

Dyslexia: a holistic review of the strengths and difficulties

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Background to the research

The field of dyslexia has often been subject to controversy and contradictions, whether this has been through media reports of reported cures or through the ongoing debate about whether dyslexia exists. There are numerous official definitions that attempt to clarify an increasingly complex condition, such as this one provided by the International Dyslexia Association's Board of Directors in November, 2002.

“Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and / or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.”

This definition reflects the trend towards encompassing a number of traits within the dyslexia syndrome, moving further away from a definition of dyslexia as primarily a deficit in reading abilities as suggested by Critchley (1970) who described dyslexia in the following terms:

“A disorder manifested by difficulty in learning to read despite conventional instruction, adequate intelligence, and socio-cultural opportunity. It depends on fundamental cognitive disabilities which are frequently of constitutional origin.”

Two features of the complexity in current debates are the recognition of the co-occurrence of dyslexia with other specific learning difficulties (e.g. Shoemaker and Kalverboer, 1994; Losse *et al.*, 1991; Gillberg and Gillberg, 1989; Rasmussen and Gillberg, 2000; Dewey *et al.*, 2002; Visser, 2003) and the movement towards emphasising concurrent strengths and abilities (West, 1997; Aaron, Phillips and Larsen, 1988; Cooper, 2007). In a sense, these two agendas are in conflict as the first focuses on dyslexia as a diagnostic label and largely equates to a medical model of disability whereas the latter argues that dyslexia is a difference rather than a deficit and is more in tune with a social model of disability. A comprehensive review of research within the field adds fuel to the debate by pointing out the multiple and conflicting uses of the term and concluding that ‘in dyslexia research and practice, there is a degree of inconsistency verging on anarchy’ (Rice and Brooks, 2004). This paper will explore the evidence for co-occurring syndromes to demonstrate how dyslexia can be seen as part of a wider spectrum of specific learning difficulties. The social model of dyslexia will also be examined, which emphasises the role of society in limiting those with specific learning difficulties as well as recognising the talents and strengths that are often present. The possibility of unifying these theories to provide a coherent understanding of specific learning difficulties will also be explored.

Literature Review

The term specific learning difficulties incorporates the following syndromes: dyslexia, dyspraxia (also known as developmental coordination disorder), Attention Deficit (Hyperactivity) Disorder (ADHD) and high-functioning autistic spectrum disorders (the most common of which is Aspergers syndrome). If we seek to define these as discrete conditions, dyslexia relates primarily to difficulties with the acquisition of reading and writing abilities, dyspraxia to problems with planning and executing physical movement and coordination, dyscalculia refers to mathematics and number difficulties, ADHD relates to deficits in attention, impulsivity and/or hyperactivity and autistic spectrum disorders relate mainly to limitations with social skills and communication as well as the presence of restrictive and stereotyped behaviour.

Carrying out a cross comparison of research in these areas reflects the professional 'ownership' of each condition. Dyslexia, which was initially conceived as a visual disorder (Hinshelwood, 1895) is now in the arena of education and psychology and has become embraced by many as a difference rather than a disability. Assessment is often referred to as a process of identification rather than diagnosis and can be carried out by specially trained teachers and educational psychologists. Dyscalculia is a relatively new addition to the spectrum of specific learning difficulties. Although formal procedures for identifying dyscalculia have not yet been fully standardised, educational psychologists often use a variation of the dyslexia assessment process. Dyspraxia is identified through behavioural assessments that are usually carried out by physiotherapists or occupational therapists although educational psychologists are increasingly participating in the assessment process particularly for adults. ADHD and autistic spectrum disorders (ASD) are categorised as psychiatric conditions and currently co-exist within psychological and medical models through which the conditions are identified. Research into each of these conditions has evolved independently due to the location of the syndromes within different professional areas. However, a cross comparison of findings deepens our understanding of the common themes that are beginning to emerge from these various research fields. The bulk of available research focuses on the co-occurring nature of dyslexia, dyspraxia and ADHD and will now be explored.

Although dyslexia is primarily associated with literacy development, in the past few years a much wider range of difficulties have become incorporated into the spectrum of indicators used to identify the condition. Challenging behaviour has been observed in children with dyslexia (Heiervang *et al.*, 2001) and poor motor skills co-ordination or clumsiness have also been associated with dyslexia (Reid, 2003; Thomson, 2001; Farmer *et al.*, 2002; Mortimore, 2003; McLoughlin *et al.*, 1994; Bartlett and Moody, 2000). Difficulties with balance have been noted (Nicolson *et al.*, 2001; Moe-Nilssen *et al.*, 2003) and poor organisation and time management skills are reported (Reid, 2003; Thomson, 2001; Farmer *et al.*, 2002; Mortimore, 2003; McLoughlin *et al.*, 1994; Bartlett and Moody, 2000). Finally, adults with dyslexia have been found to have lower self-esteem than their non-dyslexic peers (Riddick *et al.*, 1999). This indicates the increasing tendency to associate dyslexia with the primary difficulties associated with other specific learning difficulties.

