

Chapter 7

The Acquisition of Literacy

The Rose Review of dyslexia (Rose, 2009) defines dyslexia as a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling. The review indicates that the characteristic features of dyslexia are difficulties in phonological awareness, verbal memory and verbal processing speed. This clearly places dyslexia as a reading difficulty and moreover a decoding/encoding difficulty.

Yet, it is understood that reading involves more than cracking the code and, as indicated in the previous chapter, the inferential and cultural aspects of print can be a crucial aspect of cognitive development. This has considerable implications for the child with dyslexia as the inability to read accurately and the stress involved in accessing print can be a formidable barrier preventing progress in other areas of the curriculum as well as restricting cognitive development.

The question that we need to ask is, what is reading? What are the key elements of reading, and can learners with dyslexia overcome the barriers they encounter with reading? Which areas of reading should we prioritise?

What is Reading?

What is reading? This question, despite its apparent simplicity, can raise a number of issues. Eames highlights the concepts of literacy promoted by the English Language Curriculum in the Republic of Ireland (NCCA, 1999). This proposes that reading involves both 'learning to read' and 'reading to learn'. This counters the view of reading as a narrow mastering of the technical skills relating to print. Reading is much broader than this, and this broader view has implications for studies that report on literacy levels among different populations of children and adults. It is important

Gavin Reid, *Dyslexia: A Practitioner's Handbook*, Fifth Edition.

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when interpreting these studies to ascertain the perspective held by the researchers and the criteria used to measure reading levels.

Wray (2009) argues that it is precisely an overemphasis on initial skills which might actually create some of the literacy problems that teachers later have to deal with. He suggests that for many children the problem they have with literacy is related more to their engagement with it (or lack of it) than it is to their potential to learn the requisite skills. In our answer to this question ‘what is reading?’, therefore, we need to be sure that it incorporates the technical mastering of reading as well as factors such as comprehension and engagement with the narrative. Learning to read requires a number of skills. Many of these are considered pre-reading skills and some develop as a result of reading itself. Being deprived of reading fluency, for example, can affect the development of many of the necessary subskills of reading.

Factors to Consider

Two specific factors that are important in the acquisition of literacy include:

- letter recognition:
 - segmentation;
 - blending;
 - phonemic awareness;
 - analogy strategies;
 - grapheme–phoneme correspondence;
- word recognition skills:
 - recognition of word patterns;
 - the use of visual memory skills.

These two factors incorporate both the word-attack skills and the semantic aspects of word reading. It is important, therefore, that teaching reading should be viewed in a comprehensive way and a range of both bottom-up and top-down approaches used.

Phonological Awareness

There is substantial evidence that phonological awareness is crucial to decoding print (Lindamood and Lindamood, 1998; Vellutino et al., 2004; Mahfoudi and Haynes, 2009; Reid et al., 2016). This also applies to children with dyslexia (Snowling, 2000; Miller Guron and Lundberg, 2004) and those whose first language is not English (Elbeheri and Everatt, 2016; Goswami, 2002; Nikolopoulos et al., 2003; Everatt et al., 2010).

Phonological awareness is an umbrella term that includes awareness and manipulation of speech at the word, syllable and phoneme levels. Mahfoudi and Haynes

(2009), quoting the National Reading Panel (2000) in the USA, argue that explicit, structured phonics instruction—teaching of rules that link speech information with letters and letter patterns—improves word recognition skills and contributes to spelling, decoding fluency and reading comprehension in typically developing children as well as in children with dyslexia and related language learning difficulties (National Reading Panel, 2000).

Other factors (such as environmental considerations, development of the concepts of print, development of language concepts and how the whole concept of reading is viewed by the learner) are also important. According to Wray (2009), there is a great deal of research (Keene and Zimmerman, 2007) that indicates the importance of children's prior knowledge in their understanding of new knowledge as a key factor in literacy development. He also argues that it is important that this prior knowledge needs to be brought to the forefront of the learner's mind; that is, made explicit, if it is to be utilised effectively.

The Alphabetic System—Ehri

Ehri (2002) suggests that, initially, to become skilled readers children need to acquire knowledge of the alphabetic system and that this process presents some difficulty to struggling readers. It is important that teachers understand the processes involved in reading. Ehri suggests that learning to read involves two basic processes. One involves learning to decipher the print (i.e. learning to transform letter sequences into familiar words). The other involves comprehending the meaning of the print. When children attain reading skills, they learn to perform both these processes in a way that allows their attention to focus on the meaning of the text while the mechanics of reading, including deciphering, operate unobtrusively and out of awareness.

