> …Tone of low notes a dark, rich colour (chocolate brown without the sickly taste of chocolate) evoked in the mind in passing. Outside crisp clarity – as if one had suddenly focused a lens or cleaned the windscreen so that the colours and the textures in the music shone out…we go into the fish and chip shop in happy car trance. [Will]

Involvement comes from a selective external attention ('crisp clarity') to surroundings coupled with synaesthetic internal imagery ('chocolate brown' low notes) that is informed by the music, but reflects back onto the aural perception of it. The equation of colours, textures and taste with what is heard, is evident in the language Will uses, emphasizes the blurring of modalities within the experience. This type of episode is obviously not unfamiliar to Will, as he labels it 'happy car trance'.

In the following description of a visit to the Neolithic temples of Haga Qim and Mnajdra in Malta, a broad-focussed, contemplative awareness of surroundings is once again mediated by the imagination. As in the two examples above, solitude appears as a pre-requisite for this to occur:

> I waited until no-one else was around – just a man and his dog guarding them [the temples]. You don't want other people with their handbags and toffees – you want to reach through to the past. It was the approach to the place that caught me – a long path through fields. The temple uprights stand like huge dinosaur teeth, worn limestone peaks bright against the vivid sea and sky -Wow! I was in awe of the place – you just couldn't help but imagine what it was like 5-6000 years ago. [Lilia]

Imaginative involvement: summary

All absorption marked by imaginative involvement featured a restricted awareness span, but the locus of attention during episodes varied, with three main 'types' of experience emerging:

1. An external attentional focus on an automatic or repetitive task and initial physical absorption (e.g. digging) prompted internal reminiscence/imagery that might or might not be linked to that task. Seemingly inconsequential triggers (gravel) acted as a short-cut to extensive reminiscences. On one level, imaginative involvement provides a relief from such mundane occupations, and seems to be a coping mechanism for such situations. At the same time, simple tasks seem to calm or occupy a part of the mind, allowing mental 'space' or even 'granting permission', for other thoughts to occur via a relaxation of a more restless, critical awareness.

2. Attention could be inwardly focused from the start of the point of involvement (stemming from a volitional desire to detach from surroundings) as when imagining novels in the head, or daydreaming.

3. Attention could be divided throughout between inwardly generated imagery which is linked to or blended with external surroundings (especially when on the move). Such multi-layered experiences often constituted richly positive involvements.

Imagery appeared to be influenced by the nature of particular activities. Images experienced when reading tended, unsurprisingly to feel more prescribed or guided when compared to the 'less sharply specific' imagery triggered by music (although this was not true in the case of reminiscence/strong association).[4] However, when *listening* to stories or spoken word, internal imagery sometimes incorporated elements of external surroundings (e.g. when listening to a folk-tale 'the swirled patterns of a bleached wooden beam suggesting something celtic') just as when listening to music. The most involving imagery was multi-dimensional, and often described as filmic ('I see the action, I hear the conversation…a *full* experience').

Summary of involving features

Across activities, episodes of absorption were commonly characterized by imaginative involvement and multi-sensory engagement. In addition, movement, pattern and repetition were stimulus properties frequently referred to as affording involvement across a diverse range of artistic and non-artistic activities. Movement emerged as a focus for involvement (as seen, as heard, as felt) in several ways: from movement suggested by music, to movement as narrative process in literature and sport, or movement of natural objects (e.g. clouds), self-movement or being on a moving object (e.g. a train). Hearing music could also intensify the sense of movement present in other perceptual modes. Repetition – of action, of sound or visual pattern – was also a common focus for involvement, often occurring in conjunction with a restricted attentional focus on a small number of stimuli. From an evolutionary

perspective such features may hold an innate fascination because the detection of their presence possesses adaptive value (in terms of monitoring external threats and recognizing and organizing the surrounding environment). Evolutionary aesthetics is a developing field of research that examines ancestral preferences connected to choice of suitable habitat, food, sexual partner etc (Voland, 2003). One hypothesis has been that the invariant properties of certain stimuli allows them to 'function as test patterns to tune our perceptual machinery' (Tooby and Cosmides, 2001: 17). One reason why visual and decorative arts have the capacity to hold attention is therefore because they exaggerate naturally occurring visual phenomena (Ramachandran and Hirstein, 1999).

