Chapter 1

Theoretical Framework: Foundations of Learning to Read

Children vary in the age at which they first start to talk and in the skill with which they use language to communicate. For this reason, it is not unusual for late-talking, speech difficulties or slow language development to go unnoticed in a family, particularly in a first-born child. However, delays and difficulties in speech and language provide some of the first clues that a child is at risk of reading difficulties. This book is concerned with how children with such difficulties can be helped, not only to learn to read, but also to improve their spoken language skills. In this chapter we begin by outlining the structure of spoken language before going on to describe how language skills are the foundation of literacy development and specifically, how the development of reading draws on these skills. We close by considering some of the main characteristics of children who, despite having received good instruction, fall behind their peers in reading development.

THE STRUCTURE OF LANGUAGE

Language is a complex system that requires the coordinated action of four subsystems: **Phonology**, **Semantics**, **Grammar** and **Pragmatics**. *Phonology* is the system that maps speech sounds onto meanings and is critical for reading development, while meanings are part of the *semantic* system. *Grammar* is concerned with **syntax** and **morphology** (the way words and word parts are combined to convey different meanings) and *pragmatics* is concerned with language use.

An assumption of our educational system is that by the time children start school, the majority are competent users of their native language (but see below).

- They can listen to what people say to them and understand.
- They can follow instructions.
- They can speak clearly.
- They can use language to express their needs.
- They can convey a message to someone else.
- They can take turns in conversation.

These are all reasonable expectations. But for far too many children, poor language at school entry can begin a downward spiral of poor literacy, under-achievement and in the longer term, poor job prospects. Before we consider language skills specifically in relation to literacy development, let us spend some time describing the different language skills children bring to the task of learning. These are vocabulary, **grammar**, **pragmatics** and **phonology**.

Vocabulary

Vocabulary knowledge refers to all of the word forms and meanings that we know and is a key component of language comprehension. Vocabulary is also one of the strongest predictors of educational success. During the pre-school years, typically developing children extend their vocabulary at a very rapid rate, possibly adding around 50 to 70 words to their vocabulary-base each week mostly through conversation. By the time children go to school, they typically have an oral vocabulary of some 14,000 words. However, as Isobel Beck and her colleagues (Beck, McKeown and Kucan, 2002) have pointed out, beyond school age, most conversations contain words that everyone understands and therefore they no longer provide an effective means of promoting vocabulary knowledge. Rather, at this stage, children begin to learn words through reading and explicit teaching.

When a child hears a familiar word, he or she automatically activates its meaning in what is known as a 'semantic representation'. If the child has good vocabulary, they also activate the meanings of related words. Therefore children with good vocabulary are at an advantage in learning: not only do they know the meanings of the individual words they hear but also these words provide them with a context within which to interpret larger units of discourse.

Some words cause particular problems for comprehension in young children or those with language delay. These include:

- question words (*what, who, whom, when, where, how, whose, which, how many, how much, why* (Ripley, Barrett and Fleming, 2001));
- words with more than one meaning (ambiguous words, such as *bat*, *minute*); and
- homophones (words that sound alike, such as *bear* and *bare*).

Grammatical Skills

Grammar is a system of rules that specifies how words are used in sentences to convey meaning. In order to comprehend, children must be able to use grammatical clues in sentences. Children also use **grammar** to learn the meanings of new words. In a classic example reported by Lila Gleitman (1995) children were shown a picture of someone sifting through a bowl of confetti. How children interpreted the meaning of a nonsense word depended on the grammatical construction of the question they were asked. For example, if asked, 'Can you see any *sebbing*?' (verb), children pointed to the person's hands (where the action was performed). If asked, 'Can you see a *seb*?' (common noun), they pointed to the bowl. If asked, 'Can you see any *seb*?' (mass noun), they pointed to the confetti.