Ehri suggests that children acquire listening comprehension skills in the course of learning to speak. She also argues that decoding print is not a natural process in the same way as speech. The brain is specialised for processing spoken language, but not written language (Liberman, 1992). In order for reading and writing skills to develop, Ehri suggests that written language must penetrate and gain a foothold in the mechanisms used by the brain to process speech.

Reading as a Process

These factors underline the view that reading is an interactive and reciprocal process. In other words, the more skills the child has access to, the more competent he or she will become, not only in reading as an activity but also in the development of the subskills of reading. The flipside of this also applies—that is, those children who lack competence in reading subskills will not have ready access to print and are consequently deprived of an opportunity to develop these skills, which can have an adverse effect on comprehension and other cognitive benefits derived from reading.

This is described as the Matthew effect (Stanovich, 1986), which means the 'rich' get 'richer' and the 'poor' get 'poorer'. Therefore, those children who have reading skills will have greater opportunity to develop other linguistic, comprehension and cognitive skills through the practice of reading. Reading is therefore interactive and reciprocal and this is highlighted in the model suggested by Adams (1990a). Adams' model of the reading system highlights the interactions between context, meaning, orthography (print) and phonology (speech).

The orthographic processor is responsible for sequencing the letters in a word, the phonological processor for matching those letters to the letter sound, the meaning processor relates to the reader's knowledge of word meaning and the context processor provides an overview of the meaning of the text. These processors work together and receive feedback from each other.

Ehri (2002) suggests that children can use at least two different methods to read words as they process text. These are:

- *Decoding words*—This involves transforming letters into sounds and blending the sounds to form recognisable words.
- *Analogising to known words*—Using this method, readers may read a new word by recognising how its spelling is similar to a word they already know as a sight word; for example, reading beak by analogy to peak.

Goswami (1990) showed that beginning readers can use their knowledge of rhyming words to read words by analogy, especially if the rhyming clue words are in view. However, Ehri suggests that having some decoding skills appears to be required for beginners to analogise using sight words in memory (Ehri and Robbins, 1992). She also indicates that predicting words from graphophonemic and context cues, such as pictures, the preceding text or beginning letters can help readers predict the identity of an unfamiliar word through using the syntactic context.

Ehri also suggests that children can read by 'sight'. This involves reading words by memory, which requires children to access information stored in memory from previous experiences of reading the words. This means that the child must have previously read the word. Ehri suggests that in each of the above—the use of context, beginning letters or graphophonemic cues—the processes differ. As readers attain literacy skills they learn to read words in all four ways. It is important to recognise, therefore, that for children with dyslexia who may have difficulty in utilising one particular approach it is important to attempt another method. This highlights the fact that there is no one single approach to teaching and acquiring literacy.

Reading Skills

The skills used in reading are little different from many of the skills used in other aspects of learning. For example, linguistic, visual and auditory skills are all essential

for access to reading. These skills are also used in other learning activities such as in speech, listening and creative and visual work. These skills develop independently of reading because they are used in learning activities other than reading.

Reading Practice

The research does indicate, however, that reading can help to further develop the skills noted above. This highlights the importance of being an able and motivated reader. The view that the actual practice of reading fosters reading and learning skills is quite prevalent (Stanovich, 1988; Wray and Lewis, 1997; Wray, 2009). This means that reading practice is essential to develop skills as a reader and for children with dyslexia it is essential that this practice should be structured and guided by the teacher. Reading practice also helps to develop automaticity. This is important for reading fluency.

Cunningham et al. (2011) argue for multiple exposure for children with reading difficulties and the need to include more high-frequency words in text as this can contribute to the development of automaticity. They also indicate that we need to focus on both phonological development and orthographic (visual) processes, as both contribute to lexical quality.

Developing Reading Skills

Adams (1990b) suggests that activities designed to develop young children's awareness of words, syllables and phonemes significantly increase their later success in learning to read and write. The impact of phonemic training on reading acquisition, Adams suggests, is especially strong when phonemes are taught together with the letters by which they are represented. This suggests an important role for the teacher in the fostering of reading skills.

