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Predictors of Wellbeing in Young Adults with Aphasia and Young Adults with Developmental Language Disorder

by

Vasiliki Kladouchou

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School of Health Sciences,

City, University of London, UK

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Στους γονείς μου, Αντώνη και Γεωργία,

που πάντα ξεκλειδώνουν τις πόρτες προς τα όνειρα μας.

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Abstract

In health research, there is an increasing interest in the impact of disorders on people's wellbeing, while understanding its main predictors is crucial before effective interventions and services can be developed. Accumulating evidence shows that both aphasia and developmental language disorder (DLD) have profound social and emotional effects on people's lives, with most of research focusing on older adults with aphasia and children/adolescents with DLD. Although young adulthood is a challenging life-stage, stroke incidence increases in young adults (YA), and DLD has been acknowledged as a lifelong disorder persisting beyond adolescence to young adulthood, there is a gap in the literature concerning the wellbeing of YA with these disorders. The main aim of this research is to investigate predictors of wellbeing in YA with aphasia and YA with DLD and make a direct comparison between the two for first time. This will help stakeholders understand the similar and different pathways to wellbeing between two language disorders of different etiologies that have described to share some common symptoms.

A cross-sectional between-group study was designed. YA (18-40 years old) recruited adopting a broad recruitment strategy which included the involvement of schools, organisations, and use of social media. Fourteen different questionnaires and psychometric measures were administered to all participants to capture wellbeing (dependent variable) and potential drivers of it, including demographics, language, cognition, health, social functioning, emotional health, and personal resources (independent variables). The feasibility of testing procedure and acceptability of testing materials were informed by a pilot study. One-way ANOVAs and Kruskal-Wallis tests were used as appropriate to compare language, cognition, and wellbeing across the three groups. Consistent and differentiating predictors and correlates of wellbeing across groups were investigated with the use of standard multiple regression and statistical comparison of correlations of independent samples, respectively.

Nineteen individuals with aphasia (mean age of 34.8 years), 20 with DLD (mean age of 28.2 years), and 39 people with no history of language disorders (mean age of 29.5 years) were recruited, resulting in a total of 78 participants. A) YA from clinical groups shared similar language and cognitive profiles, scoring significantly lower in language and cognitive domains compared to controls. B) Positively, wellbeing of young people with language disorders was similar to that of neurotypical controls. C1) General health, social support, emotional and behavioural difficulties, and self-esteem were significant consistent predictors of wellbeing for the overall sample, accounting for 57% of the variance in the wellbeing scores. C2) There was a statistically significant difference in how social connectedness and self-esteem were associated with wellbeing between TD and aphasia groups; the relationship was stronger for the TD group. The relationship of overall language with wellbeing was significantly different between the TD and DLD groups, as was the relationship between oral expression and wellbeing for the aphasia and DLD groups. The links between language and wellbeing were strong for the DLD group, but small/unimportant for the other two groups.

Despite common clinical characteristics, similar levels of wellbeing, and some sharing predictors of wellbeing between the two clinical groups, their pathways to wellbeing differed, perhaps reflecting the different origin and etiology of the two language disorders (developmental vs acquired). For YA with DLD wellbeing was primary affected by their inherent clinical characteristics, while having grown up with intact language skills YA with aphasia and their wellbeing were mostly influenced by the emotional and health consequences secondary to aphasia. Finally, in TD YA, internal resources and social aspects of life seemed to drive wellbeing the most. This work can stimulate new research that considers the multifaceted nature of wellbeing, inform the development of support services tailored to the specific needs of young adults, and encourage clinicians to consider holistic therapeutic approaches with continual psychosocial support in order to help YA with aphasia and those with DLD reach their full potential.

List of abbreviations

ADL: activities of daily living
A-FROM: Framework for Outcome Measurement
AQ-10: Spectrum Quotient - 10
ASD: autism spectrum disorder
ASLTIP: Association of Speech and Language Therapists in Independent Practice
BESD: behavioural, emotional, and social difficulties
CELF: Clinical Evaluation of Language Fundamentals
CIQ: Community Intergration Questionnaire
City: City, University of London
CLQT: Cognitive Linguistic Quick Test
D-KEFS: Delis-Kaplan Executive Function System Battery
DLD: developmental language disorder, 16
DV: dependent variable
EQ-5D-3L: European Quality of Life - Three Dimensions
EQ-5D-5L: European Quality of life Five Dimension Five Level scale
EQ-VAS: EuroQol Visual Analogue Scale
FAST: Frenchay Aphasia Screening Test
GHQ-12: General Health Questionnaire - 12 Item
GHQ-28: General Health Questionnaire – 28 item
GSE: General Self-efficacy Scale
HRQoL: health-related quality of life
ICF: International Classification of Functioning, Disability and Health
IV: independent variable
LD: learning disability
MLS: Manchester Language Study
MOS-SSS: Medical Outcome Studies Social Support Survey
NICE: National Institute for Health & Care Excellence
NVIQ: non-verbal IQ
ONS: Office for National Statistics
ONS4: Office for National Statistic's subjective wellbeing questions
PIS: Participant Information Sheet
PwA: people with aphasia
QoL: quality of life
RCPM: Raven's Coloured Progressive Matrices
RCSLT: Royal College of Speech and Language Therapists
RQ: research question
RSE: Rosenberg Self-esteem Scale
SCS: Social Connectedness Scale
SCS-R: Social Connectedness Scale – Revised
SD: standard deviation
SDQ: Strength and Difficulties Questionnaire
SES: socioeconomic status
SLI: specific language impairment
SLTs: speech and language therapists
SSNS: Stroke Social Network Scale
SWEMWBS: Short Warwick-Edinburgh Mental Wellbeing Scale
TD: typically developing
VAS: Visual Analogue Scale
WAB-R: Western Aphasia Battery - Revised
WEMWBS: Warwick-Edinburgh Mental Well-being Scale
WHO: World Health Organisation
WIAT-II: Wechsler Individual Achievement Test - Second Edition
WISC: Wechsler Intelligence Scale for Children
YA: Young adults

CHAPTER 1

1 Introduction

The purpose of the current project is to explore factors that affect wellbeing in two vulnerable yet understudied groups with language disorder: young adults (YA) with aphasia and YA with developmental language disorder (DLD). This chapter provides the background to the project, defines relevant concepts, and presents related theoretical models.

1.1 Background

In recent years, there has been an increasing interest in the impact of communication disorders on people's lives and interventions that produce meaningful real-life outcomes can lead to enhanced quality of life (QoL) (Chapey et al., 2000). As a result, changes are occurring in the way health care provision is viewed. Language disorders lead to psychosocial difficulties (Durkin & Conti-Ramsden, 2010; Hilari et al., 2012) which influence people's QoL and the outcome of rehabilitation (Gainotti, 1997). Thus, there is an increasing need for clinicians to provide intervention in the context of each person's broader life quality issues, with emphasis not only on improving physical function, but also emotional and social wellbeing (Department of Health, 2007). Although understanding of the main predictors of wellbeing of people with such disorders is crucial before interventions and service provision can be targeted effectively, knowledge of factors affecting wellbeing outcomes is limited.

Aphasia is a communication disability caused most by a stroke. Stroke is the third biggest cause of death in the UK (Wolfe, 2000), with 7% of all deaths in the UK being caused by stroke (Stroke Association, 2017). It is also the most common cause of complex disability in adults in the Western world (Adamson et al., 2004). In 2010, there were 17 million incidences of first-time stroke worldwide (Feigin et al., 2014), while there are more than 1.2 million stroke survivors in the UK (Stroke Association, 2017).

Although strokes most typically occur in older people, a significant proportion of younger people is affected (Daniel et al., 2009; Naess et al., 2009). The incidence of ischemic stroke in individuals aged below 55 years has been rising over the last three decades (Bejot et al., 2014). Approximately 10% to 14% of all ischemic strokes occur in YA aged 18 to 50 years (Schaapsmeerders et al., 2013). About 30% of stroke survivors present with aphasia (Flowers et al., 2013). Fifteen percent of individuals under the age of 65 experience aphasia after the first ischemic stroke, while the relevant percentage for individuals 85 years old and over is 43% (Engelter et al., 2006). The increasing stroke rates in this younger age group is accompanied by an increasing interest in stroke outcomes and their predictors for this age group (Nedeltchev, 2005).

DLD, on the other hand, occurs in childhood with a prevalence of 7.6% according to the latest estimate (Norbury et al., 2016) and is diagnosed when language lags behind other areas of development for no apparent reason (Bishop & Snowling, 2004). Only recently has DLD been acknowledged as a long-term disorder, resulting in more attention to long-term outcomes and to wider life issues (Botting, Toseeb, et al., 2016; Botting, Durkin, et al., 2016; Brownlie et al., 2016; Clegg et al., 2005; Conti-Ramsden et al., 2016; Howlin et al., 2000). Longer-term investigations have found that receptive and expressive language disorders tend to persist into later childhood, adolescence, and early adult life (Botting, 2020; Clegg et al., 2005). In particular, research has shown that almost half of children diagnosed with DLD will experience communication impairment as a lifelong disorder (Clegg et al., 2005; Conti-Ramsden & Botting, 2008; Snowling et al., 2006).

As sufficient communication is an integral part of positive QoL (Lee et al., 2015), language problems in both groups described above are likely to have a significant impact on people's lives. Research in these areas has focused primarily on wellbeing and QoL of *older adults* with aphasia and *children and adolescents* with DLD and has revealed profound negative emotional and social consequences in both groups (Clegg et al., 2005; Hemsley & Code, 1996). However, there is limited evidence for outcomes in young adulthood for either disorder.

1.2 Definitions

1.2.1 Aphasia

Aphasia refers to the disruption to any or all of the skills, associations, and habits of spoken and/or written language, produced by injury to certain brain areas specialised for these functions (Goodglass & Kaplan, 1983). All languages can be similarly affected, including sign language used by deaf people. In some individuals, the ability to use non-verbal communication, such as drawing or gesturing, is also impaired (Code & Herrmann, 2003). Aphasia is most often caused by stroke, but any disease or damage to the parts of the brain that control language can result in aphasia, including brain tumours, traumatic brain injury, and progressive neurological disorders (Code & Herrmann, 2003). Throughout the present thesis, the term *aphasia* will be consistently used to mean the acquired language impairment of adults following stroke as described above.

1.2.2 Developmental Language Disorder

There has been ongoing discussion about the most appropriate terminology to use for children who have difficulties with expressive and/or receptive language skills in the absence of other underlying reasons. Different terms have been used in the literature, with *specific language impairment* (SLI) being the most common until recently. Previously SLI was used to describe children with language impairment whose cognitive skills were within normal limits and where there was no identifiable reason for the language impairment. It was determined by applying exclusionary criteria, so that it was defined by what it is not rather than by what it is (Reilly et al., 2014).

An important set of papers, led by articles from Bishop (2014) and Reilly et al. (2014), raised and discussed different issues about the criteria and terminology of the disorder, such as the identification of the language problem and diagnostic criteria. This debate highlighted the need for consensus on the term and criteria to be used, to facilitate communication between stakeholders. The CATALISE panel (Bishop et al., 2016; Bishop et al., 2017) agreed the terms *Language Disorder* and *DLD*. The former is an umbrella term to refer to language difficulties that interfere with communication or learning in everyday life and which are unlikely to resolve spontaneously. Children with Language Disorder can have other diagnoses associated with language difficulties, such as autism, Down's syndrome, hearing impairment, brain injury, cerebral palsy, or epilepsy. The term DLD is reserved for children who do not have the diagnoses listed above. All children who were previously diagnosed with SLI would fit the new criteria for DLD. The two terms differ in the following two ways: DLD does not require a) a mismatch between verbal and nonverbal ability (cognitive referencing) and/or b) an uneven profile of language skills. In addition, the panel agreed that DLD often co-occurs with other disorders and difficulties, which means that DLD should not be ruled out in the presence of other diagnoses, but rather it should be considered when deciding on intervention and education plans.

Thus, the new term DLD as agreed via a Delphi consensus (CATALISE; Bishop et al., 2016) will be used throughout this thesis to mean difficulties with expressive and/or receptive language skills that impact on everyday life, where there is no identifiable reason for the language impairment. Mismatch between verbal and nonverbal ability and/or an uneven profile of language skills will be not considered necessary. Also, participants should have no additional diagnosis (e.g., autism spectrum disorder [ASD]).

1.2.3 Young adults

What constitutes young adulthood cannot be exactly defined, as it varies based on a mix of overlapping indices employed (legal, maturational, occupational, sexual, emotional), or on whether a developmental or a social perspective is taken (Levinson, 1986).

Despite this fluidity, there is broad agreement that it is essentially the twenties and thirties which constitute 'Early adulthood' which is the basis for what Levinson calls the Dream, i.e., a vision of one's goals in life which provides motivation and enthusiasm for the future (Birch, 1997). Building on historical work by psychodynamic theorists such as Erikson and Freud, Levinson's framework is perhaps the best-known theory of adult development. According to it, the ages of 17 to 45 encompass early adulthood, which he divides into the novice phase (17–33 years of age) and the culminating phase (33–45 years of age). Levinson further divides the novice phase into the stages of early adult transition (17–22 years of age), entering the adult world (22–28 years of age), and age-30 transition (28–33 years of age). The culminating phase consists of the settling down (33–40 years of age) and midlife transition (40–45 years of age) stages.

Although there is no agreement on the exact ages comprising young adulthood, most of the literature agrees on what characterises this age stage. Moving into adulthood is a life phase characterised by the adoption of new roles and statuses. Completing school, seeking higher education, moving into work life, leaving the parental home to establish one's own residence, forming romantic relationships, getting married, becoming a parent, and/or pursuing other endeavours that help set them on healthy and productive pathways are key normative developmental tasks in young adulthood (Oesterle et al., 2010).

There is an upwards extension in the age at which many social milestones are now reached (including partnering, parenting, and economic independence) which also reflects the changing expectations of education and training before employment, greater availability of and changing social norms around contraception, and difficulties in transitioning to economic independence (Sawyer et al., 2018). The transition to adulthood can also be a time of increased vulnerability and risk. YA may be unemployed, lack access to health care, suffer from mental health issues or other chronic health conditions, engage in harmful activities such as heavy drinking, illicit drug use, and drive under the influence. YA are moving out of the services that supported them as children and adolescents, whereas adult systems (e.g., the adult health care system, the labor market, and the justice system) may not be well suited to supporting their needs (National Research Council, 2013).

A sense of social and financial independence, autonomy, and responsibility are often associated with the above-mentioned role transitions and can be markers of young adulthood (Arnett, 1998, 2000). A better understanding of the needs and desires of YA as a distinct age group is crucial for developing approaches and informing services to best support this exciting but also challenging transition into adulthood.

1.3 Wellbeing: Models, Concepts and Definitions

1.3.1 Well-known disability models in language disorders

Broadly used models of disability relevant to the language disorders and models more specific to wellbeing and its nature are discussed below for better understanding the context of research into wellbeing and the relationship between wellbeing and its explanatory factors,

Defining wellbeing is a difficult task. In this section different models and frameworks of disability and wellbeing will be presented and considered, in an attempt to clarify the way wellbeing and relevant concepts are used in the present project. This will lead to a definition of wellbeing as developed for this project.

Historically, two major conceptual models of disability have been proposed in the literature: the *medical model of disability* and the *social model of disability* (Oliver, 1981; UPIAS, 1976). The former model views disability as a feature of the person, directly caused by impairment or health condition. Disability, in this model, calls for medical or other intervention to correct the problem with the individual. The social model of disability, on the other hand, sees disability as a socially created problem and not an attribute of an individual. In the social model, disability demands a socio-political response, since the problem is created by an unaccommodating physical environment brought by attitudes and other features of the social environment. It looks at ways of removing barriers that restrict life choices for people with disability.

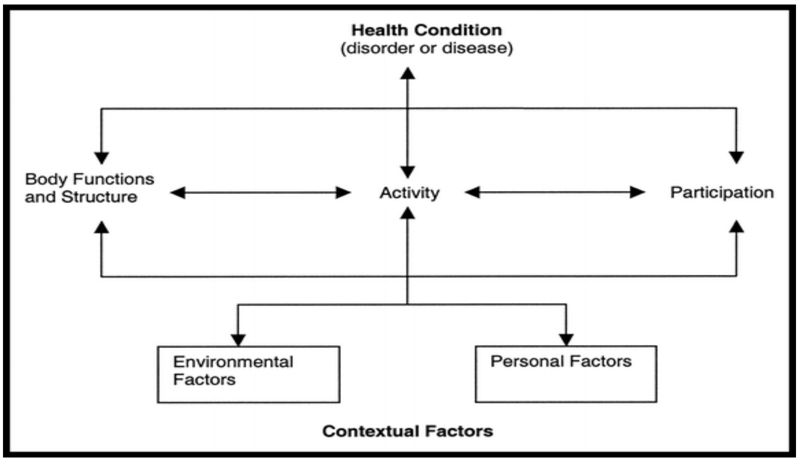
According to World Health Organisation (WHO, 2002), neither model is adequate on its own, although both are partially valid. Disability is a complex phenomenon that is both a problem at the level of a person's body and a social phenomenon. Disability is always an interaction between features of the person and features of the overall context in which the person lives, with some aspects of disability being almost entirely internal to the person, while others are mostly external (WHO, 2002).

To address the limitations of these two models, the WHO (2001) has proposed a biopsychosocial model: the International Classification of Functioning, Disability and Health (ICF). ICF provides a coherent view of different perspectives of health: biological, individual, and social. The ICF is relevant to this project as it aims to provide a scientific basis for studying and understanding health and health-related states, outcomes, determinants, and changes in health status and functioning. The diagram presented in Figure 1.1 is a representation of the ICF model.

ICF is relevant to language disorder and has been applied in both aphasia (Simmons-Mackie & Kagan, 2007; Worrall et al., 2011) and DLD (Washington, 2007). In the ICF, functioning and disability are multi-dimensional concepts related to a) the body functions and structures of people and impairments thereof (functioning at the level of the body), b) the activities of people and the activity limitations they experience (functioning at the level of the individual), c) the participation or involvement of people in all areas of life and the participation restrictions they experience (functioning of a person as a member of society), and d) the environmental and personal factors which affect functioning and disability (and whether these factors are facilitators or barriers).

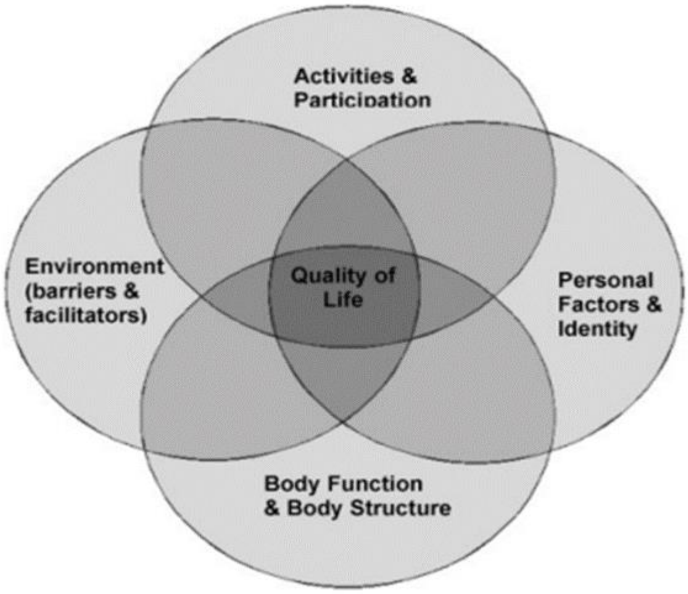
As illustrated in Figure 1.1, the ICF conceptualises a person's level of functioning as a dynamic interaction between their health condition, personal factors, and environmental factors. Relevant to this project, the ICF is a framework and classification system on which tools for assessing individual functioning may be based. It puts assessment into context and provides the focus for selecting relevant aspects of functioning and disability for evaluation.

Figure 1.1: *Interactions between the components of International Classification of Functioning, Disability, and Health (ICF) (WHO, 2001)*



Grounded in the ICF, Kagan et al. (2008) adopted an outcome framework relevant to the real-life impact of aphasia. This framework was developed for planning interventions that ensure maximum real-life outcome for PwA and their families. The schematic they developed (Figure 1.2) highlights QoL as a central feature for people affected by aphasia and it is known as the Living with aphasia: Framework for Outcome Measurement (A-FROM) (Kagan et al., 2008).

Figure 1.2: *Living with Aphasia: Framework for Outcome Measurement (A-FROM) (Kagan et al., 2008)*



In this framework, the use of overlapping circles, rather than separate boxes with arrows (as in ICF), is deliberate. It highlights the real-life overlap and interaction between the four domains of ICF and overall QOL in aphasia. In A-FROM, anything outside of the person that facilitates and/or hinders communication (including individual/societal attitudes, partner attributes, physical factors, and language barriers) would be categorised under the environment subdomain. Participation refers to actual involvement in relationships, roles, and activities of choice which are all situations that form part of daily life. Finally, the personal factors included in the framework concern inherent characteristics of the person, such as feelings, emotions, attitudes, and identity or sense of self.

Expert opinion, together with an emerging research literature, suggests that interventions should go beyond addressing just the language impairment itself and target wider aspects of life with aphasia. This type of ICF approach has not been adopted in DLD research.

The A-FROM is in line with the values of the Life Participation Approach to Aphasia (LPAA; Chapey et al., 2000). Driven by a growing interest in treatments that produce meaningful real-life outcomes leading to enhanced QoL, but also by consumers frustrated by unmet needs and unfulfilled goals, Chapey et al. (2000) proposed the LPAA. This is a philosophy of service delivery that meets the needs of people affected by aphasia, confronting the pressures from the speech and language therapy profession, providers, and funding sources. The authors call for broadening and refocusing assessment, intervention, policy making, advocacy, and research on the consequences of aphasia. In all stages of management, LPAA approach focuses on the re-engagement in life by strengthening daily participation in activities of choice. It begins with initial assessment and intervention, which continues until the individual with aphasia no longer elects to have communication support.

The present project applies principles of the LPAA approach. Firstly, it includes assessment of aspects relevant to life participation and evaluation of competencies of YA with aphasia and DLD. In addition to assessing language and communication deficits, this project also evaluates aspects of QoL and life participation. Although this project does not address treatment directly, it aims to inform intervention that does not focus on language impairment only, but rather on reducing barriers to life participation. Finally, LPAA highlights the need to report not only on language, but also on life activities, social connections, and emotional wellbeing, which are all primary aspects of the present project.

In summary, several participation intervention approaches and conceptual frameworks been developed, which aim to maximise re-engagement in life. The ICF helps to re-direct the focus to health and QoL. The A-FROM is based on the ICF and was developed to guide outcome measurement for aphasia, with emphasis on real-life outcomes, while the LPAA emphasises the concerns and desires of PwA within the treatment process. Although A-

FROM and LPAA have been developed for aphasia, their principles can be applied in other language disorders, including DLD.

The models and frameworks presented so far focus on functioning, life participation, and QoL. Wellbeing, the focus of the present study, is a different but less researched concept. A description of these terms and their distinction follows, before wellbeing models and definitions relevant to the present project are presented.

1.3.2 The concepts of quality of life, health-related quality of life, and wellbeing

Many of the emotional and social concepts that are considered related to wellbeing in the present project fall under the umbrella term *QoL*. Although the terms *wellbeing* and *QoL*, together with *health-related quality of life* (HRQoL), are targeted with commonly used patient-based outcome measures, the terms are often defined loosely or not defined at all in the literature. Also, they are frequently used interchangeably, causing considerable confusion in the area.

The confusion between the terms *wellbeing* and *QoL* may start within the area of subjective wellbeing. Subjective wellbeing includes the constructs of life satisfaction, positive affect, and negative affect (Diener & Suh, 1997) and is the most commonly used term for wellbeing. The term assigns a central importance to an individual's appraisal of their state of health (Muldoon et al., 1998). According to Gill (1994), this is a reflection of the way that people perceive and react to their health status and to other non-medical aspects of their lives. Subjective wellbeing theories base their notion of wellbeing on the fact that people are regarded as the best judges of the overall quality of their lives and it is a straightforward strategy to ask them about their wellbeing (Frey & Stutzer, 2002). Many years ago, Shin and Johnson (1978) described the concept of wellbeing as an overall evaluation of a person's QoL based on their own chosen criteria (Diener et al., 1999; Keyes et al., 2002) and this judgement is also reflected in today's literature (Rees et al., 2010; Stratham & Chase, 2010). Dodge et al. (2012) believe though that a narrow emphasis on QoL cannot adequately help to define wellbeing, as wellbeing is a broader concept.

As with wellbeing, defining QoL has also proven to be challenging (Felce & Perry, 1995). While there is no universal definition of QoL, one well-established definition of QoL is the one given by the WHO that defines QoL as:

> An individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. It is a broad ranging concept affected in complex ways by the person's physical health, psychological state, level of independence, social relationships, and their relationships to salient features of their environment (WHOQOL, 1997, p.1).

A related concept is that of HRQoL, which is relevant but subtly different to QoL. HRQoL focuses on the perceived impact of a health state on an individual's potential to live a fulfilling life. As a point of distinction, the term *QoL* is more general and includes a potentially larger variety of factors which may affect an individual's perceptions, feelings, and behaviors related to daily functioning (e.g., neighborhood, family). Those include, but are not limited to, health status and medical interventions (Bullinger et al., 1993).

Karimi and Brazier (2016), in a recent opinion paper about the concepts of *health*, *QoL*, and *HRQoL*, explored the differences among these concepts, by reviewing different definitions that have been used in the literature. They concluded that the concept of HRQoL overlaps with that of both health and QoL, leading to confusion. According to them, often when authors are referring to QoL, they actually refer to HRQoL and not QoL itself; they are actually measuring only one domain of QoL, usually physical functioning (Karimi & Brazier, 2016).

In a nutshell, the impact of health on how people feel, function, and evaluate their lives (wellbeing) is HRQoL which is part of QoL. QoL, in turn, is a much broader concept including perception of all aspects of life and experience. HRQoL and QoL concepts will not be analysed further here as they are not the focus of the present study. Dodge et al. (2012) acknowledge that the term QoL is used interchangeably with wellbeing in a variety of disciplines making the task of defining wellbeing “conceptually muddy” (Morrow & Mayall, 2009, p. 221).

1.3.3 Wellbeing models and definitions

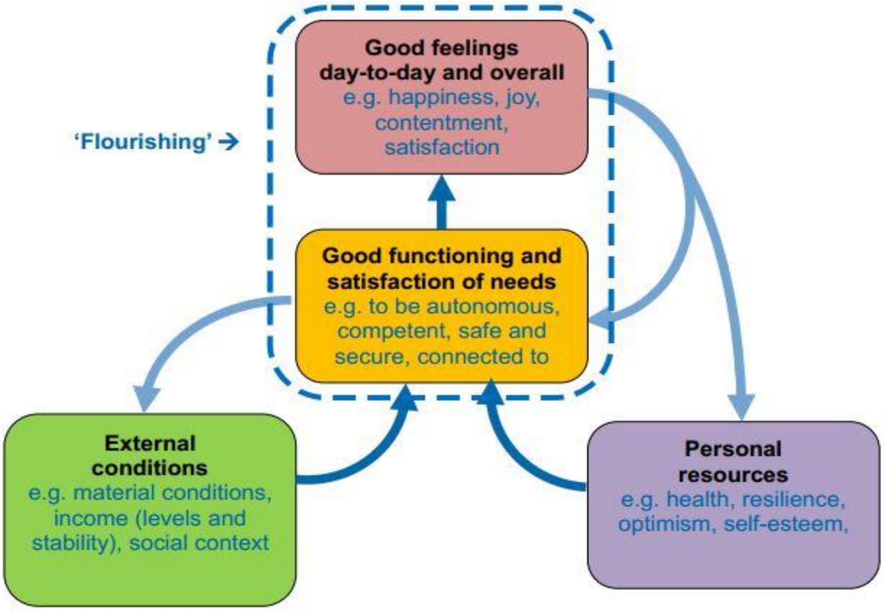
Although research on wellbeing has been growing in recent decades (e.g., Diener et al., 1999; Keyes et al., 2002), there is still no clear universal definition of the concept (Dodge et al., 2012; Forgeard et al., 2011; Pollard & Lee, 2003; Ryff, 1989; Ryff & Keyes, 1995). Part of the reason for this may be that researchers have focused on the dimensions of wellbeing, rather than what actually defines it (Dodge et al., 2012).

As there is neither a precise nor agreed definition of wellbeing, the current project adopts elements from different perspectives. Michaelson et al. (2012) suggest that wellbeing can be understood as how people feel and how they function, both on a personal and a social level, and how they evaluate their lives as a whole. They further explain that, how people feel refers to emotions such as happiness or anxiety. How people function refers to aspects such as their sense of competence or their sense of being connected to those around them. How people evaluate their life is captured in their satisfaction with their lives or how they rate their lives in comparison with the best possible life. This definition is in line with how the present project views wellbeing.

Another good attempt to express the nature of wellbeing is offered by the UK Government's Whitehall Wellbeing Working Group (2006): "Wellbeing is a positive physical, social, and mental state […]. It arises not only from the action of individuals, but from a host of collective goods and relationships with other people. It requires that basic needs are met... It is enhanced by conditions that include supportive personal relationships, involvement in empowered communities, good health, financial security, rewarding employment, and a healthy and attractive environment" (Whitehall Wellbeing Working Group, 2006, p. 3).

The New Economics Foundation (NEF) highlights the importance of separating wellbeing from the factors that drive or influence it. *Wellbeing* refers to how people are in themselves, while the potential drivers of wellbeing refer to external factors such as income, housing, education, social networks, and certain internal aspects such as health, optimism, and self-esteem, all of which influence how people feel and function (Michaelson et al., 2012). In 2008, Thompson and Marks developed a model of wellbeing and its drivers, as part of the Government Office for Science's Foresight Project on Mental Capital and Wellbeing, known as NEF's dynamic model of wellbeing (Figure 1.3) (Michaelson et al., 2012).

Figure 1.3: *New Economics Foundation's dynamic model of wellbeing (Thompson & Marks, 2008)*



The model describes how an individual's external conditions such as their income, employment status, and social networks act together with their personal resources such as their health, resilience, and optimism to allow them to function well in their interactions with the world and therefore experience positive emotions. When people function well and experience positive emotions day-to-day and overall, they are thought of as 'flourishing'.

Three feedback relationships are highlighted within this dynamic system: a) A person who is functioning well will be better able to improve their external conditions (Thompson & Marks, 2008); b) Emotions provide a crucial feedback mechanism (Marks, 2011); and c) Experiencing positive emotions broadens horizons for action and, over time, builds personal resources (Fredrickson, 2001).

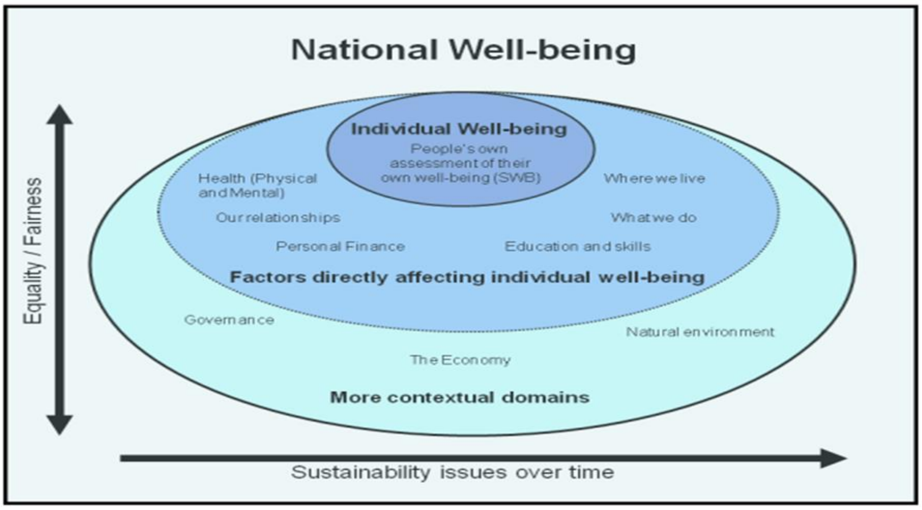
In 2007, the Office of National Statistics (ONS) started examining existing datasets and how these could be used to help build a clear picture of societal wellbeing. From this, the Measuring National Wellbeing programme was launched to provide a fuller understanding of wellbeing using a trusted dataset (Allin & Hand, 2017). A discussion paper was then developed on domains and measures of national wellbeing for consultation (Beaumont, 2011) which was used to refine and discuss those constructs.

Several factors identified by the ONS as influencing individual wellbeing, as described in Figure 1.4. The model includes the three broad domains of wellbeing and its determinants, as proposed by the ONS (Beaumont, 2011), i.e., individual wellbeing, factors directly affecting individual wellbeing (e.g., health, relationships) as well as more contextual domains such as the economy and the natural environment.

In the national debate, individual wellbeing emerged as an area that was important to people (Beaumont, 2011). Figure 1.4 shows that individual wellbeing is best understood by relating it to areas that directly affect it, as well as to more contextual domains that are important but contribute less directly.

The National Wellbeing Framework is relevant to the present study, as it directly considers individual wellbeing and the factors affecting it. Although the influence of factors of the contextual domain on wellbeing is acknowledged, such factors are less relevant to the research questions of the present project.

Figure 1.4: *National Wellbeing Framework (Beaumont, 2011)*



Combining the above literature, a broad definition of wellbeing is adopted in the current project as follows:

Wellbeing can be understood as how people feel and how they function, both on a personal and a social level, and how they evaluate their lives as a whole. It is dependent on individuals' physical, social, and mental state, which can be influenced by external and internal drivers.

There is very little work in the evidence base on wellbeing of YA with aphasia and YA with DLD. Before looking at this work in Chapter 3, the next chapter will present a review of the literature on wellbeing related constructs of older people with aphasia (PwA) and children and adolescents with DLD, - age groups in which these language disorders and accompanied impairments have been investigated extensively.

CHAPTER 2

2 Wellbeing and Related Constructs in Older People with Aphasia and Children and Adolescents with Developmental Language Disorder

The interest of the present project is in wellbeing and drivers of it, but wellbeing per se has rarely been studied as such in the literature of communication impairments and researchers have not used measures of wellbeing to tap on it in the way this study does. The working definition outlined in Chapter 1 tends to appear in the literature under two key themes: emotional health and social functioning and so the present literature review is structured to reflect that. It is not directly looking at wellbeing, but at related constructs which according to the suggested definition are mostly factors affecting global perceptions of wellbeing rather than internal components of it.

This chapter presents a review of the literature around the emotional and social drivers of wellbeing in aphasia and DLD. The literature on aphasia reflects mostly older adults, the typical demographic affected by stroke, whilst the literature on DLD covers children and adolescents. For DLD, the focus here is on findings for adolescents because adolescence as an age stage is closer to young adulthood. However, findings for children are given when appropriate, as until recently DLD was emphasised as a childhood disorder and most of the studies have been conducted with children.

Emotional health in aphasia is described first, followed by emotional health in DLD and synthesis of the findings. The same structure is followed for social functioning.

2.1 Emotional Health

2.1.1 Emotional health in aphasia

Emotional health is usually conceptualised in the clinical literature as depression and anxiety. Self-esteem is another frequently discussed factor in emotional health aphasia literature, although low self-esteem it is not an emotional or mental health problem in itself, but they are closely linked.

2.1.1.1 Depression

Ayerbe et al. (2013) in their meta-analysis found that the prevalence of depression after stroke is 29%, with a cumulative incidence of 39–52% within five years after stroke. Sixty-two to 70% of PwA after stroke suffer from depression, with the incidence of severe depression increasing from three to 12 months after stroke (Kauhanen et al., 2000). Aphasia has been reported as a possible risk factor for depression in the literature (Thomas & Lincoln, 2006). A recent study investigated self-reported emotional difficulties in people with chronic stroke with and without aphasia one year post-stroke and the relationship between aphasia severity and self-reported symptoms of post-stroke depression and anxiety (Døli et al., 2017). Authors found a significant correlation between aphasia severity and symptoms of depression. Although there were no significant differences between the aphasic and non-aphasic groups on self-reported symptoms of anxiety and depression, the symptoms that PwA reported were associated with specific language problems, such as the ability to repeat, and to read and comprehend words and sentences (Døli et al., 2017).

Thomas and Lincoln (2008) explored factors related to psychological distress in people with stroke, including PwA, and found expressive communication impairment and dependence on personal activities of daily living (ADL) to be significant predictors of psychological distress at one month after stroke. Expressive communication impairment, psychological distress at one month after stroke, and having a more severe stroke were significant predictors of psychological distress at six months post-stroke. These findings were in some agreement with an older study (Aström et al., 1993), where aphasia and living alone were the most important predictors for major depression.

More recently, Hilari et al. (2010) also explored what factors related to psychological distress in people who have had a stroke, including PwA, at the time of the stroke (baseline) and up to six months post-stroke. Like Thomas and Lincoln (2008), they found that psychological distress at the time of stoke predicted distress at six months. Although at three months after stroke PwA were more likely to be distressed compared to those without (93% and 50% respectively), that trend did not continue at six months and aphasia did not directly predict distress at any time point; a finding in accordance with some previous studies of post-stroke depression (Berg et al., 2003; Spalletta et al., 2002). It is possible that the exclusion of people with severe receptive aphasia and the small number of PwA in this study have contributed to these results (32/87 had aphasia at baseline but only 11/71 at 6 months) (Hilari et al., 2010).

The studies above provide some evidence for the association between depression and aphasia. However, aphasia is seldom explored as a risk factor for depression. In a systematic review on predictors of depression post-stroke, only three of the 23 studies reviewed included aphasia as a potential risk factor for depression and only one indicated aphasia as a predictor (Kutlubaev & Hackett, 2014). In their systematic review, investigating patterns of inclusion and exclusion of PwA in studies that explored depression after stroke, Townend et al. (2007) found that of the 129 studies included, three quarters reported some exclusion of PwA. Many of the studies reviewed do not report exclusively on PwA, but on people who have had a stroke, with some having aphasia. As aphasia presents specific challenges, it is not clear the extent to which the findings from stroke studies which do not report separately for aphasia can be generalised to the aphasia population. In other words, studies that include exclusively PwA could find different risk factors for depression. The exclusion of PwA from studies has been raised as an important issue in aphasia literature (Hilari & Northcott, 2006) and it is due to the language problems of this group which usually lead researchers to assume participants' inability to complete self-report measures. The use of proxy respondents to gather information on emotional health of PwA is also problematic, as emotional wellbeing cannot be easily observed and evaluated by others, in contrast with some more objective aspects of life such as physical or social functioning (Cruice et al., 2005; Hilari et al., 2007).

2.1.1.2 Anxiety

The studies discussed thus far focused on depression which is typically the aspect of emotional health referred to when researchers and clinicians discuss emotional health in aphasia. In contrast, research on anxiety in PwA is limited compared to that on depression. Nevertheless, a recent study with PwA after stroke showed a high prevalence of anxiety, i.e., 44% and 41%, as assessed with the Behavioural Outcomes Anxiety and Hospital Anxiety and Depression Scale (HADS) scales respectively (Morris et al., 2017). Associations were found between anxiety and severity of aphasia as well as anxiety and age with younger people being at greater risk of anxiety development. It is worth noting that the prevalence found may be overestimated, given that when anxiety assessed with a different tool, i.e., Generalised Anxiety Disorder-7, it gave a considerably lower rate (16%). Generalised Anxiety Disorder-7 has not been used in people with stroke before though, and so the authors considered the results of Behavioural Outcomes Anxiety and Hospital Anxiety and Depression Scale more representative.

Comparing PwA to those with stroke but without aphasia, a systematic review showed lower levels of anxiety for the latter group, with an overall polled estimate of anxiety disorders of 18% as assessed with clinical interviews and an estimate of 25% for anxiety as evaluated with the use of a rating scale (Campbell et al., 2013). These findings were confirmed by a later study focusing on emotional health at one-month post-stroke (Shehata et al., 2015). These reports have been contradicted by a more recent study (Døli et al., 2017) which showed that levels of anxiety as reported by PwA did not differ from those with stroke without aphasia. It is important to consider that in this study, participants only had mild aphasia one year after stroke. Another factor that could have contributed to the different findings of the two studies is time of assessment after stroke, with Shehata et al. (2015) assessing anxiety within one month after stroke and Døli et al. (2017) assessing participants one-year post-stroke. For people who have had a stroke more generally, it seems that anxiety rates increase with time (Campbell et al., 2013), although such data specifically for PwA is not available.

Therefore, research around anxiety and aphasia is limited, in terms of both prevalence and risk factors. A finding of interest for the present project is that age has been identified as a risk factor for anxiety in PwA, with younger people being at greater risk (Morris et al., 2017).

2.1.1.3 Self-esteem

Self-esteem is another aspect of emotional health that has been discussed in aphasia. Researchers have argued that communication competence affects levels of self-esteem (Andersson & Fridlund, 2002; Harter, 1993) and self-esteem can impact one's willingness to engage in communicative encounters (Simmons-Mackie & Kagan, 2007; Côté, Getty, & Gaulin, 2011). However, Bakheit et al. (2004), who were among the first to explore self-esteem in PwA quantitatively, did not find evidence of low self-esteem in their sample either shortly after stroke onset or three or six months after stroke. Moreover, they found no relationship between severity of aphasia and levels of self-esteem during the first six months of recovery (Bakheit et al., 2004).

In a survey of 173 speech and language therapists in the UK, only 15% reported using a measure of self-esteem (Brumfitt, 2006). Despite some evidence on the importance of self-esteem in recovery and rehabilitation, research around this concept is limited and evidence is not sufficient for drawing conclusions about its relationship with aphasia. Even for stroke patients without aphasia, research is limited and the evidence contradicting (Chang & Mackenzie, 1998; Ellis-Hill & Horn, 2000).

Looking at the relationships between depression, anxiety, and self-esteem, in a study of people with stroke, including PwA, a co-occurrence of anxiety and depression was observed in 17% of the sample. Half of the depressed individuals also had an anxiety disorder and 67% of respondents with an anxiety disorder had depression (Bergersen et al., 2010). Among people with stroke, Fung et al. (2006) found depression to be negatively correlated with both global self-esteem (individual's positive or negative attitude toward the self as totality; Rosenberg et al., 1995) and state self-esteem (short-lived changes in an individual's self-esteem; Heatherton & Polivy, 1991). In their systematic review of factors related to self-esteem after acquired brain injury, Curvis et al. (2018) found depression to be strongly associated with low self-esteem, alongside anxiety, psychological distress, and QoL. However, neither of these two studies included participants with aphasia. Yet, the above findings suggest inter-correlations between different impaired aspects of emotional health, probably indicating an interesting area for deeper investigation in aphasia.

PwA experience a range of emotional responses, which are related not only to the language impairment itself, but also to the consequences of it. Feelings that have been described in the literature, mainly through qualitative assessment, include: sadness, despair, having no energy, lack of interest or motivation to engage in activities, a sense of feeling stuck or 'lifeless' (Northcott & Hilari, 2011), frustration, friction, misunderstanding, loneliness, feeling of being an outsider, loss of control, loss of authority, difficulty controlling emotions, loss of autonomy, irritation, stress, annoyance (Dorze & Brassard, 1995; Parr, 2001), fear, bewilderment, fury, amusement, shock, and embarrassment (Shehata et al., 2015).

2.1.1.4 Summary of emotional health in aphasia

As emerges from the above literature, depression, anxiety, and self-esteem are the three most usually investigated aspects of emotional health in older adults with aphasia. There is accumulating evidence supporting the co-existence of aphasia and depression. The evidence for anxiety in PwA is limited, but worthy of further investigation. Self-esteem has been implicated as important for aphasia rehabilitation. Nevertheless, conclusions on levels of self-esteem in PwA cannot be drawn based on the current evidence. Future research is essential, first to establish the potential emotional drivers of wellbeing in PwA, especially in terms of anxiety and self-esteem, and second to find factors contributing to those drivers as the existing evidence is not conclusive. An important issue that has been discussed in the literature is the exclusion of PwA in the studies evaluating emotional health after stroke, which should be considered when interpreting the results but more importantly be addressed in the future.

2.1.2 Emotional health in DLD

DLD is traditionally thought as an early years disorder. Driven by studies that showed children with DLD are at risk of developing social, emotional, and behavioural problems (Beitchman et al., 1986; Conti-Ramsden et al., 2013; Howlin et al., 2000), researchers started to investigate the extent to which these problems persist beyond childhood, indicating an increasing interest in the long-term outcomes of children with DLD and their trajectory. Evidence, although limited, has showed that in about half the children with language difficulties at the age of 5, lifelong impairment appears to be a reality, with difficulties of children with DLD continuing into adolescence and adulthood (Beitchman et al., 2001; Clegg et al., 2005; Conti-Ramsden et al., 2008; Johnson et al., 2010). As these individuals develop, the challenges widen to include areas of difficulty that are not directly related to communication skills (Conti-Ramsden & Botting, 2008).

2.1.2.1 Depression and anxiety

Lindsay and Dockrell (2012) looked at age trends of behavioural, emotional, and social difficulties (BESD) at 8, 10, 12, and 16 years of age in students with a history of DLD and found the mean level of emotional symptoms to increase over the period from 8 to 16 years. This, however, masked an initial drop in the percentage of students with clinically significant difficulties from 14% at 8 years to 7% at 10 years followed by an increase to 21% at both 12 and 16 years.

In the Manchester Language Study, adolescents with a history of DLD aged 16 years old were found to be at increased risk of experiencing symptoms of depression and anxiety compared to their typically developing (TD) peers, based on both self- and parent-report measures (Conti-Ramsden & Botting, 2008). When data from childhood to adolescence (ages 7 to 16 years) was statistically modelled from the same longitudinal cohort, emotional difficulties were found to decrease, although emotional problems still remained above population norms (St Clair et al., 2011). Expressive language did not predict emotional outcomes and no relationship was found between reading accuracy or receptive language and emotional health. However, an association found between pragmatic language and emotional health.

Later, Wadman et al. (2011) examined depressive and anxiety symptoms reported by adolescents with and without a history of SLI at 16 years and a year later, using the same Manchester study cohort. They evidenced that participants with DLD continued to experience significantly more anxiety symptoms at 17 years but showed a drop in depressive symptoms over the year (16 to 17 years of age). Individuals with DLD, however, showed higher levels of depression symptoms than did TD peers, based on clinical thresholds. In particular, for depression, more than a third (38.3%) of young people with DLD fell into this higher risk group at 16 and 14.0% for anxiety, compared to 15.2% and 3.0% respectively for their TD peers. For age 17, the relevant percentages were 20.2% and 11.2% for the DLD group and 17.8% and 1.1% for their TD peers (Botting, Toseeb, et al., 2016). For individuals with DLD in this study, peer problems at 16 years predicted concurrent depressive symptoms and adolescents who experienced more bullying at 16 years were more likely to become or remain at risk for depression at 17 years. They also indicated that depressive symptoms associated with academic achievement during compulsory education (age 16) were no longer related a year later. Behavioural difficulties (namely conduct problems, hyperactivity, and peer problems), language ability, and NVIQ did not contribute to depressive symptoms (Wadman et al., 2011).