Conclusions

Absorption: trait or state?

One aim of this project was to clarify is whether the absorbing and dissociative experiences described by participants derived primarily from a psychological capacity for involvement (involvement as trait, consistently apparent across a diverse range of situations) or from interaction with specific contexts and stimulus properties that relied upon individual preferences and current emotional set (involvement as state, apparent in selective contexts).

Establishing a link between trait and state absorption using questionnaire results proved problematic because experiential reports of participants with scores *below* the mean did not predict an expected low score for trait absorption, either in terms of frequency or intensity of absorbing episodes and it is possible that the MODTAS only relates to certain aspects of experience. For example, the lowest scoring participant described an established (twenty year) practice of imaginative involvement (creating and reviewing novels in the head). Examination of the structure and content of the MODTAS suggests some reasons for this.

The original TAS was the result of a factor-analytic study of hypnotic-like experiences in everyday life, tracing its origins to Shor's (1960) pioneering work in that area. Jamieson (2005: 126-7) has identified five over-arching factors represented within the MODTAS: aesthetic involvement in nature (factor 1), ASC (factor 2), imaginative involvement (factor 3), ESP (factor 4) and synaesthesia (factor 5). This indicates that the scale is 'not a rag-bag of independent items connected only by spurious random inter-item correlations' (2005: 131). Nevertheless, it has limitations. Jamieson acknowledges that the primary factors he has identified may 'not exhaust the entire domain of expression of the higher order factor [absorption]' (2005: 133). Additionally, sensory modalities are unevenly represented e.g. 'factor 1 items are predominantly visual in modality, [indeed, in the current project, the highest scores were attained by artists], raising the question of whether corresponding scales should be developed for other sensory modalities' (Jamieson, 2005: 126). Nagy and Szabo's (2002) 29 item questionnaire designed to tap musical involvement (only five items on the MODTAS reference this) is one example of such a scale. Because the MODTAS does not appear to provide a complete phenomenology of absorption (Jamieson, 2005), and did not directly tap all of the experiential details relating to absorption mentioned in participant reports, the use of a different questionnaire may have revealed a different correlation between trait and state. For example, because Shor's (older) 28 item Personal Experiences Questionnaire, (PEQ) on which the TAS draws, is designed to assess the extent of 'hypnotic-like' experiences in everyday life (i.e. not solely absorption), it possesses a slightly different emphasis. The more inclusive brief refers to a wider concept (of trancing) and dissociative and absorbing items intermingle more extensively than in the TAS. Thus, it relates more specifically to vacancy, flow and automatic task completion.[5]

Inevitably, all scales must function as methodological artifacts that 'construct the evidence' to a greater or lesser extent. The concepts of 'trait' and 'state' are also constructions deriving from formal (nomothetic, questionnaire-based) and implicit ('common-sense') personality theories. In this division of experience a trait is defined as a characteristic that endures over time, whereas a state is transient and dependent on situation and mood. Trait theories are attractive because 'without this underlying idea of consistency the notion of personality seems to vanish' (Thomas, 2002: 295), but it is important to appreciate that there is no firm consensus within psychological literature that traits must always be in evidence from birth.

Participant reports in the comparative project suggest that brief, often subtle and easily forgotten episodes of absorption are a common feature of daily life, and that whilst some participants may display a seemingly greater 'trait capacity' for absorption, it is more fruitful to abandon notions of trait and state, and consider it as an attentional given that is informed by an interactive process between organism and environment. This way of managing attention (effortless and non-volitional) is present in childhood (easily observable in the way babies interact with their surroundings) but may be concealed/lessened in adult life due to the influence of culture and personal circumstance. Although a given, it will be influenced by factors such as motivation, involvement in particular skills and – crucially – perceptual habits. Becker (in Juslin and Sloboda, 2001) has adopted Bourdieu's notion of *habitus* to describe the situatedness of experience, describing it as 'an embodied pattern of action and reaction in which we are not fully conscious of why we do what we do' (2001: 138). The contexts in which a person is likely to experience absorption will be influenced by this 'embodied pattern of action and reaction' together with how conscious they are of the occurrence of such experiences.