Adams (1990a) also suggests that independent writing activities can help foster an appreciation of text and its comprehension. She also promotes phonic instruction to help with both the sounds of words and the spellings of words. Reading aloud to children, according to Adams, is perhaps the single most important activity for building the knowledge and skills eventually required for reading.

Key Factors

Many of the visual and auditory aspects of reading do not develop spontaneously in children with dyslexia. These skills need to be taught, and usually in an explicit, sensitive and structured manner. Some of the skills that are required in reading include

automatic rapid word and letter recognition, phonological and visual skills, and knowledge of the concepts of print.

These include:

- Auditory factors:
 - recognition of letter sounds;
 - recognition of sounds and letter groups or patterns;
 - sequencing of sounds;
 - discriminating sounds from other sounds;
 - discriminating sounds within words;
- Linguistic factors:
 - the flow of oral language does not always make the break between words clear;
 - retaining the sounds in memory;
 - articulating sounds;
 - recognising the sounds in written form;
- Visual factors:
 - recognising the visual cues of letters and words;
 - familiarity with left–right orientation;
 - recognising word patterns;
 - recognising letter and word shapes;
- Contextual factors:
 - acquiring vocabulary knowledge;
 - acquiring general knowledge;
 - using context as an aid to word recognition, comprehension and analogy skills.

How one decides to prioritise the teaching of these skills within a programme or approach depends to a great extent on the strengths and difficulties of the child. This interaction of skills underlines the multifaceted nature of reading and the long-standing notion that no one method, medium, approach or even philosophy holds the key to the process of learning to read (DES, 1975).

Hunt (2002) suggests that there are dangers in using findings about what skilled readers do in order to draw direct implications about teaching practices for non-readers. He quotes an example from the work of Goodman (1976) that used the evidence from miscue analyses conducted on competent readers to argue that effective and efficient reading is driven more by cognition than graphophonemic processes. He speculated that the fluent reader ‘samples the print’, using just enough visual information to confirm hypotheses derived from context. This top-down model of reading persuaded many to adopt the strategy, which became known as the ‘psycholinguistic guessing game’ (Goodman, 1976). Thus, inexperienced readers confronted with an unfamiliar word were discouraged from sounding the word out and, instead, persuaded to guess what would make sense in the context.

However, it has now been suggested that readers actually fixate on each word, and, in fact, good readers do not need to use context because they have efficient decoding

skills. In fact, the reliance on context is more characteristic of poor readers who use guesswork to compensate for inefficient word recognition (Stanovich and Stanovich, 1995). According to Hunt (2002), these developments in knowledge about skilled reading behaviour have been used as arguments against teaching children to focus on the meaning of what they read until the alphabetic principle is firmly in place and children are able to recognise a number of regular words in isolation (McGuinness, 1998).

There are dangers in exclusively depending on either the bottom-up skills approach or the use of text experience and context (top-down). Both are necessary for effective reading. According to Hunt, the teaching implications of emphasising context through the use of natural language books, discussion of stories and their links to real life, and encouragement of active comprehension strategies provides learners and teachers with a vision of literacy much richer than that offered in code-based reading schemes. This in fact highlights the long-standing debate described by Soler and Smith (2000; Chall, 1967) as the 'reading wars'.

Luke et al. (2001) describe today's young readers as surfers on an ocean of signs: 'post-modern childhood involves the navigation of an endless sea of texts'. Whether or not children can recognise the actual words of these texts rapidly and automatically, they will be affected by the social and commercial pressures that they exert. Hunt (2002) suggests, therefore, that when developing a reading programme for children with dyslexia, word recognition teaching approaches should be accompanied by a critical literacy approach to enable texts that shape children's lives to have a more direct impact. Hunt actually suggests that the types of text that critical literacy involves could provide supportive, motivating contexts for these learners to begin to acquire access to the lexicon. This point will be developed in the following chapter in which key aspects of critical literacy will be discussed.

The Development of Reading

Developing Print Awareness

There are a number of important subskills that contribute to the reading process. These skills do not all appear at once, but are developing skills relating to a number of factors. It can be suggested that a child's background such as prior learning and home background can contribute to a great extent to what is achieved in school (Harrison, 1994). Gustaffsson et al. (2011), from the University of Gothenburg in Sweden, indicated that one of the more stable and consistently observed phenomena in education is the impact of the student's home background on achievement. From this it follows that the pre-reading skills and the existence of a literacy-rich home environment are important.