The significant drop in depressive symptoms between 16 and 17 years of age in the DLD group that found in Wadman et al. (2011) report superseded by the later finding that the depression levels in those with DLD, which decreased post-compulsory schooling (age of 17 years), rose again by 24 years of age (Botting, Toseeb, et al., 2016). The drivers for this pattern were transition based, i.e., moving from school to college to employment. In particular, those who left compulsory school provision for more choice-driven college but who were not in full-time employment or study by 24 years of age were more likely to show this depression pathway. Botting, Toseeb, et al. (2016) tested predictors of depression in adolescents with DLD and found that receptive language, expressive language, and NVIQ did not predict depression either at age 16 or at age 17, confirming previous findings (Wadman et al., 2011). However, when Conti-Ramsden et al. (2013) examined the self-reported social, emotional, and behavioral functioning of the cohort at age 16 found that for the increased emotional symptoms of adolescents with DLD compared to their TD, receptive language was the only significant predictor, i.e., adolescents with better receptive language were less likely to report emotional difficulties. Overall, the Manchester study shows that the relationship between emotional health symptoms and language and cognitive ability in adolescents with DLD is not straightforward. When interpreting the study's results it must be considered that most of the adolescents in the study did not appear to be experiencing emotional difficulties.

Beitchman et al. (2001) followed up a cohort of children with DLD from 5 to 19 years of age and evaluated them during this period for the presence of possible psychiatric symptoms. Participants with DLD were at greater risk of having ADHD (Beitchman et al., 1996) and later had increased rates of anxiety disorders (Beitchman et al., 2001) and aggressive behaviour (Brownlie et al., 2004). A raised incidence of attention (e.g., ADHD diagnosis) and social difficulties (e.g., social phobia diagnosis) among adolescents (15 years old) with persistent language impairment was found by Snowling et al. (2006). However, according to that study, the rate of psychiatric disorder was low in all groups of adolescents, including young people with resolved or persistent speech and/or language impairment. There was no significant association between having a history of speech and language delay and rate of adolescent psychiatric disorder and no evidence of internalising problems. Comparing people with resolved and those with persistent language impairment, it was found that the latter exhibited a higher risk of psychiatric morbidity in adolescence. It should be noted, however, that in the Snowling et al. (2006) study, findings are based on clinical interviews with people with communication difficulties, while the other studies used screening tools instead which are typically more objective.

Ripley and Yuill (2005) assessed the receptive and expressive language abilities of 19 primary and secondary school age boys who were permanently excluded from school. Expressive language problems dominated and were linked to high levels of emotional symptoms. Clegg et al. (2009) tested 15 pupils of secondary-school age who were at risk of permanent school exclusion, but still in mainstream educational provision. However, both studies identified unrecognised language impairment in conjunction with severe behaviour problems and school exclusion. Furthermore, both studies identified a proportion of pupils with emotional and behaviour problems but no language impairment. In contrast to the findings of Ripley and Yuill (2005), Clegg et al. (2009) failed to find any specific associations between types of language impairment and types of emotional and behaviour problems.

There is also evidence of increased incidence of language problems and DLD in populations referred to psychiatry. Young offenders have been found to have 64% significantly lower scores for expressive language than for receptive language (Pryor, 1998, as cited in Ripley & Yuill, 2005). In accordance with that, Ripley (1984) reported that 71% of a population of adolescents with DLD who were referred to a psychologist for aggressive behaviour had expressive language problems. A review of 10 years of research in the area found strong evidence that language impairments were often not picked up by child and adolescent mental-health teams or professionals working with psychiatric disorders (Toppelberg & Shapiro, 2000).

In adolescence, people with DLD may be particularly vulnerable to feeling stress in social situations, as they are expected to participate in wider and often more challenging social relationships within the context of significant language and conversational difficulties (Rice et al., 1991). More recent evidence confirms this. Wadman et al. (2011) obtained self-report measures of social stress (discomfort or anxiety), social skills, and social acceptance of adolescents with DLD. Although most of the participants with DLD perceived themselves as having adequate social skills and positive social acceptance, they reported experiencing significantly more social stress than the adolescents without DLD. Even after excluding participants with especially poor self-perceptions of social skills and/or social acceptance, the participants with DLD still had a higher mean social stress score compared to their TD peers. Negative associations of medium strength were found between social stress and perceived positive social skills and perceived social acceptance, with the latter predicting social stress the most. In terms of the association between language and social stress, expressive language ability was negatively correlated with social stress and was predictive of it when was included in the regression model alone. The correlation between receptive language or NVIQ and social stress was not significant.

2.1.2.2 Self-esteem

Within the Manchester Language Study, adolescents with DLD have been observed to have high levels of shyness and low levels of self-esteem. In Wadman et al. (2008) report, participants with DLD aged 16 and 17 years rated themselves as significantly shyer (experiencing discomfort and inhibition in the presence of other people) than adolescents with no language impairments, and this effect was large (Wadman et al., 2008). Language did not predict a global measure of self-esteem in 16-year-olds with DLD, once shyness was included in the regression, and therefore the authors argued that shyness was a mediator of the effect of language difficulties on self-esteem (Wadman et al., 2008). Similarly, Lindsay and Dockrell (2012) found that language measures at 8 and 10 years did not predict self-concepts of scholastic competence, social acceptance, and global self-worth later at 16 and 17 years.

Emotional and behavioural difficulties in childhood and adolescence are confirmed in a recent systematic review and meta-analysis of prospective cohort studies of children with DLD, with initial assessment at 3.0 to 8.8 years and follow-up duration ranging from 2 to 12 years (Yew & O'Kearney, 2013). It included 19 follow-up reports. From them, five reports concerned internalising problems and included 396 people with DLD in total. The study revealed that children with DLD were almost two times more likely than TD children to show disorder levels of internalising problems. At follow-up, compared to the average child with typical development with the symptom severity at the 50th percentile, the symptom severity of the average child with DLD was at the 72nd percentile. Similar severity levels were also observed for externalising and ADHD symptoms for the DLD group compared to the TD group (Yew & O'Kearney, 2013).

2.1.2.3 Summary of emotional health in DLD

In summary, anxiety, depression, and self-esteem/self-perceptions are the three most investigated aspects of emotional health in adolescents with DLD. There is accumulating evidence that the above emotional aspects are impaired in this clinical group. Emotional symptoms in adolescents with DLD are not directly associated with language ability, reading skills or gender based on current evidence, but they do seem related to concepts such as peer relationships, social acceptance, shyness, academic achievement, and transitions in complex ways.

Trajectory studies from childhood to adolescence in people with DLD have revealed that age has a key role to play in emotional health. For example, evidence shows that depressive symptoms decrease through adolescence and increase again during early adulthood, in contrast with anxiety symptoms, which remain stable over time. Perceived self-esteem seems also to vary according to the age that testing takes place. Such findings suggest that there may be changes and differences in emotional health between adolescence and young adulthood.

2.1.3 Summary of emotional health findings in Aphasia and DLD

Bringing together the evidence on emotional health in older PwA and adolescents with DLD, four main points of interest emerge:

a) Emotional health is affected in both aphasia and DLD and similar aspects of emotional health have been investigated. Those include depression, anxiety, and self-esteem.

b) Depression seems to be a common problem in both groups. Depression in PwA is persistent in the long-term post-stroke. In the DLD group, there is some evidence that depressive symptoms decrease during adolescence and increase again in early adulthood. Anxiety is a well-established difficulty in adolescents with DLD. Although there is evidence that PwA experience higher levels of anxiety compared to people with stroke without aphasia and that people of younger age are in increased anxiety risk compared to older individuals, the evidence is not yet clear enough to draw conclusions for the severity of anxiety symptoms in this population. Finally, while low levels of self-esteem are evident in adolescents with DLD, more research is needed on the impact of aphasia on self-esteem where limited evidence has shown no issues.

c) Based on the current review, it seems that though both older PwA and adolescents with DLD encounter increased depression and anxiety levels, there are differences in terms of what factors are associated with such problems in each group. Moreover, based on existing evidence, people with DLD seem to experience greater anxiety, while YA with aphasia experience greater depression levels.

d) In addition, the evidence presented in this chapter studied the two populations in different ages and life stages (older PwA vs. adolescents with DLD), where different emotional and other needs are anticipated. Thus, research which compares people of a more similar age is needed.

2.2 Social Functioning

2.2.1 Social functioning in aphasia

2.2.1.1 Social isolation, social exclusion, and social networks

Language has been described as the 'currency' of relationships (Parr et al., 1997) and thus language problems such as those caused by aphasia put people at risk of shrinkage of their social network, including friends and acquaintances, and at risk of changes in relationships (Vickers, 2010). Social networks typically constitute the arena for life participation for most people, with those with aphasia frequently experiencing limited participation in social activities and unemployment (Fotiadou et al., 2014; Northcott, Marshall, et al., 2016; Northcott, Moss, et al., 2016; Northcott & Hilari, 2011), leading to social isolation, exclusion (Howe et al., 2008; Parr, 2007), and lower QoL (Hilari et al., 2012; Pike et al., 2017). A survey by the American National Aphasia Association found that the vast majority of the respondents with aphasia (90%) felt socially isolated, while approximately 70% felt that people avoided contact with them because of their difficulties with communication (Davidson et al., 2008). Social exclusion can occur within different social life domains for PwA, including interpersonal (limited association with groups and places in society) and infrastructural (employment services, information), and it is accompanied by negative feelings (Parr, 2007). Fotiadou et al. (2014) found that reduced social networks in participants with aphasia were related mostly to reduced work and community activities as well as environmental barriers and fatigue.

Friendships are core to social engagement, QoL, and wellbeing for older adults (Davidson et al., 2008) and have received special attention in aphasia literature. Hilari and Northcott

(2006) found that from a sample of 83 people with chronic aphasia, 64% saw their friends less than before the stroke, while 30% had no close friends at all. Other studies have also reported changes in social networks, not only with quantity, but also with the quality of friendships diminishing in aphasia (Cruice et al., 2006; Davidson et al., 2003).

Northcott and Hilari (2011) explored reasons for loss of friendships after stroke by interviewing 29 purposively sampled people with stroke, including 10 with aphasia. They found that loss of shared activities, reduced energy levels, physical disability, unhelpful responses of others, environmental barriers, changing social desires, closing in on oneself, and aphasia were contributors to changes in friendships for this group. PwA, in particular, experienced the most negative reactions compared to other people, with authors supporting the conclusion that the substance of friendships alters in this population. Moreover, all the participants who had lost their entire friendship networks in this study had aphasia (Northcott & Hilari, 2011).

2.2.1.2 Social activities and social participation

Many of the studies that focus on social aspects of life in aphasia have adopted qualitative designs, giving prominence to the voice of PwA. When PwA were asked about goals in their lives, they highlighted their need for engagement in social, leisure, and work activities, among others (Worrall et al., 2011). The authors concluded that the majority of goals and desires of this population fits under the activities and participation subdomains of the ICF framework, confirming the importance of social reintegration into society. It is evident that aphasia commonly results in a loss of ability to function in many social activities of daily life, such as leisure and occupational activities. Cruice et al. (2006) revealed that participants with aphasia engaged in significantly fewer social activities than controls (particularly leisure) and that the majority of PwA was not satisfied with the social activities they were involved in. The activities common to all participants with aphasia were most likely to take place within the home, in contrast to their non-aphasic peers, for whom common activities took place outside the home. Hilari (2011) confirmed the reduction in participation in social activities and community life that people with stroke face in the long-term (Kelly-Hayes et al., 2003; Mayo et al., 2002), reporting separately for PwA. She found that PwA performed significantly fewer extended ADL (domestic, social, leisure, work activities) than people with stroke without aphasia and the difference significantly increased between three and six months post-stroke. Given that at six months post-stroke the two groups were similar in other potentially contributing factors, the author suggested that these differences were likely to occur due to aphasia. This suggestion can also be supported by the fact that participants with aphasia in that study had achieved a good level of independence in basic ADL, most of which did not require a demanding level of language use.

Dalemans et al. (2010) explored how PwA perceive their social participation and influential factors of participation, through interviews and diary keeping. PwA expressed their need for engagement, involvement, and feeling of belonging. They also indicated that the quality of activities was more important than the number or the type of activity. According to them, (a) personal factors (motivation, physical and emotional condition, and communication abilities), (b) the role of the central caregiver and the characteristics of the communication partner (willingness, skills, and knowledge), and (c) environmental factors (quietness and familiarity of the place) influenced their engagement in social life. Similarly, Howe et al. (2004) showed that both personal factors such as demographics, sociocultural background, education, labour, income, accommodation as well as environmental factors including physical, social, and attitudinal environment in which people live can have an impact on participation in life for PwA. Conducting multiple regression analysis, with the number of hours spent out of home as the dependent variable, Code (2003) found severity of aphasia, age, time since onset, and presence of hemiplegia to account for 30% of the total variance, highlighting that severity of aphasia had a particularly negative impact. A study reporting on people with stroke (but without aphasia) suggested that in the long-term post-stroke, functional disability, depression, and low self-esteem were the strongest predictors of social participation restrictions (Chau et al., 2009). As these results cannot be generalised to a population with aphasia, it would be informative for these aspects to be tested as predictors of social life in aphasia as well.

Importantly, the findings above are confirmed by two reviews. Dalemans et al. (2008) carried a systematic review aiming to investigate participation in working-age people (under 65 years old) with aphasia after stroke, with respect to the following domains of social life: a) domestic life, b) interpersonal life, c) education and employment, and d) community, civic, and social life. Including 18 studies, the review showed a reduction in domestic activities and changes in interpersonal interactions and relationships. Shifts were observed in contacts with others, from friends to professionals, and changes in roles as partner, family member, parent, friend, and citizen. Affected employment in terms of reduced hours or level of demand was also reported. Nine years later, the above systematic review was updated by Pike et al. (2017). As an additional finding, they reported studies that described limitations in the domains of community, civic, and social life, which had not been identified before in Dalemans et al. (2008).

Comparing their results with the ones of Dalemans et al. (2008), Pike et al. (2017) noted that over the last decade there had been an increase in research into contextual factors impacting on social participation in PwA and in the use of conceptual frameworks, with the

ICF being the prominent framework, compared to the A-FROM. Also, a greater use of standardised assessments and larger sample sizes were observed. The authors concluded that the rising population of young PwA was receiving increasing attention in research over the years.

2.2.1.3 Social support

Although some aspects of social networks seem to be severely affected by aphasia, this does not seem to be the case for perceived social support. Hilari and Northcott (2006) looked at patterns of social support in people with chronic aphasia following stroke and examined the relationship between social support and HRQoL. They found that PwA felt well supported in the chronic stage post stroke and in a later study this was confirmed for the first six months post-stroke (Hilari, 2011). Only two social support aspects were significantly correlated with HRQoL, namely informational support and social companionship, but severity of aphasia did not affect any support aspects (Hilari & Northcott, 2006).

2.2.1.4 Employment

The ability to return to work is a key factor in a younger person's wellbeing and is salient throughout the literature on young stroke survivors (Morris, 2011), with many studies using return to work as a measurement of recovery or rehabilitation outcome (Daniel et al., 2009). Those who are not able to return to work after a stroke can have poor psychosocial outcomes (Röding et al., 2003). In a cross-sectional study of 120 young people with stroke aged 18 to 64, which was carried out in Sweden, restrictions in leisure activities and work had the most negative impact on global health, with lower ratings of physical health linked to not being able to return to work (Vestling et al., 2003). In fact, one of the main findings for reduced QoL in young stroke survivors has been unemployment (Naess et al., 2006).

PwA report loss of employment and changes in their ability to participate in work (Pike et al., 2017). Compared to other people with stroke, those with aphasia are less likely to return to work (Graham et al., 2011). Indeed, comparisons have shown that from those employed before their stroke, 33% of PwA and 69% without aphasia were employed at the follow-up (Naess et al., 2009). Older evidence has also shown that the majority of PwA do not return to work, few return to some level of employment, and very few return at the same level (Hinckley, 1998; Parr et al., 1997). These results are in agreement with more recent studies such as that of Hilari and Northcott (2006) where 56% of participants were of working age. They showed that no PwA returned to full time employment and only 6% had some part-time or voluntary work or were students. In a similar vein, Fotiadou et al. (2014) studied blog posts of PwA and found that only 2/10 individuals were employed. It is possible though that people who are in employment have less time for writing blogs. Reduced productivity levels in working-age participants have been also confirmed by other researchers (Dalemans et al., 2010), including reviews of the literature (Dalemans et al., 2008).

A number of factors have been identified to be related to return to work after stroke in PwA, including aphasia, fatigue, older age, epilepsy, short attention span, and limited multitasking abilities (Fotiadou et al., 2014), psychological problems, workplace flexibility, social support, motivation (Carriero et al., 1987; Hatfield & Zangwill, 1975), motor impairment (Carriero et al., 1987; Dawson & Chipman, 1995), cognition (Carriero et al., 1987; Hatfield & Zangwill, 1975), personality (Eisenson, 1966), and other demographics such as education (Dawson & Chipman, 1995). Degree of linguistic impairment was seen as a potential barrier for return to work by PwA, speech and language therapists, and employers, although the latter may perceive this as less of a barrier than the other two groups (Garcia et al., 2000). The evidence above though has been contradicted by two other studies which did not find a relationship between return to work and severity of aphasia (Carriero et al., 1987; Hatfield & Zangwill, 1975).

2.2.1.5 Summary of social functioning in aphasia

In summary, many aspects of social life and participation are affected in Pwa. PwA usually experience social isolation and exclusion, with reduced social network and changes in relationships, especially in friendships, to be evident. Changes in extended daily activities are also observed in this population which seems to be due to aphasia. Return to work after stroke has received attention in younger people with stroke. A range of factors have been identified to influence social participation and aspects of it in PwA. Such factors should be explored and targeted in intervention, following an approach that considers the principles of health and disability models that centre the social nature of the individual at the heart of the therapy process.

2.2.2 Social functioning in DLD

Social life plays a key role in young people's wellbeing and, as TD adolescents do, those with DLD are interested in socialising with others (Wadman et al., 2008). Experiencing social difficulties with peer relations and friendships during childhood may mean that many young people with DLD enter adolescence less equipped with and less practised in the skills needed for this area of life, and quite likely less confident in their abilities.

2.2.2.1 Peer interaction, social competence, and social acceptance

A growing body of evidence has revealed that children with DLD are at social disadvantage, with teachers rating them as having poorer social skills compared to their peers (Fujiki et al., 1996; McCabe, 2005). Observational studies of children with DLD aged between 6 and 12 years suggest that they are less effective in accessing an ongoing peer interaction (Brinton et al., 1997; Liiva & Cleave, 2005). These difficulties are associated with problems in social competence (Hadley & Schuele, 1998), which is conceptualised as entailing effectiveness in social interactions (Rose-Krasnor, 1997). Indeed, children with DLD have been rated by parents and teachers as having poorer social competence than their peers (Hadley & Schuele, 1998; McCabe, 2005). They also demonstrate different peer interaction patterns compared to TD children in terms of selection of conversation partners (Rice et al., 1991), conversational responsiveness (being ignored by peers and ignoring peers' initiations) (Hadley & Rice, 1991), and the amount of time of peer playground interactions (Fujiki et al., 2001).

Children with DLD aged between 7 and 10 years old have been found to have significantly lower perceived social acceptance than their TD peers and this difference was large. There was also a causal relationship between impaired communication and social competence (Marton et al., 2005). However, as previously stated, Lindsay and Dockrell (2012) found that language measures at 8 and 10 years did not predict later perceived social acceptance at 16 and 17 years of age. In addition, children with DLD are perceived as less desirable playmates by other children (Gertner et al., 1994). Nevertheless, Wadman et al. (2011) showed that most adolescents with DLD in their study perceived themselves as having adequate social skills and positive social acceptance.

Children with DLD are often socially withdrawn (Brinton & Fujiki, 1999; Cohen et al., 1998; Fujiki et al., 1996, 2001). They have been reported to interact with fewer peers and to be less satisfied with their social relationships compared to their TD peers (Fujiki et al., 1996). Lindsay et al. (2007) reported that 27% - 30% of children with DLD aged between 8 and 12 years were rated by their teachers as having significant peer problems. In observational studies and studies utilising hypothetical conflict scenarios, children with DLD were found to resolve fewer conflicts, to produce fewer resolution or negotiation strategies, and to use inappropriate resolution strategies or strategies of a lower developmental level (Brinton et al., 1998; Horowitz et al., 2005).

2.2.2.2 Prosociality

Compared to their TD peers, people with DLD are less likely to exhibit skilled prosocial behaviour in childhood (Brinton et al., 2000; Fujiki et al., 1999) and adolescence (Knox & Conti-Ramsden, 2007). Durkin and Conti-Ramsden (2007) found adolescents with DLD to be less prosocial compared to their peers. Similarly, when Conti-Ramsden et al. (2013) checked prosociality in adolescents with and without a history of DLD. They found that although the majority of adolescents in both groups (87% DLD and 96% TD) reported prosocial behaviour within the typical range at age 16, the mean prosocial score for adolescents with DLD was significantly lower than that of their TD peers. Also, males were 18 times more likely to report borderline or abnormal prosocial behaviour compared to females. Receptive language was a significant predictor of prosocial behaviour, but in the opposite direction to problems in other areas such as emotional symptoms and hyperactivity, i.e., adolescents with better receptive language were more likely to report borderline or abnormal prosocial behaviours. Authors speculated that better receptive language may foster more awareness of difficulties. NVIQ became a significant predictor only after controlling for gender and expressive and receptive language. Evidence indicates that adolescents who perceive themselves as prosocial tend to be more socially confident and to spend more time in constructive peer activities (Jacobs et al., 2004).

2.2.2.3 Difficulties in peer relations

Lindsay and Dockrell (2012) evaluated BESD and found that the greatest discrepancy between adolescents with DLD and those without was for peer problems. The DLD sample mean was higher than the norm at 16 years, indicating more difficulties which were relatively stable between 8 and 12 years but increased significantly at 16 years. These findings confirm the St Clair et al. (2011) results who also found that social problems became more evident from childhood to adolescence. The increase in peer problems over the four-year period tested was not associated with language levels at ages 8 or 10. Conti-Ramsden et al. (2013) found that the odds of reporting borderline or abnormally high levels of peer problems were 12 times higher for individuals with a history of DLD. Gender, NVIQ, and receptive and expressive language abilities were not significant predictors of peer problems.

Mok et al. (2014) showed that nearly 40% of adolescents with DLD appeared to be impaired in their interactions with peers by age 16. Early expressive language, reading abilities, and receptive language skills were not associated with difficulties in peer relations, in contrast with pragmatic abilities which showed stronger association.

2.2.2.4 Friendships and relationships

Durkin and Conti-Ramsden (2007) investigated social behaviour and the quality of friendships in the same cohort as Mok et al. (2014), with 120 adolescents with DLD and 118 TD peers. They found that although more than half of the participants with DLD experienced good quality of friendships, as a group they were more likely to exhibit poorer quality of friendships (in terms of non-intimate social relationships, current friendships, and having at least one relationship which involves seeking and sharing contact), compared to their peers. This is in line with older studies identifying language problems as a predictor of long-term social problems (Beitchman et al., 1996; Howlin et al., 2000). Poorer quality of friendships was predicted by prosocial behaviour, literacy, NVIQ, and problem behaviour. Although poorer social skills and functional outcomes (friendships and social activity) seem to be experienced by young people with DLD (Conti-Ramsden & Botting, 2008), the relationship between friendships and language is not straightforward. In contrast to the findings of the above studies, non-significant relationships have been found between both concurrent and earlier (at the age of 7 years) language abilities and measures of social behaviour (friendships and social activities) at 16 years (Conti-Ramsden & Botting, 2008). Interestingly though, functional outcomes such as socialising with peers and going out socially were predicted by concurrent language, social skills, and social cognitive ability.

Another important element in close friendships and romantic relationships seems to be engagement, which according to Wadman et al. (2011) is a problematic area for adolescents with DLD. Twenty-four percent of adolescents with a history of DLD was classified as having poor emotional engagement in close relationships, compared to only 2% of the TD adolescents. Language ability, prosocial behaviour, and shyness were concurrently predictive of level of emotional engagement in close relationships. Caldwell et al. (2004) showed that negative self-views about relations with peers predicted social disengagement and stress, which in turn predicted subsequent social withdrawal and still more negative self-views.

2.2.2.5 Victimisation and bullying

Several studies have shown that children with DLD are at risk of victimisation and bullying. At the age of 11, children with DLD report experiencing more bullying compared to TD peers, with 36% of those with DLD considering themselves at risk of being bullied at school, compared to 12% of their TD peers (Conti-Ramsden & Botting, 2004; Knox & Conti-Ramsden, 2003). However, this is not always the case and some studies have found no increased risk of victimisation in children with DLD (Lindsay et al., 2008).

Increased risk of bullying has been shown not only for children, but also for adolescents with DLD. A study that included a large number of adolescents with various developmental disorders including DLD, revealed that more than half of them had experienced bullying (Doren et al., 1996). These findings were confirmed by Knox and Conti-Ramsden (2007) who showed that although bullying seemed to decrease from childhood to adolescence in people with DLD (from 44% as children to 17% at the age of 16), adolescents with DLD were still more at risk of being bullied compared to their TD peers, with an incidence of teasing 10% higher for the former group. Clegg et al. (2012) found that bullying was still present in the workplace for people with DLD.

Experience of bullying has been found to predict self-report symptoms of depression and anxiety in childhood and adolescence (Bond et al., 2001; Hawker & Boulton, 2000). Wolke et al. (2001) found children involved in bullying (bully/victim/both) had significantly higher total behaviour problems, hyperactivity, conduct problems, peer problem scores, and lower prosocial behaviour scores than children with no bullying experiences. Regarding adolescents with DLD, poor social skills (Whitney & Smith, 1993) and peer acceptance difficulties (Mishna, 2003) are commonly cited risk factors of bullying. In a similar vein, Card's (2003) meta-analytic review on victims of peer aggression, which included 205 studies, showed that poor quality of friendships, small number of friends, and higher peer rejection were the strongest factors associated with bulling. Knox and Conti-Ramsden (2003), however, found neither friendships nor prosocial behaviour to contribute to the prediction of bulling at the age of 16 in adolescents with DLD, in contrast with behavioural/socio-emotional problems which were significant predictors. This is supported by Beitchman et al. (1996) finding that emotional behavioural problems can be a risk factor for being bullied. An interesting finding from the Knox and Conti-Ramsden (2003) study was that language ability within the DLD group did not appear to contribute to bullying per se. This possibly shows that it is not the language impairment itself that increases the risk of bullying, but may be the social or emotional and behavioural problems that accompany the language impairment (as indicated above).

The findings described so far show that children with DLD have impaired social skills and competence. They are less accepted compared to their peers, frequently experiencing social withdrawal. Problems with peer relations are evident, whilst victimisation and bullying are frequently reported in this population. Summarising factors that are related with social problems, functional outcomes (such as socialising with peers, going out socially) have been predicted by concurrent language, social skills, and social cognitive ability. Similarly, social competence has been related to impaired communication. In terms of social acceptance, it has been related to perceived positive social skills and perceived social acceptance has been additionally found to predict social stress. Receptive language has been a significant predictor of prosocial behaviour, which in turn has been related to social confidence and the amount of time spent in peer activities.

There is a body of evidence suggesting no associations of NVIQ, receptive and expressive language abilities, reading abilities, and gender with peer problems. However, pragmatic abilities have been associated with such problems. Poorer quality of friendships has been predicted by prosocial behaviour, literacy, early expressive and receptive language, NVIQ, and problem behaviour. If we consider poor friendship quality as a peer problem though, more research is needed for valid conclusions. Language ability, prosocial behavior, and shyness were concurrently predictive of level of emotional engagement in close relationships. In terms of social withdrawal, evidence suggested that self-views about relations with peers predicted social disengagement and stress, which in turn predicted subsequent social withdrawal and still more negative self-views.

Finally, poor social skills and peer acceptance difficulties have been commonly cited risk factors of bullying. Behavioural and socio-emotional problems have been indicated as significant predictors of bulling, in contrast with language ability within the DLD group, which did not appear to contribute to bullying per se, suggesting that problems accompanying DLD are related with increasing risk of bulling, rather than the language itself.

2.2.3 Summary of social functioning findings in aphasia and DLD

Synthesising the findings above on the social functioning of older PwA and adolescents with DLD, three main points emerge:

a) Social difficulties are evident in both aphasia and DLD groups.

b) Despite some common ground (e.g., relationships such as friendships, social withdrawal), overall, different social aspects have been explored and seem problematic in the two groups. Social networks, social isolation, social support, social activities, and participation, as well as employment have been investigated in the aphasia literature. In DLD, on the other hand, the focus has been on peer interaction, social competence, social acceptance, prosociality, difficulties in peer relations, victimization, and bullying.

c) Comparing influencing variables for each group, the majority of PwA felt that people avoided contact with them due to their difficulties with communication. In DLD, evidence suggests that social disengagement and stress were predicted by self-views about relations with peers. It may be that language problems contribute to social withdrawal in both groups, but perhaps if people experiencing withdrawal are young when this happens, they attribute it to themselves, whereas if they are adults it is more possible to attribute it to the disorder, i.e., aphasia. Regarding social relationships and friendships in particular, according to PwA loss of friendships is due to the loss of shared activities, physical disability, reduced energy levels, environmental barriers, reduced mood for socialising, and negative reactions of others. In adolescents with DLD poor quality of friendships is influenced by prosocial behaviour, problem behaviour, language disorder, and NVIQ.

In conclusion, based on the current review, the literature of older PwA and adolescents with DLD tends to focus on different aspects for each group. Even when the type of difficulty is the same, it seems that its nature and its influencing factors may be different between the groups.

2.3 Overview and Conclusions

Depression, social isolation, decrease in activities and change in family roles have been regularly reported in chronic aphasia (Hinckley & Packard, 2001). Bronken et al. (2012) highlighted that communication difficulties resulted in restricted interactions with other people and left a person with aphasia at risk of psychosocial problems. This point has been further supported by Cruice et al. (2003) study which showed that aphasic people's communication was a predictor of their psychosocial wellbeing and social health. Importantly, a systematic review revealed that aphasia severity, communication disability, other medical problems, emotional distress/depression, activity limitations, and social factors (reduced social network and support) predicted lower Health Related Quality of Life (HRQOL) in PwA (Hilari et al., 2012). Results of these studies cannot be generalised to the younger population of PwA though, as the samples studied in these reports concerned primarily older adults. Despite the findings of Dalemans et al. (2008) and Pike et al. (2017) on PwA of working age, evidence for early adulthood is still lacking.

Regarding DLD, there is now increasing evidence that the emotional and social difficulties that children with DLD have continue into adolescence. A review focusing on emotional and social functioning of adolescents with DLD in terms of peer relations, peer friendships, bullying, emotional difficulties, and psychiatric difficulties suggested that, although highly heterogeneous as a group, adolescents with DLD tend to be more vulnerable to problems in these domains than TD peers (Durkin & Conti-Ramsden, 2010). More recent reports show that emotional and social difficulties of children with DLD persist not only into adolescence, but also into early adulthood.

Most of the literature breaks down wellbeing into different emotional and social components as presented in this chapter. However, the present project will investigate wellbeing as a global concept first and then the factors which may affect wellbeing (including social and emotional factors) in the two populations of interest. As the present project focuses on early adulthood, a systematic review focusing exclusively on the predictors of wellbeing in YA with aphasia and those with DLD follows, including more details on important longitudinal studies that have created the current knowledge.

CHAPTER 3

3 Systematic Review of Wellbeing in Young Adults with Aphasia and Young Adults with Developmental Language Disorder

3.1 Introduction

The previous chapter presented a literature review focusing on emotional and social difficulties that older adults with aphasia and adolescents and children with DLD may experience together with factors related to those difficulties. The present chapter comprises a systematic literature review on the key area under investigation in this project: factors influencing wellbeing in YA (18-40 years of the age) with aphasia and YA with DLD.

3.2 Methods

The Centre for Reviews and Dissemination (Dissemination, C. F. R. A, 2009) and the PRISMA Group (Moher et al., 2009) guidelines on conducting and reporting systematic reviews were followed in the present review.

3.2.1 Eligibility criteria

3.2.1.1 Studies

The present review included studies that reported research data on factors associated with, or predictive of, wellbeing in YA with post-stroke aphasia and YA with DLD. The focus was on psychosocial aspects of wellbeing aiming to ensure conceptual accordance with the current wellbeing-related literature (see Chapter 2). Only publications in English and Greek language were examined. There were no other restrictions, such as publication date, source type, geographical location, setting, and study design. Validated measures (for quantitative studies) and established ways of analysing data (for qualitative studies) had to be applied for the studies to be included in the review.

3.2.1.2 Participants

Participants of the studies had to have a mean/median age between 18 and 40 years (referred to below as YA), to be included in the review. Aphasia reports had to include information on YA who had acquired aphasia following stroke. There were no restrictions on aphasia and stroke type and severity. The DLD reports had to include information on YA who had DLD, without the presence of co-occurring diagnoses, such as ASD or ADHD. No other exclusion criteria for participants were applied.

3.2.2 Sources of information

The following electronic full-text and bibliographic databases were searched: CINAHL Complete, Communication Source, MEDLINE Complete, PsycARTICLES, PsycINFO, with the use of the EBSCOhost platform. Embase (1974-2017), AMED (Allied and Complementary Medicine), EBM Reviews - Cochrane Central Register of Controlled Trials, EBM Reviews - Cochrane Database of Systematic Reviews, Global Health, and Ovid MEDLINE(R) databases were also accessed through the Ovid Online platform.

3.2.3 Search strategy

The Advanced Search/Multi-Field search option was selected in both databases, to allow a 'Field search', where combination of related keyword terms from every concept of the topic is feasible. To enhance search terms, two advanced search techniques were used: a) truncation, that broadens the search to include various word endings (by entering the root of a word and putting the asterisk (*) at the end; e.g., *aphasi**, enabling words such as *Aphasia* or *aphasic* to come up) and b) double quotation marks (in EBSCOhost only) as a search technique for exact phrase searching, avoiding searching for individual terms when the phrase is the target (by enclosing the words in double quotation marks; e.g., "quality of life"). Abstract (AB) was selected as a field, enabling the terms used to be searched in documents' abstract. Using keyword-searching limited to the Abstract field reduces the number of results which are retrieved in error or are only on the periphery of the topic area. Terms used for each concept as synonyms were combined with the Boolean operator 'or' in order to retrieve records containing either word, broadening the results.

A separate search was performed for Aphasia and DLD. Concepts included in the search comprised: a) the language disorder (Aphasia/DLD), b) wellbeing and related concepts, c) predicting and/or influencing factors, and d) YA (see below reasons for eventually excluding this category from the search strategy). The concept searches were combined using the operator ‘and’, which narrows the results to retrieve records containing all the concepts together. The only search limiter used was that of Language.

Age (YA: 18-40 years old) was initially included as a distinct concept category in the search strategy. Different keyword terms describing this age group were used, including “YA”, “aged 18 – 40”, “early adulthood”, “early adult life”, “working age”. However, when this technique was tested, there was a sharp decline in the number of results. In addition, relevant articles that had been found manually did not come up in the electronic searches. Using the age filter for young adulthood, as provided by the two platforms, was another technique that was tested to make the results specific to the age under study. With the age filter, many negative results came up, i.e., papers about older PwA and children with DLD. Moreover, papers that included at least one term of each main concept in the abstract and should have come up, did not come up. After having examined these two approaches and found them to be ineffective, age was not used as a search concept nor as a filter in the search strategy. Instead, the PhD student searched all the papers manually for the criterion of age, when they passed the title screening. Though laborious, this approach minimised the possibility of missing relevant papers.

Subject Heading (MeSH) searching was initially tried out for the present systematic review. However, MeSH terms that came up were not helpful, as they were very specific in most cases (e.g., for aphasia, all different Aphasia types were suggested), while for some concepts no subject headings were found. Thus, a keyword search level was used. The few MeSH terms that seemed relevant were used as keyword terms. The comprehensiveness of the search strategy and the keywords used was tested multiple times by discussing it with the PhD research team, a specialist librarian, and other researchers and by trying various strategies before deciding on the final one.

The following search strategy was used for the EBSCOhost platform:

Aphasia search:

S1. AB aphasi* OR AB dysphasi* OR AB "acquired language impairment"

S2. AB psychosocial OR AB ("quality of life" or qol) OR AB (wellbeing or well-being or well being) OR AB social OR AB emotion* OR AB ("health related quality of life" or hrqol or HRQoL) OR AB psychol* OR AB life satisfaction OR AB participation

S3. S1 AND S2

S4. AB predict* OR AB factor* OR AB variable* OR AB determinant* OR AB indicator* OR AB contribut* OR AB descriptor* OR AB relat* OR AB correlat* OR AB associat* OR AB influenc* OR AB (impact or affect or effect)

S5. S3 AND S4

S6. Narrow S5 by Language: English and Greek

DLD search:

S1. AB "developmental language impairment*" OR AB "developmental language disorder*" OR AB ("specific language impairment" or SLI) OR AB "specific language disorder" OR AB "language impairment" OR AB "language disorder"

S2. AB psychosocial OR AB ("quality of life" or qol) OR AB (wellbeing or well-being or well being) OR AB social OR AB emotion* OR AB ("health related quality of life" or hrqol or HRQoL) OR AB psychol* OR AB life satisfaction OR AB participation

S3. S1 AND S2

S4. AB predict* OR AB factor* OR AB variable* OR AB determinant* OR AB indicator* OR AB contribut* OR AB descriptor* OR AB relat* OR AB correlat* OR AB associat* OR AB influenc* OR AB (impact or affect or effect)

S5. S3 AND S4

S6. Narrow S5 by Language: English and Greek

The same strategy was used for Ovid Online platform, except for the double quotation marks used in EBSCOhost, which were not needed in Ovid Online (e.g., “quality of life” in EBSCOhost vs quality of life in Ovid Online, as shown below). The Aphasia search using the Ovid Online platform is given below, as an example:

1. (aphasi* or dysphasi* or acquired language impairment).ab.

2. (psychosocial or (quality of life or qol) or (wellbeing or well-being or well being) or social or emotion* or (health related quality of life or hrqol or HRQoL) or psychol* or life satisfaction or participation).ab.

3. 1 and 2

4. (predict* or factor* or variable* or determinant* or indicator* or contribut* or descriptor* or relat* or correlat* or associat* or influenc* or (impact or affect or effect)).ab.

5. 3 and 4

6. limit 5 to English and Greek language

7. remove duplicates from 6

Manual searches were also conducted by searching a) the reference list of eligible articles and b) the Google Scholar web search engine using the search terms described, altogether, e.g., *Psychosocial Predictors of Wellbeing in Young Adults with Aphasia.*

3.2.4 Data management

Study data was stored and coded within Zotero, - an open-source reference management software developed by the Center of History and New Media at George Mason University.

3.2.5 Screening

After removing duplicate studies, resources resulting from the searches were screened against the eligibility criteria. Where eligibility could not be decided based on the title or abstract solely, the full text was retrieved. Reasons for exclusion by text are documented below. The full text of studies passing the screening process was obtained. Studies that were relevant to the review topic but did not meet the criteria for inclusion, such as opinion pieces, theoretical papers, or policy documents, were set aside to be used for background when relevant. Reviews adopting systematic methodologies were used to extract relevant original research papers, when relevant.

3.2.6 Data extraction

Study and participant characteristics extracted included: study design, sampling method of the clinical group of interest, sample size, disorder characteristics, gender, age under investigation, socioeconomic status, current employment/education level, and ethnic background.

3.2.7 Data analysis

Due to the high levels of conceptual and methodological heterogeneity among the included studies, data analysis took the form of a narrative synthesis of the evidence, which is an appropriate approach for synthesising the results of studies with disparate study aims and designs (Popay et al., 2006).

3.2.8 Critical appraisal

The methodological quality of studies was assessed using the Joanna Briggs Institute Critical Appraisal Checklists for cohort, cross-sectional, and qualitative studies, depending on the design of each study.

3.3 Results

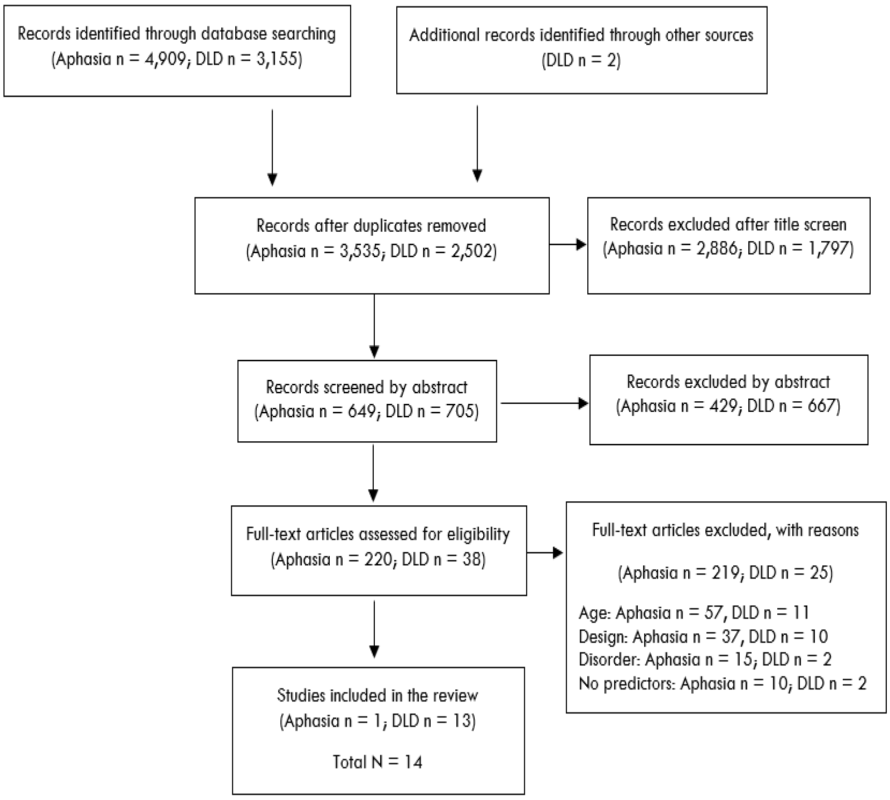
3.3.1 Study selection

Electronic database searches using EBSCOhost were initially conducted in March 2017 and using Ovid Online in June 2017, resulting in a total of 5,872 (Aphasia: *n* = 3,794; DLD: *n* = 2,078) studies. In October 2020, the searches were re-run to update the review results. The search strategy was identical to the first one, as previously detailed. The only difference was that after inserting the Language filter, results were also filtered by 'Published Date' to include reports published after the abovementioned dates only. To achieve this, publication date range was set between 2017 and 2020. This resulted in a total of 1,562 new results (Aphasia: *n* = 1,115; DLD: *n* = 447).

Figure 3.1 details the study selection process, separately for aphasia and DLD studies. Only one reason is given per excluded study, though in many cases more than one of the mentioned reasons applied.

After de-duplication, 6,035 studies remained (Aphasia: n = 3,535; DLD: n = 2,500). The relevance of these papers was examined. Reviewing the titles led to excluding 4,683 papers (Aphasia: n = 2,886; DLD: n = 1,797). The abstracts of the remaining papers (Aphasia: n = 649; DLD: n = 703) were then reviewed and a further 1,096 articles were excluded (Aphasia: n = 429; DLD: n = 667). The full text of the 256 remaining references was reviewed (Aphasia: n = 220; DLD: n = 36) and further 244 references were excluded (Aphasia: n = 219; DLD: n = 25). Reasons for exclusion comprised age, design (not original research study), language disorder other than aphasia or DLD, or not looking at predictors or associations of wellbeing. Papers that could not be accessed online were requested by contacting the authors. The electronic searches resulted in one aphasia and 11 DLD studies that met the criteria for the present review. Two more DLD studies were found manually and included in the review. Fourteen studies in total were reviewed.

Figure 3.1: *Study selection flowchart*



Note. n = number of studies for each group; DLD: Developmental language disorder; *N* = total number of studies.

3.3.2 Characteristics of included studies

Study characteristics are reported in detail in Table 3.1. All studies included in the present systematic review were published in English, with a range of publication dates of 20 years (from 2000 to 2020).

3.3.2.1 Aphasia reports

Only one aphasia study met the criteria for the present review (Kim et al., 2005), which was a cohort study. Participants who had a stroke were recruited through the stroke registry of the Asan Medical Center, in Seoul, South Korea. Participant demographic details were collected at the time of admission and they were assessed for neurological problems, motor and functional disability, and risk factors.

A follow-up assessment took place one to five years later, when QoL and relevant areas were assessed. The study included 96 young-onset (15-45 years) and 160 old-onset (>45 years) participants, with a total sample size of 256 people. In total, 15 people (9.4%) of the younger group and 13 people (8.1%) of the older group had aphasia ($N = 28$; 10.9%). Although information about lesion side, location, and type of stroke was given, details about the type and severity of aphasia were not provided. Demographic characteristics included age (mean age of young-onset participants = 39 years old; mean age of old-onset participants = 62 years old), education, gender, marital status, economic status, and employment. Ethnic background was not provided.

3.3.2.2 Developmental language disorder reports

In total, 13 DLD reports were included in the present review. Of these, one was qualitative (Carroll & Dockrell, 2012) and the remaining 12 were quantitative in design. All 13 reports were part of four longitudinal projects. Two reports (Clegg et al., 2005; Howlin et al., 2000) came from the original project of Bartak et al. (1975), which was one of the first, if not the first, longitudinal studies that identified children with DLD at an early age and followed them into adulthood. This is a long-term study of a small sample recruited in the

UK. Similarly, three reports that met the criteria for the present review (Bao et al., 2016; Brownlie et al., 2016; Voci et al., 2006) were part of a 26-year three-stage epidemiological project, known as the Ottawa Language Study, which used a prospective longitudinal design (Beitchman et al., 1986). This is a large-scale longitudinal study that recruited a community sample in the Ottawa-Carleton region. The third project is the Manchester Language Study (MLS) (Conti-Ramsden et al., 1997; Conti-Ramsden & Botting, 1999), - a large scale longitudinal research programme which has produced the largest number of papers from a single project in this review: a) Toseeb et al. (2017), b) Botting, Toseeb, et al. (2016), c) Botting, Durkin, et al. (2016), d) Conti-Ramsden et al. (2016), e) Durkin et al. (2017), and f) Conti-Ramsden et al., (2018). Unlike the Ottawa study, the MLS recruited a clinical sample in the UK. Finally, Carroll and Dockrell (2010) and Carroll and Dockrell (2012) also shared common participants. The project by Carroll and Dockrell is a shorter-term longitudinal study of a small school UK sample.

These four studies have some important differences in terms of sampling/recruitment process. Bartak et al. recruited boys aged between 4;6 and 9;11 years, with normal non-verbal intelligence but with severe developmental impairment of language comprehension. Originally, these children comprised a comparison group against which to compare the progress of children with autism. The follow-up phases report on a proportion of the boys with DLD, initially identified through six special units (attached to hospitals) and six special schools and tested again in adulthood. Clegg et al. (2005) also recruited siblings of participants who met specific criteria for comparison. In addition, an IQ matched group of participants was recruited.

