

CHAPTER I

Introductory Chapter
Dyslexia in Adult Students

1.1 Introduction

This chapter aims to provide an understanding of the nature of adult dyslexia within the context of university by presenting some useful definitions of dyslexia. However, there is no single definition of dyslexia which adequately covers the broad spectrum of this condition. Instead, some useful definitions of 'dyslexia' as an umbrella term to describe a range of heterogeneous conditions are presented. This explanation of dyslexia helps to highlight the array of difficulties that the adult student diagnosed with dyslexia may face whilst at university. Whilst some definitions of dyslexia have focused solely on the literacy difficulties associated with this, other definitions have included additional or co-occurring difficulties. Accordingly, some of the more useful definitions of adult dyslexia are appraised here, such as the definition devised by Sir Jim Rose, who at the time was a Labour member of parliament tasked with investigating how to improve provision for children with dyslexia during the school years. The definition of dyslexia in the Rose report was later adopted by Dyslexia Action (2009). The British Dyslexia Association (BDA)'s (2007) definition is also appropriate when applied to understanding adult dyslexia, as it not only draws attention to the characteristic features of dyslexia but also acknowledges other connected difficulties. In spite of these more appropriate definitions of dyslexia provided by Rose (2009), Dyslexia Action (2009) and the BDA (2007), which draw attention to the varied range of deficits associated with dyslexia, what is missing from these definitions is mention of associated difficulties that may not be in the cognitive realm, but are connected with the behavioural realm, and are directly influenced by and impacted upon due to dyslexia, such as anxiety, stress and other negative emotional consequences related to dyslexia. Whilst definitions of dyslexia have focused on its cognitive effects, behavioural effects have been to a great extent largely neglected.

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Additionally, we cannot draw attention to differences in definitions of ‘dyslexia’ without acknowledgement of Elliott and Grigorenko’s (2014) controversial dyslexia debate. They argue that the diagnostic label of ‘dyslexia’ is problematic, as the criteria that the diagnosis is based upon are scientifically questionable and conceptually ambiguous. They also argue that there is no substantial evidence to separate those labelled as dyslexic from ‘poor readers’ (Elliott & Grigorenko, 2014). Despite their argument having over the years gained precedence, it is dismissed here, as they not only fail to recognise the spectrum condition nature of dyslexia, but their account of dyslexia is not based on evaluating any kind of scientific data from research work on various types of causal theories of dyslexia.

Consequently, we cannot dispense with Elliott and Grigorenko’s concept of dyslexia without establishing evidence for the existence of dyslexia. Delving deeper into evaluating evidence from scientific work behind causes of dyslexia enables us to develop a comprehension of what possibly underlies this condition. Additionally, literature on causes requires appraising here in relation to how individually each causal theory would map onto our understanding of what can be referred to as the various subgroups of adult dyslexia. Subgroups refers to individuals with dyslexia who, although they share a commonality in that they are all diagnosed with the same condition, i.e., dyslexia, some individuals, however, will have a profile of dyslexia showing notable weaknesses in sensory processing ability. As such, they may form part of the subgroup of people with dyslexia who have noticeable temporal processing deficits, or they may be in the subgroup with pronounced difficulties in visual tracking stability, and so will be in the visual/magnocellular deficit subgroup. Whilst these individuals with dyslexia share common core characteristics and deficits of dyslexia, which may be phonological and short-term/working memory problems, they will also have difficulties in other areas described by the various causal theories.

Subsequently, it is argued that although it is useful to know what these causal theories and effects of them for the student with dyslexia are, causal theories focusing on providing evidence for a single deficit are less appropriate than models such as Pennington’s multiple deficit model (2006), as this defines dyslexia as attributed to a set of causes, with one cause triggering another in a chain of causation effect. This model is also efficient for characterising students with a diagnosis of dyslexia comorbid with negative emotional consequences, such as anxiety, as it enables us to understand that cognitive weaknesses manifested by dyslexia can impact

on the behavioural realm to be the source of the anxiety in the causal chain effect. As such, this chapter discusses the following theories and models:

- The phonological theory, which emphasises the difficulty of matching sounds in spoken language to letters in written language, is considered. However, as it is too focused on reading disorders, it cannot usefully be applied to an understanding of the range of difficulties, not just reading, manifested by dyslexia in adult students.
- The short-term/working memory theory, as possibly underlying the phonological deficit, is discussed as an alternative hypothesis to the phonological theory.
- The hypothesis of a cerebellar deficit, a mild disorder in the part of the brain responsible for receiving information from the sensory systems and for coordinating movement and speech, is assessed.
- Also assessed are the temporal processing model and difficulties in sequencing accurately the order of sounds in spoken words and the order of letters in written words.
- The visual/magnocellular model and difficulties with the pathway responsible for controlling eye movements, which is also required for visual input to be effectively signalled to the cerebellum, are investigated, but as argued above, critiqued on the grounds that they are searching for evidence of a single deficit. Although the model is valuable for shedding light on various deficits of dyslexia, not all people with dyslexia will have these difficulties.
- Pennington's multiple deficit model (2006) is then discussed as being more useful, as it takes into consideration the full range of cognitive difficulties and associated difficulties manifested by dyslexia. Frith's causal model framework (2002) is also appropriate, as rather than pinpointing dyslexia to a single cause, it states that dyslexia should have three levels of description which interact with each other, the behavioural, cognitive and biological.

1.2 Not Useful Definitions of Dyslexia

Historically, definitions of dyslexia have been riddled with uncertainties. For example, Reiss and Brooks (2004) on the definition for adult learners with dyslexia specify that 'there are many definitions of dyslexia but no consensus. Some definitions are purely descriptive, while others embody causal theories. It appears that "dyslexia" is not one thing but many, in so far as it serves as a conceptual clearing-house for a number of reading skills

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deficits and difficulties, with a number of causes’ (Reiss & Brooks, 2004, p. 11). Consequently, there are multiple definitions of dyslexia. Furthermore, Reiss and Brooks (2004) go on to say, ‘there is no consensus, either, as to whether dyslexia can be distinguished in practice from other possible causes of adults’ literacy difficulties. Many “signs of dyslexia” are no less characteristic of non-dyslexic people with reading skills deficits. In our present state of knowledge, it does not seem to be helpful for teachers to think of some literacy learners as “dyslexics” and of others as “ordinary poor readers”’ (Reiss & Brooks, 2004, p. 11).

Consequently, Hynd and Cohen (1983) suggest that a reason why the question of definitions of dyslexia has not been given greater emphasis in the literature is the ambivalence over the nature of the characteristics that constitute dyslexia. They state: ‘attempting to define dyslexia can be one of the thorniest problems related to the study of this condition’ (Hynd & Cohen, 1983). This leads to uncertainty over prevalence and disputes over causes, which brings us to Elliott and Grigorenko’s (2014) book, *The Dyslexia Debate*.

Elliott and Grigorenko have drawn from a range of literature on definitions of dyslexia to argue that the diagnostic label of ‘dyslexia’ is a cultural meme that remains unscientific, conceptually dubious and problematic. They argue that there is no distinguishable difference between children categorised as poor readers and children labelled dyslexic. Vellutino (2014), in a review of the final chapter of Elliott and Grigorenko’s book, states that ‘after summarising issues and problems associated with the lack of consensus regarding the definition, cause(s), and remediation of dyslexia and following the discussion of the tension between the “science and politics” of dyslexia as a neuropsychological construct, the authors assert that the term has engendered unnecessary confusion in the field and has long since passed its usefulness for scientific and practical purposes’ (Vellutino, 2014, p. xv). However, Elliott and Grigorenko’s concept of dyslexia is problematic, as it is perceived merely as a reading disability and children with dyslexia are placed in the same category as children struggling to read, possibly due to causes other than dyslexia. Consequently, there is too much of an emphasis on dyslexia as just a literacy difficulty. As such, whilst their argument may be more applicable to childhood dyslexia due to the significance placed on reading development in the early years, this oversimplification of dyslexia as a single deficit condition associated purely with reading does not apply to an understanding of the nature of adulthood dyslexia, particularly in the context of university. Whilst there may be a mild reading difficulty

prevalent in some but not all adult students with dyslexia, this is not primarily the main deficiency. Many adults with dyslexia entering university have developed strategies to cope with literacy demands. Additionally, Elliott and Grigorenko's (2014) negation of dyslexia, rather than being based on critiques of psychometric tests used to diagnose dyslexia, or on evaluations of empirical evidence into causes of dyslexia, becomes condensed into a political discussion of suitable methods to teach children struggling with literacy either 'top down' (reading focusing on semantic and syntactic processes) or 'bottom up' (a focus on phonics). Elliott and Grigorenko appear unable to provide a picture of dyslexia as a heterogeneous spectrum condition which is evidenced by Pennington's work on the multiple deficit model and aetiology of dyslexia, and they rather simplistically disregard dyslexia because they are unable to pinpoint any single clear-cut cause. They argue that it is impossible to provide a justification for a category of dyslexia as a subset of those who encounter reading difficulties.