The HMI report in Scotland on Dyslexia (HMIe, 2008) indicated that, although education authorities did not categorise dyslexia at the pre-5 stage they did

implement a strong focus on early intervention and many employed early intervention teachers.

Visual Aspects

Adams (1990a) discusses the importance of the visual aspects of print and how this relates to the different types of print young children come across—the sources range from instructions for toys to comic books. She asserts that this visual awareness of print does not develop in isolation, but becomes a component of the developing child's environment. This leads to the child developing concepts of print such as left and right, words, sentences, the back of the book and the front. It is important, therefore, to ensure that the child has a grasp of these basic concepts of print, a point highlighted by Clay (1985) in the Reading Recovery Programme. Tunmer et al. (1988) found that the performances of children on tests designed to measure concepts about print have been found to predict future reading achievement. Adams suggests that basic knowledge about print is essentially the foundation upon which orthographic and phonological skills are built.

There is evidence that visual difficulties can have a key role to play in the barriers experienced by children with dyslexia (Everatt, 2002; Singleton, 2009). Singleton shows how visual stress that may be experienced by children with dyslexia can affect reading fluency and other reading skills. Adams (1990a) suggests that recognising the visual identities of letters is an important stage in reading development and that this skill takes time and practice and necessitates a degree of visual attention. Adams suggests that the cause of poor readers displaying errors in letter orientation may reflect insufficient knowledge of letter shapes. It seems, therefore, that the reading process is underpinned by the visual recognition of individual letters and then transposing these letters into their phonological correspondences.

Holland (2012, 2016) indicates that there is much more to visual difficulties in relation to dyslexia than coloured overlays, which is a popular response. He argues in both papers that it is important to understand the visual system and the role of the magnocellular (response to peripheral and background awareness) and parvocellular pathways (awareness of details and specific items) in order to understand the nature of the child's difficulties in accessing print fluently. He estimates that between 10 and 15% of the child population have visual inefficiencies that impact on learning, and suggests some indicators such as the following may be helpful:

- Often loses place when reading.
- Misses out words or rereads the same word.
- Needs to use a finger or marker to keep their place.
- Quickly becomes tired when reading.
- Experiences transient blurred or double vision during close work.
- Complains of words 'moving about', 'shimmering' or 'dancing' when reading.
- Has difficulty copying from board down on to paper.

- Complains of headache (usually around the temples) after close work.
- Has poor concentration for close work.
- Short and often decreasing working distance.
- Continuous reading is inaccurate, yet can read single words quite easily.
- Has difficulty 'taking in' what is being read, and has to read something several times for meaning.

Role of Phonological Information

Tunmer and Greaney (2008) highlight the importance of utilising phonological information to identify unfamiliar words. They suggest that it is crucial to recognise phonological skills and strategies in beginning literacy development. Research has established that making use of letter-sound relationships to identify unknown words is the basic mechanism for acquiring sight word knowledge (Ehri, 2005; Tunmer and Chapman, 1998, 2006). Tunmer and Greaney suggest that the formation of visuophonological connections between printed words and their spoken counterparts in memory provides the basis for fast, efficient recognition of words, which in turn frees up cognitive resources for allocation to sentence comprehension and text integration processes. They indicate that for children encountering difficulty in making connections between speech and print, explicit instruction in phonemic awareness and alphabetic coding skills is critical.

Phonological Representations and Dyslexia

There is a considerable body of evidence to show that dyslexic children have difficulties that primarily affect the phonological domain of language processing. Hatcher and Snowling (2002) suggest an extremely influential hypothesis, which in recent years has indicated that the difficulties associated with dyslexia and reading can be traced to problems at the level of phonological representations. Dyslexia, they suggest, is considered a specific disorder of development because phonological processing is selectively impaired in dyslexic people, while other aspects of their language, for instance their vocabulary and grammatical skills, are normal. Snowling and Hulme (1994) argue that children create phonological representations by mapping the speech they hear on to the speech they produce, and vice versa. Gradually over development, the specification of spoken words built up through this process becomes more and more detailed as the child's proficiency with speech increases. This would imply that phonological representations have a key role to play in the development of reading as well as speech.