Formally, grammar is made up of **morphology** as well as **syntax**. **Morphology** refers to the basic structure of words and the units of meaning (or morphemes) from which they are formed; the word '*boy*' is a single morpheme but the compound word '*cowboy*' contains two morphemes, '*cow*' and '*boy*'. In English, there are relatively few compound words of the '*cowboy*' type; however, words like '*camping*' (*camp* + *–ing*) or '*camped*' (*camp* + *–ed*) also contain two morphemes and '*decamped*' contains three. Inflections are parts of words that cannot stand alone (e.g., *–ed*, *–ing*, *–un*) but when combined with a stem they serve a grammatical function. Verb inflections are particularly important to comprehension – they denote contrasts between for example, past and present tense (walk/walked), singular and plural forms (house/houses). The verb 'walk' is a single morpheme; when it is used to refer to the past, the inflection –ed is added making 'walked' a two-morpheme word. Similarly, to use the verb 'walk' to refer to a man, it is necessary to add the third person singular inflection –s; hence 'he walks'. 'Walks' is also a two-morpheme word (even though it has only one syllable). Figure 1.1 illustrates a task often used to assess children's ability to produce grammatically correct forms of verbs. In the first picture, the girl is picking flowers. The child is asked to say what the girl has done in the second picture: 'She has picked the flowers.'
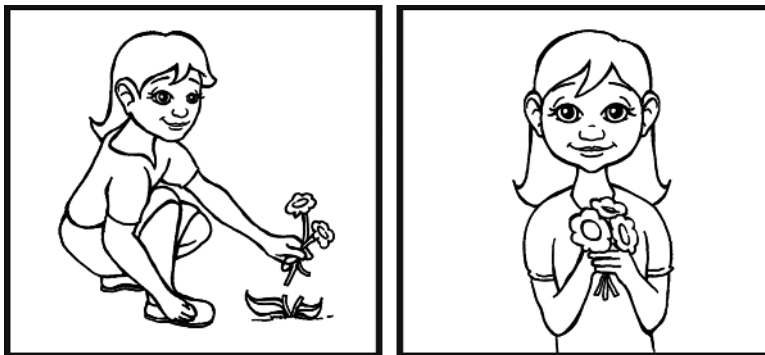

Figure 1.1 Figure illustrating a task to assess children's ability to produce grammatically correct forms

Pre-school children often have difficulty with grammatical markers like inflections. In particular, they may miss off inflections when referring to third person singular: 'mummy cook'. They may also make mistakes on irregular past tense forms: 'the man *goed* there'.

Syntax refers to the grammatical structure of sentences; different grammatical forms generally take particular semantic roles in the sentence. Nouns usually refer to *agents* or *objects* whereas verbs refer to *actions* or *feelings*. In a similar vein, *prepositions* signify location while *adjectives* and *adverbs* are used to describe nouns and verbs respectively.

Most children have a grasp of simple sentence structure but more complex structures may cause difficulty through the primary school years. More complex constructions include:

- passives, e.g., '*The window was broken by the boy.*'
- embedded clauses, e.g., '*The girl with the red hair ran away.*'
- relative clauses '*The boy who delivered the news was scared.*'

Children also sometimes have difficulties with pronouns. They may often misuse them or have difficulty knowing who or what they refer to, both within a sentence ('*he is in the car*') and across sentences ('*The boy loved his puppy. He put it in the car*').

Pragmatic Abilities

Pragmatics is the system of language which is concerned with communication and specifically, how language is used in context. Efficient communication depends upon the speaker and listener sharing certain assumptions, for example, that communication between them should be both informative and relevant to the topic under discussion. Ideally it should also be truthful, clear, unambiguous and economical. More generally, communication frequently involves looking beyond the precise information stated or beyond its literal interpretation. When people have pragmatic difficulties, their language behavior violates these assumptions: they may talk at length about topics not directly relevant to the present situation or use an inappropriate 'register', such as speaking in an overly formal manner for the context. Perhaps most commonly they get the 'wrong end of the stick'.