The relationship between dyslexia and motor skills difficulties is well documented by researchers (Dewey *et al.*, 2000; Fawcett and Nicholson, 1995; Kaplan *et al.*, 1998;

Nicholson and Fawcett, 1999; Portwood, 2001; Wolff *et al.*, 1990). Seeking an underlying aetiology to explain the breadth of dyslexic difficulties, Nicholson and Fawcett (1990) analysed the learning processes behind reading and identified the automatic response to text required to develop reading fluency. They found evidence to support their theory that dyslexic children would have difficulty automatizing any skill whether cognitive or motor. Reid and Fawcett (2004) suggest that problems in the functioning of the cerebellum account for a number of the wide-ranging difficulties associated with dyslexia, including balance, handwriting, phonological awareness, working memory, spelling and motor skills. A number of these skills are also associated with dyspraxia, most notably balance, handwriting and motor skills. Studies have also indicated that children with dyslexia have difficulties with the processes of attention and attention shifting (Facoetti *et al.*, 2001 and Moores *et al.*, 2003) which are usually associated in particular with ADHD. Portwood (2001) suggested that 40 – 45% of children with dyspraxia, also known as developmental coordination disorder (DCD) have co-occurring dyslexia, ADHD or autistic spectrum disorders. Thus the range of difficulties associated with dyslexia incorporate deficits linked to other specific learning difficulties, once again emphasising co-occurring syndromes.

Although the core deficits associated with dyspraxia (also known as developmental coordination disorder) relate to motor skills and coordination (Piek and Edwards, 1997; Peters *et al.*, 2001) research demonstrates an overlap with other specific learning difficulties. In one study, participants with dyspraxia performed significantly worse than controls in measures of reading, writing and spelling, particularly in relation to word attack skills, a measurement of phonological processing abilities usually associated with dyslexia (Dewey *et al.*, 2002). Reading comprehension difficulties have also been observed amongst children with DCD (Kadesjo and Gillberg, 1999). Difficulties with time management have been associated both with dyslexia and DCD (Reid, 2003; Thomson, 2001; Farmer *et al.*, 2002; Mortimore, 2003; McLoughlin *et al.*, 1994; Bartlett and Moody, 2000, Kirby and Drew, 2003). Researchers have also demonstrated a link between DCD and problems in attention and learning (Gillberg and Rasmussen, 1982; Kadesjo and Gillberg, 1998; Landgren *et al.*, 1996). One study refers to parental reports of concentration difficulties and notes that half the participants with DCD had been diagnosed by a physician as having ADHD and were taking prescribed medication for their symptoms (Dewey *et al.*, 2002).

Compared to dyslexia and dyspraxia there is less knowledge of the aetiology of ADHD, which may be due to inconsistency in research methods and case selection (Lesesne *et al.*, 2000). The core symptoms of ADHD are inattention, hyperactivity and impulsiveness (Barkely *et al.*, 1996; Epstein *et al.*, 1997; Munden and Arcelus, 2000). However, it has been observed that ADHD occurs in conjunction with another SpLD in 50% of cases and that in particular a significant co-morbidity between dyslexia and ADHD exists (Hinshaw, 1992; Semrudk-Clikeman *et al.*, 1992; Shaywitz *et al.*, 1994). Piek *et al.*, (1999) found that symptoms of attention deficit were a significant predictor of motor co-ordination problems. A combined disorder known as DAMP (deficits in attention, motor control and perception) has been the focus of longitudinal studies (Sugden and Wright, 1998) and research suggests a link between motor control problems and ADHD (Kadesjo and Gillberg, 1998). In adults, poor psychosocial functioning has been noted particularly where ADHD and DCD co-occur (Rasmussen and Gillberg, 2000). Difficulties with timekeeping accuracy and temporal awareness

have also been reported amongst young adults with ADHD (Barkley, 1997; Barkely *et al.*, 2001).