Table 3.1: *Study characteristics*

	Developmental language disorder													Aphasia
	Batrak et al. study		Ottawa study			Manchester Language study						Carroll & Dockrell study		
Study characteristic	**Howlin et al. (2000)**	**Clegg et al. (2005)**	**Brownlie et al. (2016)**	**Voci et al. (2006)**	**Bao et al. (2016)**	**Toseeb et al. (2017)**	**Botting, Durkin, et al. (2016)**	**Botting, Toseeb, et al. (2016)**	**Conti-Ramsden et al. (2016)**	**Durkin et al. (2017)**	**Conti-Ramsden et al. (2018)**	**Carroll & Dockrell (2010)**	**Carroll & Dockrell (2012)**	**Kim et al. (2005)**
Study design	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cohort	Cross-sectional	Qualitative (follow up)	Cohort
Sampling method of clinical group of interest	-Convenience sample -Six special units & six special schools -UK		-Probability sample -All English-speaking kindergarten children aged 5 -Ottawa-Carleton Ontario, Canada			-Probability sampling within clusters (all from language units) -All language units children aged 7 -England						-Purposive sampling -All people graduated from a specific school -South east England		-170 consecutive patients of stroke registry of the Asan Medical Center
Sample size (n)	DLD = 20	DLD = 17; TD Siblings = 16; IQ match control group = 17 (+1,384 subjects of NCDS)	DLD: T1=84 T2=74 T3=68 TDPs: T1=135 T2=132 T3=123 Total: T1= 219 T2=206	DLD= 76; TDP= 126; Total =202	DLD: T1= 84, T2=74, T3=68; TDPs: T1= 135, T2=132, T3=123; Total: T1= 219,	DLD=84; TDPs =65; Total= 149.	DLD=81; TDPs=87; Total= 168.	DLD= 107; TDPs=99; Total= 206.	DLD=84; TDPs=88; Total=172 .	DLD=84; TDPs=8; Total= 172	DLD=84; TDPs=88; Total=172	DLD=60	DLD=19	Young-stroke onset patients: n = 96; Old stroke-onset patients: n = 160; Total: n = 256

Study characteristic	Developmental language disorder													Aphasia
	Batrak et al. study		Ottawa study			Manchester Language study						Carroll & Dockrell study		
	Howlin et al. (2000)	**Clegg et al. (2005)**	**Brownlie et al. (2016)**	**Voci et al. (2006)**	**Bao et al. (2016)**	**Toseeb et al. (2017)**	**Botting, Durkin, et al. (2016)**	**Botting, Toseeb, et al. (2016)**	**Conti-Ramsden et al. (2016)**	**Durkin et al. (2017)**	**Conti-Ramsden et al. (2018)**	**Carroll & Dockrell (2010)**	**Carroll & Dockrell (2012)**	**Kim et al. (2005)**
			T3=191		T2=206 T3=191									
Disorder characteristics DLD: language and IQ skills Aphasia: aphasia & stroke type and severity.	✓ Info for language and cognition for childhood and adulthood.	✓ Info for language an cognition for mid-thirties [Reference for childhood, middle childhood, early twenties, and mid-thirties is cited].	✗ Neither language nor cognition information is given for the ages under study. [Reference is made for the recruitment time (age 5)].	✗ [Reference is made for age 5 and reference for more details is cited].	✓ Language and cognition for age 12; PIQ information is given for all three time points. Reference is made for age 5 and reference for more details is cited.	✓ (For all three time points) Reference is made for the recruitment time (age 7) and reference to the initial study for more details implied.	✓ (For the current age) Reference is made for the recruitment time (age 7) and reference to the initial study for more details.	✓ (For all three time points) Reference is made for the recruitment time (age 7) and reference to the initial study for more details.	✓ (For the current age) For language and PIQ. Reference is made for the recruitment time (age 7) and reference to the initial study for more details.	✓ (For the current age) For language and PIQ. Reference is made for the recruitment time (age 7) and reference to the initial study for more details.	✓ (For the current age) For language and PIQ. Reference is made for the recruitment time (age 7) and reference to the initial study for more details.	Language skills information for age 11 given; no PIQ.	Language skills information at 16 given; no PIQ.	Stroke characteristics are given; not aphasia type and severity.
Gender	✓	✓	✓	✗	✗ [Reference is cited].	✓	✓	✓	✓	✓	✓	✓	✓	✓

Study characteristic	Developmental language disorder													Aphasia
	Batrak et al. study		Ottawa study			Manchester Language study						Carroll & Dockrell study		
	Howlin et al. (2000)	**Clegg et al. (2005)**	**Brownlie et al. (2016)**	**Voci et al. (2006)**	**Bao et al. (2016)**	**Toseeb et al. (2017)**	**Botting, Durkin, et al. (2016)**	**Botting, Toseeb, et al. (2016)**	**Conti-Ramsden et al. (2016)**	**Durkin et al. (2017)**	**Conti-Ramsden et al. (2018)**	**Carroll & Dockrell (2010)**	**Carroll & Dockrell (2012)**	**Kim et al. (2005)**
Ages under investigation Mean (SD) / Range in years	DLD: 24.10 (1±56)/ (21.10 -28.2)	DLD: 36.2(1.25)/ 33.0-38.1 Siblings: 36.1(6.04)/ 25-44 IQ matched control group: 36.8(2.2)/ 34.1-39.1	DLD & TD: T1=19 T2=25 T3=31	DLD: 18.4 (.51)/ 18–20	DLD & TD: T1=19 T2=25 T3=31	DLD:24 TD: 24	DLD:24,4 TD: 24	DLD: 24 TD: 24	DLD: 24.4(0.65)/ 23.4-25.8 TD: 24.1(0.9)/ 22.3-26	DLD: 24 TD: 24	DLD: 24.4 (0.65)/ 23.4-25.9 TD: 24.1 (0.9)/ 22.3-25.9	DLD: 19/ 17-22	DLD: 21	Young-onset stroke patients: 39 (7); Old-onset stroke patients: 62 (8).
Socioeconomic status	✗	✗	✗ Info is not given. [Reference is made for SES at 5]	✓	✓	✓*	✓*	✓*	✓*	✓	✓*	✗	✗	✓
Current employment/ education level	✓	✓	✗	✗	✓ [Education for 5 and 12]	✗	✗	✓	✓	✗	✓	✓	✓	✓

Study characteristic	Developmental language disorder													Aphasia
	Batrak et al. study		Ottawa study		Manchester Language study							Carroll & Dockrell study		
	Howlin et al. (2000)	**Clegg et al. (2005)**	**Brownlie et al. (2016)**	**Voci et al. (2006)**	**Bao et al. (2016)**	**Toseeb et al. (2017)**	**Botting, Durkin, et al. (2016)**	**Botting, Toseeb, et al. (2016)**	**Conti-Ramsden et al. (2016)**	**Durkin et al. (2017)**	**Conti-Ramsden et al. (2018)**	**Carroll & Dockrell (2010)**	**Carroll & Dockrell (2012)**	**Kim et al. (2005)**
Ethnic background	✗	✗	91% White/ Caucasian	Caucasian	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

Note. Regarding reports that are part of project A or B (see below), brackets include information that is not documented into the report but can be assumed through data given for other reports that are part of the same project. ✓ = information given; ✗ = information not given; TDPs = typically developing peers; IQM = IQ matched; NCDS = National Child Development Study; PIQ = performance IQ; ✓* = reference in terms of group matching, but without detailed description.

The Ottawa Language Study included a community sample. Participants were recruited at age five as part of a three-stage epidemiological study of communication disorders. A one-in-three stratified random sample of all kindergarten children with proportionate allocation was used in the Ottawa–Carleton region of Canada (*N* = 1,655). The sample then completed a speech and language screening and speech and language therapists (SLTs) further assessed children who failed the screening. In total, 180 children were diagnosed with speech disorder and/or language disorder, and 142 of them received parental consent for further participation. A group of 142 children without language or speech disorders, matched on age, sex, and classroom was also selected. These 284 children were the Wave 1 participants of the study and were contacted for follow-up at ages 12 (Wave 2), 19 (Wave 3), 25 (Wave 4), and 31 (Wave 5). Participation rates were 86%, 91%, 85%, and 80% respectively. As relevant to the present project, Voci et al. (2006) report for participants of Wave 3, while Bao et al. (2016) and Brownlie et al. (2016) report for Wave 3 but also Waves 4 and 5.

In the MLS, the authors approached all language units in England, i.e., 118 in total, identifying all children aged 7 years old who were attending language units. From all eligible children, the authors took a 50% randomly selected sample. This resulted in an initial cohort of 242 children with DLD. Individuals were contacted again at ages 8, 11, 14, 16, 17, and 24. The reports included in this review followed children with DLD initially recruited at 7 and tested them again in adulthood. The reports included here refer to participants belonging to the 24-year-old group. A comparison group was recruited for the study at around age 16 and thus skills of younger age are not provided for this group. These participants had no history of special educational needs or speech and language therapy provision. Groups did not differ in age, gender, household income at age 16, and non-personal income at age 24. In each of the reports included here, the sample size of participants differed because only participants with data for at least two of the three time points could be included in reports of transitions for analysis purposes and this number differed depending on the outcomes of interest.

Carroll and Dockrell adopted purposive sampling for their study. All participants had attended a residential special school for pupils with DLD in the south east England and received a speech therapy programme that was integrated into the school curriculum. Seventy-nine young people had completed their compulsory education at the school during the targeted period (2000 to 2004). They were all initially contacted by post and then, where possible, by telephone to request participation in the follow-up study. Sixty pupils agreed to participate in the first of the two projects included here (Carroll & Dockrell, 2010), where participants had a mean age of 19 years. Two years later, 19/60 of the participants took part in a second investigation (Carroll & Dockrell, 2012) who had a mean age of 21 years. Nineteen out of 60 participants is a poor follow-up rate, which should be considered when interpreting the results of the present review.

Characteristics for each report are provided in detail in Table 3.1. Looking at all 13 reports together, the sample size ranged as follows: for DLD participants, from 17 (Clegg et al., 2005) to 107 (Botting, Toseeb, et al., 2016) and for typically developing peers (TDPs) from 33 (Clegg et al., 2005: 16 siblings and 17 IQ-matched control group) to 126 (Voci et al., 2006). Considering all the participants (DLD and TDPs) as a group, the range of the sample size among reports was between 50 (Clegg et al., 2005) and 206 participants (Botting, Toseeb, et al., 2016). The total number of participants with DLD and TDPs was estimated around 316 and 258 participants respectively, resulting in an approximate total sample size of 574 participants (this calculation includes one report of each study, i.e., the one with the most participants and from the last wave of examination when applicable). The reports of Carroll and Dockrell (2012) and Howlin et al. (2000) did not recruit TD participants.

Eleven from the 12 quantitative reports provided some information about the disorder characteristics of participants with DLD. However, some of them did not report on PIQ. Some reports included information about the baseline assessment, others about the age under investigation (adulthood), and others about both (for more details see Table 3.1). Two reports (Bao et al., 2016; Brownlie et al., 2016) from the Ottawa study did not give information about the disorder characteristics; they provided references for this information instead. In terms of demographic details, all, but two papers (Bao et al., 2016; Voci et al., 2006) clearly stated participants' gender. In Bao et al. (2016) and Voci et al. (2006) papers, although percentages of males and females were not presented, it is clear that gender had been considered as a factor, and details were given in other papers that followed. Age of participants was reported in all articles. The range of mean ages investigated in the papers included in the present review which focused on YA was between 18.4 and 36.2 years.

Eight out of 13 reports provided some information about socioeconomic status (SES) of the participants. All three papers from the Ottawa study (Bao et al., 2016; Brownlie et al., 2004; Voci et al., 2006) reported this factor at age 5 of participants, taking into account income, education, and occupational status. In a similar vein, all papers from the MLS (*N* = 6) assessed this factor in terms of household income at age 16 and personal income at age 24 (Botting, Durkin, et al., 2016; Botting, Toseeb, et al., 2016; Conti-Ramsden et al., 2016; Conti-Ramsden et al., 2018; Durkin et al., 2017; Toseeb et al., 2017). The remaining four papers did not make a reference to socioeconomic level of participants (Carroll & Dockrell, 2010, 2012; Clegg et al., 2005; Howlin et al., 2000). Employment status or education level at the time of the study were clearly stated in nine out of 13 reports. Two papers from the Ottawa study (Brownlie et al., 2016; Voci et al., 2006) and three MLS papers (Botting, Toseeb, et al., 2016; Durkin et al., 2017; Toseeb et al., 2017) did not report on education or employment. Regarding the MLS study though, these characteristics were found in other reports. Only two papers (both coming from the same initial study) clearly reported on the ethnic background of the participants, i.e., 91% White Caucasian (Brownlie et al., 2016; Voci et al., 2006).

3.3.3 Critical appraisal and risk of bias

The Joanna Briggs Institute critical appraisal tools were used to evaluate the methodological quality of the articles in the present systematic review. Three different checklists were used to cover designs of all articles, i.e., cohort (Table 3.2), cross-sectional (Table 3.3), and qualitative (Table 3.4) study designs (Joanna Briggs Institute, nd).

Table 3.2 summarises the critical appraisal of all cohort studies. In all 12 studies the groups selected for comparison were as similar as possible in characteristics, excepting language and cognitive performance, as expected, which were differentiating factors among the clinical and TD groups. In all studies, all participants' language and cognition abilities were measured in a similar way, ensuring appropriate assignment of participants to DLD or control group. All cohort studies included in the present review used reliable and validated measures for testing clinical characteristics of language and cognition, which are extensively used in the DLD literature. However, in some reports authors do not comment on the psychometrics of the measures used, which is a limitation. In all studies, potential confounders were identified and included mostly participant characteristics such as age, gender, and socioeconomic status. In six studies, statistical comparison between the groups took place to test for potential cofounding factors and no differences were found. Also, all studies used strategies to deal with effects of potential confounding factors including a) matching of participants in recruitment so that effects of confounding factors could be adjusted for and b) adjustment in data analysis, i.e., researchers used multivariate regression analysis to account for the confounding factors measured. In all studies the outcomes were measured with valid and reliable measures, but again most of the reports were not referred to this aspect in the relevant papers. In addition, use of composite scoring, which was used in two studies, should have been considered more carefully. In one, a composite score was used although this not recommended by the scale developers, while in the other the study, composite calculation is not mentioned.

Follow-up time was long enough for outcomes to occur in the studies. In most of the studies there was some loss of participants, reasons for which were provided in most cases. For addressing attrition, some studies tested differences between the initial and later sample, finding no differences. Some reports used data from people who had data for all time points only, while others used more sophisticated techniques, e.g., multiple imputation or modelling. Two studies did not address attrition. Importantly, all studies used appropriate data analysis. It is worth noting that as the included studies were evaluative and not intervention studies the item “The participants should be free of the outcomes of interest at the start of the study” (Joanna Briggs Institute, nd; checklist for cohort studies) was not applicable for the included studies. As emerged, although some studies could have provided more details in the reports regarding measures’ psychometrics and attrition, they were all rigorous enough to be included in the present systematic review.

Table 3.2: *Critical appraisal of the cohort studies*

	Developmental language disorder studies											Aphasia study
Checklist item	**Howlin et al. (2000)**	**Clegg et al. (2005)**	**Voci et al. (2006)**	**Brownlie et al. (2016)**	**Bao et al. (2016)**	**Botting, Toseeb, et al (2016)**	**Conti-Ramsden et al. (2016)**	**Botting, Durkin, et al. (2016)**	**Toseeb et al. (2017)**	**Durkin et al. (2017)**	**Conti-Ramsden et al (2018)**	**Kim et al. (2005)**
Were the two groups similar and recruited from the same population?	Yes. Presented in Bartak et al. (1975). Comparison group: ASD, no control group was included.	Yes. (where possible). Three comparison groups were included.	Yes.	Yes.	Yes.	Yes. As much as possible as TD people were recruited later than people with DLD.	Yes. As much as possible as TD people were recruited later than people with DLD.	Yes. As much as possible as TD people were recruited later than people with DLD.	Yes. As much as possible as TD people were recruited later than people with DLD.	Yes. As much as possible as TD people were recruited later than people with DLD.	Yes. As much as possible as TD people were recruited later than people with DLD.	Yes. In terms of setting. This study aimed to compare the two groups under study.
Were the exposures measured similarly to assign people to both exposed and unexposed groups?	Yes. Presented in Mawhood et al. (2000)	Yes.	Yes. Presented in Young et al. (2002)	Yes. Presented in Young et al. (2002)	Yes. Presented in Young et al. (2002)	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.
Was the exposure measured in a valid and reliable way?	Yes. Presented in Mawhood et al. (2000)	Yes.	Yes.	Yes. But not mentioned in this paper.	Yes.	Yes. But not mentioned in this paper.	Yes.	Yes. But only reliability for NVIQ is mentioned in the report.	Yes. But not mentioned in this paper.	Yes.	Yes.	Unclear. For the authors, the exposure was stroke which was measured with CT/MRI. Aphasia exposure for the present study) was measured with a structured questionnaire provided by trained nurses, but no details are given.

	Developmental language disorder studies											Aphasia study
Checklist item	**Howlin et al. (2000)**	**Clegg et al. (2005)**	**Voci et al. (2006)**	**Brownlie et al. (2016)**	**Bao et al. (2016)**	**Botting, Toseeb, et al (2016)**	**Conti-Ramsden et al. (2016)**	**Botting, Durkin, et al. (2016)**	**Toseeb et al. (2017)**	**Durkin et al. (2017)**	**Conti-Ramsden et al (2018)**	**Kim et al. (2005)**
Were confounding factors identified?	Yes.	Yes.	Yes.	Yes.	Yes.	Yes. No differences found.	Yes. No differences found.	Yes. No differences found.	Yes. No differences found.	Yes. No differences found.	Yes No differences found.	Yes.
Were strategies to deal with confounding factors stated?	Yes. Matching in recruitment.	Yes. Matching in recruitment where possible.	Yes. Matching in recruitment where possible.	Yes. Matching in recruitment/ Controlling in regression.	Yes. Matching in recruitment.	Yes. Matching in recruitment.	Yes. Matching in recruitment.	Yes. Matching in recruitment.	Yes. Matching in recruitment.	Yes. Matching in recruitment.	Yes. Matching in recruitment.	Yes. Comparison of the two groups /Multiple regression analysis with dummy variable.
Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.	N/A.
Were the outcomes measured in a valid and reliable way?	Yes. But not mentioned in this paper. Reliability is given for one measure only. Also, no details are given for the composite scores used.	Yes.	Yes. Psychometrics are not provided for all measures.	Yes, but not mentioned in this paper.	Yes.	Yes, but not mentioned in this paper.	Unclear. Authors present good reliability for the wellbeing measure used. However, a composite score is not recommended by the tool developers. Also, analyses include a lot of single question scales.	Yes. But authors were not referred to validity, - only reliability. For the support scales, no information is provided.	Yes.	Yes, but authors do not mention psychometrics for all measures.	Yes. As much as possible. Some outcomes were captured with materials developed by the authors, which is reasonable given the nature of those outcomes: education status/support.	Yes, but authors were not referred to it, except for one measure.

	Developmental language disorder studies											Aphasia study
Checklist item	**Howlin et al. (2000)**	**Clegg et al. (2005)**	**Voci et al. (2006)**	**Brownlie et al. (2016)**	**Bao et al. (2016)**	**Botting, Toseeb, et al (2016)**	**Conti-Ramsden et al. (2016)**	**Botting, Durkin, et al. (2016)**	**Toseeb et al. (2017)**	**Durkin et al. (2017)**	**Conti-Ramsden et al (2018)**	**Kim et al. (2005)**
Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.
Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Yes. Reasons for loss are provided.	Yes. Reason of are not provided for two people.	Yes. Reasons for loss are provided.	No. Reasons for loss are not provided in this report.	No. Reasons for loss are not provided, although details for each wave's attrition is provided and differences between groups are explored.	Yes. Reasons for loss are provided.	Yes. Reasons for loss are provided.	Yes. Reasons for loss are provided.	Yes. Reasons for loss are provided.	No. Reasons are not given in this report.	Yes. Reasons for loss are provided.	Yes. Reasons for loss are provided.
Were strategies to address incomplete follow up utilized?	No.	Yes. Only those DLD subjects that were assessed at each of the four time points were included in the longitudinal analysis.	Yes. Testing for differences between groups /Acknowledging in limitations.	Yes. Testing for differences between groups/Multiple imputation.	Yes. Exploration of change in association between LD &psychiatric trajectory when participants were assumed to drop out at different rates.	Yes. Testing for differences between groups/ Modelling accounting for attrition across time was used (growth curve modelling).	Yes. Testing for differences between groups and no differences were found.	Yes. Testing for differences between groups.	Yes. Testing for differences between groups and no differences were found for the DLD group. For the TD people, results were mixed.	No.	Yes. Testing for differences between groups and no differences were found.	Yes. Testing for differences between groups and where differences were found it was acknowledged as a limitation.

	Developmental language disorder studies											Aphasia study
Checklist item	**Howlin et al. (2000)**	**Clegg et al. (2005)**	**Voci et al. (2006)**	**Brownlie et al. (2016)**	**Bao et al. (2016)**	**Botting, Toseeb, et al (2016)**	**Conti-Ramsden et al. (2016)**	**Botting, Durkin, et al. (2016)**	**Toseeb et al. (2017)**	**Durkin et al. (2017)**	**Conti-Ramsden et al (2018)**	**Kim et al. (2005)**
Was appropriate statistical analysis used?	Yes	Yes.	Yes.	Yes.	Yes	Yes	Yes.	Yes	Yes	Yes.	Yes.	Yes.
Overall appraisal:	Include.	Include.	Include.	Include.	Include.	Include.	Include.	Include.	Include.	Include.	Include.	Include.

Note. ASD: Autism Spectrum Disorder; TD: typically developing; DLD: Developmental Language Disorder; NVIQ: non-verbal IQ; CT: computerised tomography; MRI: Magnetic resonance imaging; LD: language disorder. For the first eleven items the possible answers were Yes, No, Unclear, or Not applicable. For Overall appraisal, the possible answers were Include, Exclude, or Seek further info. Exposure in this study is the diagnosis of language disorder, as intervention was not provided.

Tables 3.3 and 3.4 cover the cross-sectional and qualitative studies included in the present review, respectively. Both studies had good methodological quality and were included in the synthesis of the results, as detailed in the tables.

Table 3.3: *Critical appraisal of the cross-sectional study (Carroll & Dockrell, 2010)*

Checklist Item	**Answer**
Were the criteria for inclusion in the sample clearly defined?	No.
Were the study subjects and the setting described in detail?	Yes.
Was the exposure measured in a valid and reliable way?	Yes, but it is not mentioned by the authors.
Were objective, standard criteria used for measurement of the condition?	Yes.
Were confounding factors identified?	Yes.
Were strategies to deal with confounding factors stated?	Yes.
Were the outcomes measured in a valid and reliable way?	Unclear. Interview questions and relevant information are not provided.
Was appropriate statistical analysis used?	Yes.
Overall appraisal	Include.

Note. For the first eight items the possible answers were Yes, No, Unclear, or Not applicable. For Overall appraisal, the possible answers were Include, Exclude, or Seek further information.

Table 3.4: *Critical appraisal of the qualitative study (Carroll & Dockrell, 2012)*

Checklist Item	**Answer**
Was there a clear statement of the aims of the research?	Yes.
Is a qualitative methodology appropriate?	Yes.
Was the research design appropriate to address the aims of the research?	Unclear. Researchers do not discuss the design and how they decided the methods used.
Was the recruitment strategy appropriate to the aims of the research?	Yes.
Was the data collected in a way that addressed the research issue?	Yes.
Has the relationship between researcher and participants been adequately considered?	Unclear. There is a statement about discussion of participants regarding concerns for knowing the interviewer prior to interview.

Checklist Item	Answer
Have ethical issues been taken into consideration?	Yes.
Was the data analysis sufficiently rigorous?	Yes.
Is there a clear statement of findings?	Yes.
How valuable is the research?	The research is valuable. It discusses contribution to existing knowledge and current practice or policy and identifies new areas of research. Implications provided are general though.
Overall appraisal:	Include.

Note. For the first ten items the possible answers were Yes, No, Unclear, or Not applicable. For Overall appraisal, the possible answers were Include, Exclude, or Seek further information.

3.3.4 Synthesis of the results

As the study designs and outcome measures used varied markedly, the results are synthesised descriptively. First the results of the single aphasia study are presented, followed by the synthesis of the DLD studies.

3.3.4.1 Aphasia

Just one stroke study met the criteria for the present review (Kim et al., 2005). The study looked at which demographic, clinical (risk factors, residual neurological problems, motor impairment, and functional disability), and activity of daily living variables were correlated with or predictive of QoL and its subdomains in young-onset and old-onset stroke patients. QoL was assessed with the Stroke Specific QOL scale (Williams et al., 1999). On univariate analysis, factors associated with the low overall QoL in young-onset patients included severe dependence/disability (based on modified Rankin score), the presence of motor impairment, aphasia, dysarthria, dysphagia, and no employment status, while alcohol drinking at the time of follow-up was related to high QoL. Follow-up modified Rankin score, motor dysfunction, dysarthria, and economic status were predictors of overall QoL in regression analysis. Aphasia predicted the language subdomain of QoL but not overall QoL or any social or emotional subdomains such as mood, social roles, or work/productivity. Aphasia was also a predictor of personality (being irritable; being inpatient; personality change) in this group. Similar to young-onset people, in old-onset patients, aphasia predicted only the language subdomain of QoL.

3.3.4.2 Developmental language disorder

3.3.4.2.1 Qualitative report

Looking at the DLD qualitative study that was included in this review (Carroll & Dockrell, 2012), some main themes emerged as facilitators and barriers of post-16 education and employment transition for YA with a history of DLD. Personal characteristics of participants (application to their studies and employment responsibilities, their ability to utilise personal skills and talents, and their positive attitude to challenges) and the role played by their parents, including financial, emotional, and practical support, as well as their experience or knowledge for providing appropriate direction to their children, acted as enablers of the transition. Although professional advice and education/qualifications helped the transition for participants' future careers, sometimes they were viewed as challenges for them. In particular, professional advice acted as a facilitator by helping in decision making about the future, but some professionals seemed to be unreliable in terms of their promises and directions which acted as a negative experience for the young people. Although education and qualifications mainly helped YA with DLD in their academic transition, lack of qualifications hampered their search of employment. Finally, examination performance, social competence in the education environment, job seeking (especially for jobs that require good language skills), and their self-confidence constituted challenging areas for this group of YA due to their history of DLD.

3.3.4.2.2 Quantitative reports

Considering each aspect of functioning (social, emotional, personal resources, and other) that could affect wellbeing, the following results emerged.

Various social aspects of the life of young people with DLD have been explored. They include the following: social competence (*n* = 1 report), prosocial behaviour (*n* = 1 report), community/social integration (*n* = 2 reports; one study), independent living (*n* = 1 report), relationships (*n* = 2 reports; two studies), friendships (*n* = 3 reports; two studies), support (available support, organised support, nominated person, reported social support, other perceived support: *n* = 1 report; institutional and employment support: *n* = 1 report; one study), employment (*n* = 4 reports; three studies), academic outcome (*n* = 3 reports; two studies) and education to employment transition (*n* = 1), social problems (*n* = 1), and behavioural problems (*n* = 1). One report has combined employment, relationships, independent living, and friendships together, referring to this as social adaptation.

In terms of the emotional health of YA, subthreshold and diagnosed social phobia have been explored (*n* = 2 reports; one study), as well as social interaction anxiety (*n* = 1 report), social performance anxiety (*n* = 1 report), psychiatric disorder (*n* = 1 report), anxiety (*n* = 2 reports; one study), depression (*n* = 2 reports; one study), social fears (*n* = 1 report), and social interaction fears (*n* = 1 report).

Aspects that could fit under personal resources that have been investigated in studies included in the present SR are as follows: (social) self-efficacy (*n* = 2 reports; two studies), shyness (*n* = 1 report) and self-esteem (*n* = 1 report).

Self-rated health (*n* = 1 report) and problems during the last six months (*n* = 1 report) have also been explored as wellbeing influencing factors. Disorder-related and demographic variables, including early language, (TD vs DLD) language, and concurrent language impairment, NVIQ, developmental time/age, and gender have been consistently used as potential correlates and/or predictors of wellbeing of YA in the DLD literature. One study measured wellbeing itself (consisted of life satisfaction, happiness, and feeling that life is worthwhile) as a global concept and used it as a dependent variable , similar to the present study.

As the aim of the present project was to explore factors associated with (correlation analyses) or predictive of (regression analyses) wellbeing, all the reports that were included in this review have looked at correlations and predictions between variables. Although in principle, some variables could have been explored as dependent variables or main outcome measures and others as independent predicting variables, this is not the case in the DLD literature; thus, the presentation that follows includes relationships between variables more general.

Studies that have explored social functioning in DLD have tested a number of variables and outcomes. Aspects of social adaptation, namely employment, relationships, independent living, and friendships have been found to be related with language, literacy, and pragmatic language impairment (Clegg et al., 2005). In this study, an association reported between relationships and independent living with cognitive outcome, but more research is needed in this area, as the study involved only 17 YA with DLD. Furthermore, all DLD participants were male, which could have influenced the results, as some of the aspects explored may be affected by gender. Gender, for example, has been identified as a factor of vulnerability for employment and academic achievement, with girls being at a disadvantage (Carroll & Dockrell, 2010). However, this finding could not be confirmed by statistical analyses due to the small sample size of the study and should be interpreted with caution because recruitment of participants took place only from one special school and thus these findings cannot be generalised to the broader population of YA with DLD. Social integration and problems as well as friendship difficulties in adults with DLD have also shown association with prosociality levels at younger ages. Toseeb et al. (2017) indicated that at the age of 24 years, being in a DLD group with a prosocial trajectory was significantly protective in other social domains (friendship difficulties and social integration), compared to being in the DLD moderate prosocial trajectory (Toseeb et al., 2017) and this evidence is strong, with a large representative sample and good external validity.

Educational/vocational qualifications and employment type have been also linked with language, reading, and NIVQ skills in the literature (Conti-Ramsden et al., 2018). This is important, as the nature of transition from education to employment is a factor predicting depression in DLD group. In particular, young people with DLD who moved out of school into college at age 17 and then faced difficulty in gaining full-time employment were more likely to experience a decrease-rise pattern in depression symptoms (Botting, Toseeb, et al., 2016). Not only educational and vocational outcomes, but also community integration has been found to be correlated with depression and anxiety levels (Botting, Durkin, et al., 2016). Anxiety and depression were also correlated with the number of problems the participants experienced (situations such as crisis, partner, family, friend, financial, loneliness, illness, being upset about life condition, work, dealing with official documentation, and general administration), and the amount of organised support they received. Personal problems, organised support received, and self-efficacy have been confirmed as predictors of depression with the use of regression analysis (Botting, Durkin, et al., 2016).

Self-efficacy and personal resources seem to also play an important role in how adults with DLD feel and intercorrelations between such variables have been identified. In a recent study, higher levels of shyness in adolescence were associated with higher levels of shyness, lower social self-efficacy, and lower self-esteem in adulthood (Durkin et al., 2017), while shyness and self-esteem in adulthood were associated with better language at 17 and 24 years. Using mediation analysis, the authors showed that language ability in adolescence was a predictor of shyness in young adulthood, which in turn was negatively associated with self-esteem. A previous paper from the same study has also revealed that there is a relationship between emotional health and language which is fully mediated by self-efficacy (Botting, Durkin, et al., 2016).

Research has shown that early language skills are correlated with prevalence of social phobia, frequency of social fears, and maternal phobic anxiety (Voci et al., 2006). However, the relationship between social phobia and language has proved to be attenuated by SES (Brownlie et al., 2016). In logistic regression analysis, lower socioeconomic status and being later born in the family were significantly associated with social phobia at 19 years of age (Voci et al., 2006). In addition, a relationship has been indicated between decreased probability of having a psychiatric disorder and absence of maltreatment, maternal psychological distress, and specific learning disorder in DLD (Bao et al., 2016). Furthermore, between ages 19-25 and 19-31, having an intact family or having special education decreases the probability of having a psychiatric disorder (Bao et al., 2016).

The only paper that addressed wellbeing as a concept directly (consisted of life satisfaction, happiness, and life being worthwhile) used multiple regression models to allow examination of several predictors of wellbeing simultaneously (employment, relationships, and self-rated health) (Conti-Ramsden et al., 2016). All models tested were significant, with self-rated health being the most consistent predictor of personal wellbeing for individuals with a history of DLD in relation to life satisfaction (21% of variance), happiness (11%), and perception that things one does in life are worthwhile (32%). Although this report had large sample sizes and used rigorous methods (probability sampling; rigorous statistical analyses) that made its results robust, some of the measures used were developed by the authors themselves (due to their nature, e.g., relationships/employment), while others were single items and composite scores that were not recommended by the scale developers. These limitations should be kept in mind while interpreting the results.

In summary, there is consensus that having DLD increases the risk of poor social and emotional outcomes. It seems that social adaptation and vocational/employment outcomes are associated with both language-related variables and social skills (e.g., prosociality). Other factors such as employment pathway and personal resources seemed to act as protective factors against poor outcomes, especially where emotional health was concerned. This review found that language skills did not predict emotional outcomes or psychiatric disorders directly, either concurrently or longitudinally within the DLD group. However, both inherent (e.g., self-efficacy) and environmental factors (e.g., social support) have been shown to influence emotional health in YA with DLD.

3.3.5 Relevant studies that were excluded

It is worth noting that some longitudinal studies in the field were not included in this review as they failed the inclusion criteria. Elbro et al. (2011) report included a 30-year follow-up of participants selected from clinic files. The participants were admitted to the clinic in childhood (typically between the ages of 3 and 9 years) because of severe speech and language problems and were followed up 30 years later. At follow-up, most of participants with severe language-learning impairments reported more literacy difficulties, higher levels of unemployment, and lower socio-economic status compared to the general population. However, the paper did not report separately for DLD in terms of what predicted emotional and social aspects tested. Instead, it reported for the whole sample of participants which included not only YA with DLD, but also participants with other diagnoses in addition to their language impairments such as neurologic signs and/or psychiatric diagnoses. Thus, it did not meet the inclusion criteria of the present review.

Another paper by Records et al. (1992) investigated the QoL of YA with a history of DLD. They did not find significant differences between participants with DLD and controls in terms of personal happiness, life satisfaction, and status in some domains of life such as family and social life. They identified, however, some differences in employment and education status, with people with DLD being in disadvantage. This paper was not included in this review, as it did not look at factors associated with or predicting QoL or wellbeing, but only at differences between groups.

The Snowling et al. (2006) and Whitehouse et al. (2009) reports, although relevant were also excluded. Those involved a sample of participants initially recruited by Bishop and Edmundson (1987) who asked professionals for referrals of 3- to 4-year-olds who had a history of DLD. Regarding the former, although it reports relevant data from adolescence, it does not extend to young adulthood (this paper is included in Chapter 2, as relevant). The latter reported that participants in the DLD group were likely to pursue vocational training and work in jobs not requiring a high level of language or literacy ability. Difficulties in establishing social relationships were also identified. Similar to the Records et al. (1992) article, the paper of Whitehouse was also excluded because it did not investigate factors associating with or predictive of wellbeing outcomes.

Finally, papers by Law and colleagues (Law et al., 2009; Schoon et al., 2010) relevant to this project are which report on data from a study known as the 1970 British Cohort Study. This is an ongoing longitudinal study that includes all 17,196 children born in Great Britain in one week in 1970 as participants (Elliott & Shepherd, 2006). Six follow-up studies have monitored cohort members' physical, educational, and social development and transitions to adult life. Law et al. (2009) reported that a group with low language in this cohort showed poor reading, mental health, and employment. Similarly, Schoon et al. (2010) indicated that early receptive language skills were significantly associated with adult mental health as well as psychosocial adjustment during early childhood and in later life. Due to the fact that the 1970 British Cohort Study has generic data, limited use of validated outcome measures, and no measures on wellbeing, these studies did not meet the quality criteria for the present review.

3.4 Discussion

3.4.1 Discussion of findings

Twelve quantitative and one qualitative report were found to report on social, emotional, personal, and related outcomes in YA with DLD. Only one aphasia study met the criteria for this review. Social and emotional aspects of life constituted the most researched areas, with employment, academic outcome, friendships, relationships, social integration (social aspects), depression, anxiety, social phobia (emotional aspects), and self-efficacy (personal resources) having been studied in more than one reports (from 2 to 4 reports). However, conclusions cannot be drawn about the relative importance of each of the factors explored in the literature of YA with DLD and those with aphasia, due to the small number of reports measuring each specific variable (in most cases, each variable is examined once) and the heterogeneity in methodology adopted across studies.

All studies included in the present review were rigorous in terms of quality. The majority of them had large sample sizes and used reliable and valid exposure and outcome measures and sophisticated statistical analyses. Nevertheless, current evidence on wellbeing and related aspects in YA with DLD and, especially, those with aphasia is limited and inconclusive. While only one aphasia study met the inclusion criteria of the present review, the thirteen DLD reports included were actually part of four studies - a fact that confirms the lack of research in this area. As this review also revealed, research on wellbeing and its predictors in YA with aphasia and YA with DLD is only recent: the oldest report included here was conducted 20 years ago and many of the papers were published within the last four years. It is suggested that the lack of sufficient evidence on the area in both disorders of interest is largely due to the age criterion applied in this review. As the previous chapter (Chapter 2) indicated, a substantial body of evidence exists on social and emotional aspects of life in children and adolescents with DLD and older PwA. It is relevant to note that the only aphasia study included had participants with a mean age of 39 years, i.e., on the upper limit of the age criterion (18-40 years) for inclusion in the present study. This lack of research can be explained considering that DLD has only recently been acknowledged as a lifelong disorder, and a rise of stroke incidence in young people has also recently been observed. In addition, holistic approaches to disability, such as the social model of disability and the ICF, which expanded the focus of assessment and therapy from the clinical characteristics of a disorder to its psychosocial effects, wellbeing, and QoL is a relatively recent initiative.

3.4.2 Strengths and limitations of evidence

The methodological quality of studies included in this review was overall good. However, based on current findings, the comparative importance of different factors associated with or predicting wellbeing is not clear for either group.

The one aphasia study included did not exclusively focus on aphasia, but on stroke, and included PwA as part of a wider group. Nevertheless, research shows that QoL in people with and without aphasia is different, with the former group performing less favourably (Hilari, 2011). Also, importantly, QoL, which was the main outcome measure of the Kim et al. (2005) study, is a related but different concept to wellbeing and thus the two cannot be directly compared. Finally, the Kim et al. (2005) study aimed to compare older and younger people with stroke; TD participants were not included in the study, making the conclusions about the level of functioning in people with stroke as compared to the typical population impossible.

In terms of DLD studies, only one examined wellbeing as a global concept (Conti-Ramsden et al., 2016). That paper looked at associations between personal wellbeing constructs and health, employment, and relationships. Only that study investigated factors that affect wellbeing itself as the present study will do. This was similar in design to the aphasia study included in this review that looked at factors affecting QoL (Kim et al., 2005). In both, wellbeing/QoL was the outcome measure and the remaining measures acted as potential influencing/predicting factors. However, in the Conti-Ramsden et al. study (2016) many single question measures were used, which may have affected the reliability of the results. A review of wellbeing measures found no reliability or validity evidence for any of five single-item wellbeing measures that were investigated (Cooke et al., 2016). In addition, most of the studies that were included in the present review used correlation, not regression, analyses which do not allow examination of the relationship between variables. The wide range of outcome measures used in the literature, the diversity in definitions of wellbeing, and the lack of a consistent conceptual framework for wellbeing have also contributed to the significant heterogeneity of findings existing in the wellbeing research, hindering clear conclusions on the topic.

No reports were found to compare wellbeing between YA with aphasia and YA with DLD. Also, a straight comparison between the groups of interest based on the results of the present review is not possible due to the limited evidence about YA with aphasia and the variety of variables that have been examined in the DLD studies. As a result, the evidence base is currently not sufficiently robust to determine differences in factors affecting wellbeing between YA with DLD and those with aphasia.

At the review level, this is the first attempt to synthesise research on predictors of wellbeing in YA with DLD and YA with aphasia. Given the heterogeneity observed in this area, there were no restrictions placed in this review in terms of study design or outcome measures, as long as they were valid and reliable. A strength of this review is that many different searches were tried for addressing the issue of inconsistency of terms used in the literature of wellbeing and its predictors, with the final search including broad rather than specific concepts of wellbeing (e.g., social or emotional, instead of friendships or depression respectively), ensuring maximum inclusiveness. As well as a comprehensive search strategy, this review also included both quantitative and qualitative studies. In addition, as the age of the participants was a key factor for the present review and the current project, different approaches were tried to ensure inclusion of all eligible studies, including an age filter and age as a separate concept category in the search strategy. As those proved ineffective, manual search was applied instead to ensure that relevant papers were not overlooked. Finally, the fact that two platforms (EBSCOhost and Ovid Online) were used for accessing databases relevant to the topic under study made the present review more robust, since the number of hits retrieved from different databases with the same search can vary significantly (Younger & Boddy, 2009).

3.4.3 Conclusions

The limited existing evidence shows that wellbeing as expressed through a number of social, emotional, personal resources, and other outcomes in the literature of YA with aphasia and YA with DLD is impaired comparted to that of TD people. However, the evidence is not sufficient to lead us to valid conclusions in terms of what predicts wellbeing and whether its predictors are different across the two groups. This review showed that wellbeing itself is not typically investigated as an outcome measure, but instead factors related to it are investigated as both outcome and influencing variables. Importantly, a comparison between the two disorders has been never attempted before, despite their clinical similarities.

The results of the present systematic review confirmed the need for the present project as they showed that a) YA with aphasia and YA with DLD are two understudied groups of people with language disorder, b) conclusions about what predicts wellbeing in these two groups are not feasible based on the current evidence, and c) a direct comparison between these two groups has not been previously attempted. Considering the number of studies that met the inclusion criteria for the present review and the methodological and conceptual heterogeneity characterising those studies, it is clear that this field needs further investigation.

3.5 Rationale for the current project

The current project is innovative in three different ways: the age group under study i.e., YA (18-40 years); the direct comparison between aphasia and DLD; and the innovative design using wellbeing as an outcome variable and factors that the systematic review revealed as important, as potential influencing factors of it. Below, more detailed rationale for each aspect of this project is given.

3.5.1 Reasons for studying young adults

Whilst wellbeing has been explored in *older adults* with aphasia and *younger people* with DLD, there is a gap in the literature concerning wellbeing of *YA* with these disorders. In the case of both clinical groups, more in-depth research is needed into the factors that predict wellbeing as this is crucial for effectively targeted interventions and service provision. Taken together, these two groups represent a substantial group of young people with language and associated impairment in the UK. Those aged 18-40 consist an important group to study in terms of their contribution and burden to society and in terms of informing us about change and associations in the effects of language impairment across the lifespan. YA have extensive life demands and long-life expectancy during which they start to have an active social life, form a family, gain employment, and make decisive career moves (Schaapsmeerders et al., 2013). People with language difficulties aged between 20 and 65 years face an enormous challenge to regain a meaningful level of participation in society, to fulfill their roles as parent, partner, colleague or other (Neau et al., 1998; Parr, 2001). This is in contrast with relatively older people with language disorders for whom work may no longer be an issue, whose children are mostly no longer living with them, and where social relationships are different in nature (Dalemans et al., 2008).

In the literature, YA who have had a stroke have been described as a distinct group which may not fit easily into standard services which are designed for older people. Their medical needs may differ, with more emphasis on diagnosing the specific cause of the stroke. Rehabilitation may require special attention to work prospects and family caring (Stroke Association, Intercollegiate Working Party for Stroke, Royal College of Physicians of London, 2004). Although some clinical guidelines do not distinguish between different age categories in the recommendations made for service provision, the UK National Clinical Guideline for Stroke (5th edition; Rudd et al., 2016) suggests that the needs of working-age adults may not be met by standard stroke services. They advise that local service providers identify how the specific clinical, rehabilitation, and social needs of younger people with stroke are to be assessed and managed. Similarly, the UK Department of Health's National Stroke Strategy (Department of Health, 2007) calls for the provision of support to meet the particular needs of people who have a stroke while in working age. A study which focused specifically on age differences amongst stroke survivors revealed that respondents aged 18 to 45 reported significantly more unmet needs than those aged 46 to 65 (Banks & Pearson, 2004). Information about the participation of this younger age group is necessary in order to adjust care to their requirements and facilitate their chances for social and occupational reintegration.

Regarding DLD, short- and long-term follow-up studies have shown that children with DLD remain at risk for a range of difficulties in adult life. According to Clegg et al. (2005), the associations between language and social adaptation in adult life were stronger than the comparable association in childhood (Clegg et al., 2005). The few studies that were eligible for the present systematic review and tracked children with DLD to adulthood showed that some of these individuals experienced considerable difficulties with psychosocial adjustment. Similar to young stroke survivors, older teenagers and YA with DLD have also expressed their concerns for lack of age-appropriate youth clubs (Myers et al., 2011).

Despite the considerable and distinct needs of this age group, there is limited evidence concerning wellbeing of YA with aphasia and DLD, as revealed from the number of eligible studies of the present systematic review. Currently YA with language impairment (both aphasia and DLD) fall through the network of education, health, and social policy and find themselves in disadvantage due to the paucity of evidence based on which to ground practice. Exploring factors that affect wellbeing in these YA will provide necessary evidence in this area.

3.5.2 Reasons for comparison between aphasia and DLD

The most authentic aspect of this project is the comparison of these two clinical groups, i.e., YA with DLD vs YA with aphasia, - a novel approach that has not been attempted before. There are important theoretical and practical reasons for studying these two populations together. A direct comparison of YA with aphasia and DLD using the same measures and approach will help researchers begin to understand whether these two groups of YA share common or have different clinical characteristics and how these are reflected in their wellbeing. This was thought interesting as the current literature, separately for each group, described similar symptoms, despite their considerably different etiologies (acquired vs developmental). Although this systematic review did not permit comparison of outcomes between the two groups, the literature covered in Chapter 2 showed that at least for DLD and aphasia as occurring in their typical ages, they share common emotional difficulties, while in terms of social functioning the two populations have commonalities but have also different issues and needs. For example, both groups are affected in terms of social integration and participation in social relationships, but YA with DLD, having grown-up with a language impairment, seem to have more behavioral and peer relation problems than YA with aphasia who mostly face shrinkage of their social network after their stroke. Differences are evident in factors contributing to these outcomes as well, but a comparison study is crucial for valid conclusions.

From a different perspective, studies of children who have difficulty communicating since birth and studies of adults who lost the ability to produce or understand aspects of language after brain injury can throw light on how language is learned and processed. Though research in these areas has evolved independently, direct comparisons between the two may yield new insights (Bishop et al., 2014).

3.5.3 Reasons for studying wellbeing and its predictors

Wellbeing is fundamental to the overall health of an individual, enabling them to successfully overcome difficulties and succeed what they want in life. Knowing the main predictors of wellbeing is crucial for meaningful interventions for people with language disorders. The literature and systematic reviews presented above showed that younger and older people with aphasia and DLD have emotional, social, and other difficulties. Nevertheless, whether and how those difficulties affect wellbeing in these groups is not clear yet and this is what this project aims to explore. The difficulty of defining wellbeing, which in turn results in a great heterogeneity in concepts and measures used in the literature to investigate it, has significantly contributed to the paucity of research on wellbeing in these two groups. Thus, investigating wellbeing and its predictors will help better understand what affects and what comprises wellbeing in general and those two clinical groups in particular.

3.6 Aim and Research Questions of the Thesis

The purpose of the current project is to explore the wellbeing and its predictors in two understudied groups: YA with aphasia and YA with DLD. The research questions of the project are as follows:

1) How do the language and cognitive skills of the TD, Aphasia, and DLD groups compare?
2) Is wellbeing different between young adults with aphasia and those with DLD, and is it poorer in comparison to TD young adults?
3) a. What predictors of wellbeing are consistent across the TD, aphasia, and DLD groups?
    b. What are the differentiating wellbeing predictors across the TD, aphasia, and DLD groups?

CHAPTER 4

4 Pilot Study

4.1 Introduction

This chapter collates and re-analyses data collected by previous undergraduate students of the PhD supervisors, as part of final-year projects, in the earlier stages of conceptualisation of this PhD project. Students recruited participants during the academic years 2015-2016 and 2016-2017 and investigated components of wellbeing of YA with DLD, YA with aphasia, and TD YA. The methodology and results gained through the pilot study directly informed the main research in this thesis. The aim of the pilot study was to ascertain whether participants could complete a range of measures capturing language, cognition, and potential correlates/predictors of wellbeing to test the acceptability of testing materials and feasibility of the testing procedure and inform measure selection for the main study. Importantly, as has been highlighted in the previous chapters, no published study has been found comparing these two language-impaired populations of YA on wellbeing and related constructs. Therefore, existing literature could not be used to inform the main study and this pilot research is the first preliminary study that attempted to explore the potential benefits of a direct comparison. The pilot study aimed to address the following questions:

a) What is the feasibility of the testing procedure and acceptability of testing materials?
b) Does psychosocial wellbeing differ in YA with DLD and those with aphasia and it poorer in comparison to TD YA?