If this is the case, the emphasis on trait studies in absorption research may simply be an extensive and enduring example of what attribution theory terms the 'fundamental attribution error': [6]

> When interpreting other people's behaviour, human beings invariably make the mistake of overestimating fundamental character traits and underestimating the importance of situation and context. We will always reach for a "dispositional" explanation of events, as opposed to a contextual explanation…the fundamental attribution error makes the world a simpler and more understandable place. (Gladwell, 2001: 160).

Music and absorption

Whilst absorption may result from interaction with a range of artistic and non-artistic activities, empirical evidence suggests that music may be a particularly effective agent in the facilitation of absorption because it affords multiple potential entry points to involvement i.e. a wide variety of attentional loci. Absorption may centre on one or a combination of the following:

- Acoustic attributes of music (qualities of sounds themselves e.g. timbre, resonance, rhythm, pitch etc). Headphones may mediate involvement, triggering a fascination with virtual spatial features i.e. a perceptual sense of being surrounded by sound, sound moving from left to right or between foreground and background. Music, through its internal organization, may disrupt temporal synchronicity, allowing the perceiver to temporarily stand outside clock time via entrainment to a different time frame. A sense of temporal compression or suspension and of being perceptually 'hooked' by movement are common to the experience of a range of involving

activities, but music is able to articulate such phenomena particularly clearly, perhaps because it is more 'transparent' as a medium i.e. not a carrier of semantically exact meaning.

- Source specifications of music i.e. memories and personal/cultural associations which trigger imaginative involvement
- Physical entrainment to music
- Emotion induced or represented by music
- Fusion of modalities (aural, visual, kinaesthetic).

Participant reports showed that multi-modal absorbed experiences featuring music were extremely common, indicating that it is a particularly effective mediator of experience. Music can enable individuals to blend/bind together of elements of external awareness that might otherwise be perceptually separated, and also to link internal thoughts and associations with external concerns. Music is particularly adaptable to circumstance due to its very lack of prescriptive 'content'. Because it is not a prime means of communication, but a semantically malleable, embedded, portable medium, it is easily customized, and therefore intimately connected with mental self-regulation, potentially facilitating subtle shifts of consciousness during the process of daily living, including instances of low arousal absorption. In comparison with more extreme or profound alterations of consciousness experienced whilst listening to or playing music, subtle shifts of psycho-physiological functioning have received little academic attention. Further empirical research concerning the psychological processes involved in everyday music listening is needed in order to be able to establish whether findings from this project are generalisable to larger populations.

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Endnotes

(1) The structure and content of the experience response form drew on Sloboda et al.'s Experience Sampling Method Response Sheet, used in their 2001 study of music in everyday life. In particular, it reproduces section A, and uses some of the bipolar mood scales from section B. In the event, the bipolar mood scales included on experience response forms were of limited value, because the grid provided was sometimes misunderstood, or words (such as detachment) were differently interpreted.

(2) In an extensive discussion on the relationship between music and motion, Clarke remarks that because 'subjective engagement with music is strongly corporeal, proprioceptive, and motional [it] may on occasion provide listeners with experiences of "impossible worlds" that have the attraction of other forms of virtual reality' (2001: 229). The engagement he describes accords well with the suggestion (from this project) that such experiences may involve shifts of consciousness, including absorption.

(3) Flaherty observes that ‘it has become commonplace for directors to depict violence in their films through slow-motion cinematography’ (1999: 51) thus communicating a sense of protracted time.

(4) Imaginative involvement when reading was not restricted to fiction. For example, ideas presented in factual documents are rarely specifically prescriptive, often employing metaphors which demand imaginative ‘decoding’.

(5) There are various versions of the PEQ, which date back to a 149 item scale from 1960. John Kihlstrom, who worked with Shor’s colleague, Martin Orne between 1970-1975 has kindly supplied me with the 28 item version, but advises against using it (personal correspondence). Whilst the TAS has a far tighter internal construction, I do not consider that it has superceded the PEQ in all aspects, as participant reports from this project have made clear.

(6) The term was originated by Lee D Ross, professor of social psychology at Stanford University and refers to situations in which people tend to see the behaviour of others as linked to what ‘kind’ of person they are, as opposed to being a response to demands of a particular circumstance.