Hatcher and Snowling (2002) report that the most consistently reported phonological difficulties found in dyslexia are limitations of verbal short-term memory. These can be noted in difficulties in following instructions, memorising lists,

carrying numbers and in keeping up with dictation. They report that the evidence from brain-imaging studies indicates that the brain regions that are usually highly active in normal readers during short-term memory tasks show lower levels of functional activation even in highly literate dyslexic readers (Paulesu et al., 1996).

Stages of Reading Development

The reading process can also be monitored through a series of stages. Frith (1985) identifies the following developmental stages in the acquisition of reading skills.

Logographic Stage

The child makes use of visual recognition of overall word patterns—thus, he or she is able to recognise words as units. This may not necessarily mean that the child can reproduce these words accurately (this would be an alphabetic skill), and as a result the child can easily misspell words he or she is able to read.

Alphabetic Stage

The child tackles the sound-symbol correspondence, and one can identify if children possess this one-to-one correspondence between the letter and the sound. Ehri suggests that the alphabetic stage can be divided into four phases that capture the changes that occur in the development of sight word reading: pre-alphabetic, partial alphabetic, full alphabetic and consolidated alphabetic (Ehri, 1995a, 1999; Ehri and McCormick, 1998). Each phase is labelled to reflect the predominant type of connection that links the written forms of sight words to their pronunciations and meanings in memory. Therefore, during the pre-alphabetic phase beginners remember how to read sight words by forming connections between selected visual attributes of words and their pronunciations or meanings. This phase is called pre-alphabetic because letter-sound relations are not involved in the connections.

When pre-alphabetic readers read print in their environment, such as stop signs and fast food restaurant signs, they do this, according to Ehri, by remembering visual cues accompanying the print rather than the written words themselves.

The next phase is the partial alphabetic phase. Here beginners remember how to read sight words by forming partial alphabetic connections between only some of the letters in written words and sounds detected in their pronunciations. Because first and final letters are especially salient, these are often the cues that are remembered.

To remember sight words in this way, partial alphabetic readers need to know some letter–sound correspondences and have some phonemic segmentation. During the next phase, the full alphabetic phase, beginners remember how to read sight words by forming complete graphophonemic connections. This is possible because readers know how the major graphemes symbolise phonemes in the conventional spelling system (Venezky, 1970, 1999). In applying this knowledge to form connections for sight words, spellings become fully bonded to pronunciations in memory (Ehri, 1992; Perfetti, 1992).

The final phase, according to Ehri, is the full alphabetic phase when readers are able to decode words by transforming graphemes into phonemes, and they are able to retain sight words in memory by connecting graphemes to phonemes. These processes acquaint them with the pronunciations of syllabic and sub-syllabic spelling patterns that recur in different words. The letters in these patterns become consolidated into larger spelling–sound units that can be used to decode words and to retain sight words in memory.

Orthographic Stage

The child possesses and comprehends knowledge of the letter–sound relationship as well as structure and meaning. Thus, as well as being aware of rules, the child can use cues and context.

It has been argued that children with dyslexia can find the alphabetic stage difficult because the sound–symbol correspondence rests to a great extent on skills in phonics. Before children, therefore, acquire a competent understanding of the relationship between letter units (graphemes) and sound units (phonemes) they need a degree of phonological awareness (Snowling, 2000).

Frith (2002) puts forward the view that writing and the desire to write helps to enhance the alphabetic stage of reading because spelling is linked more directly to the alphabetic principle and letter–sound relationships. This view is also supported by the work of Bradley and Bryant (1991), who found that beginner readers in the process of acquiring the skills of the alphabetic stage use visual strategies for reading, but phonological strategies for spelling. In their study children read correctly words that were visually distinctive such as ‘school’ and ‘light’, but failed to read simpler words like ‘bun’ and ‘sit’. Yet these children tended to spell correctly words they had failed to read such as ‘bun’ and ‘sit’ and spell incorrectly words they had read by focusing on the visual patterns (school, light).

The alphabetic reader, according to Snowling (2000), may also find difficulty reading words that have inconsistent orthographic patterns, but that are pronounced in the same way. Similarly, irregular words are mispronounced (e.g. ‘island’ would be pronounced ‘is-land’).

This developmental aspect of reading serves to illustrate the importance of the procedure of error analysis and identifying the type and pattern of errors made by children with difficulties in reading.