There is debate on how to conceptualise the recognition of shared symptoms amongst specific learning difficulties. Knivsberg *et al.*, (1999) challenge the use of the term comorbidity, highlighting the fact that this is defined by Stedman's medical dictionary as 'the simultaneous occurrence of two or more unrelated conditions or disorders,' whereas they question whether specific learning difficulties are in fact 'unrelated' conditions. Powell and Bishop (1992, p 762) suggest that specific learning difficulties are caused when early development of the brain is disrupted and the behavioural symptoms that result will depend on 'the extent and location of the underlying neurological abnormality' which suggests a unifying aetiology for all specific learning difficulties.

Kaplan *et al.* (1998, p 484) believe that 'comorbidity is the rule rather than the exception' and argue that if a similarly high level of co-morbidity between conditions was observed in physical health, a common underlying disorder would be diagnosed rather than the existence of a number of discrete conditions. Although they acknowledge that there is a valid case for the existence of subgroups of specific learning difficulties, they believe that a unified diagnosis would be more appropriate and argue that studying SPLD's as though they are 'pure' conditions is misleading. Kaplan *et al.* (2001) believe the term 'Atypical Brain Development' (ABD) describes a single syndrome that manifests in a variety of individual behavioural difficulties.

Conceptualising specific learning difficulties as atypical and referring to comorbidity reflects a medical model of disability. Swain *et al.* (2003) point out that the medical model views the difficulties faced by disabled people as a direct result of their impairment and are due to the medical nature of their condition. This equates to the deficit model of dyslexia, where research is focused on essentially seeking the underlying aetiology to explain the causes of the condition. Moores (2004) notes that 'as far as deficits in dyslexia are concerned, with a few notable exceptions it is a case of 'seek and you shall find'' reflecting the increasing breadth of difficulties that have been associated with the condition as research grows.

The social model, in contrast, emphasises the role society has in contributing to difficulties experienced by those with a disability: 'It is not individual limitations, of whatever kind, which are the cause of the problem but society's failure to provide appropriate services and adequately ensure the needs of disabled people are fully taken into account in its social organisation' (Oliver, 1996). Although the social model has since been further explored, extended and challenged (Walker, 2004; Burchardt, 2004; Thomas, 2004; Gabel and Peters, 2004; Dewsbury *et al.*, 2004; Siminski, 2003; Swain *et al.*, 2003; Tregaskis, 2002; Swain and French, 2000; Becket and Wrighton, 2000) it can be seen to parallel the development of the difference model of dyslexia, which emphasises the talents and strengths shared by those with dyslexia.

Viewing dyslexia in terms of a social model of disability would suggest that many of the difficulties could be overcome by making society more accessible. For dyslexic people, this would suggest making changes in the compulsory educational system as this is where many of the difficulties begin (Hughes and Dawson, 1995). Research suggests that the educational system shapes the experiences of those with dyslexia through the dominant social and political forces of the time (Hearne and Stone, 1995).

Miles and Miles (1999) believe that the reaction to dyslexia in Britain was 'largely hostile' during the 1970s. Riddick (2002) suggests that educationalists in this era were reluctant to accept the construct of dyslexia and applied instead a deficit model, relating dyslexia to poor intellectual capacity, low levels of motivation or a poor home environment. Research found dyslexic adults had experienced reactions to their difficulties that undermined their self-esteem (Riddick *et al.*, 1997; Riddick, 2001). Alexander-Passe (2006) found that dyslexic female teenagers were at higher risk of low general and academic self-esteem as well as moderate depression in comparison to male dyslexic teenagers. Thomson (1996) found two main reactions to stress experienced at school in dyslexics. He argues that dyslexic children have a tendency for their behaviour in the classroom to become either anxious and withdrawn, or boisterous and silly. Hearne and Stone (1995) note that the remedial approach favours the provision of extra tuition for children in the areas where they experience difficulty, rather than enabling these children to build on their talents. Moores (2004) suggests that more research is needed on dyslexic children's abilities to allow teachers to build on children's strengths, rather than simply remediate their difficulties.

Assessment procedures for dyslexia evolved from psychometric testing and higher education assessments still specify a requirement for an intelligence quotient score to be included. However, the report of the National Working Party no longer requires that a discrepancy between literacy attainment and underlying intelligence should be present. This development may reflect criticisms that have increasingly been levelled at conventional measures of intelligence. The validity of IQ scores in relation to the assessment of dyslexia has been challenged. Stanovich (1986) suggested that difficulties with acquiring reading skills can lead to consequences for cognitive development as well as contributing to motivational and behavioural difficulties. Thus IQ scores may not prove reliable for diagnostic purposes when assessing for dyslexia as the potential to develop the skills required by these tests may be limited in people with reading difficulties.