In their earlier paper titled 'Does dyslexia exist?' (2008), Elliott and Gibb pose the question 'Is dyslexia a clinically or educationally meaningful term for differentiating between children with reading difficulties?' Within the context of preschool and primary school, if Elliott and Gibb define dyslexia as confined to reading difficulties, then their argument that children labelled as dyslexic and children labelled as poor readers should be given the same reading interventions does carry some weight. As their focus is specifically on developing skills in the child to read efficiently, then reading interventions that work for a dyslexic child are also likely to work for a child considered a struggling reader. However, if we rephrase their question and apply it to adult student dyslexia within the context of higher education and ask 'Is dyslexia a clinically or educationally meaningful term for differentiating between students with dyslexia and students without dyslexia?', then we arrive at quite a different response. From a practitioner perspective, the label 'dyslexic' has proven to be an educationally meaningful term for adult students when diagnosed. From practitioner experience, many university students are only diagnosed with dyslexia later in life. Quite often, this is after they have arrived at university. Usually, they have struggled with aspects of schooling, but due to their literacy levels being average at school, which disputes the argument that dyslexia is narrowly constricted to a reading difficulty, were never identified as dyslexic. However, these adult students, who often have difficulties with information processing, working memory, coordination and other co-occurring difficulties associated with dyslexia, have always felt different to their non-dyslexic peers and have often wondered why they struggled

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and continue to do so with certain aspects of their academic lives. On diagnosis of dyslexia, in working practice, students frequently state how relieved they are that they now have an explanation and reason for their difficulties, and comments such as ‘through all these years, I just thought I was stupid’ are typical. So, in relation to the Elliott and Grigorenko question, for these students, yes, dyslexia is a clinically meaningful term.

1.3 Useful Definitions of Dyslexia

Despite controversies over definitions of dyslexia – largely due to academics like Elliott, Grigorenko and Gibb – some institutions have attempted to provide a functional definition. However, some definitions are still limited due to the focus on one aspect of dyslexia. For instance, the British Psychological Society (BPS) suggest that ‘dyslexia is evident when accurate and fluent word reading and/or spelling develops very incompletely or with great difficulty’ (BPS, 1999). This definition focuses on literacy learning and development at the ‘word level’. There is no mention of underlying causes or other core difficulties. Other definitions provide a more comprehensive description of dyslexia, by specifying factors that underlie the disorder, and the types of variations in behaviour caused/ influenced by the underlying factors. For example, Hulme and Snowling describe dyslexia as ‘a cognitive disorder of genetic origin affecting reading and spelling development’ (Hulme & Snowling, 2009). This definition is supported by substantial evidence to suggest that a core cognitive disorder at the root of dyslexia is the difficulty of mapping letters to sounds – phonology and difficulties with phonological coding – ‘the ability to use speech codes to represent information in the form of words and word parts’ (Vellutino et al., 2004, p. 4). For Vellutino et al. (2004), dyslexia is interpreted as a ‘specific reading disability (dyslexia) in otherwise normal children’ that ‘has been and continues to be defined as a basic deficit in learning to decode print’ (Vellutino et al., 2004, p. 6).

Yet, this exclusive focus on using a scientific approach to measure phonological deficits as cause of dyslexia could be to the detriment of looking at other difficulties associated with dyslexia, and the implications these have for other types of study skills, which may or may not relate to literacy. This is relevant for looking at adult dyslexia, whereby the individual may have developed compensatory strategies for coping with reading and spelling, but may have difficulties with organisational skills, which could impact negatively on planning structures for essay writing and managing time effectively.