Limitations of the Stage Model of Reading

Snowling (2000) suggests some limitations of the stage model of reading. She suggests that the mechanisms involved in the transitions between stages are unclear. She also suggests that the stage model of reading implies an ordered sequence of stages or phases, yet it is acknowledged that the course of reading development is not the same for all children and, indeed, the actual reading strategies used by children may be influenced to a great extent by the teaching regime to which they are exposed. Additionally, in some situations some children omit one of the stages. Snowling (2000) cites the example of the German language where children quickly reach a high level of competence in the alphabetic stage, and therefore a logographic stage is not easily observed (Wimmer, 1996). Similarly, Snowling cites a number of studies that claim that dyslexic readers can reach the orthographic phase without passing through the alphabetic phase.

Vellutino et al. (2004) argue that the evidence suggests that inadequate facility in word identification, due, in most cases, to more basic deficits in alphabetic coding, is the basic cause of difficulties in learning to read. The evidence suggests, they argue, that, in most cases, phonological skills deficiencies associated with phonological coding deficits are the probable cause of the reading difficulties rather than visual, semantic or syntactic deficits. They do acknowledge, though, that in some children reading difficulties may be associated with general language deficits. Vellutino et al. argue that skilled reading involves comprehension of meaning from running text and this is a complex process that depends on adequate development of two component processes: word identification and language comprehension. Word identification is a lexical retrieval process that involves visual recognition of a uniquely ordered array of letters as a familiar word and implicit (or explicit) retrieval of the name and meaning of that word from memory.

Language comprehension involves integration of the meanings of spoken or written words in ways that facilitate understanding and integration of sentences in spoken or written text in the interest of understanding the broader concepts and ideas represented by those sentences. They argue that children who have difficulty in acquiring phonological awareness and learning to map alphabetic symbols to sound will also have difficulty acquiring orthographic awareness and general orthographic knowledge. There is abundant evidence, they assert, that the child who has limited phonological awareness and limited alphabetic mapping skills also has limited orthographic awareness and limited orthographic knowledge.

Although they acknowledge that there is considerable evidence that limited knowledge of print concepts and conventions and limited pragmatic knowledge have often been observed in children who also experience early reading difficulties and can certainly contribute to early reading and language difficulties, limitations in such knowledge are probably not basic causes of specific reading disability.

They argue that there is now strong and highly accepted evidence in support of weak phonological coding as an underlying cause of the disorder. They define phonological coding as the ability to use speech codes to represent information in the

form of words and parts of words. Their evidence for this comes from training and intervention studies which have documented that direct instruction designed to facilitate phonological awareness and letter–sound mapping has a positive effect on word identification, spelling, and reading ability in general.

This has implications for intervention and the approaches used to teach reading to children with dyslexia.

Reading and Memory

There is also evidence that dyslexic children's reading development can be affected by long-term memory factors. This can account for many difficulties, such as problems memorising the days of the week or the months of the year, mastering multiplication tables and learning a foreign language. Dal (2008) suggests that memory difficulties, for example, difficulties associated with storing and subsequently accessing new vocabulary, can be challenging for learners with dyslexia. He suggests that foreign language learning makes intensive use of memorisation. In order for words and phrases to be memorised, they first have to enter short-term working memory, so that they can be transferred to long-term memory. At a later stage they must then be recalled into working memory to be assembled into coherent messages, an important cognitive ability which is seen as a necessity for developing the learner's schema for language learning. He argues that dyslexic students are likely to have difficulty at all stages and that each stage will require consolidation. Hatcher and Snowling (2002) suggest that this long-term learning problem can be related to the retrieval of phonological information from long-term memory and can account for the word-finding difficulties often experienced by children with dyslexia.

Relationship between Phonology and Orthography

It can be argued that the persistent difficulties with phonological awareness associated with dyslexia are not universal, but appear to be specific to children learning to read in irregular or 'deep' orthographies, such as English (Everatt and Elbeheri, 2008). The task of learning to read in an alphabetic system requires the child to associate letters with their sounds, and then appreciate how sounds can be blended to make words. At a basic level, therefore, learning to read requires the child to establish a set of connections between the letters (graphemes) of printed words and the speech sounds (phonemes) of spoken words. This relationship between orthography and phonology needs to be made at a 'fine-grained level'—the phoneme level—to ensure that new words that have not been seen before can be decoded, otherwise the dyslexic child will be faced with a considerable challenge at each new word, as she or he will not have the bank of phonological knowledge to decode new words.