In contrast to these disadvantages, many researchers have associated dyslexia with strengths and abilities. Ingesson (2006) found that although verbal IQ scores decreased significantly over a period of six and a half years, there was a significant increase on scores of performance IQ. Ingesson tentatively suggests that dyslexic children may develop creative, intuitive and visual problem-solving techniques as a compensatory strategy and also cautions that the lag in verbal scores may be more evident when special education has not been provided. Additionally, the notion of intelligence as it is currently measured has been fundamentally challenged. Cooper (2007) argues that the current markers for intelligence, such as 'early learning of literacy, and good personal organisation and good working memory' are disabling for people with dyslexia and result from 'seeing difference incorrectly as deficit'. He argues that if the skills that dyslexic people possessed were used as measures of intelligence, then non-dyslexic people might be considered 'disabled' in comparison. Increasingly, skills and abilities have been identified as part of the dyslexia syndrome and the large number of celebrities with dyslexia have been presented as role models. West (1997) emphasises the strengths associated with dyslexia, suggesting that visual-spatial abilities and verbal weaknesses are often characteristic of successful and creative thinkers. He argues that technology is taking over basic literacy skills and the world is becoming increasingly dominated by visual methods of communication, areas in which he believes dyslexic people are advantaged.

Green (1998) believes that children with dyslexia are failed by the educational system and suggests a different approach to intelligence based on theories by Howard Gardner. Gardner challenged traditional ways of conceptualising and measuring intelligence. He argued that the education system largely valued, tested and rewarded abilities in linguistic and logical-mathematical intelligence. These two forms of intelligence combine to define the intelligence quotient (IQ) as introduced by psychologists and also happen to reflect the individual strengths of those pursuing careers as psychologists (Gardner, 1999). However, Gardner argues that the concept of IQ fails to acknowledge and recognise the full range of human strengths and proposed a further five forms of intelligence. He identifies these intelligences as bodily-kinaesthetic, musical, spatial, interpersonal and intrapersonal (Gardner, 1984). In 1999, Gardner expanded this list further and suggested that naturalistic intelligence was also relevant although he hesitated over including existential/spiritual abilities in his multiple intelligences theory.

Gardner's theory allows us to conceive how particular strengths are recognised and valued by society in such a way that individuals who do not perform well in these areas are disadvantaged. Some of the forms of intelligence named by Gardner have their counterpart deficit in our current spectrum of specific learning difficulties. Broadly speaking the deficits associated with dyslexia are those identified within linguistic intelligence, dyspraxia relates to limitations with bodily-kinaesthetic intelligence, dyscalculia relates to difficulties with mathematical-logical intelligence and autistic spectrum disorders to limited interpersonal intelligence. ADHD is harder to categorise but may include deficits with aspects of intrapersonal intelligence relating to the management of one's own behaviour. Of course, even when conceptualised as discrete syndromes, these multiple intelligence categories do not neatly define each specific learning difficulty. However, when we conceive of this theory in relation to specific learning difficulties we add a useful perspective to the social model of disability. Some capabilities are less valued within the schooling system, such as musical and artistic abilities. Although common sense suggests that some people struggle to develop these skills, there are no diagnostic labels, assessment procedures or support systems to identify and deal with such difficulties perhaps because these are not considered to be essential life skills. It may be that the theory of multiple intelligences cannot in itself theoretically explain the co-occurrence of specific learning difficulties but it may be useful in terms of helping those with dyslexia to discover and utilise their strengths.

Conclusion

Whether we are in a position to suggest that specific learning difficulties merely indicate a naturally occurring variance in human capabilities is unclear. However, although the dyslexia profession has allegedly embraced a social model of dyslexia, current research predominantly focuses on difficulties relating to individual experiences of dyslexia. Essentially the cause of the condition is sought in the structure of the individual's cognitive processes and difficulties with learning. The quest to fully explain dyslexia has resulted in an ever-widening range of symptoms being incorporated into definitions alongside the inclusion of difficulties associated with related syndromes. If we are to progress a social model of dyslexia it may be appropriate to lessen the focus on 'what is dyslexia' that has driven so much research and ask instead, 'where is dyslexia'? We may find that the conditions that give rise to dyslexia are in fact located in the deeper structures of the education system or society as

a whole and that the current approaches that are taken to alleviate dyslexia-related difficulties are rather more superficial in their scope and impact than we would care to admit. For those with specific learning difficulties to develop a genuine sense of their unique value and inherent talents may require changes more fundamental and holistic than have currently been considered.

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