4.2 Method

4.2.1 Design

The study was cross-sectional and adopted a between-group method. All participants completed the measures with a student researcher, in an interview format.

4.2.2 Recruitment of participants

4.2.2.1 Means of recruitment

Participants with aphasia were recruited through community groups, charity organisations such as The Stroke Association as well as support groups. Participants with DLD were recruited through a Facebook group for students who had left a special school, through charities, and through a specialist sixth form college. Twitter was also used to contact potential participants. Participants of the TD group were recruited through the broader social network of the student researchers, similar advertising, and by word of mouth. All participants were from Greater London.

4.2.2.2 Eligibility criteria

The inclusion criteria were as follows: All participants had to be between 18 and 35 years old and to have no current diagnosis of learning disability, autism, or other neurological disorder. Additionally, they had to have English as their first language. To be eligible for the study, participants for the aphasia group had to have aphasia due to a stroke. To be eligible for the

DLD group, participants had to have a diagnosis of DLD. Typically developing participants had to have no acquired or developmental impairments.

For the two clinical groups, to take part in the study, a minimum score of 7/15 on the receptive domains of the Frenchay Aphasia Screening Test (FAST; Enderby et al., 1987) had to be obtained to ensure that participants had an adequate level of language to understand and complete the measures of the study and had adequate capacity to consent. Having no diagnosis of language impairment, the TD participants were assumed to have a sufficient level of understanding of language to complete all the measures, without testing it with the FAST.

4.2.3 Ethics

This study received full ethical approval from the Language and Communication Sciences Proportionate Review Committee of the School of Health Sciences Research Ethics Committee of City, University of London (City) (Reference number: LCS/PR/BSc/15-16/02). It also received full ethics approval from the Ethics Committee of the special sixth form college involved.

4.2.4 Procedure

Potential participants were provided with information on the project (aphasia or DLD participants were provided with an easy read version) and given 48 hours to consider their decision, before obtaining written consent for taking part in the study. Information and contact details were exchanged for those considering taking part.

Once participants had agreed to take part, a time and location was agreed to meet up individually with one of the student researchers. Interviews took place in the young person's school, support group facilities, libraries, City's facilities or a quiet community setting. The meeting duration with each person ranged from one to two hours, with as many breaks as requested, or took place across two sessions if preferred by the participant.

Each participant signed a consent form and completed a brief case history on demographic information. The FAST was administered to those with aphasia and DLD to check whether the participant passed the criterion of 7/15 to ensure they had the language abilities to consent and comprehend the tasks. If, thereafter, the participant was not eligible for the study, the researcher would explain why their participation would be terminated. Language, cognitive, and psychosocial assessments were then carried out.

4.2.5 Assessment measures

4.2.5.1 Language: Frenchay Aphasia Screening Test

The FAST (Enderby et al., 1986) is a four-part test which used to assess comprehension, expression, reading, and writing skills. Scores on the FAST range from 0 to 30, with higher scores indicating better language. The FAST requires participants to follow 10 short instructions, to describe a picture, and name as many animals as they can in one minute for expression to demonstrate auditory comprehension, to follow five written commands for testing reading comprehension, and to write a picture description for writing evaluation. The scores for each section are added together, creating a total score.

Functional literacy was also assessed in the pilot study. However, this was not an area that was considered directly relevant to the aims of the main study and thus data and findings for functional literacy are not presented in the present thesis.

4.2.5.2 Cognition

4.2.5.2.1 Raven's Coloured Progressive Matrices

The Raven's Coloured Progressive Matrices test (RCPM; Raven, 1995) was used in this study to assess non-verbal intelligence based on visuospatial reasoning. It is a 36-item test, split into three sets of 12 items each, and it is a non-verbal test of aspects of cognitive functioning. Participants have to point to the pattern that will fit the piece missing in the main pattern shown from a choice of six options. Each set gets progressively harder. Scores on this measure can range from 0 to 36, with a higher score indicating higher intelligence.

4.2.5.2.2 Delis-Kaplan Executive Function System Battery

4.2.5.2.2.1 Trail Making

Three subtests of the Trail Making test of the Delis-Kaplan Executive Function System Battery (D-KEFS; Delis et al., 2001): number-letter switching, number sequencing, and letter sequencing. Those tasks are assessing different cognitive processes such as mental sequencing, cognitive flexibility, multi-tasking, simultaneous processing, and divided attention. Visual scanning and motor speed were not of interest for this study and therefore they were not tested. Switching Cost score was calculated by taking the average of two control conditions and subtracting this figure from the time on the switching condition. Scores on this task are switching costs, expressed in seconds.

4.2.5.2.2.2 Colour Word Fluency

The Colour Word Interference subtest of the D-KEFS is based on the inhibition Stroop procedure (Stroop, 1935). This task measures inhibition, another aspect of executive function, by looking at the ability to override the natural tendency to read a known word. For example, for the word *red* written in blue ink, the participant has to say 'blue' the colour of the word, instead of reading the word *red*, which is the overlearned response to the word. There are four conditions to this test, each getting progressively harder. Scores represent the time it takes to complete the tasks.

4.2.5.2.2.3 Verbal Fluency

For the purposes of this study, only the category fluency condition of the D-KEFS was used. This requires the participant to name as many items in two separate categories (animals and boys names – these are done separately) in one minute as quickly as possible. Scores represent the total number of valid responses generated.

4.2.5.2.3 Odd One Out

The Odd One Out (Henry, 2001) task is a measure of visuospatial working memory that involves identifying the 'odd one out' in a set of three pictures, then remembering and pointing to where all the 'odd one out' shapes were. This task gets progressively harder, potentially reaching a series of six sets of pictures. The task yields two scores, - a span score and a total number of trials score. The span score ranges from 0 to 6, with a higher span score indicating better working memory. The second score is the total number of trials and this score can range from 0 to 24; the trials are stopped, however, once the participant reaches their span score.

4.2.5.3 Psychosocial measures

Psychosocial wellbeing measures (as called in the projects of the students that originally collected the data of this pilot study) included health, social functioning, emotional health, and personal resources measures (as conceptualised in the main study) and were all measured with self-reported scales. For the DLD and aphasia groups, the presentation of the measures were modified to be more communicatively accessible (see 5.5.). Student researchers read out loud each item, while the participant could look at it and read. Then, the participant had to point to their response which was recorded by the student researcher.

All of the self-reported measures administered in the pilot study were also used in the main project and details about them can be found in Methods chapter (Chapter 5). Those measures include the: EQ-5D-5L (EuroQol Group, 2009; as cited in Herdman et al., 2011) which was used as a measure of general health; Stroke Social Network Scale (SSNS; Northcott & Hilari, 2013), Medical Outcome Studies Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991), and Social Connectedness Scale (SCS; Lee & Robbins, 1995) which administered for measuring social aspects of life; General Health Questionnaire – 28 item (GHQ-28; Goldberg, 1978) which assessed emotional health; and General Self Efficacy Scale (GSE; Jerusalem & Schwarzer, 1995) which was used to measure self-efficacy (a measure of personal resources).

4.2.6 Data analysis

Descriptive statistics were used to summarise participant characteristics and their performance in each of the outcome measures used. To explore the feasibility of the testing procedures, the student projects were reviewed for information on recruitment, time taken to administer the measures, and breaks needed. Accessibility was evaluated by exploring scoring on measures, e.g., ceiling or floor effects, as well an exploration of missing data. Any anecdotal participant comments on acceptability were also considered. In terms of comparison analyses, as only three PwA were recruited, their data was compared to the other groups' data descriptively. TD and DLD participants were compared with independent samples t-tests where data was parametric and with Mann Whitney U tests where data was non-parametric.

4.3 Results

4.3.1 Participant characteristics

A total of 61 participants were included in the study: 13 with DLD, three with aphasia and 45 TD YA. Table 4.1 presents participants characteristics. As can be seen the TD and DLD groups are of similar age but differ on several other aspects of demographic status.

Table 4.1: *Participant characteristics*

	TD group	**DLD group**	**Aphasia group**		
Characteristic	*n* = 45	*n* = 13	Case 1	Case 2	Case 3
Average age (years)					
Exact age value			25	25	28
Mean (SD)	24.71 (4.53)	21.54 (6.02)			
Range	18.00 – 35.00	18.00 – 35.00			
Median	23.00	19.00			
(IQR)	(21.00 - 27.50)	(18.00 -23.00)			
Skewness	.739	1.833			
Gender n (%)					
Male	20 (44.4%)	5 (28.5%)			
Female	25 (55.6%)	8 (61.5%)	✓	✓	✓
Living arrangements n (%)	*n* = 44				
Living alone	2 (4.5%)	0		✓	

	TD group	**DLD group**	**Aphasia group**		
Characteristic	*n* = 45	*n* = 13	Case 1	Case 2	Case 3
Living with family	25 (56.8%)	7 (53.8%)	✓		✓
Living with partner	4 (9.1%)	0			
Living with friends	13 (29.5%)	0			
Boarding school	0	6 (46.2%)			
Marital status n%	*n* = 44				
Single	24 (54.5%)	10 (76.9%)	✓	✓	✓
Married or in relationship	20 (45.5%)	3 (23.1%)			
Educational level n (%)					
Secondary school	2 (4.4%)	0			
Vocational course	4 (8.9%)	7 (53.8%)			
A-levels	6 (13.3%)	5 (38.5%)	✓		✓
University degree	33 (73.3%)	1 (7.7%)		✓	
Employment status n (%)					
Unemployed	2 (4.4%)	2 (15.4%)			✓
Student	14 (31.1%)	10 (76.9%)			
Voluntary work	0	1 (7.7%)		✓	
Part-time job	8 (17.8%)	0	✓		
Full-time job	21 (46.7%)	0			
Ethnic group n (%)					
White	24 (53.3%)	8 (61.5%)	✓	✓	✓
Asian	16 (35.5%)	2 (15.4%)			
Black	4 (8.9%)	2 (15.4%)			
Mixed	1 (2.2%)	1 (7.7%)			
Additional health Conditions n (%)					
Yes	4 (8.9%)	5 (38.5%)		✓	
No	41 (91.1%)	8 (61.5%)	✓		✓
Comorbid DLD Conditions n (%)					
None	N/A	8 (61.5%)		N/A	
ASD		1 (7.7%)			
ADHD		3 (23.1%)			
ASD & ADHD		1 (7.7%)			

Note. TD: Typically Developing; DLD: Developmental Language Disorder; n: number of participants; SD: standard deviation; IQR: Interquartile range; N/A: not applicable; ASD: Autistic Spectrum Disorders; ADHD: Attention Deficit Hyperactivity Disorder.

4.3.2 Feasibility of testing procedure and acceptability of testing materials

Recruitment of participants was more challenging than expected. For the one group of students the aim was to recruit 30 participants overall, i.e., 10 participants for each of the three groups. In total, 16 different charities and schools were contacted. Through follow-up emails and calls 11 participants with DLD were recruited, the majority of whom were from the same specialist school. Despite numerous contact attempts with 21 different aphasia charities and support groups, only two PwA consented to take part, both from the same support group. There were no problems recruiting TD participants and students of this set recruited 15 TD participants, resulting in 28 participants in total. The second group of students (n = 3) aimed to recruit 45 participants in total (each student, five participants for each group). Facing similar recruitment difficulties, 33 participants were recruited, from which 30 were TD, and only two had DLD and one aphasia.

Overall, participants dealt well with the testing procedure. In terms of assessment conduction, it was lengthy, but did not last longer than expected. Students spent up to two hours with participants in total, including breaks. In terms of acceptability, some participants commented that the SSNS should have more ‘updated’ means of contact as possible answer options, e.g., WhatsApp or Social Media instead of ‘Letter’. Moreover, participants commented that for some measures they felt they were forced to choose an answer, when they felt they were between two ratings. There was missing data from pilot testing. Seven people with DLD, one PwA, and one TD participant did not complete one or more standardised tasks. The Trial Making switching task was particularly challenging; there were missing data from five people with DLD due to refusal of completion). Two participants from the TD group, one from the DLD group, and two from the aphasia group reached ceiling in RCPM, while data from two participants with DLD was missing because they found the tasks difficult, declining to complete them. Verbal Fluency Task, Colour Word Interference (Condition 4) measure, and the EQ-5D-5L were not completed in one set of student projects which led to missing data for 30 TD, two DLD, and one participant with aphasia. However, all other measures were completed by all participants (except for one TD participant who did not complete the Somatic Symptoms category of GHQ-28 and another who did not complete the Social Dysfunction category; no reasons provided).

4.3.3 Comparison in language, cognition, and psychosocial wellbeing measures across TD, Aphasia, and DLD groups

The first part of this research question can only be answered descriptively, by comparing the individual scores of the three PwA with the mean/median scores of the other two groups (see Appendices A, B, C). This is because there were not enough PwA for a statistical group comparison between aphasia and the other two groups. Given the small sample size and to avoid multiple comparisons, for the self-reported measures the overall scores were compared but not the subdomain ones.

4.3.3.1 Language

Appendix A includes median (IQR) FAST scores as FAST data was skewed. There was a significant difference between TD participants and DLD participants in the FAST total (U = 178.00, p = .008), in FAST Expression (U = 212.50, p = .005), in FAST Reading Comprehension (U = 247.50, p = .008), and in FAST Writing (U =. 187.50, p < .001), with people with DLD scoring lower in all cases.

There was no difference on the FAST comprehension score (U = 222.00, p = .071) between TD and DLD groups.

4.3.3.2 Cognition

Appendix B shows cognitive measures data for the three groups. Significant differences were seen on: both conditions of the Colour word interference test of inhibitation (Condition 3: $t(54) = 7.21$, $p <.001$; Condition 4: $t(11.14) = 4.39$, $p = .001$); the Odd One Out task which tested working memory ($U = 55.50$, $p < .001$); and the memory span task ($U = 53.5$, $p <.001$). The DLD group scored lower than the TD group in all those domains.

No differences were found on the RCPM ($t(10.70) = 1.12$, $p = .29$), verbal fluency ($U = 46.00$, $p = .058$) or trail making assessments ($U = 133.00$, $p = .24$), between the TD and DLD groups.

4.3.3.3 Psychosocial wellbeing measures

Descriptive statistics for the self-reported measures across the three groups are given in Appendix C. Significant differences between TD and DLD groups were found on the MOS Social Support Scale ($U = 145.00$, $p = .006$); Social Connectedness [$t(15.02) = 3.02$, $p = .009$], and Self-efficacy [$t(56) = 2.69$, $p = .009$], but not on GHQ-28 ($U = 264.00$, $p = .59$), EQ-5D-5L ($U = 75.50$, $p = .72$) or Social Network [$t(56) = -0.45$, $p = .65$]. YA with DLD scored less favourably in all three MOS Social Support Scale, Social Connectedness, and Self-efficacy compared to their TD peers.

4.4 Discussion

4.4.1 Feasibility of testing procedure and acceptability of testing materials

The first aim of the current pilot study was to test the feasibility of the testing procedure and whether participants could deal well with the measures and the design, confirming the acceptability of testing materials. It revealed that, in overall, the design of the study and most of the measures used especially the self-reported ones were acceptable. There were a few issues, however, that are important to be considered and be addressed for the main study.

First, regarding feasibility of the testing procedure, the recruitment of participants with DLD and aphasia was proved difficult, especially for those with aphasia. This suggested that a broad recruitment approach and a long recruitment period need to be adopted in the main study. An aspect to be carefully examined for the main study is the session format. In the pilot study, where the assessment process was lengthy, lasting up to two hours, some participants required breaks, while others rejected the breaks offered. This suggests that this population has variable needs, and the researcher should be flexible in terms of deciding the total duration of a session, breaks, and/or splitting sessions in more than one, to ensure participants' optimum wellbeing and performance.

Second, in terms of acceptability of testing materials, the ceiling effects in some scores and missing data observed in some cognitive tasks from people belonging to the clinical groups suggested that these cognitive measures may not be appropriate for the populations of interest. Furthermore, the ceiling effect found in the majority of DLD participants in the FAST indicates that a different language screening test needs to be used in the main study. Moreover, the SSNS includes some questions about how participants were in contact with people of their social network, providing email, letter, or phone as answer options. Many participants stated that they used WhatsApp or texted family and friends, and it was unclear whether that was the same as phone contact. They also mentioned that they used social media and there was no option for this. These aspects could affect the accuracy of participants' answers and scores and need to be taken into consideration during the administration of this measure, e.g., by verbally clarifying that phone includes mobile apps, as scale developers recommended. Many participants also commented that letters are not as a means of contact anymore and emails are mostly used for work and for keeping in contact with colleagues.

4.4.2 Comparison of psychosocial wellbeing measures across TD, Aphasia, and DLD groups

The second aim of the pilot study was to compare psychosocial measures (general health, social functioning, emotional health, and personal resources measures) in YA with DLD, those with aphasia, and TD participants. The differences between aphasia and the other two groups were addressed descriptively, not statistically, due to the small number of participants in the group (n = 3). Thus, the discussion for the aphasia group below is only tentative and should be interpreted with caution.

Based on the pilot results, all the health, social, emotional and personal resources scales were used in the main study as potential correlates/predictors of the main wellbeing measure, together with some additional ones. Participants with DLD showed lower scores compared to their TD peers in connectedness, a finding related to research indicating that people with DLD have difficulties with peer interaction and feel more isolated in comparison to their TD peers (Clegg et al., 2005). DLD also scored lower in social support which is interesting given that almost half of the participants with DLD were students in a boarding school for people with speech and language needs, meaning that support was always available to them in the school, while they were amongst peers with similar difficulties. Although, for these reasons, one would expect those adults with DLD to have good perceived social support levels, still, they did not feel as well-supported as their TD peers. It may be that those people perceive more support from people in the school environment, but not generally (for example family), as suggestyed by a study that compared social outcomes and perceived social support between students from day schools and boarding schools (e.g., Pfeiffer et al., 2016).

Social network ties were evaluated in the present pilot study and similar overall scores observed between DLD and TD groups. To avoid multiple analyses, differences between groups in subdomains of the SSNS were not tested statistically. Exploring similarities and differences in subdomains would help better understanding of social network characteristics of people with DLD as compared to their TD peers. Having a look at Appendix C for example, at the SSNS subdomains' scores, the DLD group had higher mean scores in Groups subdomain, but lower in Friends, Relatives, and Overall satisfaction domains compared to the TD group. This perhaps shows that although people with and without DLD perceive their social network similarly, there may be some differences in its specific aspects that need further exploration.

In the present study, all three PwA scored higher for the total SSNS compared to the TD group. Literature of older PwA has found that although those with aphasia have a reduced social network post stroke in terms of friends, their relationships with their family and children remain stable (Northcott, Marshall, et al., 2016). Also, they report more dependence on family structures than on others of the same age (Hilari & Northcott, 2006; Northcott & Hilari, 2011) and by having those people around them they feel well-supported (Hilari & Northcott, 2006; Northcott, Moss, et al., 2016). This can be the case for the participants of this study, as two of them scored higher than the TD group in social support measure. In addition, as observed through the social connectedness scale scores, the three participants with aphasia scored lower in comparison to the TD group, indicating that they may feel less connected to others in their environment. This is in line with literature that shows that those with aphasia experience increased loneliness and social exclusion (Parr, 1994; Parr, 2007). It may be the case that the good scores in SSNS and social support of this group are enhanced by the fact that Pwa included in this study attended a group for young stroke survivors, which made them feel highly supported by being in contact with other young people going through the same experience. Due to the small number of PwA in the present study, these interpretations are only tentative.

In the pilot study, self-efficacy of people with DLD was at significantly lower levels than their TD peers, supporting other recent research (Durkin et al., 2017). Social self-efficacy, as a key area of social confidence, calls for clinicians' attention because it has been found to predict social competence, emotional wellbeing, and career progress (Botting, Durkin, et al., 2016; Rice et al., 1997; Smith & Betz, 2000). Botting, Durkin, et al. (2016) concluded that self-efficacy seems to play a protective role against mental health issues, maybe more than other external factors such as social support, and thus it should be targeted during early years to help facilitate good emotional health in adulthood. PwA's individual self-efficacy scores varied compared to the mean scores of the other two groups (one above, one in-between, one below). No studies exist investigating the levels of self-efficacy in YA with aphasia, while the research in older people focused on communication self-efficacy and on determinants influencing self-efficacy and the self-efficacy interventions.

In terms of general health and emotional health of the present sample with DLD, the results were positive with no significant differences between the TD participants and those with DLD. This is in accordance with the findings of Conti-Ramsden et al. (2016) where there were no group differences between the DLD and TD groups in ratings of health. These findings are in contrast, however, with the outcomes of Beitchman et al. (2014) study in which people with DLD reported lower levels of perceived physical health. The differences in the results may lie in the different measures used. In the Conti-Ramsden et al. (2016) study self-reported health scale was comprised of a general question about overall health. Similarly, in the present pilot study the EQ-5D-5L VAS was analysed, which is a single question rated using a scale from 0 to 100. Data for 11 people with DLD, two PwA, and 15 TD people exist for the EQ-5D-5L.

Statistical comparison of the GHQ-28 total showed similar emotional distress levels between young people with DLD and their TD peers. These results contrast the current evidence showing that young people with language impairment are at an increased risk of depression and anxiety (Clegg et al., 2005; Hawker & Boulton, 2000). If subcategories of GHQ-28, such as depression and anxiety had been tested, perhaps different findings would have emerged. As stressed by Conti-Ramsden et al. (2008), young people with DLD are a very heterogeneous group and results cannot be generalised to everyone. This is also true for the findings of the current pilot study, firstly because the sample size was small and secondly because there was evident heterogeneity in the sample, with a range of scores in all the self-reported measures. There were participants with DLD who scored within the TD range and in some cases better than the TD participants. For this reason, the main study aimed to and included a larger sample size for establishing higher statistical power and more confidence about the findings.

In this study, both PwA who completed the scale scored above the mean scores of the other two groups in general health, which is surprising considering that people from this group have had a stroke, which typically has an important impact on health. However, data from two people only cannot be representative and thus the main study sought to make this clearer. In a similar vein, the individual emotional distress scores of PwA were very mixed and no real conclusions can be drawn for this population. Again, most of the existing evidence shows high emotional distress in PwA compared to a non-impaired population. The reasons for the apparent high psychosocial outcomes and health of the PwA who partook in this study may be because participants were supported by their families, had no mobility restrictions, and attended a group for young stroke survivors which may have helped them feel well-supported.

4.4.3 Limitations

The main limitation of the present pilot study regards the small sample sizes of the groups. Recruitment of participants for the study was proved more difficult than anticipated, with only three participants with aphasia and 13 participants with DLD taking part and those numbers were lower for some scales such as EQ-5D-5L. Statistical comparison between the aphasia and the other two groups was not feasible, because of the very small number of the former group.

In addition, there are some participants' characteristics that could have affected the comparison results. First, the majority of the participants in the TD and DLD groups were students. Some student participants commented that at certain times they felt more stressed, for example during exams, and therefore in such time periods their responses can be different than normal, affecting their performance. To address this, the main study used a broader recruitment strategy aiming to recruit not only students, but also people in employment for example, for better representation of the population. Moreover, half of the participants with DLD lived at boarding school. Thus, the odds are that the support they received was different to those with DLD living with family, friends, or alone, and to participants from the TD and aphasia groups, who mostly lived with family. Also, living in a boarding school can be assumed to have a general social impact in social development compared to live in community. Limitations were considered and informed the main project as summarised below.

4.4.4 Conclusions

This pilot study was useful for informing the main study and has important implications for the methods of the main study. First, the main study should try recruitment from a wide range of settings and locations for achieving a good representation of the populations under and avoiding a potential impact of confounding variables on results, for example the influence that attending a boarding school can have in support received by participants. Also, the great difficulty in recruiting participants with language difficulties in the pilot study, especially people with aphasia, is a warn that the main study should adopt a broader recruitment strategy and allocate more time to this part of the study. Also, the format of the main study should be carefully examined and flexibility in terms of person's preferences regarding duration, breaks, and number of sessions should be considered. Finally, the present pilot study showed that the language and cognitive tests used should be re-considered as some people from the clinical groups found them difficult or scored at ceiling.

Although conclusions cannot be drawn in terms of comparisons between the aphasia group and the other two groups, due to its small sample size, this pilot study is an important contribution to the literature. It provides information for wellbeing-related constructs that are considered crucial for the good functioning of young people with aphasia and DLD, which is of increasing interest in the literature. In summary, it seems that the current study's results are in accordance with the limited existing DLD literature, where low levels of social connectedness, social support, and self-efficacy have been identified. On a positive note, the pilot study showed that people with DLD score similarly to TD people in general heath, emotional distress, and overall social networks. However, such assumptions need further explanation, examining not only the general scores but also the performance on specific domains of those measures, as descriptive observation of the scores of subdomains pointed out some potential differences between the groups. Existing DLD literature shows that all the constructs explored in this pilot study are related to wellbeing in some way and should be part of future intervention approaches. Also, there may be some intercorrelations between those constructs which would be interesting to explore in the future.

A finding with important implications for service provision is that although the majority of the DLD participants were still in school, and thus known to services, they still reported lack of social support and feeling isolated in society compared to their TD peers. This may be largely due to lack of knowledge about how best to serve those people's needs. Also, as has been already mentioned, social and emotional aspects should be targeted in intervention and personal resources, such as self-efficacy, should be considered for the prognosis and as potential facilitators or barriers for the intervention. In a similar vein, YA with aphasia mentioned that there were no support groups for people of their age, as support groups were typically for older adults with aphasia. This is a particular issue for young people with chronic conditions who are likely to have life-long health care and social needs. Documenting similarities in support needs for these two groups will enable services to adapt efficiently. Otherwise, with little support and a wide range of needs, this group of YA can become 'lost' in the system in adulthood.

Although this pilot study was of a small scale and requires interpreting with caution, it indicated that aspects considered to have an impact on wellbeing in DLD and aphasia are affected in YA with those disorders, highlighting the need for further research around the area. Importantly, this study was crucial for informing the design of the main study, the methodology of which is presented in detail in the next chapter.

CHAPTER 5

5 Methodology

5.1 Design

A cross-sectional, between-group study was carried out to examine and compare predictors of wellbeing in YA with aphasia, YA with DLD, and a TD population with no language impairments. Data on wellbeing, social functioning, emotional health, personal resources, general health, language, and cognition was collected from all three groups for comparison. The feasibility and acceptability of the study design the and the assessment tools were tested and confirmed through a pilot study (see Chapter 4) before data collection for the present project commenced.

5.2 Ethical Approval

The study received full ethical approval from the Language and Communication Sciences Proportionate Review Committee of the School of Health Sciences Research Ethics Committee of City, University of London (Reference number: PR/LCS/PhD/17-18/03), on 12/01/2018 (Appendix D). It also received full ethics approval from the Ethics Committee of one of the specialist schools and colleges that this study recruited participants from.

5.3 Recruitment of Participants

Twenty YA with DLD, 19 YA with Aphasia, and 39 TD YA, i.e., 78 participants in total, were recruited.

5.3.1 Eligibility, inclusion, and exclusion criteria

To take part in the study, participants were required to be YA within the age range of 18 to 40 years and to fit into one of the three groups under study: post-stroke aphasia, DLD, or TD. Post-stroke aphasia and DLD diagnoses were based on information obtained from the recruiting sites and/or on self-reports of those recruited in the community. Language difficulties were then determined through the screening procedure.

Participants needed to have English as their first language to take part (based on self-report), as the assessment measures used were standardised in the English language. It was required that participants be based in England, firstly, because subjective wellbeing varies in many ways across cultures and thus for clear conclusions it was decided the study should be focused in one country only and, secondly, for practical reasons, i.e., some of the scales used can be only administered in a 'paper and pencil' format (e.g., the cognitive measure used), which means that in person administration was required for data collection. Also, all participants needed to have capacity to consent in order to take part making sure they comprehended the study and its impact. This was tested during screening (for more details see section 5.3.3). Participants were excluded if they had co-occurring diagnoses of ASD, ADHD, Learning Disability (LD), or a neurological impairment other than stroke, because such diagnoses could affect performance on language, cognition, and on self-reported measures used, hampering the accurate interpretation of the results.

5.3.2 Means and settings of recruitment

As YA with aphasia and YA with DLD are hard to reach populations, the project employed a broad recruitment strategy. The PhD student approached charities, organisations, support groups, researchers, and SLTs, mainly through email or face-to-face meetings and provided them with information about the project. She also used City's existing links with previous research participants via a database (see below for details). In addition, she broadly promoted the project through websites or social media (Twitter and Facebook) in order to target the young demographic of the sample. Potential participants who were interested in the study or their significant others contacted the PhD student, as did clinicians and researchers who then passed on details of the project to potential participants they knew. Participants were recruited all over England, as detailed in Results chapter.

For PwA, initially the Aphasia Research Register of City was accessed. The City Aphasia Research Clinic holds a list of PwA who have registered their interest in participating in research taking place at City. Moreover, the supervisors of the PhD student and people from the broader research team of the university helped identify participants through their networks and suggested relevant settings to approach. The PhD student approached various stroke and aphasia charities, organisations, and support groups, including Stroke Association, TALK, Speakability, Sarah's Communication Stroke Support Group, Aphasia Re-Connect, Say Aphasia, Headway, Speakeasy, North East Trust for Aphasia, InterAct Stroke Support, Better Conversations with Aphasia, and Speak With IT and requested help with recruitment of participants with aphasia. Stroke and Aphasia Facebook and Twitter groups were also contacted. As this study focused on YA, posts on social media, including flyers, were also used aiming to advertisement of the project and recruitment of participants. Lastly, a donation was made to a stroke charity (Different Strokes) so that the project was promoted through their website and social media on a weekly basis.

Some of the YA with DLD were also recruited via Twitter and Facebook. In addition, the PhD student contacted charities and support groups for people with DLD, e.g., RADLD, Afasic, NAPLIC, and I CAN asking them to advertise the project on their websites and social media.

Most of them posted on Facebook or Twitter or retweeted project-related information. The DLD Research team at City helped to identify participants through their networks as well. Finally, YA with DLD were identified and recruited through a specialist school and college. As the school had students up to 21 years old, the administration team sent to ex-students with DLD who were still within the targeted age range or to their significant others a written invitation by post. People who were interested contacted the PhD student. Other schools with language units across England were contacted via email as well to help with recruitment. In some cases, participants or their significant others suggested other specialist schools to consider as potential settings of recruitment.

In addition, the Royal College of Speech and Language Therapists promoted the project for both clinical groups, through their RCSLT basecamp page, RCSLT research Newsletter, their Facebook page, through CEN pages, and through specific contacts they found relevant. Finally, the PhD student shared information with the Association of Speech and Language Therapists in Independent Practice (ASLTIP), which advertised the project on their members forum.

Typically developing YA were recruited through social media and the broader social networks of the PhD student and her supervisors, including friends, acquaintances, colleagues, and friends of friends. This was achieved by contacting people, face-to-face or through email, to take part and/or suggest others that would be interested in the study.

Snowballing was also used as a means of recruiting more participants for all three groups. At the end of each session, the PhD student asked participants to pass information of the project (e.g., flyers) to other people they knew who might be interested. These requests were followed up by emails, as appropriate.

No incentives or rewards were given to participants for being involved with the study. However, travel expenses were refunded when applicable.

5.3.3 Recruitment procedure

Participants who were interested in the study were provided with information on the project via email, including a Participant Information Sheet (PIS). If people were interested in taking part, a meeting was arranged. During the meeting, information about the project was re-iterated, using the PIS, before asking for written consent. Participants were then screened with language testing (see Screening Tasks below) and a case history for eligibility. This was followed by the main assessment procedure, as described below.

Only participants who had capacity to consent were considered for participation in the study. Participant information materials and consent forms were developed to be communicatively accessible to those with DLD and those with aphasia (e.g., presenting one idea at a time, using simple sentences, key words in bold, and pictures). Any queries participants had about the study were discussed with the PhD student, before she obtained consent. To ensure participants had adequate language and cognition to understand and retain important information regarding the study, after information giving and before consenting, the PhD student asked potential participants with DLD and aphasia the following three simple yes/no and forced alternative questions: (a) 'Is this study about a *drug* or *how you feel*?' (b) 'Will I visit you *once* or *many times*?' (c) 'Can you stop if you wish, *yes* or *no*?'. This checked participants' basic understanding of key aspects of the study. People who answered all three questions correctly were considered to have the capacity to consent. All participants were recruited and assessed by the PhD student.

5.4 Assessment Procedure

The data collection started in May 2018 and was completed in September 2019. Participants were seen a date and time convenient to them, while the location was decided based on participants' preferences. Assessments took place in quiet rooms with minimal distractions, i.e., meeting rooms at City, participants' workplace, public libraries' meeting rooms or at participants' homes when no other options existed. When home visits took place, the Health Services Research Staff Personal Safety Procedures were followed.

The duration of the assessment varied depending on each participant's abilities and preferences. On average, the whole process, including information giving, consent, screening, collection of case history details, and completion of the assessments lasted three and a half hours for participants with DLD, while for participants with Aphasia it lasted about four hours. Participants were provided with as many breaks as needed. Most of the PwA completed the assessment in two sessions (about two hours each) and few of them in three. Most of the participants with DLD chose to complete the procedure in one session, although there were some that needed two sessions. For people who needed more than one session, the interval between the two sessions varied depending on their availability with an average interval of 13 days. All TD participants completed the whole process in one session, with most of them needing no more than one and a half hours in total. Participants were tested individually, except for two - one person with aphasia who asked to be with their social worker and one person with DLD who attended the session with their mother.

For tasks of measures that test language understanding, i.e., WIAT-II^{UK}, Cognitive Linguistic Quick Test (CLQT; Helm-Estabrooks, 2001), and Bedside WAB-R, instructions were video recorded as presented by a native speaker of the English language (an SLT and postdoctoral research fellow at City) and played back to participants during measure administration. This was to ensure that the tasks were clear to participants and their responses not affected by the PhD student's accent, who is not a native English speaker.

With participants' consent, the sessions were video recorded using a Canon LEGRIA HF R806 Digital Camcorder. The recording took place for supervision and so that scoring of assessments could be checked after the session. If participants did not want to be recorded, they could still take part in the study. Assessments were carried out in the same order for all participants, as presented in the following section.

5.5 Assessment Measures

As this study aims to compare two populations with language disorders of different nature and the targeted age range is not the typical one for the disorders of interest, it was not feasible in all cases to use measures that have been validated with both populations. However, all the measures selected in the current project have been used in the literature with at least one of the populations of interest and where possible with both. For example, the SSNS (Northcott & Hilari, 2013) has been developed specifically for people who have had a stroke. However, it is also relevant to DLD as research has shown that the social life of this population is affected as well, especially as people grow older. The WIAT-II^{UK} (Wechsler, 2005), on the other hand, has been extensively used in children with DLD, but it can also be used with adults and its domains are relevant to both clinical groups. Other measures, such as the Rosenberg Self-esteem Scale (RSE; (Rosenberg, 1965) have been standardised in the general population, but have also been used in both clinical populations of interest.

Sixteen assessment measures were used, of which one was completed only by those with aphasia (WAB-R; Kertesz, 2006) and one only by those with DLD (Spectrum Quotient 10, AQ-10; Allison et al., 2012), as they were not relevant to TD people. In total, 15 measures were completed by participants of the clinical groups and 14 by TD participants.

The selection of the factors/variables to be tested in the present project as predictors of the main wellbeing measure (Warwick-Edinburgh Mental Well-being Scale; WEMWBS) was based on the systematic review conducted (Chapter 2). All factors that appeared to be related with wellbeing in YA with DLD and/or Aphasia in the literature were included as potential predictor variables. These comprised social functioning, emotional health, personal resources, general health, language, and cognition variables.

For the participants with aphasia and DLD, the presentation of the self-reported measures, including wellbeing, health, social, and personal resources measures was modified to be communicatively accessible in line with best practice. For instance, practice items to familiarise participants with the response formats, white space, and emboldening key words were used, while presenting one task item per page (Herbert et al., 2019; Rose et al., 2011). Their content was not changed to avoid affecting measures' psychometric properties.

For all the self-reported measures, an interview-based administration took place in order to facilitate understanding of the instructions by participants and accurate completion. With the clinical groups, the PhD student read out each item, while the participant could also read and/or look at it. Then the participant pointed to their response, which was then recorded by the PhD student. For the controls, self-completion took place, with the PhD student present to explain the purpose of each measure and answer any questions raised.

Below a detailed description of the measures used is provided, in the order they were administered to participants during the study.

5.5.1 Screening tasks: sentence repetition and verbal fluency of Wechsler Individual Achievement Test – Second UK Edition

The WIAT-II^{UK} (Wechsler, 2005) is an individually administered test developed to evaluate achievement of children and adolescents between 4 and 16 years and 11 months. Adult norms are also available in the U.S., for 17 to 85 years of age. WIAT-II^{UK} assesses various academic skills in reading, mathematics, and written and oral language. It can be used though to test only specific areas of need, as in this study. Two tasks of the Oral Expression subtest were used to screen for language impairment, i.e., the Sentence Repetition task (repeating sentences with increasing complexity) and the Verbal Fluency A (Animals) task, which asks participants to name as many animals as possible in one minute. These two tasks are typical screening tasks for language problems. They were selected because they have been found to separate individuals with the disorders of interest from those with typical language and thus have been designated as clinical markers of language impairment (e.g., for sentence repetition in DLD see Conti-Ramsden et al., 2001). In terms of scoring, for the Sentence Repetition task, the score can range from 0 to 9; 1 point was given when the sentence was repeated without error or 0 points if any error occurred. For the Word Fluency task, each animal named got 1 point and points were added up to calculate the total score. Psychometric characteristics of the WIAT-II^{UK} are provided in the section Language Measures - WIAT-II^{UK} below. Participants from all three groups were screened.

5.5.2 Wellbeing measures

Wellbeing measures were selected based on the definition of wellbeing presented in Chapter 1, which was based, among others, on the NEF model of wellbeing. NEF's 'What Works Centre for Wellbeing' recommends the following tools for measuring wellbeing: the WEMWBS (Tennant et al., 2007), the Office for National Statistics' (ONS) subjective wellbeing questions (Tinkler & Hicks, 2011), and the Social Trust Question (Michaelson et al., 2012). These measures were used in this study. Michaelson et al. (2012) suggests the Short WEMWBS (SWEMWBS) instead of the full WEMWBS for quicker administration. However, as wellbeing was the primary measure of interest for the present study, it was considered appropriate to use the full scale, which provides a fuller picture of mental wellbeing with a better balance of feeling and functioning items than the 7-item SWEMWBS.

By using these three wellbeing measures, this study assesses mental wellbeing, subjective wellbeing, and social wellbeing, covering all important aspects of it. The primary measure among them is the WEMWBS, which is a psychometrically robust multi-item scale of mental wellbeing. All three are broadly used measures as well as short and easy to administer, an important factor to consider for the language-impaired groups.

It is worth noting that the Measuring National Well-being Dashboard, which monitors and reports how the UK is doing in different areas of life that matter most to the UK public, also uses the WEMWBS and ONS questions to assess the mental and personal wellbeing of British people (Beaumont & Thomas, 2012). Relevant findings for 2018 are published online (https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/measuringnationalwellbeing/qualityoflifeintheuk2018).

5.5.2.1 Mental wellbeing: Warwick-Edinburgh Mental Well-being Scale

The WEMWBS is a self-completed tool that was developed to enable the monitoring of mental wellbeing in the general population and the evaluation of projects, programmes, and policies aiming to improve wellbeing. It was developed by Warwick and Edinburgh Universities (Tennant et al., 2007). WEMWBS is a 14-item scale with a five-point response scale, from 'None of the time' (1) to 'All of the time' (5), summed to provide a single score ranging from 14 to 70. Higher scores indicate greater overall mental wellbeing. The items are all worded positively and cover both feelings (confidence, feeling relaxed, cheerful, and having the energy to spare) and psychological functioning (optimism, autonomy, agency, curiosity, clarity of thought, and positive relationships;) such as ' I've been feeling relaxed', 'I've had energy to spare', 'I've been feeling optimistic about the future', or 'I've been dealing with problems well'.

As wellbeing is a subjective concept, there are no proposed score cut-offs. However, research that looked at the WEMWBS in relation to measures of depression and psychological distress showed that a WEMWBS score of less than 40 could indicate high risk of major depression and scores between 41 and 45 could be considered in high risk of psychological distress and increased risk of depression (Taggart et al., 2015). The WEMWBS, however, was not developed to measure mental illness and should not therefore be used for screening purposes (Taggart et al., 2015). Normative data from the WEMWBS based on people in the UK have been published presented by age (https://digital.nhs.uk/data-and-information/publications/statistical/health-survey-for-england/health-survey-for-england-2011-health-social-care-and-lifestyles; Stewart-Brown & Janmohamed, 2008).

The WEMWBS has been validated for the measurement of mental wellbeing among people aged 13 to 74 in the UK. Tennant et al. (2007) used a university student sample for testing psychometrics and the findings were confirmed by a later analysis of data from two population surveys (*n* = 2,075 for the combined datasets, with complete WEMWBS scores for *n* = 1,749) (Stewart-Brown & Janmohamed, 2008). Excellent internal consistency was indicated (α = .91; α = .89 in the student sample). Test-retest reliability, as tested in a sample of 124 students recruited from two universities in England at one week was high (ICC = .83). Face validity was also tested in groups with members of the general population in England and Scotland and results suggested that the WEMWBS was clear, user-friendly, and unambiguous. Validity was further supported by a significant moderate negative correlation with the General Health Questionnaire 12 (GHQ-12).

The WEMWBS has been used in two Aphasia trials in the UK: the Solution Focused Brief Therapy for PwA (Northcott et al., 2019) and the SUpporting wellbeing through PEeR Befriending trial (Hilari et al., 2019).

5.5.2.2 Personal wellbeing: Office for National Statistic's subjective wellbeing questions

The questions of ONS (Ralph et al., 2011) were created by specialists in the field of wellbeing (Dolan & Metcalfe, 2011). In 2011, the UK ONS introduced a set of four personal wellbeing questions (ONS4) in the Annual Population Survey (APS; https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/methodologies/annualpopulationsurveyapsqmi), aiming to collect subjective wellbeing data. ONS4 gained National Statistics status in 2014 and are used in many extensive UK surveys today, including the Integrated Household Survey (https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/sexuality/methodologies/integratedhouseholdsurvey) (325,000 individual respondents – the biggest pool of UK social data after the census) and the Millennium Cohort Study (https://cls.ucl.ac.uk/cls-studies/millennium-cohort-study/).

The ONS4 was used in the current project to capture what people think about their wellbeing. The questions evaluate satisfaction with life, feeling that the things done in life are worthwhile, happiness, and anxiety levels during a specific period. Participants responded to each item with a number, from 0 (not at all) to 10 (completely). For anxiety, high scores indicate higher anxiety rates but for the other three items, higher scores indicate more favourable outcomes. Each question has its own score and they are not intended to be combined in a composite score. Thresholds for ONS4 have been suggested and currently used by ONS, as shown in Table 5.1.

ONS questions have been used in DLD literature. In previous research with YA with DLD and YA without language impairments, α was .82 and .76, respectively (Conti-Ramsden et al., 2016), indicating good internal consistency.

Table 5.1: *Labelling of ONS4 thresholds, UK*

Life satisfaction, life being worthwhile, happiness scores		**Anxiety scores**	
Response on an11-point scale	Label	Response on an11-point scale	Label
0 to 4	Low	0 to 1	Very low
5 to 6	Medium	2 to 3	Low
7 to 8	High	4 to 5	Medium
9 to 10	Very high	6 to 10	High

Note. Adapted from Office of National Statistics

5.5.2.3 Social wellbeing: Social Trust Question

The Social Trust Question was devised by Noelle-Neumann in 1948 to measure trust in a wide and unfamiliar circle of others (as cited in Delhey et al., 2011). It has been used in numerous surveys and is the most frequently used measure of generalised trust across the social sciences (Sturgis & Smith, 2010). It aims to capture the extent to which people trust others, by asking: ‘Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?’. The question was used here for measuring social trust as an indicator of social wellbeing (Michaelson et al., 2012).

Although initially, a dichotomised ‘yes/no’ option was provided as a response, national surveys in Europe shifted to an 11-point scale, from 0 (‘can’t be too careful’) to 10 (‘most people can be trusted’). The 11-point response scale was used in the present study. This permits not only a more subtle gradation of perceived trust levels, but also provides a meaningful distribution of responses (Helliwell et al., 2016). The possible scores of the Social Trust Question range from 0 to 10 and a higher score indicates higher social trust. Cut-off values for what is considered low or high social trust are not available. There are results of large-scale surveys that have used the Social Trust Question which could be used for comparison (Phillips et al., 2018).

There is conflicting data in the literature on the use of the Social Trust Question;. Some researchers have found no relationship between the question and trusting behaviour, whilst others have found a significant correlation between the question and their experimental measures (Naef & Schupp, 2009). The criticisms of the Social Trust Question are related to its validity and reliability (Reeskens & Hooghe, 2007), as according to some researchers, the question is not precise, the possible answers are not mutually exclusive, and only one item is unlikely to be a reliable measurement (Glaeser et al., 2000; Miller & Mitamura, 2003; Yamagishi et al., 1999). Whilst acknowledging the limitations that a single question has as a measure, the Social Trust Question was still considered the most appropriate one as a measure of social wellbeing for the current project. It has been shown to be a good overall measure, related to a number of objective factors, and it is the most widely used measure in wellbeing research (Michaelson et al., 2012). It fits with NEF’s dynamic model of wellbeing and it is quick to administer which is important to consider for the present project given the large number of assessments used. Social trust was not the primary area of interest in this project and so the use of a more extensive scale to assess it was not a priority. The Social Trust Question has been used in YA with DLD before (Conti-Ramsden et al., 2016).

Both the ONS4 and Social Trust questions were used as supplementary to WEMWBS wellbeing measure, as their limitations as single questions are recognised. They were considered important to be reported though to examine if there is any discrepancy in group comparison results for the three measures. Also, as they have been proposed and used by the government, their use can allow a future comparison between the findings of this study and UK wide data.

5.5.3 Health, social, emotional, and personal resources measures

5.5.3.1 General health: European Quality of Life - Five Dimensions

The EQ-5D is a standardised measure of health status developed by the EuroQol Group (1990) to provide a simple descriptive profile and a single index value for health status. It was created to be used in the clinical and economic evaluation of health care as well as in population health surveys, being applicable to a wide range of health conditions and treatments. The EQ-5D-5L (EuroQoL group, 2009; as cited in Herdman et al., 2011) is the latest version which has improved measurement properties, including feasibility, no ceiling effects, discriminatory power, sensitivity, and convergent validity and therefore may be more useful for measuring population-level health status as well as improved responsiveness and reliability (Janssen et al., 2008).

The EQ-5D-5L's descriptive system comprises five dimensions, i.e., mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Each dimension has five levels: no problems, slight problems, moderate problems, severe problems, and extreme problems (van Hout et al., 2012). For the EQ-5D-5L, participants had to choose the option that best describes how they were feeling on the day of the test administration in each of the five dimensions. Scores on each domain can range from 1 (no problem) to 5 (unable to perform). This results in a one-digit number expressing the level selected for that dimension. The digits for the five dimensions can be combined in a five-digit number describing the respondent's health state. The numerals 1-5 have no arithmetic properties.