1.4 More Useful Definitions of Dyslexia

A more useful definition for adult dyslexia – as it does take co-occurring difficulties associated with dyslexia into consideration, which helps us to understand types of difficulties encountered with studying at university – is provided by Rose’s (2009) six-part definition, which was embraced by Dyslexia Action (2009). This definition not only describes the characteristic features of dyslexia at the cognitive level as ‘difficulties in phonological awareness, verbal memory and verbal processing speed’ (Rose, 2009, p. 10), it also acknowledges that there are other connected difficulties experienced by some (but not all) individuals with dyslexia: ‘co-occurring difficulties may be seen in aspects of language, motor co-ordination, mental calculation, concentration and personal organisation, but these are not, by themselves, markers of dyslexia’ (Rose, 2009, p. 10). These co-occurring difficulties are often prevalent in individual students who attend study support, and they often require a varied range of interventions. Another useful definition for contextualising an understanding of adult dyslexia, and types of problems encountered with study skills associated with this, is provided by the BDA. This describes dyslexia as a condition that is ‘likely to be present at birth and to be lifelong in its effects. It is characterised by difficulties with phonological processing, rapid naming, working memory, processing speed, and the automatic development of skills that may not match up to an individual’s cognitive abilities’ (BDA, 2007).

Another useful definition of dyslexia is provided by psychologist David Grant in the text *That’s the Way I Think: Dyslexia, Dyspraxia and ADHD Explained* (2010). Grant’s work as a psychologist involves screening for and diagnosing dyslexia if evident. He argues that the clients he diagnoses with dyslexia have what he refers to as ‘spiky profiles’, which not only reveal cognitive weaknesses but also show strengths in certain areas. For example, in Grant’s testing for dyslexia, he uses the Wechsler Scales of Intellectual Abilities, which consist of a series of subtests used to measure ‘performance on a range of different skills including knowledge of vocabulary, mental arithmetic, three-dimensional thinking and speed of copying symbols’ (Grant, 2010, p. 31). Grant suggests that a typical Wechsler dyslexic profile will reveal high scores for verbal reasoning (the ability to understand and logically work through concepts and problems expressed in words) and for visual reasoning (analysing visual information and being able to solve problems based on it), yet scores will typically be lower for short-term memory and speed of visual processing. Grant argues that when

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no specific learning difficulty, such as dyslexia, is present, ‘the Wechsler profile will be fairly flat, not spiky’ (Grant, 2010, p. 32). In his text, he goes on to present a classic profile of a dyslexic student which shows that ‘she scored above average on verbal and visual reasoning skills and below average on working memory and processing speed. Whereas her Verbal Comprehension (verbal reasoning) and Perceptual Organisation (visual reasoning) scores put her in the top 20 per cent and top 23 per cent of the population respectively, her scores for Working Memory and Processing Speed put her in the bottom 9 per cent and 32 per cent respectively’ (Grant, 2010, p. 32). Consequently, this discrepancy-based definition of dyslexia focusing on the amalgamation of *both* cognitive strengths and weaknesses is more useful for our understanding of adult students with dyslexia within higher education than the definitions that merely centre on cognitive difficulties. Whilst the cognitive deficits exist and work to undermine the intellectual abilities which can be in the above-average range, Grant’s explanation of a typical dyslexic profile enables us to comprehend the types of frustrations faced by so many students with dyslexia in relation to their academic work. This is because, often aware of their intellectual ability, they become annoyed when they are unable to demonstrate this in exams due to deficits in memory processes and speed of information processing.

1.5 An Evaluation and Critique of the Main Causal Theories of Dyslexia

Next, we turn to an evaluation and critique of the main causal theories of dyslexia. This highlights the problems of theories based on attempting to hypothesise dyslexia as a single deficit, which draws attention to the appropriateness of Pennington’s (2006, 2012) and Frith’s (2002) work for characterising the full range of difficulties prevalent in adulthood dyslexia. Also, whilst a phonological deficit is usually ascribed as a core characteristic of dyslexia, other theories may or may not be prevalent in a dyslexic student profile, which is why support needs vary enormously with each individual diagnosed with dyslexia. As such, as mentioned in the Introduction (Section 1.1), it is useful to think of subgroups of dyslexics. For example, some students may just have a phonological deficit, whilst others could have a combination of phonological and short-term/working memory deficits, or phonological and sensory processing difficulties explained by both the temporal processing theory and the visual/magnocellular theory. This demonstrates the spectrum nature of dyslexia and delves deeper into

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what is underlying specific individual difficulties manifested by their profile of dyslexia.