Hatcher and Snowling (2002) and Cunningham et al. (2011) argue that the relationships between orthography and phonology are important both in the early stages of learning to read and in the development of automatic reading skills that subsequently account for reading fluency. Hatcher and Snowling suggest that in English these relationships also provide a scaffold for learning multi-letter (e.g. -ough, -igh), morphemic (-tion, -cian) and inconsistent (-ea) spelling–sound correspondences. They hypothesise that, although dyslexic children can learn to read words they have been taught, they code the correspondences between the letters of these words and their pronunciations at a ‘coarse-grained level’—chunks rather than phonemes. A consequence is that dyslexic children have difficulty generalising this knowledge, and therefore one of the most robust signs of dyslexia is poor non-word reading. It can be observed that some dyslexic children can circumvent decoding difficulties to some extent by relying or over-relying on the semantic and syntactic context (Nation and Snowling, 1998). But this is usually not totally successful, especially in the early years, as the child will not have accumulated sufficient language knowledge to use this strategy successfully. Even if this strategy is utilised, Hatcher and Snowling (2002) show that reading often remains slow and that use of global reading strategies may not be conducive to spelling, which usually remains poor across the lifespan. Essentially, learning to read is an interactive process to which children bring all their language skills and knowledge of phonological processing, and a deficit in phonological representation is the most likely source of most of the reading (and spelling) difficulties experienced by dyslexic children.

It is widely accepted (Hatcher and Snowling, 2002) that all children do not learn to read in the same way. Children have different combinations of cognitive skills and have individual styles of processing information. For example, one child may have severe phonological deficits, but good visual memory skills, while another child may have weak phonological skills and slow speed of processing. Additionally, children will very likely have experienced different methods of being taught how to read. Teaching programmes on reading should therefore recognise this and the difficulties that will confront dyslexic children if these correspondences are taught in isolation. It is important that a teaching programme integrates the visual, phonic and context aspects of reading simultaneously at all stages in reading, from early development through to competence.

Dyslexia and Different Orthographies

There is convincing evidence that the manifestation of dyslexia can vary across different languages (Everatt and Elbeheri, 2008). One of the key factors that can account for this variability is the differences in the orthographic features of different languages. Everatt and Elbeheri indicate that in some orthographies there is close to a one-to-one correspondence between the written symbol (grapheme) and the basic sound (or phoneme). In other orthographies, this correspondence is less

transparent. A letter may represent several sounds, and a particular sound may be represented by different letters, depending on the context within which the letter or sound is presented. They indicate that the English orthography is the best example of a less than transparent relationship between letters and sounds; there are many English words that may be considered irregular or exceptions because there is not a direct relationship between the grapheme and phoneme.

German, in contrast, is relatively transparent for both reading and spelling (Wimmer, 1993; Zeigler and Goswami, 2005). Similarly, Hungarian has a highly transparent orthography (Smythe et al., 2004), which means that the Hungarian child should be able to pronounce written words relatively accurately simply from sounding out the individual letters or letter combinations within a word. For the Hungarian child, a new word can be sounded out with relative ease, leading to good word-decoding accuracy levels and potentially increasing written-word learning.

The difference in how dyslexia can be noted in different languages can have implications for assessment. Many of the assessment procedures for dyslexia are based on identifying difficulties in phonological awareness and phonological processing. The work based on Arabic orthography suggests that literacy learning difficulties may be best predicted on the basis of assessment procedures that include measures of phonological processing, including phonological awareness (Elbeheri and Everatt, 2008). Irrespective of the orthography, it seems that measures of phonological processing seem to present the best tools for predicting literacy weaknesses and identifying the underlying problems associated with dyslexia.

Points for Reflection

- Consider the key factors required for the development of reading skills and reflect on how you might prioritise these skills in a teaching programme.
- Consider the role of the phonological representation hypothesis in relation to the acquisition of literacy for students with dyslexia.
- Reflect on the relationship between phonology and orthography and particularly the influence of different orthographies. Consider the impact this may have on intervention for students with dyslexia.
- What factors might you consider in supporting the literacy development of children whose first language is not English?