At the end of the scale, there is an additional question to mark on a vertical VAS ranging from 0 to 100. With it, participants rated their health on the day of administration, with 100 being the best possible health and 0 being the worst possible health. In the present project the measure of overall self-rated health status (VAS) was used and analysed because according to the developers, the EuroQol Visual Analogue Scale (EQ-VAS) represents the patient perspective, whereas five-digit value sets (EQ-5D-5L index) represent the societal perspective (i.e., what the general population thinks about the value of the health state).

Scores for self-rated EQ-VAS for the UK and reported problems by five dimensions (raw numbers, weighted proportions, % of any problem) are available for England (Szende et al., 2014). EQ-5D-5L data is also available from 996 participants representative of adults aged 18 years and over, living in private residential accommodation in England. This includes number of respondents (percentages) at different levels in the EQ-5D-5L profile, by age group and socio-demographic characteristics (Feng et al., 2015).

In terms of psychometric properties, convergent validity of the measure has been demonstrated by a moderate correlation of $r = .43$ ($p < .001$) between EQ-5D-5L and the dimensions of WHO-5 (Janssen et al., 2013). Regarding test-retest reliability, *I*CCs for the 5L version ranged from .61 (mobility) to .77 (anxiety/depression). Paired t-tests were used to assess mean differences in the two time points and showed no significant differences between assessments at time 1 and at time 2. According to Janssen et al. (2008), the 5L system is particularly useful for describing mild health problems and monitoring population health.

The EQ-5D-5L has been validated in diverse patient populations in six countries, comprising eight patient groups with chronic conditions, including stroke. Results support the validity of the EQ-5D-5L descriptive system as a generic health outcome measure in patients with acute stroke, demonstrating some psychometric advantages in comparison with European Quality of Life - Three Dimensions (EQ-5D-3L; Golicki et al., 2015). It has been also used in the Big CACTUS trial, which is a post-stroke aphasia treatment study (https://www.sheffield.ac.uk/scharr/sections/dts/ctru/bigcactus).

5.5.3.2 Emotional health

5.5.3.2.1 Emotional distress: General Health Questionnaire – 28 Item

The GHQ-28 (Goldberg & Hillier, 1979) is a self-administered screening test designed to identify psychological distress in the general population. It focuses on two main areas: the inability to carry out normal functions and the appearance of new and distressing phenomena. It assesses a person's current state and asks if that is different from their usual state. As such, it is sensitive to short-term psychiatric disorder rather than long-standing difficulties. Since its development, the GHQ-28 has been extensively used in different settings and different cultures. The questionnaire was originally developed as a 60-item instrument, but a range of shortened versions exist. The 28-item version was used in this study. This version was chosen because it gives researchers the chance to examine a profile of scores rather than a single score. The scale was used in this study to assess the participants' current emotional state.

The items of GHQ-28 split into four categories: somatic symptoms, anxiety/insomnia, social dysfunction, and severe depression. Each category contains seven items. The scale asks whether the participant has experienced any particular symptoms or behaviours recently. For example, 'Have you recently...': '...been feeling perfectly well and in good health?'; '...lost much sleep over worry?'; '...been managing to keep yourself busy and occupied'; '...been thinking of yourself as a worthless person?'. There are four response options per item (example response options: not at all; no more than usual; rather more than usual; much more than usual). The exact wording depends on the nature of the particular item. Although there are four possible scoring methods, developers suggest the GHQ scoring which is a bi-modal method: 0-0-1-1; each problem is identified as absent or present, leading to a maximum possible score of 28, with 0 to be the minimum score. Higher score indicates higher distress. The GHQ-28 yields four sub-scores (each based on seven items) and a total score.

Many studies have investigated reliability and validity of the GHQ-28 in various clinical populations. Test-retest reliability of .78-.90 has been reported (Robinson & Price, 1982) and inter-rater and intra-rater reliability have both been shown to be excellent (.90 – .95) (Failde et al., 2000). Internal consistency has also been reported at .95 (Failde & Ramos, 2000). The GHQ-28 correlates well with the Hospital Anxiety and Depression Scale (Sakakibara et al., 2009; Zigmond & Snaith, 1983) and other measures of depression (Robinson & Price, 1982).
The GHQ-28 has been validated with different population groups (see McDowell & Newell, 1996, for an overview). It has also been tested for reliability and validity in people with stroke (Lincoln et al., 2003; Robinson & Price, 1982; Thomas & Lincoln, 2006), though these studies do not report specifically on aphasia. The GHQ-28 and the shorter GHQ-12 have also been used with PwA (e.g., Hilari et al., 2001, 2003).

5.5.3.2.2 Emotional and behavioural difficulties: Strengths and Difficulties Questionnaire

The Strengths and Difficulties questionnaire (SDQ; Goodman, 1997) is an emotional and behavioural screening questionnaire for children and young people. It was used in this project to explore interviewee's strengths and difficulties in emotional and behavioural aspects. The tool can capture the perspective of children, young people, their parents, and teachers. Adult self-report version is also available and was used in the present project. There are currently three versions of the SDQ: a short form, a longer form with an impact supplement (which assesses the impact of difficulties on interviewee's life), and one with a follow-up form. All versions of the questionnaire can be given to a respondent to complete themselves. However, interview style administration is suggested for ensuring that each item is understood by the respondent, which seemed appropriate for the clinical populations of the present project. The questionnaire was completed by participants on paper in this study, but online completion is also an option.

For this research, the version with the impact supplement for self-report by those aged 18 and over was selected. This questionnaire consists of 25 items, describing positive and negative attributes. It is divided into five subscales of five items each: emotional symptoms, conduct problems, hyperactivity-inattention problems, peer problems, and prosocial behaviour. The impact supplement asks whether the respondent thinks s/he has a problem in specific areas (e.g., in emotions, concentration etc.), and if so about chronicity, distress, social impairment, and burden to others. This provides useful additional information for clinicians and researchers with an interest in psychiatric 'caseness' and the determinants of service use (Goodman, 1999).

For the prosocial subscale, examples of items include: 'I try to be nice to other people', 'I usually share with others'. For this subscale, the higher the rating the more prosocial skills the individual has. In contrast, higher ratings in the other sub-scales are associated with increased difficulties in the relevant areas. Examples of these items include: 'Other children or young people pick on me or bully me' (peer problems); 'I worry a lot' (emotional symptoms); 'I get very angry and often lose my temper' (conduct problems); 'I am constantly fidgeting or squirming' (hyperactivity).

SDQ response options are ‘not true’, ‘somewhat true’ or ‘certainly true’. Each item is scored as 0, 1 or 2. Somewhat true is always scored with 1, but whether ‘not true’ and ‘certainly true’ are scored as 0 or 2 depends on whether the item is framed as a strength or difficulty. For each of the five scales, the total score can range from 0 to 10. To generate a score of total difficulties, the four scales dealing with problems are summed, without including the pro-social scale. The authors recommend online scoring, which can be accessed through https://sdqscore.org. High scores, overall or for any subscale, point to the likelihood of a significant disorder and/or a disorder of a particular type. It has been suggested that the SDQ total difficulties score can be used for screening purposes (Mieloo et al., 2012). Though not used in this study, thresholds for identifying normal/typical, borderline, and abnormal/atypical behaviour are available for all the self-reported subscales.

The SDQ has sound psychometric properties. In a large-scale community sample of over 10,000 British children and adolescents (Goodman, 2001), reliability was generally satisfactory, whether judged by internal consistency (α = .73), cross-informant correlation (.34), or retest stability after 4 to 6 months (.62). Similar psychometric properties have been found across many countries (e.g., Yao et al., 2009). The SDQ has also been validated against psychiatric diagnosis (Becker et al., 2004) and can predict the presence of a psychiatric disorder over time (Goodman & Goodman, 2009). A recent study (Brann et al., 2018), which evaluated the psychometric properties of the SDQ in YA, supported its use in public mental health. Researchers observed that its psychometric properties appeared consistent with those of the adolescent version. The age range of the YA in the Brann et al. (2018) study was between 18 and 25 years with a mean age of 19 years though, - at the lower end of the age range targeted in the present project.

The SDQ has been used with children and adolescents with DLD (Conti-Ramsden et al., 2018; Forrest et al., 2018; Wadman, Botting, et al., 2011).

5.5.3.3 Social functioning

5.5.3.3.1 Social network: Stroke Social Network Scale

The SSNS (Northcott & Hilari, 2013) is a patient-reported measure of a person's social network following a stroke. It has been evaluated with the use of a stroke population with and without aphasia. The SSNS was used in the present project to assess aspects of a person's social network, including number of contacts, proximity with them, frequency of contact with them, and satisfaction with aspects of one's social network.

This scale asks for example: 'How many close friends do you have?', followed by questions such as: 'In the past month, how often did you see your friends?', 'In the past month, how often were you in contact with your friends by telephone, email, or letter?', and 'How satisfied were you with the frequency of contact?'. In the first two questions, participants have a 6-point response scale from 'every day' to 'not at all', whilst in the latter questions the 6-point response scale varies from 'very satisfied' to 'fairly dissatisfied'. Overall, the SSNS asks questions on five subdomains (satisfaction with social network, children, relatives, friends, and groups) over 19 items and yields scores for each of these domains and an overall score. Raw scores are converted to have a range from 0 to 100. Higher scores indicate a better functioning in terms of social network (e.g., more frequent social contact; higher levels of satisfaction with their social network).

In the PhD student's knowledge, there are no norms for the SSNS. However, using the SSNS to test social networks can give valuable information for a language-impaired group if a comparison with controls takes place, as in other studies conducted by its developers (e.g., Hilari & Northcott, 2017). The scale has been validated with people with stroke and aphasia, demonstrating good internal consistency (α = .85 for overall score; α = .74 to .87 for subdomains), acceptability (low item non-response and no floor or ceiling effects), convergent validity ($r = .34$; $r = .53$), and discriminant validity ($r = -.10$; $r = -.19$). The scale was also able to differentiate between groups (groups with high social support vs groups with low social support). In terms of responsiveness to change, there were moderate changes from two weeks to six months ($d = .32$; standardised response mean [SRM] = .46), with the Friends factor showing more change ($d = .46$; *SRM* = .50) than the Children factor ($d = .06$; *SRM* =.19), as would be expected (Northcott & Hilari, 2013). According to the developers, the scale can be used with people with mild to moderate receptive aphasia and expressive aphasia of any severity.

5.5.3.3.2 Social connectedness: The Social Connectedness Scale – Revised

The SCS-R (Lee et al., 2001) is a self-report questionnaire that was designed to assess an individual's subjective sense of connectedness to or disconnectedness from the social world. It was used in the present study to evaluate the degree to which people feel connected to others in their social environment.

SCS-R comprises 20 items, 10 positive and 10 negative. Statements are phrased as: 'I feel comfortable in the presence of strangers', 'I fit in well in new situations', or 'I see myself as a loner'. Items are rated on a 6-point scale, from 1 (strongly disagree) to 6 (strongly agree) and capture elements of closeness to others, sense of togetherness, and connection. Answers to the negative questions are reverse scored. Ratings are summed to create an overall score, with a possible range from 20 to 120 and with higher scores indicating higher social connectedness. Cut-off scores or norms for the SCS-R were not available in the literature.

Original items were theoretically derived based on Kohut's (1984) definition of connectedness and were evaluated for content validity by a panel of judges. Items not cohering, based on the results of a principal components analysis, were eliminated along with those significantly associated with social desirability. The revised tool demonstrated excellent internal consistency, i.e., $\alpha = .92$ (Lee et al., 2001) among a large group of undergraduate students.

5.5.3.3.3 Social support: Medical Outcome Studies Social Support Survey

MOS-SSS (Sherbourne & Stewart, 1991) is a multidimensional self-report social support scale that was developed for outpatients with chronic conditions. This scale was designed to be comprehensive in terms of various dimensions of social support and it was used here to evaluate perceived social support which is an important factor that may affect people's functioning and wellbeing.

This scale consists of 19 items and four functional support subscales: emotional/informational, tangible, affectionate, and positive social interaction. For each item, respondents are asked to indicate how often each kind of support would be available to them if they needed it, for example: 'Someone to help you if you were confined to bed?', 'Someone to give you information to understand a situation', 'Someone to help you with daily chores if you were sick?'. The response format is a 5-point scale ranging from 'none of the time' (1) to 'all of the time' (5). The scale yields an overall and subdomain average scores. To compare to published means, scale scores can be transformed to a 0-100 scale, using the following formula:

$$\text{Transformed score} = \frac{100 \times (\text{observed score} - \text{minimum possible score})}{(\text{maximum possible score} - \text{minimum possible score})}$$

A high overall score indicates a high level of social support. Although there are no cut-offs or norms for the MOS-SSS, in its development mean scores were provided for 2,987 patients with chronic conditions (Sherbourne & Stewart, 1991). The MOS-SSS has good psychometric properties: excellent internal consistency (overall scale $\alpha = .97$; subdomains $\alpha = .91$ to .96), good construct validity in different common chronic conditions (e.g., hypertension, diabetes, coronary heart disease, and depression), and good test-retest reliability, i.e., .78). Factor analysis suggests that the items can fit reasonably into an overall scale. The scale has previously been used with people who have chronic aphasia following a stroke as well (e.g., Hilari & Northcott, 2006).

5.5.3.3.4 Community integration: Community Integration Questionnaire

The Community Integration Questionnaire (CIQ; Willer et al., 1993) was developed to provide a measure of community integration after traumatic brain injury (TBI). It was used in this project to measure an individual's level of integration into the home and community. The CIQ consists of 15 items relevant to home integration (e.g., meal preparation, housework, childcare), social integration (e.g., shopping, visiting friends, leisure activities), and productive activities (e.g., full vs part-time work, school, volunteer activities). Different response-scales are provided depending on the type of question. For example, for questions such as: ‘Who usually does shopping for groceries or other necessities in your household?’ or ‘In your home who usually does normal everyday housework?’ possible responses are: ‘yourself alone’, ‘yourself and someone else’ or ‘someone else’. For questions such as ‘Can you tell me approximately how many times a month you now usually participate in the following activities outside your home?’ possible responses are: ‘5 or more’, ‘1 – 4 times’, ‘never’. The scale is scored to provide subtotals for each of the categories as well as for community integration overall. Most items are rated on a scale from 0 to 2 and the total score can range from 0 to 29 points: home integration (10 points maximum), social integration (12 points maximum), and productive activity (7 points maximum). A high score indicates better integration.

Dalemans et al. (2010) adjusted the CIQ to make it communicatively accessible to PwA (e.g., large font, presenting key concepts in bold type, one question per page) and tested it with PwA ($n = 150$). The measure had good internal consistency (standardised $\alpha = .75$) and an excellent test-retest reliability ($ICC = .96$). In terms of construct validity, moderate correlations with the Barthel Index for ADL (assessment of functional independence in stroke patients, the Dartmouth Coop Functional Health Assessment Charts - World Organisation of Family Doctors (a tool to determine functional ability in chronically ill patients), and the Life Satisfaction Questionnaire were found. Significant associations were also identified with regard to age and severity of aphasia. The aphasia-adjusted CIQ was used in this project, which has also been used in other aphasia studies (Hilari et al., 2019; Lee et al., 2015).

5.5.3.4 Personal resources

5.5.3.4.1 Self-efficacy: General Self-Efficacy Scale

The GSE is a self-report measure of self-efficacy. It was created to assess perceived self-efficacy with the aim of predicting coping with daily hassles and adaptation after experiencing stressful life events. The GSE is a well-known measure that has been found to be particularly useful when assessing global confidence in coping ability of individuals who have to adjust to a chronic illness (Maujean et al., 2014). The scale was used in this study to evaluate generalised self-efficacy beliefs.

The scale comprises 10 statements, e.g., ‘I can always manage to solve difficult problems if I try hard enough’, ‘Thanks to my resourcefulness, I know how to handle unforeseen situations’ or ‘I can usually handle whatever comes my way’. Each item has four possible responses from ‘not at all true’ to ‘exactly true’ (1 to 4 points respectively). The total score ranges 10 to 40, with a higher score indicating more self-efficacy.

There is no cut-off score for the GSE. Norms are available based on a heterogeneous adult population (*n* = 1,660; German version) and on a sample of 1,594 adults from the U.S. (as cited in Schwarzer, 2014). There is also an international data set file with GSE original data from 18,000 respondents that could be used as comparative data (http://userpage.fu-berlin.de/~gesund/gesu_engl/world_zip.htm).

The GSE scale has been used in numerous research projects, where it typically yielded satisfactory (and sometimes highly satisfactory) internal consistencies. In a study of 25 nations (*n* = 19,120) α was .86, ranging from .75 to .91; for the UK, α was .88 (Scholz et al., 2002). Test-retest reliability has been assessed in several longitudinal studies, e.g., with 246 cardiac patients (six-month interval, *r* = .67) and with 140 teachers (one-year interval, *r* = .75) (Scholz et al., 2002). For a shorter interval of seven weeks, r was also high, i.e., r = .82 (Røysamb & Strype, 2002). In terms of validity, the GSE has been correlated to emotion, optimism, and work satisfaction. Negative correlations have been found with depression, stress, health complaints, burnout, and anxiety. Results of the study using the GSE in 25 countries (including the UK) supported the assumption that perceived general self-efficacy is a unidimensional and universal construct (Scholz et al., 2002).

GSE has also been validated in clinical samples with good reliability and validity (for an overview see: Scholz et al., 2002). It has also been used with adults with stroke (Carlstedt et al., 2015; Volz et al., 2019), though these studies do not report on aphasia. GSE has been also used with YA with DLD (Botting, Durkin, et al., 2016).

5.5.3.4.2 Self-esteem: Rosenberg Self-Esteem Scale

RSE is one of the most extensively used measure of self-esteem (Bagley et al.,1997). It is a self-report instrument assessing global self-esteem, or one's overall sense of worthiness as a person. It was originally developed in the 1960's to be used with high school students in the U.S.A. However, since its development, the scale has been used with a variety of groups, including adults, with norms available for many of them. RSE was used in this project to measure personal self-esteem and self-esteem state in relation to other people, by asking the respondents to reflect on their current feelings.

The RSE consists of 10 items which can be answered on a four-point Likert scale, ranging from 'strongly agree' to 'strongly disagree'. Five of the items have positively worded statements, while the other five are negatively worded. 'On the whole, I am satisfied with myself' is an example of a positive statement, while 'At times, I think I am no good at all' is a negative one. Scoring for each item can range from 0 to 3 and the interpretation is dependent on the nature of questions (positive vs negative). The scale is scored by totaling the individual 4-point items after reverse-scoring the negatively worded items. The total score can range from 0 to 30, with lower scores showing lower self-esteem.

In terms of cut-off scores, a score <15 indicates a low self-esteem, a score between 15 and 25 is considered average, and a score between 25 and 30 shows high self-esteem (http://www.wwnorton.com/college/psych/psychsci/media/rosenberg.htm). RSE is not a diagnostic tool for any psychological issues.

The RSE is considered a reliable and valid tool for self-esteem assessment, with high internal consistency (.77) and minimum Coefficient of Reproducibility of at least .90 (Rosenberg, 1965). Many independent studies with different samples (such as parents, men over 60, high school students, and civil servants) showed moderate-high internal consistency (α = .72 - .87). Test-retest reliability for a two-week interval was .85, indicating excellent stability (Rosenberg, 1965). Over seven months, test-retest reliability was .63 (Silber & Tippett, 1965). Construct validity was supported by negative correlations with anxiety (- .64), depression (-.54), and anomie (-.43) (Rosenberg, 1965). The RSE is closely connected with the Coopersmith Self-Esteem Inventory. In terms of content validity, Gray-Little et al. (1997) showed that each of the ten items was differentially related to self-esteem.

A systematic review focusing on acquired brain injury in adults showed that the most used measure of self-esteem in the studies explored (*n* = 17) was the RSE (Curvis et al., 2018). RSE scale has been previously used in studies with PwA (Brumfitt & Sheeran, 1997, 1999) and YA with DLD (Durkin et al., 2017).

5.5.4 Autistic traits: Autism Spectrum Quotient-10

The Adult Autism Spectrum Quotient (AQ-10; Baron-Cohen et al., 2001) was developed for the assessment of autistic traits in adults with normal intellectual functioning. It is a self-report instrument and measures key traits which are considered to be important dimensions of ASD. The AQ-10, which was used in the present study, is an abbreviated version of the AQ and developed as a brief screener for ASD. It is a self-completed instrument and was used to determine an individual's position on the autism continuum. An interview-based completion took place for the current study.

The questions on the AQ-10 are drawn equally from five domains: Attention to detail, attention switching, communication, imagination, and social interaction. Some examples of its statements are ‘I often notice small sounds when others do not’ or ‘I usually concentrate more on the whole picture, rather than the small details’. Responses range from ‘definitely agree’ to ‘definitely disagree’. Only 1 or 0 points can be awarded for each question. One point is given for ‘definitely agree’ or ‘slightly agree’ on specific items, i.e., 1, 7, 8, 10, while one point for ‘definitely disagree’ or ‘slightly disagree’ for the rest of the items. This can result in a possible total score between 0 and 10, with higher scores indicating more autistic traits. The published cut-off value for the AQ-10 is $\geqslant 6$, i.e., scores of 6 or above are considered positive for ASD.

Allison et al. (2012) reported good psychometric properties for the AQ-10. At a cut-off point of 6 on the AQ-10 adult, sensitivity and specificity were found to be .88 and .91 respectively. Internal consistency was estimated at $\alpha = .85$ and discriminant validity ranged between .37 and .62. This supported the utility of the 10-item form of the AQ as a quick screen for ASD. The AQ-10 is recommended by National Institute for Health and Care Excellence (NICE, 2012) guidelines for autism in adults.

5.5.5 Type and severity of aphasia: Bedside Western Aphasia Battery – Revised

The WAB-R is a shorter version of the full WAB which is a widely administered language assessment for aphasia. It was developed for people with acquired neurological disorders due to stroke, head injury, and dementia aged between 18 and 89 years. It was created to evaluate the linguistic and main non-linguistic skills of adults with aphasia, providing information regarding the type and severity of aphasia. The WAB-R is most often used as a diagnostic tool in hospitals. It includes a Bedside screening tool which was used in the present project.

The Bedside WAB-R is an individually administered tool that takes the form of an interview. The reduced time to complete the Bedside WAB helps to diminish fatigue and frustration that can present during the full WAB administration. Authors suggest that when time constraints prevent administration of the full WAB-R, the Bedside test can be used (Kertesz, 2006). As the WAB was used in this study to get an aphasia severity score and aphasia type (and not to evaluate language), the Bedside version was used to minimise burden to the participants.

The Bedside WAB-R comprises nine parts, i.e., Content of Spontaneous Speech (which includes questions such as 'How are you today?', 'What is your full address?'), Fluency of Spontaneous Speech (magazine picture description), Auditory Verbal Comprehension (yes/no questions such as 'Is your name Smith?'; 'Are the lights on in this room?'), Sequential Commands (such as 'Point to the coin and the pen.'; Point with the pen to the paper.'), Repetition of Words and Sentences, Object Naming, Reading, Writing, and an optional part for testing apraxia (where clients are asked to do things, for example to 'Wave goodbye'). For the current project, Reading and Writing tasks were not administered, as they are not required to calculate an Aphasia severity score and Aphasia type. The Auditory Verbal Comprehension, Sequential Commands, and Repetition tasks were presented video-recorded by a native English-speaker as detailed in Methodology.

Calculating the severity score involves, first, summing the Content, Fluency, Auditory Verbal Comprehension, Sequential Commands, Repetition, and Object Naming scores. The total score is then divided by 6 (number of sections included) and multiplied by 10. Severity ratings between 0 and 25 show very severe aphasia, 26-50 severe, 51-75 moderate, whilst 76 and above indicate mild aphasia. For determining Aphasia type, comparison of the person's Fluency, Auditory Verbal Comprehension, and Repetition scores with the three scores associated with each Aphasia type takes place, as indicated in Table 5.2 below.

Table 5.2: *Bedside aphasia classification criteria*

Aphasia Type	**Fluency score**	**Auditory Verbal Comprehension score**	**Repetition score**
Global	<5	<4	<5
Broca's	<5	>3	<8
Isolation	<5	<4	>4
Transcortical Motor	<5	>3	>7
Wernicke's	>4	<7	<8
Transcortical Sensory	>4	<7	>7
Conduction	>4	>6	<7
Anomic	>4	>6	>6

Note. Adapted from Bedside WAB-R; Bedside Record Form (Kertesz, 2006)

The Bedside WAB-R is a condensed version of the WAB-Revised and has been used in stroke patients with and without aphasia (Hachioui et al., 2017; Wilson et al., 2018). Internal consistency of WAB Spontaneous Speech, Auditory Comprehension, Repetition, Naming, Reading, and Writing subtests has been high as tested with 140 people with post-stroke aphasia with a Cronbach's alpha a of .91 and a Bentler's coefficient *q* of .97 (Shewan & Kertesz, 1980). Kertesz and Mccabe (1977) reported excellent one-year test-retest reliability (*r* = .99) of the WAB in 22 PwA. In terms of validity, according to Shewan and Kertesz (1980), the WAB satisfies face and content validity criteria, as well as construct validity (Kertesz & Phipps, 1977). Inter-rater reliability of the WAB-R was examined recently with good results: > .80 for 11/13 subtests, with no significant differences between the means at Time 1 and Time 2 for any of the 13 subtests (Bond, 2019).

5.5.6 Language: Wechsler Individual Achievement Test – Second UK Edition

The WIAT-II^{UK} was developed to identify areas where children and adolescents may struggle or excel at in school. The test can be taken by children and adults aged between 4 and 85 years. There is a parent-report version, but as the present project concerns YA, the self-report version was chosen. This test was chosen compared to other broadly used language tests (e.g., Clinical Evaluation of Language Fundamentals; CELF and Wechsler Intelligence Scale for Children; WISC), because it has been standardised not only in children, but also in adults as needed for to the present study. Also, it includes language tasks that are relevant to all the groups in this study.

The WIAT-II^{UK} is a comprehensive, individually administered assessment and consists of four content areas and nine subtests. The content areas and subtests are as follows: Reading (Word Reading, Reading Comprehension, Pseudoword Decoding), Mathematics (Numerical Operations, Mathematical Reasoning), Written Language (Spelling, Written Expression), and Oral Language (Listening Comprehension, Oral Expression). For the present project only the Oral Language section was administered aiming to assess language comprehension and expression of the participants.

The Listening Comprehension of the Oral Language is divided into three sections: Sentence Comprehension, Receptive Vocabulary, and Expressive Vocabulary. It should be note that the tasks in Expressive vocabulary assess a participant's ability to listen and demonstrate understanding of language at word and sentence level with minimal expressive language, by pointing or using single words. For the clinical groups, the Sentence Repetition and Word Expression tasks were administered separately at the beginning of the session, as screening tools (see Screening Tasks section above).

The Oral Expression of the Oral Language is divided into three sections: Oral Word Fluency, Giving Directions, and Visual Passage Retell. These tasks assess a person's ability to use language and speech to express ideas orally in words, sentences, and text. They require the examinee to produce oral language to recall and repeat, categorise, describe, and provide information to direct others.

The Sentence Repetition task of Oral Expression and all the Listening Comprehension tasks were presented recorded by the native English-speaker, as described above. For those tasks specific rules apply. First, for each task, directions are given in terms of the exact item that the administration should start from, based on examinee's age. One point is given to the participant for each correct response and 0 points for each incorrect response. However, for these tasks a Reverse Rule applies: if a score of 0 is given to any of the first three items of each task, the examiner should administer the preceding items (typically aiming to younger ages) in reverse order, until three consecutive scores of 1. In the case that examinee has six consecutive scores of 0, a Discontinue Rule is applied and the administration is completed.

For the rest of the tasks administered for the present project scoring is as follows. For the Word Fluency tasks, 1 point is given for any response that can be categorised as an animal (Word Fluency A) or a method of moving that includes a verb (Word Fluency B). For each task's total score, the number of points earned by each response are added up. For the two Visual Passage Retell and the two Giving Directions tasks, the scoring rubric list provided on the record form is used. This includes the required story elements. For determining evidence and elaboration of a story element, the scoring criteria provided in the form are followed: 2 points are given if response shows evidence of the specific story element, with considerable elaboration; 1 point is given for responses showing evidence of the specific element, but with small degree of elaboration, and 0 points gets a response that shows no evidence of the relevant story element. For calculating the Visual Passage Retell subtotal scores from the two tasks, the two scores should be added up, as for the Giving Directions task. Each Visual Passage Retell task has a possible maximum score of 18 (total possible maximum score 36) and each Giving Direction task a maximum score of 12 (total possible maximum score 24). For obtaining a composite total score for Oral Language, standard scores of Listening Comprehension (summed up scores of individual tasks) and Oral Expression (summed up scores of individual tasks) are added up.

Modifications to the standard administration procedures are permitted if needed, even if those invalidate the use of norms. For the present project, administration was carried out as suggested by the manual. However, when a participant asked for it, repetition of the instructions took place and this was the case for all groups ensuring equal opportunities.

The WIAT-II^{UK} was initially developed for children and adolescents aged 4 years to 16 years and 11 months. However, later the test was standardised in adults aged between 17 and 85 years, in the U.S. (WIAT-II^{UK} Adult Scoring and Normative Supplement; Wechsler, 2005). This adult standardisation data (*n* = 500) was used in the present project, as appropriate per age group. The data on the internal consistency, tests-retest reliability, and interrater reliability of the WIAT-II^{UK} scores demonstrated a consistently high level of precision, especially for the composite scores. The results of reliability are presented by the authors by five age bands, i.e., 27-20, 21-25, 26-35, 36-50, and 51-85 years. Psychometric characteristics from all age bands, excepting those for the 51-85 band (which is not relevant to the present project) are as follows. For the Listening Comprehension subtest standard score, the test-retest reliability average score was .85. Test-retest reliability for the Oral Expression subtest was .75 for all bands. For the whole sample size, the overall composite reliability was .98. Interrater agreement for Oral Expression ranged between .92 and .97, with an average of .94, showing high reliability (Wechsler, 2005; WIAT-II^{UK} Examiner's Manual).

The accumulated data from studies of the WIAT-II^{UK}, including content, construct, and criterion related evidence of validity indicated that the subtests and composites adequately measured the constructs they were designed to measure. Correlations were found between WIAT-II^{UK} and the Woodcock-Johnson Psycho-Educational Battery-Revised, indicating that the level of performance of the WIAT-II^{UK} standardisation sample aligned well with performance on comparable tests and is in the expected range. Correlations in the range of .40 to .82 between WIAT-II^{UK} scores and the scores on the Wechsler Adult Intelligence Scale (Third Edition) also supported validity.

According to the developers, U.S. Normative data is appropriate for use in the UK with adult populations. Normative data is available in the relevant manual (WIAT-II^{UK} Adult Scoring and Normative Supplement), which includes subtest standard scores per age group and composite standard scores. WIAT-II^{UK} has been extensively used in the DLD literature, mostly with children.

5.5.7 Cognition: Cognitive Linguistic Quick Test

The CLQT was used to assess the cognitive abilities of the participants. The purpose of the CLQT is to evaluate the relative status of five cognitive domains, including Attention, Memory, Language, Executive Functions, and Visuospatial Skills. The test is used to identify an individual's cognitive strengths and weaknesses within these domains. It is appropriate for English speaking adults, aged between 18 and 89 years, and those who have a suspected or known acquired neurological dysfunction. The test has clear and detailed directions for administration that should be followed. The record form includes instructions for modifications, prompts, and repetitions allowed for each task. Administration took an interview format.

The CLQT comprises 10 tasks categorised as: Personal Facts, Symbol Cancellation, Confrontational Naming, Clock Drawing, Storytelling, Symbol Trails, Generative Naming, Design Memory, Mazes, and Design Generation. The Storytelling tasks were recorded by the native English-speaker as detailed earlier.

The Personal Facts task aims to assess episodic memory by asking questions about orientation to place, person, and time, i.e., ‘When/Where were you born?’; ‘What is your age now?’; ‘What is your complete current address?’. The Symbol Cancellation task evaluates visual attention, scanning, discrimination, inhibition, and response-shifting within quadrants, by requiring subjects to cross out examples of symbols that do not match the target symbol on the page, within two minutes. The next task, i.e., Confrontational Naming, assesses the ability to name pictures of common objects and the task taps semantics and phonology of language. Clock Drawing serves as a mini-screening tool for all cognitive domains. It determines the severity of neurological decline, especially in progressive diseases, by requiring participants to draw a clock, within three minutes. Storytelling assesses the ability to recall verbal information in the form of a story, by requiring the respondent to repeat a story that was read to them and to reply to relevant questions with yes/no.

Symbol Trails, which is the next task, assesses working memory, planning, and mental flexibility without placing a demand on language. It requires participants to draw lines to connect symbols by size and shapes within a specific time and comprises of three tasks. Only the third task of this category is scored, i.e., Alternating Sizes and Shapes. This task is followed by Generative Naming, which evaluates a person’s ability to generate exemplars or names belonging to a category. This section includes two tasks. In the first task (‘Animals’), interviewees have to name as many animals as they can within one minute, while for the second task, i.e., ‘m-Words’, they have to name as many different words starting with the letter m as they can.

Design Memory assesses the working/immediate visual memory with, again, minimal language demands. There are three different items in this category. For each item, the examiner asks examinee to look at two designs and try to remember them. Then, the examiner asks the examinee to point to the two designs shown to them, among five. The next category, Mazes (two tasks), assesses executive functions, whereby respondents are asked to trace lines through two mazes with different levels of difficulty. One minute is given for Task 1 and two minutes for Task 2. The last task is Design Generation. It assesses the executive functions of productivity and creativity, by asking the respondent to draw four straight lines to connect four dots and to make as many unique designs as possible.

A domain/index score can be calculated for Attention, Memory, Executive Functions, Language, and Visuospatial skills. Specific guidelines exist for determining Domain and Composite severity ratings. The score of each task, except for the Clock Drawing, contributes to a severity rating for one or more of the five domains. The possible severity ratings are: within normal limits, mild, moderate, and severe. A total composite score of severity is derived from the five domains, depending on age (18-69 or 70-89 years old).

The test-retest reliability of the CLQT has been tested in a non-clinical sample (*n* = 46), aged between 19 and 89 years (mean age: 50 years), (Helm-Estabrooks, 2001; Examiner's Manual). Test-retest reliability ranged from .61 to .90 for the cognitive domains. Absolute score difference for measuring stability was generally small (less than one-point difference for all but two tasks), indicating high consistency of scores across administrations. In terms of interrater reliability, for Clock Drawing and Generative Naming which require clinical judgements, scoring rules were developed to minimise differences among scorers. All cases in the non-clinical sample (*n* = 170) were evaluated for the Clock Drawing inter-rater reliability and an overall correlation of .86 was found between the two scorers. For the Generating Naming task (*n* = 81), the interrater reliability was .99 (Helm-Estabrooks, 2001; Examiner's Manual).

Internal construct validity was tested with confirmatory factor analysis (goodness-of-fit statistics were ≥ .97 across items from all five cognitive domains) and provided strong support for the unidimensionality of each subscale, each of which represents a different domain (for more details see the CLQT Examiner's Manual). Also, significant differences were found between clinical and typical subjects (matched by age group, education, and sex) for all 10 CLQT tasks. Finally, age and severity cut-offs can be found based on examination of neuro-typical subjects and subjects with neurological impairments.

In a study of people with Parkinson's disease (Parashos et al., 2009), the CLQT was correlated well with the Mini-Mental State Examination (MMSE; Folstein et al., 1975). The CLQT was judged to be superior to the MMSE because it is more comprehensive, it includes non-linguistic aspects, and it provides domain-specific information. CLQT has been extensively used with PwA.

5.6 Data Analysis

5.6.1 Missing data

Four different approaches were adopted for dealing with missing data, depending on its nature. Whole scale missing data was not imputed. When a person had <5% missing data on a scale or subscale (*n* = 11/78), the mean of the scale or subscale for the missing item(s) was imputed using that person's values. Then, the mean was added to the total score (Peyre et al., 2011). In CLQT, where each item has a different scoring method and the person's mean score did not apply, the mean of that item was imputed using the values of the group that the person belonged to and used in the place of the missing value (for *n* = 4/78, i.e., for 5.1% of participants, one item from the CLQT was missing). Finally, for the SSNS, missing items were replaced with the personal Overall Satisfaction Score (S5) of the individual with missing data, as recommended by the scale developers (*n* = 13/78, i.e., 10.3% of participants had one missing value from SSNS; *n* = 4, i.e., 5.1% had two missing values from SSNS). Missing data appeared across all three groups and there was no pattern in data missing, except for SSNS WN2, where data from nine participants (11.7%) was missing. This item asks people how many social groups they belong to. After exploring data, it was observed that this item was not clearly worded as a question in the form. The missing data concerned only TD people, most of whom completed questionnaires on their own.

5.6.2 Skewness

Some skewness is expected in the clinical populations of this study. Thus, when skewness was within ±1.5, a parametric test was used (Tabacknick & Fidell, 2013). Non-parametric tests were used even when only one of the compared variables exceeded this skewness.

5.6.3 Effect size calculation for comparative analyses and correlation coefficient interpretation guidelines

Effect sizes were calculated in comparative analyses. Partial eta squared (η_p^2), as used in the present study, represents the effect size for One-way ANOVA. It can be obtained from SPSS and is interpreted according to the following guidelines: η_p^2 of .01 is small, η_p^2 of .06 is medium, and η_p^2 of .14 is large.

For each Mann-Whitney test, the effect size was calculated manually using the Z score divided by the root of the total number of observations, i.e., $r = \frac{z}{\sqrt{N}}$ (Rosenthal, 1991, as cited in Field, 2018).

They were interpreted according to Cohen (1988, 1992):

- r = .10 (small effect): In this case, the effect explains 1% of the total variance
- r = .30 (medium effect): The effect accounts for 9% of the total variance

- *r* = .50 (large effect): The effect accounts for 25% of the variance

Correlations were interpreted according to Cohen (1988) criteria: an r of .50 and above is large, an r of .30 to .49 is moderate, and an r between .10 and .29 is small. An *r* below .10 is completely unimportant.

5.6.4 Main research questions

All data analyses were performed using the IBM SPSS Statistics 25 for MAC OS software package. An alpha level of *p* = .05 was used unless otherwise stated. Descriptive statistics were used to summarise participants' characteristics and performance in each of the measures used.

5.6.4.1 *Research question 1: How do the language and cognitive skills of the TD, Aphasia, and DLD groups compare?*

For comparing the groups on Language and Cognitive skills, a One-Way ANOVA was used as appropriate. Where statistically significant differences were found, pairwise comparisons were performed, aiming to test where exactly (between which groups) differences lied. Also, where One-Way ANOVAs were run for comparing groups in different variables, a Levene's test of Homogeneity of variances was run separately for each test. When homogeneity of variance was not assumed (*p* > .05), the Welch adjusted F ratio was reported. When the data was skewed (outside ±1.5 for at least one of the three groups), the Kruskal-Wallis non-parametric test was used instead. In this case, for exploring where the differences between groups lie, follow-up Mann-Whitney U tests were performed, after applying a Bonferroni adjustment to alpha values, controlling for Type I errors (Pallant, 2016). The new α, in that cases, was .0167 (Field, 2018) and the interpretation of the results was based on that new α value.

5.6.4.2 Research question 2: Is wellbeing different between young adults with Aphasia and those with DLD, and is it poorer in comparison to TD young adults?

For comparing the groups on Wellbeing measures, One-Way ANOVAs were used as the data for all groups and all measures was normally distributed (within ±1.5). As for research question (RQ) 1, where statistically significant differences were found, pairwise comparisons were performed aiming to test where exactly differences lied (between which groups). A Levene's test of Homogeneity of variances was run for each test. When homogeneity of variance was not assumed ($p > .05$), the Welch adjusted F ratio was reported.

5.6.4.3 Research question 3

5.6.4.3.1 Research question 3a: What predictors of wellbeing are consistent across the TD, Aphasia, and DLD groups?

5.6.4.3.1.1 Regression method

For investigating consistent predictors of wellbeing across the three language groups, multiple regression analysis was used. The WEMWBS was the dependent variable. Multiple regression analysis assessed the relationships between one continuous dependent variable (DV), i.e., wellbeing, and several independent continuous variables (IVs); potential predictor variables) including social, emotional, health, personal resources, language, and cognition scales. This analysis is suitable for complex, real-life research questions (Field, 2000) such as the present one.

Standard multiple regression was used for exploring factors that predict wellbeing. In this multiple regression type, all selected IVs (see below) are entered into the equation simultaneously. Each IV is evaluated in terms of how much unique variance in the DV it explains. How much of the variance in the DV is explained by the IVs as a block is also examined. Standard multiple regression was chosen rather than hierarchical multiple regression (where the order in which IVs are entered into the equation is determined by the researcher). This is because it best suited the research question, i.e., the relative importance of potential predictors of wellbeing in YA with DLD and aphasia (and comparison) has not been subject of previous research, and thus a method which makes fewer assumptions about the relevant importance of IVs is more appropriate (Field, 2009). Stepwise multiple regression (in which the order that the IVs are entered into the model is based on mathematical criteria alone) was avoided due to methodological concerns existing around that method (Field, 2018).

5.6.4.3.1.2 Procedure of choosing predictors to enter into the regression model

First, in order to determine which IVs to enter in the model, only those where there was justification based on the literature were considered, i.e., variables shown to have a relationship with wellbeing in YA with DLD and/or aphasia in the Systematic Review run. Then, and before Standard Regression Analysis took place, correlation analyses were conducted to determine which IVs would be entered as predictors in the model. Correlation analyses examined the relationship between wellbeing and all the IVs, separately for each group and for the whole sample. Only the IVs significantly associated with wellbeing (DV) in all three groups were entered in the equation, subject to usual regression assumptions. The only exception to this was Self-esteem variable (RSE) which was correlated with two out of three language groups. Thus, the final decision for entering it or not as a potential predictor in the model was based on the whole sample correlation results. Following the correlation analyses, which indicated which IVs to enter as potential predictor variables into the model, regression assumptions were tested and then the Standard Regression Analysis was run. The regression model was run for the whole sample, given that the three language groups showed similar wellbeing levels (see Results chapter), and as permitted by the present sample size.

5.6.4.3.1.3 Multiple regression statistics

The following multiple regression statistics were obtained. ANOVA was calculated to determine whether the R for regression was significantly different from zero. R^2 was used to calculate the amount of variance in the DV explained by the model. The *adjusted* R^2 was needed for estimating the amount of variance in the DV explained by the model if the model had been derived from the population from which the sample was taken. The individual contribution of each IV was assessed by inspecting their unstandardised coefficients (B). These represent the change in the DV associated with a unit change in the IV; relevant t-statistics were used to assess whether their contribution was significant. The standardised (β) regression coefficients, which represent the change in the DV associated with a standard deviation change in the IV, were used to get a better insight into the relative contribution of each IV. Squared semipartial correlations (sr_i^2) were also calculated. In standard multiple regression, sr_i^2 for an IV is the amount by which R^2 is reduced if that IV is excluded from the regression equation, representing the unique contribution of the IV to R^2 in that set of IVs. The difference between R^2 and the sum of sr_i^2 for all IVs represents shared variance (Tabachnick & Fidell, 2014).

5.6.4.3.1.4 Multiple regression assumptions

Multiple regression analysis requires certain assumptions to be met in order for the model derived to be unbiased and generalisable to the population of interest (Field, 2018). These include the ratio of cases to IVs; the absence of influential cases; the absence of multicollinearity;

the normality, linearity, and homoscedasticity of residuals (the differences between obtained and predicted DV scores); the independence of errors; and the examination for outliers in the solution. These assumptions were tested through various procedures and diagnostic tests, as described below.

There were many potential predictors and a relatively modest sample size. This could challenge the viability of the regression analysis by reducing the cases to variables ratio. One of the most broadly used formulas for sample size calculation for applying a linear regression model is $N \geqslant 50 + 8m$ (where N is the number of participants and m the number of IVs), initially suggested by Green (1991). To control the number of variables that would enter the regression model, univariate analyses were initially undertaken between each IV and wellbeing (WEMWBS), as described above.

Exploration of whether certain cases exerted undue influence over the parameters of the model took place. This analysis helped determine whether the model is stable across the sample or whether it is biased by a few influential cases. Potential influential cases were explored with Cook's distance, leverage values, and Mahalanobis distances. Cook's distance is a measure of the overall influence of a case on the model and values greater than 1 may indicate outliers. Leverage gauges the influence of the observed value of the outcome variable over the predicted values. The average leverage value is defined as $(k + 1) / n$, in which k is the number of predictors in the model and n is the number of cases. If no cases exert undue influence over the model, then all leverage values should be close to the average value ($k+1 / n$). Cases with values greater than three times the average, i.e., $3 (k + 1) / n$, should be investigated (Stevens, 2002; as cited in Field, 2018). Mahalanobis distance measures the distance of cases from the means of the predictor variables. These distances have a chi-square distribution, with degrees of freedom equal to the number of predictors (Tabachnick & Fidell, 2012, as cited in Field, 2018). To determine if any cases were multivariate outliers, the critical value of chi-square for the desired alpha level was inspected (Field, 2018; Appendix A4; p. 1005).

Potential influential cases of the model were further investigated by looking at how the estimates of *b* in the model changed as a result of excluding this case. The change in *bs* can tell how much influence a case has on parameters of the model. The difference between a parameter estimated using all cases and estimated when one case is excluded is known as DFBeta. Standardised DFBetas with absolute values above 1 indicate cases that influence the model parameters; in this project Stevens (2002) criterion was followed which suggests looking at cases with absolute values greater than 2 (as cited in Field, 2018).

Absence of multicollinearity means that IVs should not be strongly correlated with one another. The correlation matrix of the IVs was inspected for high correlations. For absence of multicollinearity, correlation coefficients should be below .80 (Field, 2018). The tolerance statistic was also used to test for multicollinearity. Its values should not be below .20 (Menard, 1995, as cited in Field 2018).

The normality, linearity, and homoscedasticity of residuals mean that residuals are normally distributed about the predicted DV scores, that they have a horizontal-line relationship with the predicted DV values, and that the variance of residuals about the predicted DV values is the same for all predicted DV scores respectively (Tabachnick & Fidell, 2014). Normality was tested by inspecting the histogram of the standardised residual plots and their normal probability plots. The histogram should be symmetrical and look like a normal distribution (bell-shaped). The normal probability plots include a straight line that represents the normal distribution and dots that represent the residuals. These dots should be on or very close to the line. Linearity and homoscedasticity were tested by inspecting the scatterplot of the standardised predicted values of DV against the standardised residuals. There should be no curve for the assumption of linearity to be met. The graph should look like a random array of dots evenly dispersed around zero for homoscedasticity to be met (Field, 2018).

The assumption of independence of errors states that for any two observations, errors of prediction (residuals) are uncorrelated. This was tested using the Durbin-Watson test, which tests for serial correlation between errors. It can vary between 0 and 4 with a value of 2 meaning that the residuals are uncorrelated. Values between 1 and 3 were seen as acceptable (Field, 2018).

An outlier is a case that differs substantially from the main trend in the data and can affect the estimates of the regression coefficients. The examination of outliers in the solution identifies cases that are poorly fit by the regression model and lower the multiple correlation. To assess whether there were any outliers in the solution, the residuals were computed. Cases with standardised residuals greater than an absolute value of 2 were identified. Ninety-five percent of standardised residuals should lie within ±2. If more than 5% of cases had standardised residuals with an absolute value greater than 2, then the model would be a poor representation of the actual data (Field, 2018).

In summary, standard multiple regression analysis was used to assess the relative impact of a selected set of IVs on wellbeing. Demographic, health, social, emotional, personal resources, and language and cognition variables were entered in the regression model if they were significantly associated with wellbeing ($p < .05$) in univariate analyses. The assumptions of multiple regression were all tested.