1.5.1 The Phonological Theory

Researchers who have mainly focused on dyslexia in childhood and reading development claim the cause of dyslexia is the phonological deficit (see Boada & Pennington, 2006; Bradley & Bryant, 1978; McDougall et al., 1994; Snowling, 1981; Snowling, Gallagher & Frith, 2003; Snowling, Van Wagtenonk & Stafford, 1988). Whilst this is more relevant for educational practitioners during early years schooling, to be able to identify dyslexia in childhood, some adult students with dyslexia will still have a mild to moderate phonological difficulty, which may present itself as slow reading speeds or difficulties with spelling, with decoding text or with producing the sounds of words accurately when reading aloud. As such, it is important for our understanding of these problems in adulthood dyslexia to comprehend what exactly phonology is and to define what happens if there is a phonological deficit.

Phonology relates to the child's perception of and production of the units of sounds used in language. In learning to read, a child is required to identify and manipulate sounds as distinctive units (segments), e.g., /p/ and /b/ are separate units of sound, referred to as phonemes. According to the connectionist model of reading development proposed by Seidenberg and McClelland (1989), phoneme awareness (sounds in language), orthography (word identification in print) and semantics (the meaning of a word) are processes that interact with each other in what is referred to as the Triangle Model (Hulme & Snowling, 2009) of reading development. Basically, a child begins to map sounds (phoneme awareness) onto graphemes (the units and representations of letters in written language, for example, the alphabetic letters). This then leads to orthography and orthographic knowledge, which is the ability to identify patterns of specific letters as words, leading to word recognition. Simultaneously, as the child's skill in word identification progresses, their phoneme awareness and the semantic meaning of the words also develop. Hulme and Snowling suggest that according to the Triangle Model, 'the process of learning to read consists of creating mappings between orthography and phonology via semantics (the semantic pathway)', which relates to the exact meanings of words and phrases. From a connectionist perspective, which is traditionally viewed as a stage-like process during which children's reading development advances due to the acquisition of phonological awareness, the child

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learning to read creates patterns/mappings of association between the recognition/identification of letters and sounds, and between letters and meaning (Hulme & Snowling, 2009).

If a child has difficulty, or is unable to create these patterns of association (mappings), this impairs the development of the phonological pathway and delays the development of the semantic pathway. The child's difficulty with accessing and blending the sounds in language and with correctly identifying the representations of letters in print impairs the child's acquirement of intact phonological representations. Instead, the understanding of individual phonemes and how they map onto the letters in print is fuzzy and confused, and the child has difficulties segmenting the words in print into sounds. Thus, the mapping of sounds to letters is problematic, which delays the child's progress in reading.

An important test of phonological difficulties and a strong predictor/marker of dyslexia in a child is how well a child performs on assessments of nonword repetition. If a child's phonological representations are deficient, this can be identified by asking the child to repeat sounds used to make up an unfamiliar or nonsense word. If the word is repeated with confusability errors and the child shows difficulties in segmenting the word using the correct sounds, then this is a marker of difficulties with phonology. Snowling et al. (1986) assessed and compared the performance of three groups of children on the repetition of high frequency (words that are used regularly), low frequency (words irregularly used, or exception words like yacht) and nonwords. The three groups consisted of a group of children with dyslexia, a non-dyslexic reading age-matched group, and a non-dyslexic chronological age-matched group. The biggest discrepancy where the dyslexic group performed poorly compared to the two matched groups was on repetition of nonwords. Hulme and Snowling argue that 'testing nonword reading gives us a tool to examine how well a child's phonological reading system is working and it is clear that a significant proportion of children with dyslexia show nonword reading problems that are even more severe than expected for their overall level of reading skill' (Hulme & Snowling, 2009, p. 54). When applied to an adult student with dyslexia, although the student may in some ways have compensated for difficulties in reading, if as a child they had a noticeable phonological deficit, when reading for university they may still struggle with the sounds of unfamiliar words. This is important to understand when students are taking specialist courses, such as medicine or pharmacy, where a lot of medical terminology is required, and some nursing students have commented on their embarrassment at being unable to accurately pronounce or read aloud names of certain medications.