TABLE CAPTIONS

Table 1

Item Response distribution for Personal Experiences Questionnaire (MODTAS) and comparison with individual question mean scores from Jamieson (2005)

Table 2

Individual aggregate scores for Personal Experiences Questionnaire (MODTAS)

FIGURE 1

Qu	Item	N	0	1	2	3	4	Mean Score	Mean Score (Jamieson)
1	Experience things as did when a child	20	2	5	10	3	0	1.7	1.64
2	Moved by poetic language	20	1	0	5	8	6	2.9	1.85
3	Watching movie/TV/play …becomes real	20	2	2	9	3	4	2.25	2.06
4	Stare at picture, look away and still "see" it	20	2	2	7	6	3	2.3	2.05
5	Feel as if mind could take in whole world	19	7	3	1	5	3	1.68	1.3
6	Like to watch cloud shapes	20	1	2	8	6	3	2.4	2.27
7	Imagine vividly – holds attention as good story would	20	1	1	3	10	5	2.85	2.53
8	Know what people mean by mystical experiences	20	2	2	4	9	3	2.45	1.47
9	"step outside" usual self –different state of being	20	3	1	4	7	5	2.5	0.99
10	Textures remind me of colours	20	8	7	2	2	1	1.05	1.26
11	Experience a special sharpening of reality	19	0	2	7	7	3	2.57	1.25
12	Get caught up listening to music - otherwise unaware	20	0	4	4	8	4	2.6	2.20
13	Imagine body so heavy it is immoveable	20	8	3	2	5	2	1.5	1.17
14	Sense presence of person before see or hear them	20	3	4	5	7	1	1.85	2.01
15	Fire stimulates imagination	20	1	4	5	5	5	2.45	2.20
16	Immersion in nature or art – consciousness altered	20	0	2	5	8	5	1.95	1.80
17	Different colours have distinctive meanings	20	6	2	5	4	3	1.8	2.34

18	Wander off into own thoughts during routine task.	20	1	1	2	12	4	2.85	2.42
19	Experiences vividly recollected as if actually happening	20	0	2	5	7	6	2.85	2.47
20	Things meaningless to others make sense to me	20	0	4	4	8	4	2.6	2.53
21	“Become” character in play when acting	20	10	2	2	1	5	1.45	1.72
22	Thoughts as visual images	20	2	3	5	3	7	2.5	2.19
23	Delight in small things e.g. soap bubbles	20	1	1	6	9	3	2.6	2.18
24	Feel lifted into air by powerful music	20	4	3	3	4	6	2.05	1.81
25	Change noise into music by way listen to it	20	3	4	2	8	3	2.2	1.5
26	Scents and smells evoke vivid memories	20	1	4	5	6	4	2.05	2.27
27	Music reminds me of pictures/moving patterns of colour	20	4	2	4	9	1	2.05	2.0
28	Know what someone is going to say	20	3	3	3	10	1	2.15	2.14
29	Physical memories e.g. of swimming	20	5	5	6	1	3	1.6	1.90
30	Sound of a voice as fascinating	19	3	5	3	2	6	2.15	1.95
31	Feel presence of someone not physically there	20	6	6	4	1	3	1.45	1.56
32	Thoughts/images as effortless	20	0	0	5	10	5	3.0	2.45
33	Different odours have different colours	20	12	3	1	2	2	0.95	1.22
34	I am deeply moved by a sunset.	20	1	1	3	4	11	3.15	2.65

Note: Entries refer to total number of responses to that item of that value.

FIGURE 2

Individual scores

1. Tilly 111	11. Joy 73
2. Chaz 106	11 (12) Hugh 73
3. Liz 99	11 (13) Judy 73
4. Tina 93	14. Louise 72
5. Monty 88	15. Gary 65
6. Hazel 86	16. Max 61
7. Clara 85	17. Jimi 56
8. Will 84	18. Gabrielle 50
9.David 81	19 D.A. 43
10. Lilia 75	20 Mary 41

Appendix 1

Personal attitudes and experiences

Please fill in the following questionnaire by circling the number which corresponds to how frequently each of the following statements is true of your experience. Where 0 means “never,” 1 means “at least once,” 2 means “occasionally,” 3 means “often,” and 4 means “very often.” It is imperative that you answer these questions as honestly as possible. Please do not return this questionnaire if you do not feel you have been able to cooperate with this request.