5.6.4.3.2 Research question 3b: What are the differentiating wellbeing predictors across the TD, Aphasia, and DLD groups?

To explore which factors affected wellbeing differently among the three language groups, correlation results (between wellbeing and IVs; RQ3a) as retrieved separately for each of the three groups were compared statistically. Only IVs that showed different correlation patterns with wellbeing across groups (based on significance) were included in this analysis. In other words, when an IV was significantly associated with wellbeing for all groups (e.g., EQ-5D-5L) or when an IV was not associated with wellbeing for any of the three groups (e.g., SSNS), correlation results among groups were not compared statistically.

A separate analysis was run for each IV of interest, for each pair of groups. Using the sample size and the r or ρ values for the relationship between WEMWBS and each IV of interest for each group, the relevant z-score and significance level of the comparison were calculated, with the use of the *Psychometrica* website (https://www.psychometrica.de/correlation.html#independent) (Lenhard & Lenhard, 2014).

5.7 Sample Size and Power Calculation

Power calculations were performed using the G*Power software for estimating the number of participants needed for the present study. The G*Power (http://www.gpower.hhu.d/) is a Statistical Power Analyses tool, that computes statistical power analyses for different tests, t-tests, F-tests, χ^2 tests, z-tests, and some exact tests. Based on the literature, large differences were expected at least between TD vs Aphasia and TD vs DLD. For One-way ANOVA (RQ1 & RQ2), for a large effect size ($h_p^2 = .14$), at an alpha level of $p = .05$, a total sample of 66 participants was needed for 80% power. For Pearson's correlations (part of the RQ3), for a medium effect size (correlation coefficient computed ρH1 = .30), at an alpha level of $p = .05$, a total sample of 84 participants was needed for 80% power. This sample size decreased to 29 for a large effect size (ρH1 = .50).

For sample size estimation for a regression analysis (RQ3), the number of predictors is required. Before data analysis we hypothesised that six would be a possible number of predictor variables. Based on this number, for a medium effect size ($\eta_p^2 = .06$), at an alpha level of $p = .05$, a total sample of 98 participants was needed for 80% power; this went up to 103 participants for seven predictor variables. For a large effect size ($\eta_p^2 = .14$) and six predictor variables, the number the sample size dropped down to 46 participants.

Based on these calculations, a sample size of 80 for RQ1 and RQ2 and a sample of 100 for RQ3 would be sufficient, expecting a medium effect size and six predictor variables. The latter also met Green's criterion of $N \geqslant 50 + 8m$ ($50 + 80x6 = 98$). The target was to recruit 100 participants for the study. This was also what was feasible for a PhD project in terms of resources available, allowing for some recruitment issues/attrition. The final sample size, number of predictors included in the regression, effect sizes, and power achieved are presented in the next chapter, Results.

CHAPTER 6

6 Results

6.1 Participants

6.1.1 Recruitment

The recruitment of participants started on 17/04/2018 and was completed on 13/09/2019, lasting 17 months in total. Eighty-six people approached the PhD student during the recruitment period expressing an interest to take part in the study: 39 TD, 25 with aphasia, and 22 with DLD. Of those, 78 participants (39 TD, 19 PwA, and 20 with DLD) took part in the study. Table 6.1 summarises the number of respondents that showed interest in the study and reasons why eight of them did not take part.

Table 6.1: *Recruitment of participants*

Partaking	**TD group**	**Aphasia group**	**DLD group**
Took part (n)	39	19	20
Expressed interest but did not take part	N/A	6	2
Reasons for not taking part		Age (*n* = 1); English not first language (*n* = 1); Cause of stroke was BI (*n* = 1); Living in USA (*n* = 1); Was referred by another participant, but did not reply when contacted (*n* = 1); Death (*n* = 1)	Initially said yes, but at the end did not respond or could not make it (*n* = 2)

Note. TD: Typically Developing; DLD: Developmental Language Disorders; *n* = number of participants; N/A: not applicable; BI: Brain Injury.

Participants were recruited from a wide geographical area in England, including Birmingham, Brighton, Cambridge, Didcot, East Sussex, Greater London, Ipswich, Kent, Maidenhead, Manchester, Oxford, Peterborough, Steyning, Surrey, Walsall, and surrounding areas.

6.1.2 Participants' characteristics

Table 6.2 presents participants' characteristics as collected through history taking, separately for each group.

6.1.2.1 Characteristics of TD participants

Typically developing (TD) participants ranged in age from 18.03 to 40.06 years with a mean of 29.5 (*SD* = 5.63). The majority of TD participants were females, i.e., 61.5% (*n* = 24), while 38.5% of participants were males (*n* = 15).

6.1.2.2 Characteristics of participants with aphasia

The age of PwA ranged between 25.11 and 40.08 years, with a mean of 34.78 (*SD* = 5.05) years. Participants were similarly divided in terms of gender, with nine being males (47.4%) and 10 females (52.6%).

Severity and type of aphasia for participants are provided in Table 6.2. The majority of participants had moderate aphasia (*n* = 10; 52.6%), while one third of the participants had mild aphasia (*n* = 6; 31.6%). Fewer people (*n* = 3; 15.8%) had severe or very severe aphasia. In terms of aphasia type, over a third of the participants had Broca's aphasia (*n* = 7; 36.8%), followed by Anomic and Conduction aphasia (*n* = 4; 21.1% each). Three individuals (15.8%)

had Transcortical Motor Aphasia and one (5.2%) had Broca's / Transcortical Motor aphasia (7 > WAB repetition score > 8). There were no participants with Global, Isolation, Wernicke's, or Transcortical Sensory aphasia.

6.1.2.3 Characteristics of participants with DLD

The age of participants with DLD ranged from 18.02 to 40.11 years, with a mean of 28.20 (*SD* = 7.17) years. Thirty-five percent of the participants of this group were males (*n* = 7) and 65% were females (*n* = 13).

Autism Spectrum Quotient-10 (AQ – 10) for adults was administered to the DLD group to determine if participants presented with any signs of ASD traits, despite having no formal diagnosis. A score of six or above in AQ-10 is considered positive for ASD. In the present sample, one quarter (*n* = 5) of YA with DLD screened positive for ASD, while the majority (*n* = 15; 75%) did not (Table 6.2). This does not necessarily mean that these people have ASD, as there is possibility that the traits covered in AQ-10 overlap with those of people with DLD.

There was a significant difference in the age of the three groups *F*(2, 75) = 6.98; *p* = .002. Those with aphasia were significantly older compared to DLD participants (*p* = .004) and TD participants (*p* = .009). TD and DLD participants did not differ significantly in age.

Table 6.2: *Participant characteristics per group*

Characteristic	**TD group** *n* = 39	**Aphasia group** *n* = 19	**DLD group** *n* = 20
Age in years			
Mean (SD)	29.5 (5.63)	34.78 (5.05)	28.20 (7.17)

Characteristic	**TD group** *n* = 39	**Aphasia group** *n* = 19	**DLD group** *n* = 20
Range	18.03 - 40.06	25.11 - 40.08	18.02 - 40.11
Gender n (%)			
Male	15 (38.5%)	9 (47.4%)	7 (37%)
Female	24 (61.5%)	10 (52.6%)	13 (65%)
Aphasia Severity n (%)			
Mild	N/A	6 (31.6%)	N/A
Moderate		10 (52.6%)	
Severe		2 (10.5%)	
Very Severe		1 (5.3%)	
Aphasia Type n (%)			
Broca’s	N/A	7 (36.8%)	N/A
Transcortical Motor		3 (15.8%)	
Broca’s / Transcortical Motor		1 (5.3%)	
Conduction		4 (21.1%)	
Anomic		4 (21.1%)	
ASD traits n (%)			
Presence	N/A	N/A	5 (25%)
Absence			15 (75%)

Note. TD: Typically Developing; DLD: Developmental Language Disorder; SD: Standard Deviation; *n* = number of participants; N/A: Not applicable.

6.2 Descriptive Statistics for tested predictor variables

Table 6.3 presents descriptive information on all self-reported measures of general health, social functioning, emotional health, and personal resources that were used as predictor variables, separately for each group. Language, cognition, and wellbeing scores are presented under Research Question 1 and 2. Means (SD) are presented for all data. Medians (IQR) are given for variables which had skewed data (outside ± 1.5 range), in at least one of the groups.

Table 6.3: *Descriptive statistics for potential predictor variables of wellbeing*

Construct	**TD group**	**Aphasia group**	**DLD group**
(Scale)	*n* = 39	*n* = 19	*n* = 20
General Health (EQ-5D-5L VAS)			
Mean (SD)	80.18 (10.80)	72.68 (19.45)	85.15 (14.69)
Range (min-max)	54.0 (45.0-99.0)	70.0 (30.0-100.0)	50 (50-100)
Skewness	-.768	-.812	-1.379
Emotional Distress (GHQ-28)			
Mean (SD)	18.31 (8.94)	24.89 (12.40)	20.40 (11.38)
Range (min-max)	42 (7-49)	42 (12-54)	42 (7-49)
Median (IQR)	16 (12-23)	20 (14-35)	16 (11.25-27)
Skewness	1.643	.970	.973
Social Network (SSNS)			
Mean (SD)	58.57 (9.91)	55.86 (10.61)	52.42 (11.39)
Range (min-max)	39.84 (40.21-80.05)	35.26 (35.74-71.00)	54.84 (41.99-58.93)
Skewness	.181	-.361	-.337
Social Connectedness (SCS)	*n* = 38	*n* = 18	
Mean (SD)	97.61 (14.46)	80.06 (12.05)	81.40 (14.38)
Range (min-max)	66 (51-117)	44 (54-98)	60 (54-114)
Skewness	-1.324	-.256	.366
Social Support (MOS-SSS)		*n* = 18	
Mean (SD)	4.43 (0.62)	3.99 (0.68)	4.05 (0.78)
Range (min-max)	2 (3-5)	3 (2-5)	3 (2-5)
Skewness	-1.384	-.595	-.755
Community Integration (CIQ)			
Mean (SD)	21.70 (3.22)	17.74 (3.25)	17.91 (4.70)
Range (min-max)	14 (15-28)	17 (3-20)	16 (11-26)
Skewness	-.530	-.586	.173

Construct	**TD group**	**Aphasia group**	**DLD group**
(Scale)	*n* = 39	*n* = 19	*n* = 20
Emotional and Behavioural Difficulties (SDQ)			
Mean (SD)	8.62 (4.08)	10.74 (5.09)	12.55 (5.66)
Range (min-max)	22 (1-23)	17 (3-20)	21 (4-25)
Skewness	.863	.313	.624
Self-efficacy (GSE)		*n* = 18	
Mean (SD)	32.34 (4.13)	26.83 (4.06)	26.60 (5.40)
Range (min-max)	18 (22-40)	16 (20-36)	23 (17-40)
Skewness	-.299	-.095	.484
Self-esteem (RSE)	*n* = 38		
Mean (SD)	32.08 (5.23)	28.78 (4.18)	29.15 (5.21)
Range (min-max)	23 (17-40)	15 (20-35)	19 (21-40)
Skewness	-.553	-.406	.227

Note. n = number of participants; TD: Typically Developing; DLD: Developmental Language Disorder; SD: Standard Deviation; min-max = minimum-maximum. Skewness values in blue colour indicate skewed data (values outside ±1.5 range).

For most of the variables, the TD group had the most positive scores, followed by the DLD group. An exception to this was the EQ-5D-5L, where the DLD group had the highest scores, followed by the TD group. The aphasia group had the lowest scores in all measures, except for the SSNS, SDQ and GSE, where the DLD group had the lowest scores, followed by those with aphasia. Those comparisons have not tested statistically though.

6.3 Missing Data

6.3.1 Scale level

Seventy-seven of the 78 participants attended 100% of their arranged sessions. One person with aphasia did not complete the final session (last four scales), as when his wife was contacted for arranging the last meeting, there was no response. This person had severe aphasia and needed more sessions than the average participant with aphasia (three instead of two sessions).

6.3.2 Item level

Small amounts of individual item data were missing from 9 out of 14 assessments. Overall, 0.90% of values were missing (*n* = 134) and 99.10% were completed (*n* = 14, 764).

6.4 Results on Research Questions

6.4.1 Research question 1: How do the language and cognitive skills of the TD, Aphasia, and DLD groups compare?

6.4.1.1 Language

The WIAT-II^{UK} descriptive statistics for Listening Comprehension, Oral Expression, and Oral Language Composite, are presented separately for each group in Table 6.4. Higher scores on this scale indicate better language skills. Means (SD) are presented for all data.

Table 6.4: *Descriptive statistics of language scores per group*

WIAT-II^{UK} domain	**TD** *n* = 39	**Aphasia** *n* = 19	**DLD** *n* = 20
Listening Comprehension			
Mean (SD)	97.95 (14.43)	65.95 (25.97)	73.90 (19.90)
Range (min-max)	58 (56-114)	66 (40-106)	62 (40-102)
Skewness	-1.413	0.637	-0.203
Oral Expression			
Mean (SD)	112.13 (11.88)	77.11 (16.14)	90.55 (15.89)
Range (min-max)	51 (84-135)	60 (41-101)	53 (62-115)
Skewness	-0.364	-1.094	-0.366
Oral Language Composite			
Mean (SD)	105.72 (13.13)	71.16 (18.22)	81.60 (16.17)
Range (min-max)	52 (75-127)	61 (41-102)	58 (51-109)
Skewness	-0.422	0.050	-0.233

Note. TD: Typically Developing; DLD: Developmental Language Disorder; WIAT-II^{UK}: Wechsler Individual Achievement Test - Second UK Edition; n: number of participants; SD: standard deviation; min-max = minimum-maximum.

WIAT-II^{UK} is measured on a continuous scale and the sample was large enough for a comparative analysis. To explore if there were any differences in Listening Comprehension, Oral Expression, and Oral Language Composite between the three groups, a One-Way independent groups ANOVA was used as the data was near normally distributed in all three groups (skewness within ±1.5 range).

There was a significant difference between the three language groups on Listening Comprehension WIAT-II^{UK} scores [Welch Adjusted $F(2, 32.82) = 20.21$, $p < .001$] with the TD group having the highest mean ($M = 97.95$; $SD = 14.43$), followed by the DLD group ($M = 73.90$; $SD = 19.90$). The aphasia group had the lowest mean ($M = 65.95$; $SD = 25.97$). There was a large effect size ($\eta_p^2 = .37$). Post-hoc comparisons (Scheffe) revealed that TD participants scored significantly better than those who had DLD ($p < .001$) and those who had aphasia ($p < .001$), but the difference between those with DLD and those with aphasia was not significant ($p = .436$).

For Oral Expression scores, there was a significant difference between the three groups $F(2, 75) = 43.40$ ($p < .001$). The TD group had the highest mean ($M = 112.13$; $SD = 11.88$), followed by the DLD group ($M = 90.55$; $SD = 15.89$) and the aphasia group ($M = 7.11$; $SD = 16.14$). A large effect size was found ($\eta_p^2 = .54$). Post-hoc comparisons (Scheffe) revealed that the Oral Expression scores were significantly different between TD and aphasia ($p < .001$), between TD and DLD ($p < .001$), and between aphasia and DLD ($p = .015$).

Regarding overall Oral Language Composite, there was a significant difference between groups, i.e., $F(2, 75) = 37.94$, $p < .001$, with a large effect size ($\eta_p^2 = .50$). Descriptive statistics showed that the TD group scored most favourably ($M = 105.72$; $SD = 13.13$), followed by those with DLD ($M = 81.60$; $SD = 16.17$) and those with aphasia ($M = 71.16$; $SD = 18.22$). Post-hoc comparisons (Scheffe) revealed that TD participants scored significantly better than those who had DLD ($p < .001$) and those who had aphasia ($p < .001$), but the difference between those with DLD and those with aphasia was not significant ($p = .110$).

In summary, as expected, in all three language areas examined, the TD participants had significantly higher scores compared to participants with DLD and those with aphasia. TD people had the highest scores and participants with aphasia the lowest in all cases. The two language-impaired groups differed significantly only in Oral Expression.

6.4.1.2 Cognition

Means (SD), range, and skewness values are presented for all CLQT data in Table 6.5. Medians (IQR) are given for variables which had skewed data (outside ± 1.5 range). CLQT domains have different possible score ranges, as detailed in the Methods chapter, but higher scores show better skills in all categories.

Table 6.5: *Descriptive statistics of cognitive scores per group*

CLQT Domain	**TD group**	**Aphasia group**	**DLD group**
Possible score range	*n* = 39	*n* = 19	*n* = 20
Attention 0-215			
Median (IQR)	208 (202-211)	202 (185-204)	194 (170.5-202)
Skewness	-4.436	-2.524	-1.692
Memory 0-185			
Mean (SD)	177.51 (7.36)	136.05 (34.77)	158.85(15.87)
Range (min-max)	34 (151-185)	133 (37-170)	53 (124-177)
Median (IQR)	179 (173-184)	140 (122-159)	164.50 (144.00-170.75)
Skewness	-1.341	-1.587	-0.828
Executive Functions 0-40			
Mean (SD)	34.49 (3.27)	28.55 (7.37)	27.75 (7.17)
Range (min-max)	13 (27-40)	30 (7-37)	27 (10-37)
Skewness	-0.345	-1.517	-0.701
Language 0-37			
Mean (SD)	35.36 (1.50)	25.08 (6.25)	31 (3.31)
Range (min-max)	5 (32-37)	24 (8-32)	12 (24-36)
Skewness	-.0857	-1.265	-0.455

CLQT Domain	**TD group**	**Aphasia group**	**DLD group**
Possible score range	*n* = 39	*n* = 19	*n* = 20
Visuospatial Skills 0-105			
Median (IQR)	100 (95-102)	99 (87.5-103)	93.0 (75.75-97.0)
Skewness	-2.061	-2.107	-2.085
Non-linguistic Cognition 0-49			
Mean (SD)	43.87 (3.41)	40.97 (8.77)	37.6 (6.46)
Range (min-max)	17 (32-49)	32 (17-49)	23 (24-47)
Median (IQR)	45 (42-46)	44 (38.5-47)	38.5 (32.25-43.0)
Skewness	-1.184	-1.826	-0.393
Composite Severity 1-4			
Mean (SD)	3.99 (0.45)	3.4 (0.86)	3.56 (0.54)
Range (min-max)	0.2 (3.8-4.0)	2.8 (1.2-4.0)	1.8 (2.2 – 4.0)
Median (IQR)	4 (4-4)	3.8 (2.8-4.0)	3.8 (3.25-4.0)
Skewness	-4.233	-1.473	-1.092

Note. CLQT: Cognitive Linguistic Quick Test; TD: Typically Developing; DLD: Developmental Language Disorder; *n*: number of participants; SD: standard deviation; min-max: minimum – maximum; IQR: Interquartile Range. Skewness values in blue colour indicate skewed data (values outside ±1.5 range).

Table 6.6 presents participants' severity classification in the five domains of CLQT, Non-Linguistic Cognition, and the Composite Severity per language group.

Table 6.6: *Descriptive statistics of severity of cognitive functions per group*

CLQT Domain	**TD group** (*n* = 39)	**Aphasia group** (*n* = 19)	**DLD group** (*n* = 20)
Attention n (%)			
Within normal limits	38 (97.4%)	15 (78.9%)	14 (70%)
Mild Problems	1 (2.6%)	2 (10.5%)	4 (20%)
Moderate Problems	0	2 (10.5%)	2 (10%)
Severe problems	0	0	0
Memory n (%)			
Within normal limits	38 (97.4%)	9 (47.4 %)	14 (70%)

CLQT Domain	**TD group**	**Aphasia group**	**DLD group**
	(*n* = 39)	(*n* = 19)	(*n* = 20)
Mild Problems	1 (2.6%)	4 (21.1%)	2 (10%)
Moderate Problems	0	2 (10.5%)	4 (20%)
Severe problems	0	4 (21.1%)	0
Executive Functions n (%)			
Within normal limits	39 (100%)	15 (78.9%)	14 (70%)
Mild Problems	0	2 (10.5%)	4 (20%)
Moderate Problems	0	1 (5.3%)	1 (5%)
Severe problems	0	1 (5.3%)	1 (5%)
Language n (%)			
Within normal limits	39 (100%)	10 (52.6%)	15 (75%)
Mild Problems	0	4 (21.1%)	4 (20%)
Moderate Problems	0	0	1 (5%)
Severe problems	0	5 (26.3%)	0
Visuospatial Skills n (%)			
Within normal limits	39 (100%)	16 (84.2%)	12 (60%)
Mild Problems	0	2 (10.5%)	7 (35%)
Moderate Problems	0	0	0
Severe problems	0	1 (5.3%)	1 (5%)
Non-linguistic Cognition n (%)			
Within normal limits	37 (94.9%)	15 (78.9%)	11 (55%)
Mild Problems	2 (5.1%)	2 (10.5%)	8 (40%)
Moderate Problems	0	1 (5.3%)	1 (5%)
Severe problems	0	1 (5.3%)	0
Composite Severity n (%)			
Within normal limits	39 (100%)	13 (68.4%)	11 (55%)
Mild Problems	0	3 (15.8%)	8 (40%)
Moderate Problems	0	2 (10.5%)	1 (5%)
Severe problems	0	1 (5.3%)	0

Note. CLQT: Cognitive Linguistic Quick Test; TD: Typically Developing; DLD: Developmental Language Disorder; *n*: number of participants.

All participants of the TD group scored within normal limits in Executive Functions, Language, and Visuospatial Skills. Only one person (2.6%) from this group had mild Attention and one (2.6%) had mild Memory problems, which resulted in 5.2% (*n* = 2) of the whole TD sample showing mild problems in Non-Linguistic cognition. The Composite Severity of cognition as measured with the CLQT was within normal limits for all TD participants.

The most severe problems in the aphasia group were observed in Memory and Language domains. In Memory, 52.7% (*n* = 10) participants had problems and 21.1% (*n* = 4) had severe problems. In Language, 47.4% (*n* = 9) had problems, 26.3% (n = 5) of those had severe problems. In Attention, Executive Functions, and Visuospatial Skills the vast majority of participants (at least 78.9%) scored within normal limits, with the Visuospatial Skills being the least affected cognitive area (84.2% within normal limits) in this group. This resulted in 15.8% (*n* = 3) of all PwA to have mild cognitive problems, 15.8% (*n* = 3) moderate to severe problems, and the rest to score within normal limits (68.4%; *n* = 13).

The DLD group had the most participants with Non-Linguistic Cognition and Composite Severity below normal limits (45%; *n* = 9), with eight (40%) of those having mild cognitive problems. Visuospatial skills was the most affected cognitive function in this group, with 40% of people having impaired skills. In the rest of the domains, at least 70% (*n* = 14) of the sample scored within normal limits.

Except for the Language domain, all other CLQT domains had skewed data (with skewness outside ±1.5) in at least one group and therefore the non-parametric Kruskal-Wallis tests were used to compare the three groups in these domains. Post-hoc comparisons were run using the Mann-Whitney test to compare each pair of groups, with Bonferroni correction applied. The new α was .0167 (Field, 2018) and the interpretation of the results was based on this new α value.

There was a significant difference in Attention scores between groups with $H(2) = 23.90$ ($p < .001$). The TD group had the highest median (*Mdn* = 208.00; *IQR* = 202 - 211), followed by the aphasia group ($Mdn = 202.00$; $IQR = 188 - 204$) and the DLD group ($Mdn = 194.00$; $IQR = 172 - 202$). Post-hoc comparisons revealed a significant difference between TD and aphasia groups ($U = 146.50$, $p < .001$; $r = 0.49$ - medium to large effect size) and between TD and DLD groups ($U = 130$, $p < .001$; $r = 0.54$ – large effect size). The difference between the aphasia and DLD groups was not significant ($U = 154.00$, $p = .311$; $r = 0.16$ – small effect size).

Regarding Memory, there was a significant difference between the groups, with $H(2) = 47.10$, $p < .001$. TD participants had the highest median ($Mdn = 179.00$; $IQR = 173 - 184$), followed by participants with DLD ($Mdn = 164.50$; $IQR = 145.0 - 170.5$). PwA had the lowest memory scores ($Mdn = 145.00$; $IQR = 126.0 - 158.5$). In post-hoc comparisons, there was a significant difference between TD and aphasia groups ($U = 16$, $p < .001$; $r = 0.77$ – large effect size) and between TD and DLD groups ($U = 81.5$, $p < .001$; $r = 0.65$ – large effect size). The difference between the aphasia and DLD groups was also significant ($U = 98.5$, $p = .010$; $r = 0.41$ – medium effect size).

Executive Functions as tested with CLQT were also significantly different between the groups, with $H(2) = 19.59$, $p < .001$. The TD group had the highest median ($Mdn = 35.00$; $IQR = 32 - 37$), followed by the DLD group ($Mdn = 31.00$; $IQR = 26.25 - 34.50$), which was followed by the aphasia group ($Mdn = 29.00$; $IQR = 22.50 – 34.00$). Post-hoc comparisons showed that TD people scored significantly better than those with aphasia ($U = 161.00$, $p < .001$; $r = 0.46$ – medium to large effect size) and those with DLD, i.e., $t(23.14) = 4.00$ ($p = .001$) ($r = 0.64$ – large effect size). The difference between the aphasia and DLD groups was not significant ($U = 178.00$, $p = .735$; $r = 0.05$ – small effect size).

To compare the three groups on CLQT Language, a One-Way ANOVA was used. There was a significant difference between the three language groups on CLQT Language scores, with Welch

Adjusted *F*(2, 27.62) = 51.33 (*p* < .001). The TD group had the highest mean (*M* = 35.36; *SD* = 1.50), followed by the DLD group (*M* = 31.00; *SD* = 3.31). The aphasia group had the lowest scores (*M* = 25.08; *SD* = 6.25). There was a large effect size, i.e., ($\eta_p^2 = .58$). Post-hoc comparisons (Scheffe) revealed that Language as assessed with the CLQT differed significantly among all three groups (p < .001 in all cases).

The Visuospatial Skills of the three groups were significantly different as tested with the CLQT, with *H*(2) = 12.90 (*p* = .002). The TD group scored most favourably (*Mdn* = 100.00; *IQR* = 95.50 – 102.00), followed by the aphasia group (*Mdn* = 99.00; *IQR* = 89.75 - 102.50). The DLD group had the lowest scores on this cognitive domain (*Mdn* = 93.00; *IQR* = 76.50 – 97.00). Post-hoc comparison indicated that although the difference between TD and aphasia groups was not significant (*U* = 336.50, p = .572; *r* = 0.07 – small effect size), the difference between TD and DLD groups was (U = 160.00, *p* < .001; *r* = 0.48 – medium to large effect size). Based on the adjusted α = .0167, the difference between aphasia and DLD groups was not significant either (*U* = 113.00, *p* = .030; *r* = 0.35 – medium effect size).

There was a significant difference between the groups in Non-Linguistic Cognition, with *H*(2) = 12.80, *p* = .002. The TD group had the highest scores (*Mdn* = 45.00; *IQR* = 42 - 46), followed by the aphasia group (*Mdn* = 44.00; *IQR* = 39.75 - 46.50), and the DLD group (*Mdn* = 38.50; *IQR* = 32.50 – 43.00). Post-hoc comparisons illustrated that there was no significant difference between TD and aphasia groups (*U* = 324.00, *p* = .439; *r* = 0.10 – small effect size), but the difference between TD and DLD groups was significant (*U* = 162.00, *p* < .001; *r* = 0.77 – large effect size). The difference between the aphasia and DLD groups was not significant based on the Bonferroni adjusted α (*U* = 116.00, *p* = .037; *r* = 0.33 – medium effect size).

There was a significant difference in the Composite Cognitive Severity between the groups, i.e., $H(2) = 21.75$ ($p < .001$), with the DLD and aphasia groups having similar severity of cognitive problems overall ($Mdn = 3.80$; $IQR = 3.30 - 4.00$; $Mdn = 3.80$; $IQR = 3.10 - 4.00$ respectively). The TD group scored within normal limits in terms of severity, with a median of 4.00 ($IQR = 4 - 4$). People with DLD had significantly more severe cognitive issues compared to TD ($U = 205.00$, $p < .001$; $r = 0.55$ – large effect size), as had PwA compared to TD ($U = 185.50$, $p < .001$; $r = 0.57$ – large effect size). The overall composite difference between the aphasia and DLD groups was not significant ($U = 184.50$, $p = .869$; $r = 0.03$ – small effect size), despite having different profiles.

To summarise, for all domains the TD group had the highest scores and in most domains the DLD and PwA groups performed similarly. Exception was the significant differences among all three groups in Memory and Language domains, with the aphasia group having the lowest scores. This pattern was also observed for Executive Functions, but the difference between aphasia and DLD was not significant in this case. In Attention, the DLD group had the lowest scores and there was a significant difference between TD and aphasia and between TD and DLD groups, but not between aphasia and DLD groups. In Visuospatial skills, the DLD group had the lowest scores again, but the scores differed significantly only between TD and DLD groups. This was also the case for non-linguistic severity, as expected given that the tasks included in the non-linguistic cognition index are the same as in the Visuospatial Skills domain. In terms of Composite Severity, the DLD group was the most severely impaired, but the difference between PwA and those with DLD was not significant.

6.4.2 Research question 2: Is wellbeing different between young adults with Aphasia and those with DLD, and is it poorer in comparison to TD young adults?

6.4.2.1 Warwick-Edinburgh Mental Well-being Scale

Descriptive statistics for the WEMWBS are presented in Table 6.7. WEMWBS scores range 14 to 70, with higher scores indicating better wellbeing. The data was normally distributed for all groups and, thus, means (SDs) are presented for each group. The difference between the three groups in WEMWBS scores was not significant, i.e., $F(2, 75) = 1.47$, $p = .236$. The effect size was small ($\eta_p^2 = .04$).

Table 6.7: *Descriptive statistics for WEMWBS per group*

WEMWBS Possible score range (14-70)	**TD group** *n* = 39	**Aphasia group** *n* = 19	**DLD group** *n* = 20
Mean (SD)	52.36 (7.41)	49.00 (7.19)	50.10 (7.82)
Range (min-max)	35 (31-66)	25 (39-64)	26 (39-65)
Skewness	-.773	.359	.385

Note. WEMWBS: Warwick-Edinburgh Mental Wellbeing Scale; TD: Typically Developing; DLD: Developmental Language Disorder; *n*: number of participants; SD: standard deviation; min-max: minimum – maximum.

6.4.2.2 Office of National Statistics questions

Subjective wellbeing was evaluated with the ONS four wellbeing questions. Descriptive statistics for the ONS4 were explored separately for each group and are presented in Table 6.8. ONS4 are scored on a scale of 0 – 10, with higher scores showing better subjective wellbeing. In all questions PwA had the most affected scores.

Table 6.8: *Descriptive statistics of ONS4 per group*

ONS4 Possible score range : 0-10	**TD group** *n* = 39	**Aphasia group** *n* = 19	**DLD group** *n* = 20
Life Satisfaction			
Mean (SD)	7.33 (1.40)	5.37 (2.19)	6.65 (1.60)
Range (mix-max)	5 (4-9)	6 (2-8)	7 (3-10)
Skewness	-.636	-.139	-.389
Worthwhile			
Mean (SD)	7.49 (1.78)	6.53 (2.39)	7.65 (2.01)
Range (mix-max)	8 (2-10)	7 (3-10)	7 (3-10)
Skewness	-1.272	-.132	-.548
Happiness			
Mean (SD)	7.21 (1.99)	6.68 (1.97)	6.80 (2.65)
Range (mix-max)	8 (2-10)	8 (2-10)	7 (3-10)
Skewness	-.976	-.573	-.233
Anxiety (reversed)			
Mean (SD)	6.41 (2.31)	6.05 (2.32)	6.75 (2.36)
Range (mix-max)	8 (2-10)	9 (1-10)	8 (2-10)
Skewness	-.397	-.608	-.362

Note. ONS4: Office of National Statistics four questions; n: number of participants; TD: Typically Developing; DLD: Developmental Language Disorder; SD: Standard Deviation; mix-man: minimum - maximum.

There was a significant difference between the groups in Life Satisfaction scores, i.e., Welch adjusted *F*(2, 35.10) = 6.62, *p* = .004; $\eta_p^2 = .19$ – large effect size. The TD group scored the most favourably (*M* = 7.33; *SD* = 1.40), followed by those with DLD (*M* = 6.65; *SD* = 1.60). PwA were less satisfied with their lives (*M* = 5.37; *SD* = 2.19). Post-hoc comparisons showed that the difference between TD and aphasia groups was significant ($p < .001$), but the other differences were not.

When participants were asked to rate whether their life is worthwhile, the DLD group gave the most positive responses ($M = 7.65$; $SD = 2.01$), followed by the TD group which had a similar mean ($M = 7.49$; $SD = 1.78$). PwA had the lowest scores for this question as well ($M = 6.53$; $SD = 2.39$), but the difference between the three groups was not significant, i.e., $F(2, 75) = 1.91$, $p = .156$. The effect size of this analysis was small ($\eta_p^2 = .048$).

In terms of Happiness, the TD group scored slightly better ($M = 7.21$; $SD = 1.99$) compared to those with DLD ($M = 6.80$; $SD = 2.65$) and those with aphasia ($M = 6.68$; $SD = 1.97$). However, the difference between the three groups was not significant: Welch adjusted $F(2, 37.54) = 0.50$, $p = .061$; $\eta_p^2 = .12$ – medium to large effect size.

The aphasia group showed the highest Anxiety levels ($M = 6.05$; $SD = 2.32$), followed by the TD group ($M = 6.41$; $SD = 2.31$) and the DLD group ($M = 6.75$; $SD = 2.36$), but the difference between the three groups was not significant: $F(2, 75) = 0.44$, $p = .647$; $\eta_p^2 = .012$ – small effect size.

6.4.2.3 Social Trust question

Descriptive statistics for the Social Trust question were explored separately for each group and are presented in Table 6.9, including means (SD), range, and skewness values. This question is scored on a 0 to 10 scale, with higher scores showing higher social trust. The difference between the three groups was close to, but did not reach significance, i.e., $F(2, 74) = 3.09$, $p = .051$; $\eta_p^2 = .077$ – medium effect size.

Table 6.9: *Descriptive statistics of Social Trust question per group*

Social Trust Possible score range: 0-10	**TD group** (*n* = 39)	**Aphasia group** (*n* = 18/19)	**DLD group** (*n* = 20)
Mean (SD)	6.03 (2.05)	6.72 (2.27)	5 (2.29)
Range (min-max)	10 (0-10)	8 (2-10)	9 (0-9)
Skewness	-1.067	-.835	-.116

Note. TD: Typically Developing; DLD: Developmental Language Disorder; n: number of participants; SD: Standard Deviation; min-max: minimum – maximum.

Summarising the results of the comparison of the three groups on the three wellbeing measures, there were no significant differences between them in any of the measures, except one, i.e., the ONS Life Satisfaction question, where a significant difference was found between the TD and aphasia groups.

6.4.3 Research question 3

6.4.3.1 What predictors of wellbeing are consistent across the TD, Aphasia, and DLD groups?

6.4.3.1.1 Correlation analysis

All the variables presented in Table 6.3 were used as possible correlates of a) the WEMWBS, b) the four ONS questions, and c) the Social Trust question, i.e., measures of different wellbeing constructs (mental, personal, and social wellbeing respectively). However, WEMWBS was used as the main outcome measure of wellbeing because the WEMWBS is the most widely used measure of wellbeing, the other two measures are treated as single items, and there were no substantial differences in wellbeing performance between measures. Correlation results between ONS Life Satisfaction with the possible correlates and ONS Happiness with the possible correlates are presented in Appendices E-H, because life satisfaction and happiness are two of the most frequently discussed concepts in wellbeing literature.

Correlation analysis results between WEMWBS and Language and Cognition constructs are presented in Table 6.10 separately for each group and for the whole sample. All correlation analysis results between WEMWBS and health, social, emotional, and personal resources variables are presented in Table 6.11.

For the whole sample, language and cognition were not correlated with wellbeing. In contrast, most of the self-reported variables were correlated with wellbeing (excluding social network and community integration).

6.4.3.1.1.1 TD group

In the TD group, mental wellbeing was significantly and strongly positively associated with self-esteem [$r(38) = .727$; $p < .001$], social connectedness [$r(38) = .696$; $p < .001$], and general health [$r(39) = .52$; $p < .001$]. Scores in emotional and behavioural difficulties [$r(39) = -.596$; $p < .001$] were also strongly, significantly, but negatively, associated with wellbeing scores; the more emotional and behavioural problems the person had, the lower their wellbeing was. A significant medium correlation was shown between scores of wellbeing and self-efficacy [$r(38) = .42$; $p = .008$] and wellbeing and social support [$r(39) = .35$; $p = .029$], showing that the participants who felt more self-efficient and had more support, reported better wellbeing. A significant medium, but negative relationship between emotional distress scores and wellbeing was found [$\rho(39) = -.35$; $p = .031$], meaning that the more emotional distress the person had the worse their wellbeing was. The relationships between wellbeing scores and scores in social network [*r*(39) = .185; *p* = .26] and between wellbeing scores and community integration [*r*(39) = .064; *p* = .70] were small and unimportant.

6.4.3.1.1.2 Aphasia group

In the aphasia group, there was a significant and large negative relationship between wellbeing and emotional and behavioural difficulties [*r(*19) = -.562; *p* = .012] and between wellbeing and emotional distress [*r*(19) = -.547; *p* = .015]. Conversely, people who had more social support and better general health reported also better wellbeing, showing a significant, medium relationship i.e., *r*(18) = . 493 (*p* = .038) and *r*(19) = .476 (*p* = .040) respectively. There was also a medium, but non-significant, positive relationship between wellbeing and self-esteem [*r*(18) = .38,*p* = .117)], social network [*r*(19) = .326; *p* = .173)], and social connectedness [*r*(18) = .324; *p* = .189)]. The relationships between wellbeing and self-efficacy and community integration were small and non-significant for those with aphasia, i.e., *r*(18) = .28, *p* = .261; *r(*19) = .193, *p* = .429 respectively.

6.4.3.1.1.3 DLD group

Looking at the relationship of wellbeing with language (WIAT-II^{UK}) and cognition, no significant relationships were found in the TD and aphasia groups. All relationships were unimportant or small, as shown in Table 6.10. In the DLD group, wellbeing was significantly and highly associated with the language domain of CLQT [*r*(20) = -57, *p* = .008] and surprisingly this relationship was negative. Negative, medium, and significant relationships were also found between wellbeing and overall cognition [*r*(20) = -.47, *p* = .037], WIAT-II Oral Expression [*r*(20) = -.46, *p* = .041], and WIAT-II Oral Language Total [*r*(20) = -.45, *p* = .046] for the DLD group, indicating that the better participants' cognitive and language skills were, the lower they rated their wellbeing.

In the DLD group, there was a significant, strong, positive relationship between wellbeing and general health [$r(20) = .570$, $p = .009$], social support [$r(20) = .568$, $p = .009$)], and self-esteem [$r(20) = .566$, $p = .009$)], and a significant, strong, negative relationship between wellbeing and emotional distress [$r(20) = -.54$, $p = .014$)], and emotional and behavioural problems [$r(20) = -.52$, $p = .020$)] . Also, there was a medium, but non-significant relationship, between wellbeing and social connectedness [$r(20) = .44$, $p = .052$)] in the DLD group. The relationship between wellbeing and self-efficacy [$r(20) = -.26$, $p = .272$)] and social network [$r(20) = .11$, $p = .650$)] was small and non-significant, while the association with community integration was negative and completely unimportant [$r(20) = -.002$, $p = -.995$)].

In summary, in the TD group, wellbeing scores were significantly associated with all, but two variables (social network and community integration). In all three groups, WEMWBS was significantly associated with general health, emotional distress, emotional and behavioural problems, and social support. In TD and DLD groups, wellbeing was also significantly associated with self-esteem. In the TD group only, wellbeing was associated with social connectedness and self-efficacy. DLD was the only group where wellbeing was significantly related with CLQT cognitive domains (Oral Language, Composite Cognition) and WIAT-II language domains (Oral Expression and Composite Language). Wellbeing was not associated with social network or community integration in any of the three groups.

Comparing the two clinical groups in terms of their wellbeing correlates, general health, emotional distress, social support, and emotional and behavioural problems were correlates of wellbeing in both groups. However, DLD had some additional correlates, including self-esteem and language and cognition domains/composites, as described above.

Table 6.10: *Correlation results between WEMWBS and language and cognition variables*

Group	**Listening Comprehension WIAT-II**	**Oral Expression WIAT-II**	**Oral Language WIAT-II**	**Attention CLQT**	**Memory CLQT**	**Executive Functions CLQT**	**Language CLQT**	**Visuospatial Skills CLQT**	**Non-Linguistic CLQT**	**Composite Cognition CLQT**
Whole Sample	*r* = -.035	*r* = .059	*r* = .018	ρ = .047	ρ = .099	*r* = -.013	ρ = .049	ρ = .017	ρ = .037	ρ = -.105
p. value	.763	.610	.878	.685	.390	.910	.669	.880	.745	.361
N	78	78	78	78	78	78	78	78	78	78
TD	*r* = -.197	*r* = -.035	*r* = -.129	ρ = -.056	*r* = -.058	*r* = -.157	*r* = -.138	ρ = -.126	*r* = -.086	ρ = -.036
p. value	.229	.834	.436	.737	.724	.339	.403	.444	.605	.827
N	39	39	39	39	39	39	39	39	39	39
Aphasia	*r* = -.030	*r* = .104	*r* = .030	ρ = .025	ρ = -.125	ρ = .112	*r* = -.082	ρ = .151	ρ = .190	*r* = -.099
p. value	.902	.672	.903	.919	.609	.647	.740	.538	.435	.688
N	19	19	19	19	19	19	19	19	19	19
DLD	*r* = -.400	*r* = **-.460**	*r* = **-.450**	ρ = -.241	*r* = -.379	*r* = -.306	*r* = **-.572**	ρ = -.144	*r* = -.187	*r* = **-.469**
p. value	.081	.041	.046	.306	.099	.190	.008	.546	.431	.037
N	20	20	20	20	20	20	20	20	20	20

Note. WIAT-II: Wechsler Individual Achievement Test - Second Edition; CLQT: Cognitive Linguistic Quick Test; r: Pearson Correlation Coefficient; ρ: Spearman Correlation Coefficient; N: Sample Size; TD: Typically Developing; DLD: Developmental Language Disorder. Significant correlations at the level of 0.05 (2-tailed) are in bold. Blue colour indicates a strong and orange a medium relationship.

Table 6.11: *Correlation results between WEMWBS and health, emotional, social, and personal resources variables*

Group	**General Health** EQ-5D-5L	**Emotional Distress** GHQ-28	**Social Network** SNSS	**Social Connectedness** SCS	**Social Support** MOS-SSS	**Community Integration** CIQ	**Emotional & Behavioural problems** SDQ	**Self-Efficacy** GSE	**Self-Esteem** RSE
Whole Sample	*r* = **.493**	*r* = **-.556**	*r* = .220	*r* = **.567**	*r* = **.477**	*r* = .148	*r* = **-.567**	*r* = **.241**	*r* = **.632**
p. value	<.001	<.001	.053	<.001	<.001	.197	<.001	.036	<.001
N	78	78	78	76	77	78	78	76	76
TD	*r* = **.521**	ρ =**-.346**	*r* = .185	*r* = **.696**	*r* = **.350**	*r* = .064	*r* = **-.596**	*r* = **.422**	*r* = **.727**
p. value	.001	.031	.259	<.001	.029	.699	<.001	.008	<.001
N	39	39	39	38	39	39	39	38	38
Aphasia	*r* = **.476**	*r* = **-.547**	*r* = .326	*r* = .324	*r* = **.493**	*r* = .193	*r* = **-.562**	*r* = .280	*r* = .382
p. value	.040	.027	.173	.189	.038	.429	.012	.261	.117
N	19	19	19	18	18	19	19	18	18
DLD	*r* = **.570**	*r* = **-.538**	*r* = .108	*r* = .440	*r* = **.568**	*r* = -.002	*r* = **-.517**	*r* = -.258	*r* = **.566**
p. value	.009	.014	.650	.052	.009	.995	.020	.272	.009
N	20	20	20	20	20	20	20	20	20

Note. EQ-5D-5L: European Quality of life Five Dimension Five Level scale; GHQ-28: General Health Questionnaire – 28 item; SSNS: Stroke Social Network Scale; SCS: Social Connectedness Scale; MOS-SSS: Medical Outcome Studies Social Support Survey; CIQ: Community Integration Questionnaire; SDQ: Strength and Difficulties Questionnaire; GSE: General Self-efficacy Scale; RSE: Rosenberg Self-esteem Scale; r: Pearson Correlation Coefficient; ρ: Spearman Correlation Coefficient; N: Sample Size; TD: Typically Developing; DLD: Developmental Language Disorder. Significant correlations at the level of 0.05 (2-tailed) are in bold. Blue colour indicates a strong, orange a medium, and yellow a small and significant relationship.

6.4.3.1.2 Regression analysis

Given that wellbeing (WEMWBS) did not differ among groups (Research question 2), to investigate consistent predictors of wellbeing across the three language groups, the common correlates of WEMWBS across groups were entered into a regression model and a Standard Multiple Regression was run for the whole sample.

Health, social, emotional, and personal resources variables as well as language and cognition variables were entered in the regression model if they were significantly associated with wellbeing ($p < .05$) in univariate analyses and correlations, as previously detailed.

None of the demographic variables was associated with wellbeing (WEMWBS). Age was not correlated with the mean WEMWBS scores when analyses were undertaken separately for each language group (TD: $r(39) = -.20$, $p = .903$; Aphasia: $r(19) = -.174$, $p = .48$; DLD: $r(20) = -.004$, $p = .987$). There were no significant differences between men and women in their WEMWBS scores [$t(76) = -.82$, $p = .41$]. Similarly, no significant differences found in WEMWBS between people who lived alone and those who lived with others [$t(72) = -1.41$, $p = .16$]. Univariate ANOVA was used to assess whether WEMWBS scores were significantly different between different Marital Status (Single, Has a partner, Married, Divorced or Widowed cases). The results were not significant, i.e., $F(2, 73) = 2.39$, $p = .09$). The respondents were then divided into two Marital Status groups: Single vs Has a partner/Married). They were compared with independent t-test and again there was no significant difference between them [$t(61.59) = 1.11$, $p = .27$]. Therefore, these variables were not included in further analyses.

The variables entered into the regression model as IVs were those that were significantly correlated with WEMWBS in all three groups when analysed separately or in two groups and the whole sample at the same time (Table 6.10 & 6.11). These variables were EQ-5D-5L, GHQ-28, MOS-SSS, SDQ and RSE.

6.4.3.1.2.1 Standard multiple regression assumptions

Before regression analysis took place, standard multiple regression assumptions were tested. Relevant results are presented in this section. Methods behind these assumptions are described in detail in section 5.6.4.3.1.4.

The cases to variables ratio was tested, using the formula $N \geq 50 + 8m$ (Green, 1991). There were five IVs (m) and $N = 78$, which meant that the desirable cases to variables ratio was not met ($78 < 90$).

As the cases to variables ratio was not met, further investigation around the issue took place. The statistical power of the test was calculated to explore whether sufficient power to detect effects was achieved or if a replication of the experiment was needed using more participants to increase power (Field, 2018). The G*Power software 3.1.9.6 for Mac OS X 10.7 to 19.15 was used to calculate post-hoc statistical power, choosing Linear multiple regression – random model function. The output showed a power of 0.99, indicating that with 78 participants, effects can be detected. The lower critical R^2 was 0.0112 and the upper critical R^2 was 0.160.