1.	I feel and experience things as I did when I was a child.	0 1 2 3 4
2.	I am greatly moved by eloquent or poetic language.	0 1 2 3 4
3.	While watching a movie, a TV show, or a play I become so involved that I forget about myself and my surroundings and experience the story as if it were real and as if I was taking part in it.	0 1 2 3 4
4.	If I stare at a picture and then look away from it, I can “see” an image of the picture, almost as if I were still looking at it.	0 1 2 3 4
5.	It feels as if my mind could take in the whole world.	0 1 2 3 4
6.	I like to watch cloud shapes change in the sky.	0 1 2 3 4
7.	I imagine (or daydream) some things so vividly that they hold my attention as a good movie or story does	0 1 2 3 4
8.	I think I know what some people mean when they talk about mystical experiences.	0 1 2 3 4
9.	I “step outside” my usual self and experience an entirely different state of being.	0 1 2 3 4

10.	Textures – such as wool, sand, wood – remind me of colours and/or music.	0 1 2 3 4
11.	I experience a special sharpening of reality.	0 1 2 3 4
12.	When I listen to music, I get so caught up in it that I don't notice anything else.	0 1 2 3 4
13.	If I wish, I can imagine that my body is so heavy that I could not move it if I wanted to.	0 1 2 3 4
14.	I somehow sense the presence of another person before I actually see or hear her/him.	0 1 2 3 4
15.	The crackle and flames of a wood fire stimulate my imagination.	0 1 2 3 4
16.	I become completely immersed in nature or in art and feel as if my whole state of consciousness has somehow been temporarily altered.	0 1 2 3 4
17.	Different colours have distinctive and special meanings for me.	0 1 2 3 4
18.	I wander off into my own thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it.	0 1 2 3 4
19.	I recollect certain past experiences in my life with such clarity and vividness that it is like living them again or almost so.	0 1 2 3 4
20.	Some things that might seem meaningless to others make sense to me.	0 1 2 3 4
21.	While acting in a play I think I could really feel the emotions of the character and "become" her/him for the time being, forgetting myself and the audience.	0 1 2 3 4
22.	My thoughts don't occur as words but as visual images.	0 1 2 3 4
23.	I take delight in small things (like the five-pointed star shape that appears when you cut an apple across the core or the colours in soap bubbles).	0 1 2 3 4
24.	When listening to organ music or other powerful music, I feel as if I am being lifted into the air.	0 1 2 3 4
25.	I can change noise into music by the way I listen to it.	0 1 2 3 4
26.	Some of my most vivid memories are called up by scents and smells.	0 1 2 3 4
27.	Certain pieces of music remind me of pictures or moving patterns of colour.	0 1 2 3 4
28.	I know what someone is going to say before he or she says it.	0 1 2 3 4
29.	I have "physical memories": for example, after I've been swimming I may still feel as if I'm in the water.	0 1 2 3 4

30.	The sound of a voice can be so fascinating to me that I can just go on and on listening to it.	0 1 2 3 4
31.	I somehow feel the presence of someone who is not physically there.	0 1 2 3 4
32.	Thoughts and images come to me without the slightest effort on my part.	0 1 2 3 4
33.	I find that different odours have different colours	0 1 2 3 4
34.	I am deeply moved by a sunset.	0 1 2 3 4

Appendix 2

Participant Occupations

Jimi, 18, year 13 student; Gabrielle, 27, primary school teacher; Clara, 28, accounts assistant; Gary, 33, fundraiser; Louise, 34, peripatetic music teacher; Liz, 40, artist and housewife; Hazel, 43, writer; Mary, 45, history of art and design lecturer; Joy, 46, author; Hugh, 46, financier; Max, 46, film recording mixer and professional musician; Tina, 46, podiatrist; Chaz, 47, clinical hypnotherapist; David, 51, finance manager; Tilly, 53 artist and therapist; Monty, 55, clinical hypnotherapist and psychotherapist; Will, 57, professional musician and storyteller; D.A., 60, film and cultural studies lecturer; Judy, 66, retired teacher; Lilia, 71, retired.