None of the cases had a Cook's distance greater than 1 (maximum Cook's distance is .22), and, thus, none had an undue influence on the model. The average leverage was calculated as $(k + 1) / n = 6 / 78 = 0.08$, with k being the number of IVs. Any value three times this value (i.e., 0.24) and above was investigated, as recommended by Stevens (2002) (as cited in Field, 2018). Only one case was above the boundary of three times, i.e., case 63, with average leverage of 0.28. The rest of the leverage values were below 0.24 (2nd highest value = 0.19). In regard to

Mahalanobis distance, at an alpha level of $p < .001$ and with *df* of 5, the critical value of chi-square was 15.09, showing that there was one multivariate outlier among the cases (max = 20.837, case 63). The second highest value was 14.02. According to influence statistics (Leverage and Mahalanobis distance) there was one potential influential case in the model, case 63. Case 63 was further investigated regarding its influence in the model. It had Standardised DFBeta values within ±1, showing that it did not influence the model parameters.

As a further investigation, Case 63 was removed from the regression model and the standard multiple regression was re-run without it. This made no difference to the results and on the balance of the evidence the case was retained. As Field (2018) suggests, cases with large leverage values do not necessarily have a large influence on the regression coefficients because they are measured on the outcome variables, not the predictors.

Residuals were checked for evidence of bias using casewise diagnostics. Ninety-five per cent of standardised residuals should lie within ±2. Three cases were found with standardised residuals greater than an absolute value of 2 (-2.04, -2.13, -2.95) and thus 96.1% (75/78) of residuals were within ±2. The model was a good representation of the data, as more than 95% (96.1%) of residuals were within ±2.

There was absence of multicollinearity among IVs. In the correlation matrix of all the predictors, there were no values greater than .63 (see Table 6.12 for details), which is below .80. All collinearity tolerance values met the set criterion: They were > .20 (Menard, 1995), with a minimum value of .40 (see Appendix I).

Table 6.12: *Testing for multicollinearity: Pearson correlations between the IVs of the multiple regression model*

	EQ-5D-5L VAS	GHQ-28	MOS-SSS	SDQ	RSE
EQ-5D-5L VAS	1	-.508**	.150	-.177	.254*
GHQ-28		1	-.377**	.629**	-.589**
MOS-SSS			1	-.386**	.451**
SDQ				1	-.601**
RSE					1

Note. EQ-5D-5L: European Quality of life Five Dimension Five Level scale; GHQ-28: General Health Questionnaire – 28; MOS-SSS: Medical Outcome Studies Social Support Survey; SDQ: Strength and Difficulties Questionnaire; RSE: Rosenberg Self-esteem Scale; **: Correlation is significant at the 0.01 level (2-tailed); *: Correlation is significant at the 0.05 level (2-tailed)

Inspection of the scatterplot of the standardised residuals versus the standardised predicted values of the DV (Appendix J) indicated that the assumptions of linearity was met as no curve was observed. Also, most of the dots looked like a random array of dots evenly dispersed around zero which means that homoscedasticity was also met. However, as there were a few points on the top-left and lower quarters of the graph that could be considered out of pattern, homoscedasticity was also tested statistically. Both Breusch Pagan (5.52; $p = .36$) and Koenker (4.47; $p = .48$) tests were run and were not significant meaning that homoscedasticity was met.

Normality of residuals was also met as a) the histogram of the standardised residual plots (Appendix K) showed that they were symmetrical and looked like a normal distribution (bell-shaped) and b) these dots on the normal probability plots (Appendix L) were on or very close to the line, confirming normal distribution.

Finally, the errors of prediction were independent of one another: Durbin-Watson test of independence of errors was 1.86, i.e., between 1 and 3.

In summary, the desirable cases to variables ratio was not met, in the regression analysis. However, the post-hoc statistical power investigation showed that the sample size was large enough to detect existing effects. There was one potential influential case which, as detailed investigation indicated, did not affect the model's parameters. There was no multicollinearity among IVs and the assumptions of linearity, homoscedasticity, normality, and independence of residuals were met. There were acceptable levels of outliers in the solution. Overall, no transformation of variables was needed for the standard multiple regression analysis.

6.4.3.1.2.2 Standard regression results

Table 6.13 presents a summary of the regression model, including the *adjusted* R^2, the R^2 *change*, the unstandardised (*B*) and the standardised (β) regression coefficients, the t-statistics, and the probability levels. The overall model accounted for 57% (adjusted $R^2 = .57$) of the variance in the WEMWBS scores. *R* for regression was significantly different from zero, with $F(5, 70) = 20.79$, $p < .001$.

Table 6.13: *Summary of standard multiple regression analysis of the relation of WEMWBS with predictors*

Predictors	**Adjusted R^2**	**R^2 Change**	**B**	**β**	**T**	**sig.**
(CONSTANT)			16.037		2.085	.041
EQ-5D-5L			.186	.367	4.069	<.001
GHQ-28			.048	.068	.567	.573
MOSSSS	.57*	.60*	2.079	.194	2.249	.028
SDQ			-.410	-.273	-2.537	.013
RSE			.475	.327	3.142	.002

Note. Dependent Variable: WEMWBS; European Quality of life Five Dimension Five Level scale; GHQ-28: General Health Questionnaire – 28; MOS-SSS: Medical Outcome Studies Social Support Survey; *: $p < .001$; SDQ: Strength and Difficulties Questionnaire; RSE: Rosenberg Self-esteem Scale.

Inspection of the B coefficients showed that EQ-5D-5L ($t(78) = 4.07$, $p < .001$), MOS-SSS $t(77) = 2.25$, $p = .028$, SDQ ($t(78) = -2.54$, $p = .013$, and RSE ($t(76) = 3.14$, $p = .002$) were all significant predictors of WEMWBS.

The β coefficients allow for the direct comparison of the predictors and they indicated that the most important predictors were general health and self-esteem, followed by emotional and behavioural problems and social support. Emotional distress (GHQ-28) was not a significant predictor. Inspection of the 95% confidence intervals for the IVs showed that for this variable the confidence intervals included zero (Appendix L, under coefficients), indicating that GHQ-28 in some samples has a negative relationship with WEMWBS and in others positive. It should be noted that removing the GHQ-28 to improve cases to IV ratio and re-running the analysis did not improve the model.

The semipartial correlations of the IVs (Appendix L, under coefficients) were squared ($.31^2 + .24^2 + -.19^2 + .17^2$) and then deducted from the R^2 (.57) to estimate the unique and shared variance of the IVs. The unique variance of the IVs was .10 for general health, .06 for self-esteem, .04 for emotional and behavioural problems, and .03 for social support. For all four of them it was .23. All together they contributed another .34 (.57 - .23) in shared variability.

In summary, high perceived general health, high self-esteem, fewer emotional and behavioural problems, and more social support were significant, consistent predictors of high levels of wellbeing for the overall sample. These variables accounted for 57% (adjusted) of the variance of WEMWBS.

6.4.3.2 What are the differentiating wellbeing predictors across the TD, Aphasia, and DLD groups?

The previous analyses explored the predictors of wellbeing that were consistent across groups. To investigate predictors of wellbeing that differed among the three language groups, a statistical comparison of correlation results between each pair of groups took place. The analysis concerned variables that appeared to show different correlation results across groups (i.e., SCS;

RSE; GSE; WIAT-II Overall Language and WIAT-II Oral Expression; CLQT Language and CLQT Overall Cognition) and results are presented in Table 6.14.

Table 6.14: *Statistical comparison of correlation coefficients between pairs of groups*

Construct (Scale)	**Aphasia - DLD**		**TD – Aphasia**		**TD - DLD**	
	z	p	z	p	z	p
SCS	-0.384	0.35	1.696	0.045*	1.31	0.095
GSE	0.067	0.473	0.526	0.299	0.63	0.264
RSE	-0.675	0.25	1.685	0.046*	0.95	0.171
WIAT-II Total Oral Language	-1.623	0.052**	0.189	0.425	-1.728	0.042*
WIAT-II Oral Expression	-1.727	0.042*	-0.464	0.321	-1.571	0.058
CLQT Overall Cognition	-1.176	0.12	-0.211	0.417	-1.607	0.054*
CLQT Language	1.632	0.051**	-0.189	0.425	1.738	0.041*

Note. DLD: Developmental Language Disorder; TD: Typically-developing; z = statistic z; p = probability p; SCS: Social Connectedness Scale; *: significant difference; GSE: General Self-efficacy Scale; RSE: Rosenberg Self-esteem Scale; WIAT-II: Wechsler Individual Achievement Test - Second Edition; **: difference close to significance; CLQT: Cognitive Linguistic Quick Test.

As Table 6.14 shows, there was a statistically significant difference in how both social connectedness and self-esteem were associated with wellbeing in TD and aphasia groups (z = 1.74, p = .041; z = 1.69; p = .046 respectively). There was also a statistically significant difference in the relationship between WIAT-II Overall Language and wellbeing (z = -1.73, p = .042) and between CLQT Language and wellbeing (z = 1.74; p = .041) when TD and DLD groups were compared. In addition, the relationship between Oral Expression and wellbeing was different for the aphasia and DLD groups (z = -1.73; p = .042).

When differences in the relationship between WIAT-II Overall Language and wellbeing as well as CLQT Language scores and wellbeing were tested for the aphasia and DLD groups, the results were just short of significance (z = -1.623, p = .052 and z = 1.632, p = .051 respectively). This was also the case for the relationship between CLQT Overall Cognition and wellbeing for the TD and DLD groups (*z* = -1.61, *p* = .054). Regarding the rest of the variables, their relationship with wellbeing was similar across groups.

In summary, there were some factors that were correlated with wellbeing in a significantly different way across groups. For people with no language disorders, self-esteem and social connectedness were the most significant wellbeing correlates. This was proved significantly different compared to the aphasia group where those variables were not important to wellbeing. For individuals with DLD, language was the most important correlate of wellbeing, although it was not correlated with wellbeing in the other two groups. This pattern was also observed and almost approached significance for Overall Cognition. Behavioural problems and emotional distress were the most important correlates of wellbeing for the aphasia group, but this was not significantly different from the other two groups, where those variables were associated with wellbeing as well. In other words, self-esteem, social connectedness, and language were differently correlated with wellbeing, depending on the language group a participant belonged to.

CHAPTER 7

7 Discussion

7.1 Key Findings

This study is one of the first to directly compare language, cognition, wellbeing and its drivers across PwA and those with DLD. While participants with aphasia and those with DLD scored more poorly than peers on language and cognition, no differences in wellbeing were detected between the three groups. Despite the similar wellbeing outcomes in the two clinical groups, however, analyses revealed differences in associations between wellbeing and language across groups. Language was directly correlated with wellbeing in DLD, but not in the other two groups. Whereas for individuals with DLD language skills was the most prominent associate of wellbeing, followed by health and social support, for PwA emotional and behavioural problems were the strongest correlates of wellbeing. For the TD group, self-esteem and social connectedness were the most important wellbeing drivers. The implications of these findings for theory and practice are discussed in the present chapter.

7.2 Research Question 1: How do the Language and Cognitive Skills of the TD, Aphasia, and DLD Groups compare?

7.2.1 Similarities and differences in language and cognition between clinical and control groups

In the present study, participants from the clinical groups scored lower than TD participants in overall language and cognition, but also in their subdomains. Lower scores compared to their

TD peers in all expressive, receptive, and overall language were expected by definition and eligibility criteria, as aphasia and DLD are language disorders. Significant differences between the DLD group and their TD peers on language scores indicate that, as a group, participants diagnosed with DLD in childhood remain disadvantaged in terms of linguistic abilities in young adulthood. These findings are in agreement with previous literature (e.g., Botting, 2020; Howlin et al., 2000; Johnson et al., 2010; Wadman et al., 2011), where children with DLD that were assessed in early childhood, were found language-disadvantaged in follow-up studies later in young adulthood. This finding supports increasing evidence that DLD can be persistent beyond adolescence (Botting, 2020; Clegg et al., 2005). In addition, at an individual level, the score range of the YA with DLD in this study shows that there was considerable variation, with some participants continuing to lag behind their peers markedly and others scoring within the normal range or high average. This finding is consistent with abundant evidence on the heterogeneity of DLD (Botting, 2020; Conti-Ramsden et al., 2008, 2016). Heterogeneity is also common in aphasia as it can affect all modalities of language processing and be of different severity: from relatively mild where the individual might have a word-finding difficulty to global where all modalities are severely impaired producing a significant disability (Code & Herrmann, 2003).

Lower cognitive performance was also expected in the clinical groups compared to their TD peers because both aphasia (Hachioui et al., 2014; Kalbe et al., 2005) and DLD (Botting, 2005, 2020; Clegg et al., 2005) are often accompanied by difficulties in cognitive functions. Unsurprisingly, in this study people from the clinical groups scored significantly worse than their TD peers in all cognitive domains, except for visuospatial skills (TD and aphasia group scored similarly), in agreement with the existing literature. In more detail, there is accumulating evidence, in both aphasia and DLD, showing difficulties in three of the domains measured here: 1) attention (Bishop & Norbury, 2005; Bonini & Radanovic, 2015; Kalbe et al., 2005; Marton, 2008; Murray, 2012); 2) executive functions such as planning, cognitive flexibility, reasoning, and inhibition (Diamond, 2013; Gallinat & Spaulding, 2014; Henry & Bettenay, 2010; Martin

& Allen, 2008; Marton, 2008; Mayer & Murray, 2012; Murray, 2012, 2017; Purdy, 2002), and 3) memory (Bavin et al., 2005; Beeson et al., 1993; Botting & Conti-Ramsden, 2001; Henry et al., 2012; Henry & Botting, 2017; Hick et al., 2005; Kalbe et al., 2005; Mayer & Murray, 2012; Seniów et al., 2009; Ullman & Pierpont, 2005).

In regard to visuospatial skills, the picture in the present project was mixed, with PwA scoring similarly with their TD peers and people with DLD significantly lower than them, being the most impaired cognitive area in the DLD group. The aphasia outcomes agree with the present aphasia literature where visuospatial skills are considered the most intact cognitive function (Kalbe et al., 2005). In the DLD literature, outcomes in regard to visuospatial skills are equivocal (Alloway & Archibald, 2008; Archibald & Gathercole, 2006; Montgomery et al., 2010), but in general, non-verbal skills are considered better than verbal skills (Bavin et al., 2005; Botting et al., 2013). Nevertheless, a meta-analysis of the data from studies comparing visuospatial working memory (storage and central executive tasks) in children with DLD and TD children showed that children with DLD have smaller capacity not only for storage, but also for processing of visuospatial information, clearly suggesting that the visuospatial working memory is affected in this group of children (Vugs et al., 2013). The low visuospatial skills outcomes may show that non-verbal abilities in this group are impaired or it might be that behind those difficulties some verbal burden is hidden. For example, Botting et al. (2013) found that in short-term memory tasks (with varying non-verbal input and output demands), those that were highly likely to be verbalised by the TD children (e.g., design memory in CLQT) were particularly difficult for children with DLD, suggesting low verbal encoding skills. It may be that the visuospatial tasks on the CLQT require verbal encoding or have some hidden verbal load.

Forty-five percent of the DLD sample had overall composite cognitive severity outside the normal limits . An equal number of particpants had non-linguistic cognition scores outside the normal limits. This finding is relevant to the recent change regarding the terminology of DLD (CATALISE:

Bishop et al., 2016, 2017) which acknowledged that the term SLI was too narrow to explain the observed wider difficulties not only in language, but also in non-verbal skills. A very recent study that focused entirely on language and cognitive skills in YA with DLD found lower non-verbal IQ performance in YA with DLD compared to their TD peers (Botting, 2020). However, the reseracher found that non-verbal IQ scores were within the normal range for those with DLD and that there is a positive pattern of change for YA with DLD, as they seem to catch-up with their TD peers with time in non-verbal cognition. It should be noted though that 34% of the initial DLD cohort (at age 7) took part in this study. Although this is a high attrition rate, testing showed that this subsample was representative of the original study's sample (MLS).

Although it is clear that most PwA and DLD also experience other neuropsychological difficulties, evidence indicates that the two populations under study are heterogeneous as to severity and type of cognitive deficits (Botting, 2020; Helm-Estabrooks, 2002; Kalbe et al., 2005; Mourik et al., 1992).

7.2.2 Similarities and differences in language and cognition between Aphasia and DLD groups

There is no previous study that directly compares language and cognitive skills of PwA and those with DLD in young adulthood and using the same assessment tools. This was the first study to do so and has revealed that the two populations share more similarities than differences in these areas. The results may not be that surprising, considering the initial theoretical base for comparing these two groups in the current project which was based on the functional similarities between the two groups as documented in the literature separately for each disorder.

The very few studies that have attempted to tease apart similarities and differences between DLD and aphasia on linguistic abilities (either by studying them separately and drawing inferences or through models) support similarities in linguistic profiles in the two groups. However, these studies are specific to linguistic abilities, including lexical difficulties and naming breakdown (Friedmann et al., 2013), type of gestures used in a confrontation naming task as pragmatic cues to compensate for the missing access to the word/language problems (Fex & Månsson, 1998), and word retrieval abilities (Kampanaros & Steenbrugge, 2013). The above papers did not directly compare the two language-impaired groups. Also, they studied the two populations at different ages, i.e., the typical demographic of the disorders (childhood for people with DLD and adulthood for PwA). It would be interesting future research to directly compare these two groups of YA on more specific linguistic tasks to explore if the similarities found in broad language and cognitive areas remain, or whether different between groups profiles emerge.

The only WIAT-II^{UK} and CLQT areas which significantly differed between groups were expressive language (WIAT-II^{UK}; aphasia scored lower), language as tested with CLQT (aphasia scored lower), and memory (CLQT: aphasia scored lower). A possible explanation for the significantly lower Oral Expression score of the aphasia group compared to the DLD group could be that anomia is reported as a universal characteristic of PwA, regardless of the Aphasia type or severity (Kohn & Goodglass, 1985). Although word-retrieval is a common difficulty in DLD, it is broadly accepted in the literature that children with DLD can present with different types of linguistic impairment depending on which aspects of language are most affected (Friedmann & Novogrodsky, 2008). Word-finding is implicated in all the Oral Expression tasks of WIAT-II, including Word Fluency, Visual Passage Retell, and Giving Directions and this may have driven the significantly lower scores of the aphasia group in this area.

The low oral expression performance may also be related to the significantly lower memory performance of the aphasia group. Indeed, memory is considered the most affected cognitive area in the aphasia literature (Kalbe et al., 2005), though it is a key affected area in DLD as well (Henry & Botting, 2017). One plausible explanation for the significant difference is related to the linguistic nature of most of the memory tasks in the CLQT. CLQT memory tasks include word fluency, story retelling, personal facts, and design memory with an order of increasing importance for total scoring. The first three of these subtests are clearly linguistic tasks and as the aphasia group was more severely impaired in language (as indicated with both CLQT and WIAT-II: expressive language), this may have influenced the total memory score.

Taken together, the results from the comparison of language, memory, and visuospatial skills can lead to some interesting theoretical implications. In particular, the fact that the aphasia group had similar visuospatial skills to TD peers, while for the DLD group visuospatial skills was the most impaired area in this study is of particular interest. This finding, in combination with the significantly lower skills of the aphasia in memory and language compared to DLD and TD groups, opens the domain-specific and domain-general discussion, suggesting that in aphasia the cognitive impairment may be mostly linguistic, but in DLD a more generalised impairment might occur. This is in accordance with Bishop et al.'s (2014) view that acquired disorders of language represent loss of previously acquired skills, usually with relatively specific impairments. In children with developmental disorders of language, selective impairment may be seen in some skills, but these may change over time, and the acquisition of language is affected more globally from the outset.

In a similar vein, Vugs et al. (2013), in their meta-analysis, suggested that the working memory deficits of children with DLD are not restricted to the verbal domain and that DLD may thus be associated with domain-general impairments of working memory. However, they highlighted that the deficit in the verbal working memory of children with DLD can be two to three times larger than the deficit in their non-verbal (Vugs et al., 2013). The present project differs from Vugs et al. (2013) in the age of the participants and in that the visuospatial skills were not limited to visuospatial working memory. An aphasia study with a similar focus also suggested that although working memory deficits are primarily evident in the verbal domain in PwA, they are not solely the result of domain-specific verbal deficits; inhibition abilities may also contribute to working memory deficits in PwA for example (Christensen et al., 2018). Fedorenko et al. (2012) addressed the issue about whether activity in Broca's area may be language-specific or related to domain-general cognitive control and concluded that Broca's area contains domain-specific language subregions intermingled with others that respond to a broad range of tasks and domains.

Taking the present and previous results together, it can be argued that in YA with DLD the cognitive difficulties are both linguistic and non-linguistic in nature, but in aphasia the cognitive difficulties are more specific to language. However, cognitive deficits in the present sample of aphasia (e.g., in memory and attention) are still evident and the dynamic relationships between language and other cognitive areas needs systematic investigation specific to this question. It is also worth noting that the previous literature used for discussion concerns younger people with DLD and older PwA compared to the present study. Changes in performance IQ (Botting, 2005, 2020; Mawhood et al., 2000) and within and across the different aspects of language (Leonard, 1998) have been found over time in the DLD literature. Thus, results from populations of different ages should be used for discussion for YA with caution.

In summary, the similarities found between most of the language and cognitive domains show that even if aphasia and DLD are completely different in etiology, onset, and origin, they share common behavioural clinical characteristics, which is in accordance with conclusions of previous research comparing these groups indirectly (Kampanaros & Steenbrugge, 2013). Although investigation of language and cognition was not the focus of this study, given the paucity of relevant data in YA with aphasia and DLD, these findings are an important contribution to the evidence base. They give policymakers, researchers, clinicals, and theorists a better understanding of trajectories of these functions and inform us about YA in their primary area of difficulty (language) across the lifespan.

More relevant to the present project, the language and cognition outcomes may also relate indirectly to the increased likelihood of mental health issues in these populations (Botting, Durkin, et al., 2016; Botting, Toseeb, et al., 2016; Clegg et al., 2005; Kauhanen et al., 2000; Morris et al., 2017). Thus, findings from RQ1 can lead to implications and speculations about the next RQ which compares the wellbeing between the three groups. The similar profiles between the two clinical groups create the speculation that wellbeing between those two groups might be similar as well. However, stroke produces damage to a mature system that has developed specialised subsystems for processing language, whereas in DLD, factors that disrupt language learning may mean that a mature, differentiated system never develops (Bishop et al., 2014). Thus, the relationship between language and wellbeing may not be that straightforward (RQ3).

7.3 Research Question 2: Is Wellbeing Different Between Young Adults with Aphasia and those with DLD, and is it Poorer in Comparison to TD Young Adults?

7.3.1 Similarities in wellbeing between clinical and control groups

The wellbeing ratings of YA with aphasia and DLD were in line with scores obtained from their TD peers in all wellbeing measures, except for the ONS Life Satisfaction question where a significant difference was found between aphasia and TD groups, with PwA scoring lower.

In aphasia literature, no studies have compared wellbeing in YA with aphasia and their TD peers. The two studies found nearest to the present research were those of Kim et al. (2005) and Hinckley (1998). Kim et al. (2005) compared QoL scores between people who had their stroke <45 years old vs >45 years old and found that the overall QoL score and each domain score (e.g., family roles, mood, self-care, social roles, thinking, and work/productivity) were significantly higher in younger people than in older ones, although language was not significantly different between groups. Importantly, this study focused on people with stroke, including PwA, and thus the results may not fully apply to aphasia. When *presence of aphasia* was entered in regression analysis as a potential predictor of QoL, it predicted the language subdomain of QoL in both groups of participants, but not the overall QoL.

The Kim et al. (2005) study did not include TD participants and thus there is no evidence on how young PwA are compared to their TD peers. Also, QoL is a different concept from wellbeing. Life satisfaction (which is a related concept to wellbeing) and its predictors were investigated by Hinckley (1998) with 31 adults with aphasia. Overall, 46% of the respondents provided a positive life satisfaction rating (very happy or content) and 54% reported a negative life satisfaction rating. They also found that time post-onset was the only factor that had an impact on life satisfaction (demographic, health, communication, social contact, and vocational information did not affect life satisfaction), with those with longer post-onset period having a lower satisfaction. These results could relate to the lower life satisfaction results found in the present project in PwA compared to their peers. However, the Hinckley (1998) study included participants with a mean age of 50 years which, although is considered a young age for stroke, is a different age category from young adulthood. There are more studies that have focused on QoL of young people with stroke (Choi-Kwon et al., 2006; de Bruijn et al., 2015), but these have excluded PwA due to their language difficulties, which is typical in the stroke literature (Hilari, 2011).

It emerges therefore, that the current study is the first to attempt a comparison of wellbeing and related concepts between young PwA and those without language problems. The current findings appear to be positive, as it would be expected that the sudden onset of disorder after stroke would be associated with major disruptions in everyday life in PwA, resulting in lower wellbeing. A possible explanation of the similar wellbeing between PwA and their TD peers is that people may have reconsidered their priorities and adjusted to life post-stroke. Having had a stroke, after being healthy and perhaps considering health and life guaranteed, may have made people reconsider their lives and "…slow down and appreciate the little things in life … and being thankful for each and every day" (American Stroke Association, n.d., p. 20). Alternatively, people with stroke may employ a range of psychological strategies to motivate themselves and make their situation appear better (Alaszewski et al., 2003). These are speculations which could be explored in more depth with qualitative research approaches.

YA with DLD in this study scored similarly to their TD peers on all wellbeing measures. The only study which looked at wellbeing in YA with DLD in the same way that this project does found similar results to the present project. In particular, Conti-Ramsden et al. (2016), using the ONS4, found the DLD group scoring similarly to the TD group. This is also in agreement with one of the first studies that looked at wellbeing of YA with language impairment (Records et al., 1992). Records et al. (1992) showed that people with DLD scored similarly to their TD peers in both the individual's perceptions regarding various life domains and in terms of subjective wellbeing components of positive affect, negative affect, and life satisfaction. The groups differed on life status domains of employment and education.

The related area of QoL of YA with DLD has been investigated by Arkkila et al. (2008) who found no significant differences between people with DLD and those with intact language in overall QoL score, although people with DLD performed significantly worse on the QoL dimensions of speech, usual activities, distress, and mental function. Johnson et al. (2010) found subjective perceptions of participants were similar regardless the group they belonged to. Records et al. (1992) and Johnson et al. (2010) suggested that even though specific aspects related to QoL may be impaired, overall perceived QoL may remain good.

Although there has been an increasing interest around wellbeing in YA with DLD during the last two decades, most of the current literature focuses on components of wellbeing rather than wellbeing as a global concept. Specifically, the focus of existing research has been on social aspects of life (Carroll & Dockrell, 2010; Clegg et al., 2005; Conti-Ramsden et al., 2016; Howlin et al., 2000; Toseeb et al., 2017), mental health (Howlin et al., 2000; Clegg et al., 2005; Toseeb et al., 2017), emotional health (Bao et al., 2016; Botting, Toseeb, et al., 2016; Botting, Durkin, et al., 2016; Brownlie et al., 2016; Schoon et al., 2010; Voci et al., 2006), personal resources (Botting, Durkin, et al.; Durkin et al., 2017; Schoon et al., 2010), health (Conti-Ramsden et al., 2016), and education and employment outcomes (Carroll & Dockrell, 2012; Conti-Ramsden et al., 2018), where people with DLD are often found to be disadvantaged. These results provide a wider context of studies that have looked at concepts related to wellbeing, but they cannot be directly compared with the current results of wellbeing. The factors explored in the studies above are used as potential determinants of wellbeing in the current study (see RQ3).

As with young PwA, these findings are quite positive, as it would be expected that having grown up with language disadvantage could result in special developmental paths compared to peers and thus lower wellbeing. The similar wellbeing between young people with DLD and their TD peers can be explained in various ways. First, growing up with a language difficulty, in this case DLD, is part of people's lives. This helps them adjust and possibly 'normalise' their history, feeling similar to TD people. Also, it may be that there are lower expectations from YA with DLD in terms of education, work, and other social roles, because of their difficulties. This may result in lower pressure compared to other young adults who typically experience increased pressure levels in this life stage, especially in today's society with rapid technological changes, economic challenges, societal expectations, and a prolonged transition to adulthood (Bonnie et al., 2014). This might make young people with DLD feel less stressed about life, especially given that they sometimes receive extra support or dispensation from their educational institution, such as extra time in exams, help with writing, reading and computer use, as well as other unspecified support (Conti-Ramsden et al., 2018) and welfare benefits (Clegg et al., 2005). It may also be, that as YA, many participants have been too young to see denied opportunities or may have been happy to be out of school and to go to higher education or to have a job. Their life may have been relatively better now, than life had been during their high school years.

Another way to interpret the similar scores between the TD people and people from the clinical groups is the possibility for people overestimating their wellbeing or denying their actual feelings. Conti-Ramsden et al. (2016) suggest that participants' good self-ratings of wellbeing may reflect a degree of optimism about their health and wellbeing and/or a supportive environment likely to include employment and/or an established personal relationship, as previous research has proposed (Durkin et al., 2009; Johnson et al., 2010). Such factors may have contributed to the present results as well, but these hypotheses need further investigation.

The present results are in agreement with the limited evidence found to be relevant to the present question. However, studies discussed in relation to the present findings have a number of limitations. Aphasia studies did not include TD people, did not focus specifically on aphasia, concerned mostly older people, and explored QoL rather than wellbeing. DLD wellbeing literature, on the other hand, looked mostly at drivers of wellbeing rather than wellbeing itself. The present findings show the importance of making a distinction between wellbeing and its determinants. Based on the present results and the limited relevant evidence existing in the field it seems that wellbeing is overall good when measured as a global concept in YA with aphasia and those with DLD. Future research is needed to replicate these findings and increase confidence in them.

7.3.2 Similarities in wellbeing between aphasia and DLD groups

One of the most interesting outcomes of the present project is that young PwA and those with DLD show similar wellbeing levels. The similar language and cognitive profiles found between the two clinical groups gave grounds for expecting such similarities between the two clinical groups. Indeed, one would expect people with similar strengths and difficulties to have similar levels of wellbeing if it is assumed that the groups are similar in other confounding factors.

Although young adulthood is a challenging life stage, at the same time for many people young adulthood is a very positive phase of life. This may affect how people evaluate their lives in a more positive way. Supporting this argument, when wellbeing was assessed using a life satisfaction measure, the relationship between age and wellbeing was U-shaped, with the highest levels of wellbeing in young adulthood and early old age, followed by a drop in the over 70s (e.g., Blanchflower & Oswald, 2008; de Ree & Alessie, 2011). Huppert (2014), on the other hand, found that a wellbeing dip is commonly seen between the ages of about 35 and 55 years coincides with the period of maximum career development and financial needs, as well as responsibility for family care.

Another and more valid explanation in the PhD student's view for the good wellbeing scores of the two clinical groups is that wellbeing is an internal subjective concept and may not depict external objective conditions of one's life (Campbell et al., 1976; Kammann, 1983; Larsen et al., 1985). Used in its subjective sense, wellbeing refers to the way people experience their lives, which may bear a strong or only a weak relationship to the objective facts of people's lives. Accordingly, having typical language abilities or a good job may not necessarily lead to reports of greater wellbeing (Campbell et al., 1976), as wellbeing is a multidimensional personal state with complex interactions between several internal and external drivers (Andrews & Withey, 1976; Diener, 1984). Wellbeing is associated with meeting a potential, developing strong relationships, and doing things that one considers important and worthwhile.

From a theoretical perspective, the findings so far open the discussion about mental wellbeing and mental illness and whether the two should be regarded as lying along a single continuum or are not at opposite ends of a continuum but rather form two different continua (e.g., Can one have mental illness and be flourishing at the same time?). The results of the present project support that the latter view is valid. According to the two-continua model, the strongest proponent of which is Keyes et al. (2002), one continuum goes from severe mental illness to no mental illness, while the other goes from low wellbeing ("languishing") to high wellbeing ("flourishing"). Borrowing from this model, this project proposes that language disorders such as aphasia and DLD can coexist with wellbeing through a complex relationship: People can have high sense of wellbeing despite their language disorder and accompanying problems. By the same logic, neurotypical controls can experience a subjective state of grief and unhappiness in the absence of any noticeable disorder. According to Edwards and Imrie (2008), wellbeing can be achieved if people with disabilities overcome or internally adapt to their own individual limitations. "This emphasis is repeated in much of the research on disability and wellbeing, in which personal attitudes and/or feelings are conceived of as a function of impairment or the medical condition" (Edwards & Imrie, 2008, p.345).

Based on existing literature, it is likely that health, emotional, social and related aspects of life will be affected in the two clinical groups compared to their TD peers, although this was not tested here. However, it seems that, how an individual perceives those aspects is influenced by one's personality, personal values, attitudes, behaviours and internal resources. Longitudinal studies have confirmed that personality characteristics of individuals in their early teens predict wellbeing in mid- and later life (e.g., Abbott et al., 2008). Also, individuals who are more intrinsically motivated show higher wellbeing relative to those who are more extrinsically motivated (Kasser & Ryan, 1993; Sheldon et al., 2005). It is likely that positive attributional styles, including optimism and self-esteem, contribute to overall subjective wellbeing. Considering these, it may be that internal characteristics of a person outweigh the objective impact that a language disorder can have on a person with aphasia or DLD, resulting in normal levels of wellbeing.

Lastly, even though wellbeing may be similar between PwA and people with DLD, their social, emotional, and physical functioning may differ. Consequently, their levels of functioning in different areas may affect their wellbeing differently. This is a topic relevant to the next research question as well, where similarities and differences in predictors of wellbeing between groups are discussed.

7.4 Research Question 3

7.4.1 What predictors of wellbeing are consistent across the TD, Aphasia, and DLD groups?

As a first step, common determinants of wellbeing in YA, regardless of the group they belonged to, were investigated. From the five variables entered into the regression model, all but one (emotional distress as tested with GHQ-28) significantly predicted wellbeing. Perceived general health, self-esteem, emotional and behavioural difficulties, and social support (in order of importance of contribution to the model) jointly accounted for 57% of the variance in wellbeing (WEMWBS).

Perceived health was the most important predictor of wellbeing in the present sample of YA. This is consistent with literature in large scale studies of the general population (Dolan et al., 2008; Shields & Price, 2005). In YA, perceived QoL has been correlated with self-rated health (Vaez et al., 2004), while in a qualitative study of 126 young individuals, participants emphasised that "you cannot get very far without good health" (Berglund et al., 2006, p.5). It is interesting that some researchers exclude health as a potential predictor of quality of life in young people, because they claim that young people very seldom face health problems and thus there is a lack of variance among the young (Pichler, 2006).

In young people with DLD, the existing evidence regarding self-reported health is limited, but is in agreement with the present thesis' findings, with self-reported health being the most important predictor of personal wellbeing (21% of variance) compared to other factors such as employment situation or relationship status (Conti-Ramsden et al., 2016). Self-rated health was also an important predictor for the TD participants in that study. In aphasia, only one study tested health in relation to wellbeing in relatively younger PwA (mean age of 50 years) (Hinckley, 1998). In contrast to the current study, Hinckley (1998) found that health did not have a significant impact on the likelihood of positive satisfaction with life. These different results could be explained by different measures used to test satisfaction with life. Hinckley (1998) used a single-question i.e., 'Overall, how would you rate your current lifestyle' with the use of a four-point scale. The validity and reliability of single-question measures can be questionable (Cooke et al., 2016).

Social support also predicted wellbeing in all groups of participants. To the PhD student's knowledge, the direct relationship between wellbeing and social support has not been previously explored in healthy YA. However, social support has been indicated as a moderator between indicators of wellbeing (loneliness, depressive symptoms, and physical health) and stress in YA in different ways, depending on the relational context in which it occurs (family, friends, and romantic partners) (Lee et al., 2018; *n* = 628). This finding suggests that depression is malleable by environment in YA. This is in accordance with some DLD literature. Conti-Ramsden et al. (2016) suggested that supportive social contexts (family members, close friends) may make a considerable difference to how YA perceive their wellbeing when times are tough in people with DLD. In a similar vein, Johnson et al. (2010) found that people who had strong social support networks at age of 19 years reported higher QoL scores at 25 years, suggesting that family support may act as a buffer with respect to QoL in the face of adverse outcomes (Johnson et al., 2010). These results, however, contradict the results of Botting, Durkin, et al. (2016) who investigated the impact of social support on emotional wellbeing in young adulthood, including 81 adults with a history of DLD (aged 24). They found that whilst the availability of social support was similar across groups, people with DLD received more help from others, but social support was not significantly related to emotional health in those with DLD. In contrast, for TD YA, uptake of support indicated poorer emotional health. It is possible, though, that social support was confounded by support needs, i.e., TD people asked for less social support than people with DLD which masked any effect of social support and this can have influenced the results of the study.

No studies looking at the relationship between wellbeing and social support in YA with aphasia were found. Research into older people with post-stroke aphasia show links between social support and QoL (Brown et al., 2012; Hilari et al., 2012), while specific types of support have been related with HRQoL more than others, i.e., informational support and social companionship (Hilari & Northcott, 2006). Nevertheless, as noted by ecological systems and life-course theories of development, an individual's need for social support may vary with age-related changes. This may be particularly true across contexts because as life circumstances change both individuals' social networks and their needs for different types and amounts of support also change (ISchoon & Heckhausen, 2019). Thus, the studies concerning older PwA may not be informative for younger people who have different support and service provision needs.

In the future, research should examine the relational context of social support, because support from different interpersonal relationships may influence individuals in distinct ways, under differential circumstances, and during different life stages via an interplay of developmental trajectories and social pathways (Lee & Goldstein, 2016). Psychological research, for example, distinguishes between structural (e.g., network size) and functional (e.g., satisfaction with support) aspects of support, while makes a distinction between perceived and received support (Laireiter & Baumann, 1992). As perceived social support was a predictor of wellbeing for all groups in the present project, but social network was not correlated with wellbeing for any of the groups, deeper exploration on the topic is needed. Finally, as many of the existing studies are observational (e.g., Botting, Durkin, et al., 2016), experimental investigation of the impact of social support on wellbeing would be useful to inform clinical practice, as a recent aphasia intervention study for supporting wellbeing in PwA has done (Hilari et al., 2019).

SDQ also predicted wellbeing in the whole sample of the present study. This measure taps into broad emotional and behavioural issues. In the aphasia literature, behavioural problems have not been investigated previously. In terms of emotional health, the only study that compared predictors of QoL in old and younger adults with stroke, including PwA, found that although depression was a factor closely related to QoL in old-onset patients, this was not the case for younger patients (Kim et al., 2005). Depression did not predict overall QoL or QoL subdomains in younger people with stroke. It should be highlighted, however, that Kim et al. (2005) did not focus entirely on aphasia, but on stroke. Also, depression is a specific construct of emotional health domain of SDQ. Research in older PwA has found clear links between emotional distress /depression and reduced HRQoL (for a review see Hilari et al., 2012).

For DLD, most research concerns children and adolescents, where abnormal levels of emotional and behavioural difficulties have been identified (Conti-Ramsden et al., 2013, using SDQ; meta-analysis of O'Kearney & Goh, 2012). Emotional health, on the other hand, has been the subject of much study in YA who have grown up with DLD. Most researchers have found that young people with DLD have higher depression and anxiety levels compared to controls (Arkkila et al., 2008; Botting, Durkin, et al., 2016; Clegg et al., 2005; Howlin et al., 2000; Whitehouse et al., 2009), higher rates of sub-threshold social phobia, and higher levels of social interaction anxiety symptoms (Brownlie et al., 2016; Voci et al., 2006). Importantly, longitudinal studies of children with early language problems have indicated mixed trajectory patterns of mental health problems in DLD, depending on the life stage a person is at (Conti-Ramsden et al., 2018). Some investigators have reported longitudinal increase in symptomatology (Beitchman et al., 2001), others have found resolution of difficulties (Redmond & Rice, 2002), while still others have reported curvilinear patterns, i.e., decrease followed by increase in symptoms (Botting, Durkin, et al., 2016). The latter result was driven by a particular group of people who were unemployed at 24. Changes of emotional health at different ages highlights the need for studying wellbeing separately at different life stages. Although levels of emotional health have been extensively investigated in YA with DLD, evidence about the impact of emotional health on wellbeing is lacking.

In the current study although self-esteem was also proved an important predictor of wellbeing when it was entered in the regression model, when statistical comparison of correlations took place (see RQ3b below), the correlation between wellbeing and self-esteem was significantly different between wellbeing and self-esteem for PwA and their TD peers. Thus, this construct is discussed in the next section.

Surprisingly, the GHQ-28 was the only independent variable that did not significantly contribute to wellbeing, even though it was correlated with wellbeing in all groups. This contradicts most of the current literature, especially around TD and aphasia where GHQ-28 had been extensively used and is associated with QoL (e.g., review of Hilari et al., 2012). However, the fact that the present study concerns wellbeing, not QoL, and younger people, possibly contributes to such differences. A possible explanation of this outcome is the concurrent entry of the five predictors into the regression. SDQ and GHQ-28 showed the highest correlation strength among predictor variables which was expected as both scales include assessment of emotional health (e.g., depression and anxiety). This means that when entering those variables together in the model, one of them is significant, but the other is not; it is speculated that GHQ-28 constructs have been covered to some extent by the use of SDQ which evaluates both emotional and behavioural life aspects.

From a different perspective, how the emotional aspects of wellbeing relate to the overall definition and measurement of wellbeing is not straightforward. Numerous researchers have argued that the relationship between positive and negative affect (e.g., Larsen et al., 2001; Warr et al. 1983) is complex and depends on different factors (Zautra et al., 2005). McNulty and Fincham (2012) have indicated that whether forgiveness, optimism, benevolent attributions, and kindness have positive outcomes or not in relation to wellbeing depends on the interpersonal context. For this study, this contextual dependence may mean that the extent to which wellbeing and emotional distress are independent of each other can vary according to the external and internal environmental challenges participants face.

The present findings may suggest that other inter- and intrapersonal skills are possibly involved in the relationship between wellbeing and emotional distress. Gloster et al. (2017) examined the moderating influence of psychological flexibility on the relationship between known risk factors (stressful life events, daily stress, and low social support) and physical health, mental health, and wellbeing, with a sample of 1,035 participants aged 18 to 74 years. They found that psychological flexibility regularly moderated the relationship between stress and four commonly cited dimensions of wellbeing (Keyes, 2005), with higher levels of psychological flexibility leading to more advantageous outcomes (i.e., function as a protective factor). Authors suggested that people who can flexibly interact with stressful environmental demands have greater physical, mental, and wellbeing outcomes than those who are inflexible, even if they report having more stress. Level of ability to adapt to various situational demands, to shift mindsets or behavioural repertoires when they compromise personal or social functioning, and to maintain balance among important life domains (Kashdan & Rottenberg, 2010) can determine how an individual interacts with stressors (Gloster et al., 2017).

7.4.2 What are the differentiating wellbeing predictors across the TD, Aphasia, and DLD groups?

The relationship between wellbeing and other variables was statistically compared among groups to identify potential differentiating predictors of wellbeing for the three groups. There was a significant difference in correlations between wellbeing and Oral Expression in aphasia and DLD groups; between wellbeing and overall language in TD and DLD groups, and between wellbeing and social connectedness and wellbeing and self-esteem in TD and aphasia groups. In other words, language, social connectedness, and self-esteem were differently correlated with wellbeing in the three groups.

Perhaps, the most interesting finding of the present project is the different relationships found between language and wellbeing across language groups. This significantly different relationship between the DLD and the TD groups is not surprising, as growing up with language and communication difficulties, compared to having intact language skills, is expected to affect how people feel and function in their lives. By statistically comparing correlations between aphasia and DLD though, some novel outcomes emerged. Although the two groups had similar language and cognition profiles, similar wellbeing outcomes, and the same correlates of wellbeing excepting self-esteem, in the DLD group wellbeing was also associated with language. This was significant for Oral Expression in particular, which might seem surprising given that young PwA in this study had significantly lower scores compared to those with DLD in this domain. This finding suggests that affected language during developmental years can have an impact on people's lives and their wellbeing. It is argued that the fact that this relationship was not reflected in the aphasia group, where also language difficulties exist, probably depicts the different origin and etiology of the language disorders.

Related research within the DLD group suggests that there is some connection between inherent language and emotional health, but the precise mechanisms for the link are not entirely clear. Clegg and colleagues (2005) and Conti-Ramsden and Botting (2008) found few clear associations between language and the development of emotional health symptoms. For the DLD group only, an association between concurrent receptive language and emotional health was indicated, but no relationship between early poor language scores and emotional health difficulties was found (Conti-Ramsden & Botting, 2008). Interestingly, this prohibits a directly developmental causal relationship. Instead, it is suggested that atypical development at very early stages of life can lead to several deficits which are latent until later in life (Conti-Ramsden & Botting, 2008). Although this study focused on mental health and not wellbeing, this argument can be applied in the present results as well, where a connection between concurrent language and wellbeing was found. Botting, Durkin et al. (2016) found that the relationship between language and mental health is not linear, but the relationship was fully mediated by self-efficacy, confirming the complex relationships between such constructs.

At this point, it is important to consider the negative relationship between wellbeing and language and cognition in the DLD group. Although surprising, this outcome can be explained. For a person who is born with language difficulties, the better their linguistic performance is, the more frustrated they may be as expectations increase. People with DLD have grown up with language difficulties which are part of their lives and are reflected in various ways of living, such as completing fewer years of formal education, having jobs considered semiskilled or unskilled (as cited in Arkkila et al., 2008), being in non-professional occupations or in part-time positions (Conti-Ramsden, Durkin et al., 2018). Higher language and cognitive skills can unexpectedly increase life demands and stress. Also, people with DLD typically have extra support, when available, such as welfare benefits and housing tenure (Clegg et al., 2005). If language gets better as people get older, it may mean that people will stop receiving such support and benefits, perhaps affecting their satisfaction with life. Qualitative research methods can be used to explore in more depth how people feel about their language problems and the effect they have in their adult lifestyle.

For PwA, a more diffuse casual model may explain the indirect relationship between language and wellbeing in young people. It is suggested that stroke and aphasia can lead to difficulties in general health and emotional health, for example, which in combination with lack of social support can in turn affect wellbeing. In other words, in this population, it is the consequences of language difficulties, rather than the language difficulties themselves, that seem to influence wellbeing.

A significant difference in relationship between wellbeing and self-esteem was also found between the groups. In particular, self-esteem was strongly related to wellbeing in the TD and DLD groups, but not in the aphasia group. Self-esteem is a socio-psychological construct that assesses an individual's attitudes and perceptions of self-worth (Srivastava, & Agarwal, 2013). In a review of perspectives on happiness, Ryff (1989) concluded that the most recurrent criterion for positive wellbeing had been the individual's sense of self-acceptance or self-esteem. This is in accordance with Diener's (1984) review of wellbeing where a positive association between self-esteem and wellbeing was also found. Campbell found that "Dissatisfaction with self has a more damaging effect on one's general feeling of wellbeing than dissatisfaction with any other domain of life" (Campbell, 1981, p. 195). Such results have been confirmed in research concerning healthy YA (e.g., Diener & Diener, 1995). Similarly, using regression and path analysis, Furnham and Cheng (2000) found self-esteem to be the most powerful predictor of young people's self-reported happiness. In DLD literature, self-esteem research concerns mostly children (e.g., Jerome et al., 2002) and adolescents (e.g., Wadman et al., 2008). The only study that investigated self-esteem in YA with DLD indicated a relationship between self-esteem and language and socioeconomic status as well as an association between shyness and self-esteem, but how it affected wellbeing in particular was not explored (Durkin et al., 2017). The positive relationship between wellbeing and self-esteem can be well explained. People who hold high opinions of themselves are very likely to be happy, while those you think poorly about themselves tend to be unhappy (Baumeister, 1991). Young adulthood is a period of adjustments to new patterns of life and new social expectations. How well one copes with these adjustments can affect their self-esteem, which can in turn predict wellbeing.

A different pattern was observed for young PwA in this study where self-esteem was not associated with wellbeing. This finding is in line with research showing that self-esteem was not significantly correlated with language functioning in 30 participants with left-hemisphere stroke and significant language impairments (Vickery, 2006), and that there was no evidence of low self-esteem shortly after stroke onset or at three and six months post-stroke (Bakheit et al., 2004). It may be that specific types of self-esteem are related with wellbeing in this population, e.g., communication confidence, whereas others (or overall self-esteem) are not. Why self-esteem is not that important after stroke and aphasia may be explained by Lee and Robbins' view (1995) that frustration occurring later in development may be traumatic or severe, but the self is not that structurally fragile. In other words, it is also possible that self-esteem is mostly developed through early years and is not easily affected by experiences or incidences in adult life.

Future research could explore levels of impairment of self-esteem specifically in YA with aphasia and DLD and their impact on wellbeing, as self-esteem motivates positive behaviour, promotes adjustment to disability, and influences coping strategies and dealing with adverse life events. People who have low self-esteem following brain injury, for example, may be less able to utilise coping strategies and manage the physical, cognitive, psychological, and social consequences of the injury if they are less able to focus on competence over limitations or to maintain a sense of self-worth over feelings of hopelessness (Kendall & Terry, 1996). In addition, exploration of the exact links between wellbeing and self-esteem is needed, as it may be that the relationship between self-esteem and wellbeing is not a direct one. For instance, research has shown that healthy YA with higher levels of social support from friends and parents were more likely to have a higher level of self-esteem which subsequently protected against the symptoms of depression (Huurre, 2000). Clarifying such associations could be useful for supporting recovery progress and rehabilitation.

A significant difference in relationship between wellbeing and social connectedness was also found between the TD and aphasia groups. How connected people felt with their environment was related to TD people's wellbeing in the present study. Most of current research around social connectedness in the general population concerns adolescents and, in agreement with the present findings, has shown that social connectedness and acceptance are significant and positive predictors of subjective wellbeing (Arslan, 2018). This was an expected finding as connectedness is an important protective factor of social and emotional health, providing a sense of belonging, and it is believed that having social ties to the community leads to positive outcomes such as positive mental health and health behaviour (Arslan, 2018).

In contrast, in the group with aphasia in the present study, social connectedness was not associated with wellbeing, which was an unexpected finding. This area has not been previously investigated in the literature of YA with aphasia. Literature in older people with aphasia has shown that although social networks diminish post-stroke, especially friendships, contact with children and relatives remained stable (Northcott, Marshall, et al., 2016). Thus, it may be that people stay connected with the people who remain in their lives, even if the number of those people is decreased, and thus social connectedness is not as important as are other factors in PwA's wellbeing. It may also be that PwA have developed mechanisms and coping strategies to help them focus only on relationships that are important for their lives.

It should be clarified at this point that social connectedness and social network are related but different constructs of social functioning. Surprisingly, in this project, no associations identified between wellbeing and social network scales for any of the groups. Future analysis of levels of social connectedness and of the nature of the social networks of the participants together with exploration of potential associations between the two constructs could give valuable insight about the topic.

In the TD group, self-esteem and social connectedness were the strongest correlates of wellbeing, suggesting that the wellbeing of young people with typical development is mostly affected by internal resources and social aspects of life. In the group with DLD, language, emotional, social, and personal factors were linked to wellbeing, while language was the strongest wellbeing correlate and only related with wellbeing in this group. This suggests that the clinical impairment people with DLD have grown up with has a significant effect on their wellbeing. In the group with aphasia, emotional factors followed by social support showed the strongest connection with wellbeing.

In conclusion, this project showed that young PwA and young people with DLD share similar linguistic and cognitive profiles, with a few exceptions, despite the different etiology and origin of the two language disorders. Sharing similar clinical characteristics, the two language-impaired groups showed also similar wellbeing levels, which importantly and positively were also similar to that of people without language difficulties. However, the different etiology of the two language disorders was reflected in the different nature of wellbeing. For the YA with

DLD wellbeing was primary affected by their inherent clinical characteristics (such as language problems), while having grown up with intact language skills PwA and their wellbeing were mostly influenced by the emotional impact aphasia had on their lives. Finally, in TD YA, internal resources and social aspects of life seemed to define wellbeing the most.

By comparing clinical characteristics, wellbeing, and its predictors between two language-impaired groups of developmental vs acquired origin, this research shed some light not only on the nature of wellbeing for those disorders, but also on wellbeing as a concept in general. In summary, the similar wellbeing scores between the clinical and TD groups showed that wellbeing and disorders can coexist and their relationship should be explained by looking not only at the impact one has on the other, but also in light of a person's attitudes, personal characteristics, and internal resources. The different relationship between language and wellbeing in the clinical groups raises questions on the nature of wellbeing. The present data underlines the importance of early experience (and perhaps the role of genetic factors) in wellbeing, but how much influence important events in young adulthood can have on it remains unclear. Is wellbeing in YA fixed and stable (from early years of development) or is it malleable? Can it be adjusted with time to new realities? Having explored consistent and different predictors of wellbeing across different language groups, this study argues that wellbeing is a complex, multidimensional concept, reflecting not only the clinical and psychosocial symptoms of the individual that someone would expect, but also less obvious internal resources and personal characteristics of the person.

7.5 Implications of Findings for Practice

Implications for practice are discussed separately for SLTs, service provision, and policy makers.

7.5.1 Speech and language therapy services

Assessment and therapy of language deficits is always the focus in both aphasia and DLD. However, as language and cognition are changing over time and have not been well studied in young adulthood, SLTs should adjust assessment tools, therapeutic techniques, and activities in this age when they deal with young adults. Findings of this study showed that all cognition aspects are affected in both groups (except for visuospatial skills in the aphasia group), calling for assessment and targeting of these domains in intervention. In the aphasia group, this can be achieved through language therapy as the deficits were proved mostly linguistic in nature, while in DLD both verbal and non-verbal cognition should be evaluated (with appropriate tools that separate linguistic and non-linguistic abilities) and treated as appropriate. This is particularly important for the DLD group, where it is broadly believed that cognition is intact. Targeting cognitive difficulties is important because cognitive problems can compromise language function (Senióẃ et al., 2009), can be associated with poor functional outcome (Hachioui et al., 2014), and can influence the efficacy of rehabilitation (Kalbe et al., 2005). Targeting cognition in therapy can also lead to better and faster recovery of linguistic abilities (Geranmayeh et al., 2014; Marinelli et al., 2017). Working memory training, for example, has been found to significantly improve the performance of language comprehension in healthy elderly persons and patients with mild cognitive impairment (Mewborn et al., 2017).

More broadly, as optimum wellbeing should be the ultimate aim of therapy, incorporating factors that affect wellbeing in the intervention approach, i.e., impaired areas as therapeutic targets and intact areas as therapy facilitators, should be always considered. A holistic therapeutic approach is recommended considering the specific needs of the person, including their clinical and psychosocial needs. In more detail, based on the outcomes of the present study, for YA with aphasia, wellbeing is largely driven by emotional health and personal resources and, thus, SLT-led interventions provided by professionals trained in improving wellbeing strategies are crucial. Currently, the majority of SLTs do not feel knowledgeable, confident or satisfied in this role, although they believe they have a role in addressing the psychological wellbeing of PwA (Sekhon et al., 2015).

For targeting emotional wellbeing effectively, therapists need to also ensure they address priorities of PwA during rehabilitation. Wallace et al. (2017) explored essential aphasia treatment outcomes from the perspective of an international sample of clinicians and managers working in aphasia rehabilitation. They found outcomes reaching consensus most frequently related to psychosocial wellbeing, which is in accordance with the present findings. Psychosocial wellbeing outcomes spanned a range of areas, including coping, decision-making, identity, self-worth and self-esteem, confidence, empowerment, and independence. The management of emotional wellbeing in aphasia requires the collaborative efforts of the stroke multidisciplinary team (Kneebone, 2016).

SLTs should consider the framework of stepped psychological care after stroke which can be used to guide service provision to prevent and treat emotional health in PwA. According to this framework, a range of rehabilitation interventions may be beneficial to mood at level 1 for people without clinically significant depression such as goal setting and achievement, psychosocial support, communication partner training, and narrative therapy, while people with mild symptoms of depression may benefit from interventions such as behavioral therapy, motivational interviewing, and problem solving (level 2). It is believed that SLTs have an important role to play in the first two levels, before specialist mental health and/or behavioral services are needed to address moderate and severe symptoms of depression (at levels 3 and 4 of stepped psychological care) (Baker et al., 2018). Although this model has not been tested in DLD, its principles could be also considered in that population, but involving a different team (educators rather than a stroke team, for example). However, as wellbeing in DLD is strongly language and cognition driven, based on the present outcomes, SLTs' primary role is to identify aspects of language and cognition that are impaired in YA with DLD and systematically target those, in parallel with other psychosocial affected aspects of life. The nature of relationship between wellbeing and clinical characteristics in this group, however, was proved complex in the present project and should be clarified with additional research, before it can be targeted effectively during therapy.

7.5.2 Service provision

Although stroke rates are increasing in younger people, young stroke patients feel frustrated and invisible as rehabilitation settings and care services do not acknowledge the distinct needs of this age group (Bendz, 2003; Kirkevold et al., 2018; Röding et al., 2003; Wolfenden & Grace, 2012). At the same time, although DLD is now considered a life-long disorder, specialised support for YA with DLD once they become independent is rarely available. Young adulthood is a demanding life-stage where people have different needs, wants, responsibilities, lifestyle, and expectations compared to younger or older people, especially those with life-long disorders (Hersh, 2009). There is a need for investment in service provision specific to YA with disorders with long-lasting negative impact, such as aphasia and DLD. For people with DLD, the recently introduced Special Educational Needs and Disability Code of Practice extended the commission of health, education, and social care from 18 to 25 years in the UK. However, the extent to which speech and language therapy (SLT) services have been developed for this older age group, where language directly affects wellbeing, is unclear as is the availability of services for adults with DLD over 25 years.

For addressing the needs of young PwA, psychologically oriented services such as counselling and support services are required. Peer support for example, which was also included in the National Stroke Strategy for England, is widely employed to assist the adjustment of stroke survivors through voluntary stroke groups and although the benefits of such groups remain to be established, PwA find them useful (Gallacher et al., 2013). Such provision needs to be specific to YA for them to benefit. Moreover, nowadays where social media are a big part of our lives, especially in young adulthood, online support groups could also help wellbeing of young PwA. However, these services need to be carefully developed and evaluated before implementation in practice avoiding extra frustration of people with limited digital skills.

A crucial aspect of life that should be targeted in YA with aphasia is return to work. Younger people with aphasia are less likely to return to work after stroke than those without aphasia (Graham et al., 2011). Specialised vocational rehabilitation opportunities are crucial, especially for people in young adulthood which is typically the period of maximum career development and financial needs. However, such opportunities are often limited or non-existent for younger stroke patients because the majority of strokes occur in individuals who are past working-age (Conroy et al., 2009). Stroke vocational rehabilitation programmes should include occupation specific preparation and training, education within the target workplace, participation by the person with stroke in all management aspects of their rehabilitation, and ongoing workplace advocacy from a stroke educator (Wolfenden & Grace, 2012). Communication aspects should be also addressed for PwA when entering the workforce (Isaki & Turkstra, 2000), as they face more barriers (Garcia et al., 2000, 2002). Specific to PwA, additional strategies have been proposed such as development of an assertive attitude, reduced speaking in group situations (i.e., responsibilities of the person), strategies such as task modification, reduced task demands, and reduced expectations regarding productivity (i.e., responsibilities of the employer). Encouragingly, a new trial is exploring an early vocational rehabilitation for young people with stroke in the UK, including those with aphasia and capacity to consent (Radford et al., 2020). Finding work or regaining employment post stroke can enhance a patient's recovery, self-esteem, confidence, social identity, and overall quality of life (Treger et al., 2007; Wolfenden & Grace, 2009) and in turn people's wellbeing.

7.5.3 Policy makers

The importance of wellbeing has been acknowledged by policy makers in the UK, especially in the last 10 years when the government introduced the Measuring National Wellbeing programme to help understand and monitor wellbeing (Allin & Hand, 2017). Taken together, young PwA and those with DLD represent a substantial group of young people in the UK with language and associated impairment. The present project showed that a) different factors affect wellbeing in young people with language impairments and those without and b) there may be differences between wellbeing pathways of YA vs older adults and children. Therefore, policy makers should consider the needs of YA separately: "Federal, state, and local governments and nongovernmental entities that fund programs serving young adults or research affecting the health, safety, or well-being of this population should differentiate young adults from adolescents and older adults whenever permitted by law and programmatically appropriate" (Bonnie et al., 2014, p. 7).

Raising awareness and facilitating preventative care for young PwA and DLD should be a priority for policy makers. Compared to older persons, young people who have had a stroke are more likely to survive their initial illness and live many years with functional and/or cognitive deficits that impact their daily living (Varona et al., 2004). The costs of stroke care in the UK are expected to rise rapidly over the next two decades, increasing by as much as 250% (Patel et al., 2020). Thus, more awareness should exist for the increase of stroke incidence rates in YA and the language and psychosocial consequences of it, and measures to prevent stroke occurrence and reduce its disabling effects should be developed and implemented (Patel et al., 2020). Similarly, more awareness should exist around DLD, which is a highly prevalent disorder (7.6%; Norbury et al., 2016), persisting beyond adolescence into adulthood as increasing evidence (e.g., Johnson et al., 2010), including the present project, shows. The persistent difficulties of this population increase the existing substantial costs to government spending on special education needs. The fact that DLD is a ‘hidden’ disorder and is not easily picked-up in real-life helps it go undiagnosed, unless formally assessed. The costs to the child and family as well as society as a whole when DLD goes undiagnosed have been highlighted in the literature (McGregor et al., 2020). Early diagnosis and intervention of those two language disorders will contribute to better outcomes for both the person and their family as well as the government.

7.6 Limitations and Future Research

The present study has limitations that should be addressed in future research. Although the sampling procedure was rigorous and comprehensive data was collected for each young adult in a variety of relevant domains, one methodological limitation was the relatively small sample size. A larger sample would permit more sophisticated analyses, especially in relation to what factors predict wellbeing. For example, three separate regression analyses could be performed, one for each group (instead of overall sample), including the same factors as predictor variables. A comparison of the results of such analyses would provide a more in-depth understanding of the relative importance of each predictor of wellbeing for each group.

The present project captured many constructs, resulting in a unique novel dataset. Nevertheless, to minimise multiple comparisons and the risk of Type I error, several analyses that would give valuable information around the topic were not run. For example, statistically comparing the scores of the three groups on predictor variables could help interpret the results with more confidence. In addition, as many of the scales that were predictors or correlates of wellbeing include subcategories, it would be informative in the future to investigate which subcategories are more related to wellbeing, e.g., Which domains of GHQ-28 among somatic symptoms, anxiety and insomnia, social dysfunction and severe depression are mostly related with wellbeing? Is this relationship similar among groups? Furthermore, factors related to predictors of wellbeing for each group should be investigated to inform intervention, as appropriate. For example, in the aphasia group, emotional health was found to significantly affect wellbeing, but what influences emotional health (e.g., social aspects of life)? Moderation and/or mediation analyses should be included in future research with bigger sample sizes to help unwrap such complex relationships. For example, the fact that language and cognition relate differently to wellbeing across groups perhaps suggests a moderation effect of language group on that relationship. Future research could also compare present results with norms or data provided by the government from the general UK population on mental and subjective wellbeing.

Some methodological limitations of this study concern the measurement methods. Typically, the measures used for people with developmental and acquired language disorders in the literature are different, as they are developed and standardised to capture abilities and difficulties in specific areas related to the underlying problems in each group. As this project aimed to directly compare the two clinical groups, use of common measures was necessary, making the choice of appropriate measures for capturing strengths and difficulties in both groups challenging. Some of the measures chosen may have been more appropriate for one rather than the other group (e.g., SDQ developed for developmental disorders; SNSS for people with stroke). Also, measures for DLD were mostly developed for children and measures for aphasia for older people. In the future, psychometric properties of those measures should be tested specifically in YA and adjusted to their needs if appropriate.

Another methodological limitation of the present project concerns the single-item measures used. Single-item measures have known limitations, which are mostly related to their validity and reliability. In the present project, two of the measures used (ONS4 and Social Trust question) were single items. These measures were used as complementary (not main) measures in this study and were chosen because it was thought useful to include wellbeing measures used by the government, so that future comparisons between the present data and population data can take place. In addition, when interpreting the results of the present study, the subjective nature of measures capturing wellbeing and relevant concepts should be considered. Self-report measures are subject to biases and limitations. These include social desirability effects (Northrup, 1997), subjective interpretation of questions which can result in inaccurate comparison between responses (Fan et al., 2006), introspective ability issues as participants may not be able to assess themselves accurately (Demetriou et al., 2015), and response bias in terms of previous responses, recent experiences, and mood on the day of assessment (Demetriou et al., 2015). Nevertheless, as wellbeing explores internal thoughts and feelings that are not visible to observers, self-reporting remains the most valid and appropriate method for its evaluation.

From a theoretical point of view, an interesting area of further research would be to directly compare younger with older people with post-stroke aphasia and adolescents with YA with DLD on wellbeing and its determinants, using the same measures. This would be of interest as indirect comparisons and longitudinal studies show that some different patterns emerge among different age stages. Directly comparing those groups and systematically exploring the differences or changes that age can bring in language, cognition, and wellbeing within a language group, will help advance current understanding on change and associations in the effects of language impairment across the lifespan.

In conclusion, despite its limitations, the present project is innovative in nature and offers novel findings and implications for clinical practice, service provision, policy, and theory. It makes an important contribution to our understanding of wellbeing and its drivers, adding some clarification around the complexity of the concept. The project also provides a range of directions for future research which can help address some of the project limitations and highlights the need for further investigation around wellbeing terminology and measurement. Agreeing in wellbeing definitions, understanding the boundaries among related but different to wellbeing concepts (e.g., QoL), choosing appropriate measures for capturing such constructs, and analysing patterns using appropriate methodology are all aspects that need researchers' attention in the future.

7.7 Summary and Conclusions

Those aged 18-40 are an important group to study in terms of their contribution and burden to society. Although the incidence of stroke and aphasia is increasing in younger people and DLD is now recognised as a life-long disorder, the existing evidence on predictors of wellbeing in these two groups is scarce and inconclusive. The present study is the first to directly compare language, cognition, wellbeing, and factors affecting it in YA with aphasia, DLD, and TD YA, using common assessment tools.

Three main findings emerged from this research. First, YA with aphasia and YA with DLD shared similarities in their linguistic and cognitive profiles, further breakdown and comparison of which can provide better understanding of the links between clinical characteristics and underlying deficits. The patterns of cognitive and language profiles observed suggested there may be domain-specific deficits in aphasia and domain-general deficits in DLD in young adulthood. Second, positively, wellbeing of young people with DLD and young PwA was similar to wellbeing of their TD peers. Third, despite similar scores in clinical characteristics and wellbeing and some common predictors of wellbeing among groups, pathways to wellbeing differed between language groups. Findings showed that inherent language and cognitive skills were the strongest determinants of wellbeing in YA with DLD, perhaps suggesting that for this group the pathway to wellbeing risk is ultimately neurological. In YA with aphasia, wellbeing was largely health-related and emotionally driven, arising from secondary to language consequences. It is proposed that this important difference in the associations of language and wellbeing between the two clinical groups reflects the different origin and etiologies of the two language disorders (developmental vs acquired). Finally, in YA with no language disorders several factors affected wellbeing, but wellbeing was more strongly influenced by personal resources, i.e., self-esteem and social connectedness.

Importantly, this study focused on the interfaces between different areas of linguistic, cognitive, and social-psychological functioning rather than on their properties in isolation (Perkins & Howard, 2011). Findings proved that such an approach was crucial for capturing the complexity and multifaceted nature of wellbeing, giving us valuable insights about how language skills and disorders can play a role on how people feel and function. The relationship between disability and wellbeing is important both theoretically and practically. How philosophers, policy makers, scientists, and lay people understand that relationship matters for the theories of wellbeing we develop, the judgments we make about our lives on a regular basis, and the social and health policies we adopt (Wasserman et al., 2016). The present findings have important implications, as gaging drivers of wellbeing can inform the ways in which policies and services can be 'tailored to the things that matter' (Office for National Statistics, 2015). Young people with developmental and acquired language impairments receive little formal support and find themselves in social disadvantage due to the paucity of evidence on which to ground practice and lack of understanding about how best to serve their needs. This is even though they are in a life stage with increased responsibilities and risk of mental health problems (Jurewicz, 2015).

The findings of the present project can stimulate new research that considers the multifaceted nature of wellbeing, inform the development of support services tailored to the specific needs of this age group, and encourage clinicians to consider holistic therapeutic approaches with continual psychosocial support in order to help YA with aphasia and those with DLD reach their full potential. As has been suggested by previous research and this project supports, disability per se is not detrimental to wellbeing; rather it is the wellbeing agenda which is detrimental for the wellbeing of those with disabilities.

… And because our internal world may be too complex to be captured with the use of simple questions and answers, below a poem of an aphasia-recovered patient (and previously professional writer) is presented, as an indication of the impact that language loss can have on one's life (as translated and cited in Ardila & Rubio-Bruno, 2018, p. 438):

'When Words were Lost'

And suddenly words disappeared
only shapes and things remained
but I forgot the way to name them.
A flash of lightning erased from my memory
the language inherited from other centuries
that I everyday discovered.
I had to re-invent the world around me
because that universe was only in the words.
I just understood that the silence is just a pause
separating what is and what is not.
Because it was no longer important to discover the beauty
as long as it could not be expressed in words.
I just understood that without the words the contemplation
is a useless call to the senses
that without words become regressive
blocking the deepest intelligence
And also, the feeling, the clearest one
the highest one, has to be expressed with words.

- *Ricardo Gaspari,*
Centro Integral del Rehabilitación del Afásico, Buenos Aires, Argentina

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Appendices

Appendix A: *TD, DLD, and Aphasia group scores for language measures (pilot study)*

Language Measure (possible score range)	**TD group** *n* = 45	**DLD group** *n* = 13	**Aphasia group**		
			Case 1	Case 2	Case 3
FAST Total (0-30)					
Exact score			23.00	25.00	16.00
Median (IQR)	30.00 (30.00-30.00)	29.00 (26.50-30.00)			
Skewness	-1.948	-1.821			
n scoring at ceiling	35	6		0	
FAST Comprehension (0-10)					
Exact score			6.00	8.00	8.00
Median (IQR)	10.00 (10.00-10.00)	10.00 (8.50-10.00)			
Skewness	-2.269	-1.768			
n scoring at ceiling	37	8		0	
FAST Expression (0-10)					
Exact score			8.00	9.00	5.00
Median (IQR)	10.00 (10.00-10.00)	10.00 (8.50-10.00)			
Skewness	-4.575	-2.287			
n scoring at ceiling	43	9		0	
FAST Reading Comprehension (0-5)					
Exact score			5.00	4.00	.00
Median (IQR)	5.00 (5.00-5.00)	5.00 (5.00-5.00)			

Language Measure (possible score range)	**TD group** *n* = 45	**DLD group** *n* = 13	**Aphasia group** Case 1	Case 2	Case 3
Skewness		-2.914			
n scoring at ceiling	45	11	1		
FAST Writing (0-5)					
Exact score			4.00	4.00	3.00
Median (IQR)	5.00 (5.00-5.00)	5.00 (4.00-5.00)			
Skewness	-6.708	-1.613			
n scoring at ceiling	44	8		0	

Note. In the measures above, higher scores show better abilities; TD: Typically Developing; DLD: Developmental Language Disorder; FAST: Frenchay Aphasia Screen Test; n = number of participants; SD = standard deviation; IQR = Interquartile range; Medians (IQR) are presented for skewed variables.

Appendix B: *TD, DLD, and Aphasia group scores for cognitive measures (pilot study)*

Cognition Measure (possible score range)	**TD group** *n* = 45	**DLD group** *n* = 13	**Aphasia group** *n* = 3		
			C1	C2	C3
RCPM Total (0-36)		*n* = 11			
Exact score			36	36	19
Mean (SD)	32.84 (1.82)	31.18 (4.83)			
Range	28 – 36	21- 36			
n scoring at ceiling	2	1	2		
D-KEFS Verbal Fluency Total (number of correct responses given in the allocated time)	*n* = 15	*n* = 11	*n* = 2		
Exact score			15	26	-
Mean (SD)	45.40 (6.95)	36.55 (11.52)			
Range	33 - 55	16 - 47			
Median (IQR)					
Skewness					
D-KEFS Trail Making Switching Cost (seconds)	*n* = 45	*n* = 8	*n* = 2		
Exact score			-	-.60	-36
Mean (SD)	3.89 (10.97)	19.51 (44.61)			
Minimum - Maximum	-7 - 48	-1.07 - 128			
Colour Word Interference 3 Scale Score	*n* = 45	*n* = 11	*n* = 2		
Exact score			-	1	1
Mean (SD)	10.78 (1.96)	5.73 (2.53)			

Cognition Measure (possible score range)	**TD group** *n* = 45	**DLD group** *n* = 13	**Aphasia group** *n* = 3		
			C1	C2	C3
Minimum - Maximum	7 -14	1 – 10			
Colour Word Interference 4 Scale Score	*n* = 15	*n* = 11	*n* = 1		
Exact score			-	1	-
Mean (SD)	10.87 (1.92)	5.44 (3.40)			
Minimum - Maximum	8 - 14	1 - 10			
Odd-One-Out Memory Span Trials Correct (0-24)	*n* = 44	*n* = 11	*n* = 3		
Exact score			13	9	11
Mean (SD)	18.43 (3.22)	10.82 (5.34)			
Minimum - Maximum	12 -23	5 - 24			
n scoring at ceiling	0	1	0		
Odd-One-Out Memory Span Total (0-6)	*n* = 45	*n* = 11	*n* = 3		
Exact score			3	3	4
Mean (SD)	5.02 (.81)	3.18 (1.19)			
Minimum - Maximum	3 - 6	2 - 6			
n scoring at ceiling	14	1	0		

Note. TD: Typically Developing; DLD: Developmental Language Disorder; RCPM: Raven's Coloured Progressive Matrices; n = number of participants; C: Case; SD = standard deviation; IQR = Interquartile range; D-KEFS: Delis–Kaplan Executive Function System; Medians (IQR) are presented for skewed variables.

Appendix C: *TD, DLD, and Aphasia group scores for psychosocial measures (pilot study)*

Measure (possible score range)	**TD group**	**DLD group**	**Aphasia group**		
	n = 45	*n* = 13	Case 1	Case 2	Case 3
Social Support MOS-SSS Total (0-5)					
Exact score			5.00	4.68	3.10
Mean (SD)	4.31 (.64)	3.81 (.57)			
Minimum - Maximum	2.50-5.00	2.42-4.79			
n scoring at ceiling	11	0		1	
MOS-SSS Tangible (0-5)					
Exact score			5.00	4.50	4.30
Mean (SD)	4.28 (.73)	3.86 (.74)			
Minimum - Maximum	1.50-5.00	2.25-5.00			
n scoring at ceiling	14	1		1	
MOS-SSS Affectionate (0-5)					
Exact score			5.00	4.67	4.30
Mean (SD)	4.47 (.62)	4.26 (.76)			
Minimum - Maximum	3.00-5.00	2.33-5.00			
n scoring at ceiling	20	3		1	
MOS-SSS Companionship (0-5)					
Exact score			5.00	5.00	4.30
Mean (SD)	4.46 (.54)	3.82 (.97)			
Minimum - Maximum	3.00-5.00				
n scoring at ceiling	16	3		2	
MOS-SSS Emotional/Informational (0-5)					
Exact score			5.00	4.75	2.10

Measure (possible score range)	**TD group**	**DLD group**	**Aphasia group**		
	n = 45	*n* = 13	Case 1	Case 2	Case 3
Mean (SD)	4.26 (.69)	3.70 (.62)			
Minimum - Maximum	2.00-5.00	2.63-4.75			
n scoring at ceiling	12	0		1	
Social Network SSNS Total (0-100)					
Exact score			63.73	77.67	64.16
Mean (SD)	59.8(11.76)	61.70 (17.39)			
Minimum - Maximum	28.67-100.00	20.00-89.00			
n scoring at ceiling	1	0		0	
SSNS Children (0-100)					
Exact score			25.00	25.00	87.50
Mean (SD)	24.72 (26.31)	26.15 (25.08)			
Minimum - Maximum	0 – 100.00	0-87.50			
n scoring at ceiling	2	0		0	
SSNS Friends (0-100)					
Exact score			49.00	52.50	51.00
Mean (SD)	68.11 (17.27)	46.60 (16.70)			
Minimum - Maximum	19.00 – 91.75	22.25-71.00			
SSNS Relatives (0-100)					
Exact score			56.67	56.67	66.67
Mean (SD)	69.92 (17.85)	59.82 (24.39)			
Minimum - Maximum	5.67-100.00	19.00-89.00			
n scoring at ceiling	1	0			
SSNS Groups (0-100)					
Exact score			83.50	51.00	50.00
Mean (SD)	47.47 (29.92)	58.92 (32.25)			
Minimum - Maximum	0-100.00	0-100.00			

Measure (possible score range)	**TD group**	**DLD group**	**Aphasia group**		
	n = 45	*n* = 13	Case 1	Case 2	Case 3
n scoring at ceiling	2	2			
SSNS Satisfaction (0-100)					
Exact score			75.83	64.33	73.00
Mean (SD)	71.19 (15.29)	67.49			
Minimum - Maximum	22.00-100.00	26.67-92.50			
n scoring at ceiling	2	0		0	
Social Connectedness SCS Total (8-48)					
Exact score			44.00	35.00	22.00
Mean (SD)	40.96 (7.10)	31.23 (10.96)			
Minimum - Maximum	25.00-48.00	17.00-48.00			
n scoring at ceiling	14	1		0	
Self –Efficacy GSE Total (0-40)					
Exact score			35.00	30.00	28.00
Mean (SD)	31.17 (3.53)	28.31 (2.72)			
Minimum - Maximum	23.00-40.00	24.00-32.00			
n scoring at ceiling	1	0		0	
Emotional Distress GHQ-28 Total (0-28)					
Exact score			0	3.00	18.00
Mean (SD)	4.60 (5.59)	5.00 (4.88)			
Minimum - Maximum	0-20.00	0-17.00			
GHQ-28 Somatic Symptoms (0-7)	*n* = 44				
Exact score			0	0	6.00
Mean (SD)	1.14 (1.59)	1.15 (1.41)			
Minimum - Maximum	0-5.00	0-4.00			
GHQ-28					

Measure (possible score range)	**TD group**	**DLD group**	**Aphasia group**		
	n = 45	*n* = 13	Case 1	Case 2	Case 3
Anxiety and Insomnia (0-7)					
Exact score			0	3.00	6.00
Mean (SD)	1.73 (2.22)	1.85 (2.27)			
Minimum - Maximum	0-7.00	0-6.00			
GHQ-28 Social Dysfunction (0-7)	*n* = 44				
Exact score			0	0	2.00
Mean (SD)	1.11 (1.62)	.85 (.90)			
Minimum - Maximum	0-6.00	0-2.00			
GHQ-28 Severe Depression (0-7)					
Exact score			0	0	4.00
Mean (SD)	.58 (1.29)	1.15 (2.08)			
Minimum - Maximum	0-6.00	0-6.00			
General Health EQ-5D-5L VAS Total (0-100)	*n* = 15	*n* = 11		*n* = 2	
Exact score			80.00	90.00	-
Mean (SD)	75.73 (12.57)	75.00 (23.98)			
Minimum - Maximum	50.00-100.00	30.00-100.00			
n scoring at ceiling	1	2		0	
EQ-5D-5L Mobility (1-5)	*n* = 15	*n* = 11		*n* = 2	
Exact score			1.00	2.00	-
Mean (SD)	1.13 (.35)	1.18 (.60)			
Minimum - Maximum	1.00-2.00	1.00-3.00			
EQ-5D-5L Self-Care (1-5)	*n* = 15	*n* = 11		*n* = 2	
Exact score			1.00	1.00	-
Mean (SD)	1.00 (0)	1.00 (0)			
Minimum - Maximum	1.00-1.00	1.00-1.00			

Measure (possible score range)	**TD group**	**DLD group**	**Aphasia group**		
	n = 45	*n* = 13	Case 1	Case 2	Case 3
EQ-5D-5L Usual Activities (1-5)	*n* = 15	*n* = 11		*n* = 2	
Exact score			1.00	2.00	-
Mean (SD)	1.00 (0)	1.27 (.47)			
Minimum - Maximum	1.00-2.00	1.00-2.00			
EQ-5D-5L Pain / Discomfort (1-5)	*n* = 15	*n* = 11		*n* = 2	
Exact score			1.00	2.00	-
Mean (SD)	1.47 (.64)	1.55 (.82)			
Minimum - Maximum	1.00-3.00	1.00-3.00			
EQ-5D-5L Anxiety/Depression (1-5)	*n* = 15	*n* = 11		*n* = 2	
Exact score			1.00	1.00	-
Mean (SD)	1.47 (.74)	2.36 (1.03)			
Minimum - Maximum	1.00-3.00	1.00-4.00			

Note. TD: Typically Developing; DLD: Developmental Language Disorder; FAST: Frenchay Aphasia Screen Test; n = number of participants; SD = standard deviation; IQR = Interquartile range; Medians (IQR) are presented for skewed variables; MOS-SSS: Medical Outcome Studies Social Support Survey; SSNS: Stroke Social Network Scale; SCS: Social Connectedness Scale; GSE: General Self-eeficacy Scale; GHQ-28: General Health Questionnaire – 28 item; EQ-5D-5L: European Quality of life Five Dimension Five Level scale.

Appendix D: *Ethical approval letter*

CITY
UNIVERSITY OF LONDON
EST 1894

School of Health Sciences
Research Office
Northampton Square
London EC1V 0HB

Tel: +44 (0) 20 7040 5704

www.city.ac.uk

Reference Number: LCS/PR/PhD/17-18/03
Name: Vasiliki Kladouchou, [redacted]
[redacted]
Title: Wellbeing in young adults with and without language difficulties

15 January 2018

Dear Vasiliki, [redacted]

Re: Full Ethical Approval

Following on from LCS proportionate review, I am pleased to confirm that your application has full ethical approval. Please also find attached details of the full indemnity cover for the studies.

Under the School Research Governance guidelines the applicants are requested to contact me once the projects have been completed, and they may be asked to complete a brief progress report six months after registering the project with the School.

If you have any queries please do not hesitate to contact me as below.

Yours sincerely

[redacted]

[redacted]
Research Governance Officer
[redacted]
[redacted]

Appendix E: *Correlation results between ONS Life Satisfaction and general health, emotional health, social functioning, and personal resources variables*

Group	General Health	Emotional Distress	Social Network	Social Connectedness	Social Support	Community Integration	Strengths & Difficulties	Self-Efficacy	Self-Esteem
TD	ρ = **.349**	*r* = **-.639**	*r* = **.421**	*r* = **.427**	*r* = **.377**	*r* = -.123	r = **-.460**	r = **.531**	*r* = **.625**
p. value	.029	<.001	.008	.007	.018	.456	.003	.001	<.001
Aphasia	ρ = **.504**	ρ = **-.623**	*r* = .276	*r* = .188	*r* = .368	*r* = .249	r = **-.514**	r = .355	*r* = **.516**
p. value	.028	.004	.253	.456	.133	.305	.024	.149	.029
DLD	ρ = **.590**	*r* = **-.522**	*r* = **.717**	*r* = **.618**	*r* = **.619**	*r* = -.025	*r* = -.286	r = -.151	*r* = **.455**
p. value	.006	.018	<.001	.004	.004	.916	.222	.525	.044

Note. ONS: Office of National Statistics; TD: Typically Developing; DLD: Developmental Language Disorder; r = Pearson Correlation Coefficient; ρ =Spearman Correlation Coefficient. Significant correlations at the level of 0.05 (2-tailed) are in bold. Blue colour indicates a strong and orange a medium relationship.

Appendix F: *Correlation results between ONS Life Satisfaction and language and cognitive variables*

Group	**Listening Comprehension**	**Oral Expression**	**Oral Language**	**Attention**	**Memory**	**Executive Functions**	**Language CLQT**	**Visuospatial Skills**	**Composite Cognition**
TD	*r* = -.147	*r* = -.140	*r* = -.169	ρ = -.131	*r* = -.122	*r* = -.134	*r* = .054	ρ = -.241	ρ = **-.319**
p. value	.370	.395	.303	.428	.461	.416	.742	.139	.048
Aphasia	*r* = .299	*r* = .365	*r* = .364	ρ = .118	ρ = .189	ρ = .075	*r* = .237	ρ = .082	*r* = .200
p. value	.213	.125	.125	.631	.439	.761	.329	.738	.411
DLD	*r* = -.043	*r* = -.299	*r* = -.171	ρ = .245	*r* = -.100	*r* = -.137	*r* = -.189	ρ = .129	*r* = -.151
p. value	.859	.201	.472	.299	.676	.566	.425	.588	.526

Note. ONS: Office of National Statistics; TD: Typically Developing; DLD: Developmental Language Disorder; r = Pearson Correlation Coefficient; ρ =Spearman Correlation Coefficient. Orange colour indicates a medium relationship.

Appendix G: *Correlation results between ONS Happiness and general health, emotional health, social functioning, and personal resources variables*

Group	**General Health**	**Emotional Distress**	**Social Network**	**Social Connectedness**	**Social Support**	**Community Integration**	**Strengths & Difficulties**	**Self-Efficacy**	**Self-Esteem**
TD	ρ = **.334**	*r* = **-.378**	*r* = .082	*r* = .197	*r* = .270	*r* = -.101	*r* = **-.353**	*r* = .280	*r* = **.350**
p. value	.038	.018	.620	.237	.097	.541	.028	.088	.031
Aphasia	ρ = **.715**	**-.513**	*r* = .039	*r* = .131	*r* = .437	*r* = .272	*r* = -.197	*r* = .294	*r* = .426
p. value	.001	ρ = .025	.874	.605	.070	.259	.419	.236	.078
DLD	ρ = **.523**	*r* = **-.574**	*r* = **.454**	*r* = .366	*r* = **.671**	*r* = .028	*r* = -.213	*r* = -.061	*r* = .441
p. value	.018	.008	.045	.113	.001	.906	.366	.798	.052

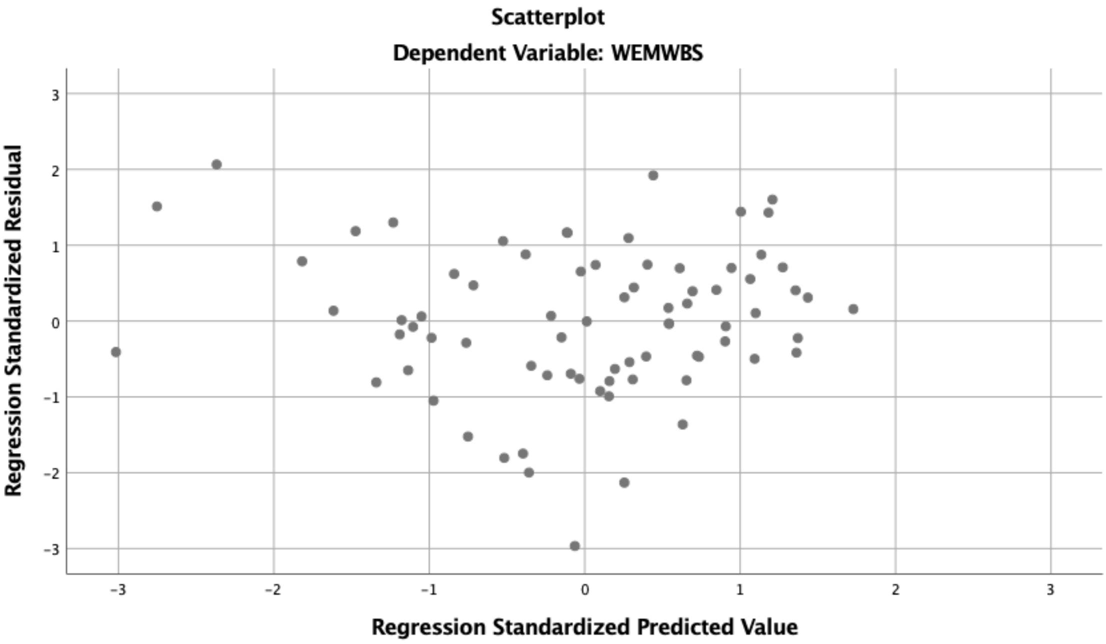
Note. ONS: Office of National Statistics; TD: Typically Developing; DLD: Developmental Language Disorder; r = Pearson Correlation Coefficient; ρ =Spearman Correlation Coefficient. Significant correlations at the level of 0.05 (2-tailed) are in bold. Blue colour indicates a strong and orange a medium relationship.

Appendix H: *Correlation results between ONS Happiness and language and cognitive variables*

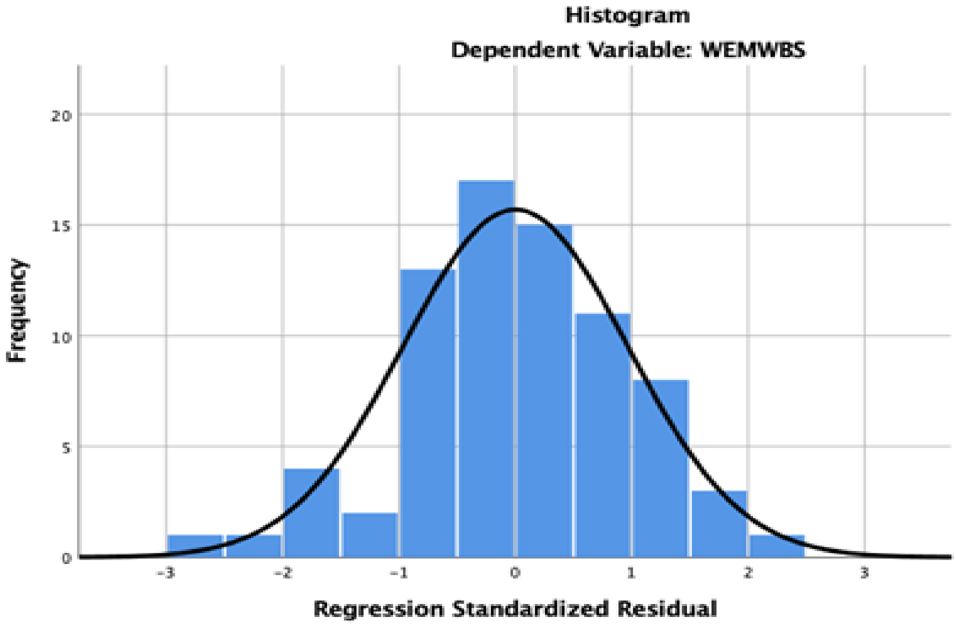
Group	Listening Comprehension	Oral Expression	Oral Language	Attention	Memory	Executive Functions	Language	Visuospatial Skills	Composite Cognition
TD	*r* = -.121	*r* = -.106	*r* = -.120	ρ = -.112	*r* = -.196	*r* = -.303	*r* = -.229	ρ = -.283	ρ = **-.322**
p. value	.464	.521	.468	.496	.231	.061	.161	.081	.046
Aphasia	*r* = -.198	*r* = .193	*r* = -.040	ρ = .138	ρ = -.022	ρ = .145	*r* = .025	ρ = .179	*r* = .091
p. value	.417	.429	.870	.573	.928	.555	.920	.463	.710
DLD	*r* = -.089	*r* = -.190	*r* = -.149	ρ = .032	*r* = -.207	*r* = -.261	*r* = -.336	ρ = -.069	*r* = -.226
p. value	.708	.423	.529	.893	.380	.267	.147	.773	.338

Note. ONS: Office of National Statistics; TD: Typically Developing; DLD: Developmental Language Disorder; r = Pearson Correlation Coefficient; ρ =Spearman Correlation Coefficient. Orange colour indicates a medium relationship

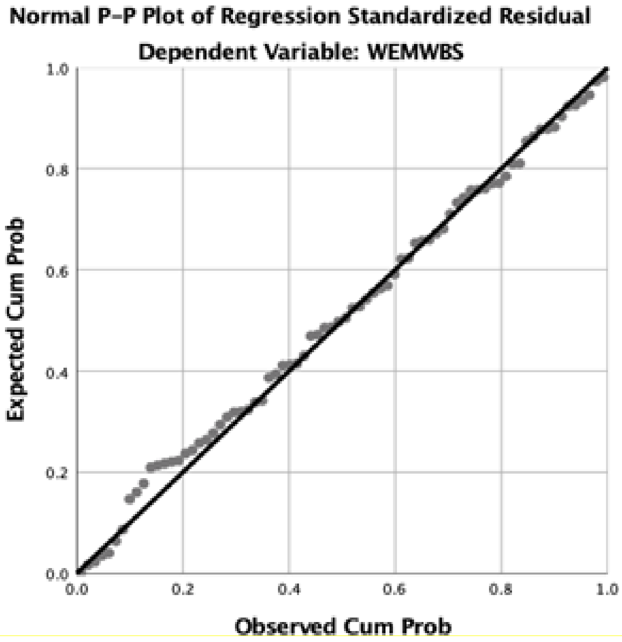
Appendix I: *Scatterplot of the predicted values and residuals*



Appendix J: *Histogram of standardised residual plots*



Appendix K: *Normal predicted probability (P-P) plot*



Appendix L: *Results of standard multiple regression analysis of the relation of WEMWBS with predictors*

Model Summary[b]

					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.773[a]	.598	.569	4.931	.598	20.791	5	70	.000	1.860

a. Predictors: (Constant), RSE: Rosenberg Self-esteem Scale, EQ5D5L: European Quality of life Five Dimension Five Level scale; MOS-SSS: Medical Outcome Studies Social Support Survey, SDQ: Strength and Difficulties Questionnaire.

b. Dependent Variable: WEMWBS: Warwick-Edinburgh Mental Wellbeing Scale

ANOVA[a]

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	2527.876	5	505.575	20.791	.000[b]
	Residual	1702.206	70	24.317		
	Total	4230.082	75			

a. Dependent Variable: WEMWBS: Warwick-Edinburgh Mental Wellbeing Scale

b. Predictors: (Constant), RSE: Rosenberg Self-esteem Scale, EQ5D5L: European Quality of life Five Dimension Five Level scale; MOS-SSS: Medical Outcome Studies Social Support Survey, SDQ: Strength and Difficulties Questionnaire.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Semipartial	Tolerance	VIF
1	(Constant)	16.037	7.690		2.085	.041	.699	31.375					
	EQ5D5L	.186	.046	.367	4.069	.000	.095	.277	.493	.437	.309	.707	1.413
	GHQ-28	.048	.084	.068	.567	.573	-.120	.215	-.556	.068	.043	.402	2.490
	MOSSSS	2.079	.924	.194	2.249	.028	.235	3.923	.477	.260	.171	.769	1.301
	SDQ	-.410	.162	-.273	-2.537	.013	-.733	-.088	-.567	-.290	-.192	.497	2.014
	RSE	.475	.151	.327	3.142	.002	.174	.777	.632	.352	.238	.529	1.889

a. Dependent Variable: WEMWBS: Warwick-Edinburgh Mental Wellbeing Scale

EQ5D5L: European Quality of life Five Dimension Five Level scale; GHQ-28: General Health Questionnaire – 28 item; MOSSSS: Medical Outcome Studies Social Support Survey; SDQ: Strength and Difficulties Questionnaire; RSE: Rosenberg Self-esteem Scale

« Φτάσε όπου δεν μπορείς »

- Ν. Καζαντζάκης