Pragmatic failure commonly occurs when the speaker does not take into account the listener's perspective and either provides too much or too little information for them to be able to communicate well. Young children often make social 'gaffes' because of limitations in their pragmatic skills. Generally such pragmatic failure is acceptable in a young child but in older children the failure to take account of the perspective of another person can seem rude or ill-judged. Figure 1.2 shows a child who is having difficulty understanding the use of figurative language when his mother tells him, 'Pull your socks up.'

Phonological Skills

Phonology is the system of language that is concerned with how speech changes denote changes in meaning. For example, there is a very small difference in sound

Figure 1.2   Illustration of pragmatic difficulty

between the words 'bat' and 'pat' but this change signals the difference between something we use to hit a ball and the way we pet a dog. The phonological difference between 'bat' and 'pat' is at the level of the **phoneme**. From a very early age children are sensitive to phonetic cues and they can use these to differentiate word meanings, but they are not aware of **phonemes**. Later when children start to speak, they mark phonemic distinctions but for some time their speech production is immature and so they may be difficult to understand.

For most children, phonological development follows a typical course and some types of speech error are common. Often before their speech becomes fully intelligible at around school age, children omit syllables from words (e.g., they say 'jamas' for 'pyjamas or 'nana' for 'banana'), misarticulate words (saying, for example, mouse for mouth) and miss out consonants from clusters (e.g., 'kate' for 'skate'). Importantly, during the pre-school years, children are not explicitly aware of the internal structure of speech; although they use speech to communicate they do not typically reflect upon it and have only limited ability to manipulate its components.

We usually use the term **phonology** in a rather different way to that discussed above when we consider phonological development in relation to reading. In this context, 'phonological abilities' usually refers to skills that involve reflecting on,

Syllable		**CRISP**		
Onset - rime	**CR**		**ISP**	
Onset - vowel - coda	**CR**	**I**	**SP**	
Phoneme	**C**	**R**	**I**	**S**	**P**

Figure 1.3   Segmentation of a syllable into onset-rime and phoneme units

processing and manipulating speech sounds (usually called **phonological aware-ness** tasks). Before reading instruction, children have considerable difficulty with **phonological awareness** tasks that involve **phonemes**. However, a persistent difficulty in segmenting the sounds of spoken words can be an important marker of a specific reading difficulty.

It is generally believed that the development of **phonological awareness** proceeds from large to small units. English has a complex syllable structure. Figure 1.3 shows how a syllable in English can be split into units of different sizes. Thus, all syllables contain a vowel; simple consonant-vowel-consonant (CVC) syllables (e.g., hat) comprise an **onset** (the consonant before the vowel –h-) and a **rime** (the technical term used to describe the unit comprising the vowel and the final consonant or coda - at). In turn, **rime** units can be segmented into phoneme units, namely the vowel (a) and the coda (t). In more complex syllables, both the **onset** and the coda may include consonant clusters (crisp).

The difficulty of a **phonological awareness** task depends on the size of the phonological unit and the nature of the manipulation that is required. Generally tasks involving the manipulation of larger units (e.g., syllables or **rime** units) are easier than tasks involving smaller units (**phonemes**) (Figure 1.4).

Tasks involving the deletion or transposition of sounds within words are typically harder than tasks requiring judgments about the similarity between sounds in words. When thinking about reading instruction, it is important to bear in mind that there is strong evidence that reading development depends upon having well developed **phoneme** awareness; activities involving syllables and rhymes help children to tune into the sounds of words but it is **phoneme** awareness that is critical for learning to read and spell.

LANGUAGE SKILLS AND LEARNING TO READ

It is useful to distinguish *speech skills* from *language abilities* when considering literacy development. Learning to read in an alphabetic system, such as English, requires the development of mappings (or connections) between speech sounds and letters – the so-called *alphabetic principle*. In turn, the alphabetic principle depends on phonemic skills. Wider language skills (vocabulary, **grammar** and
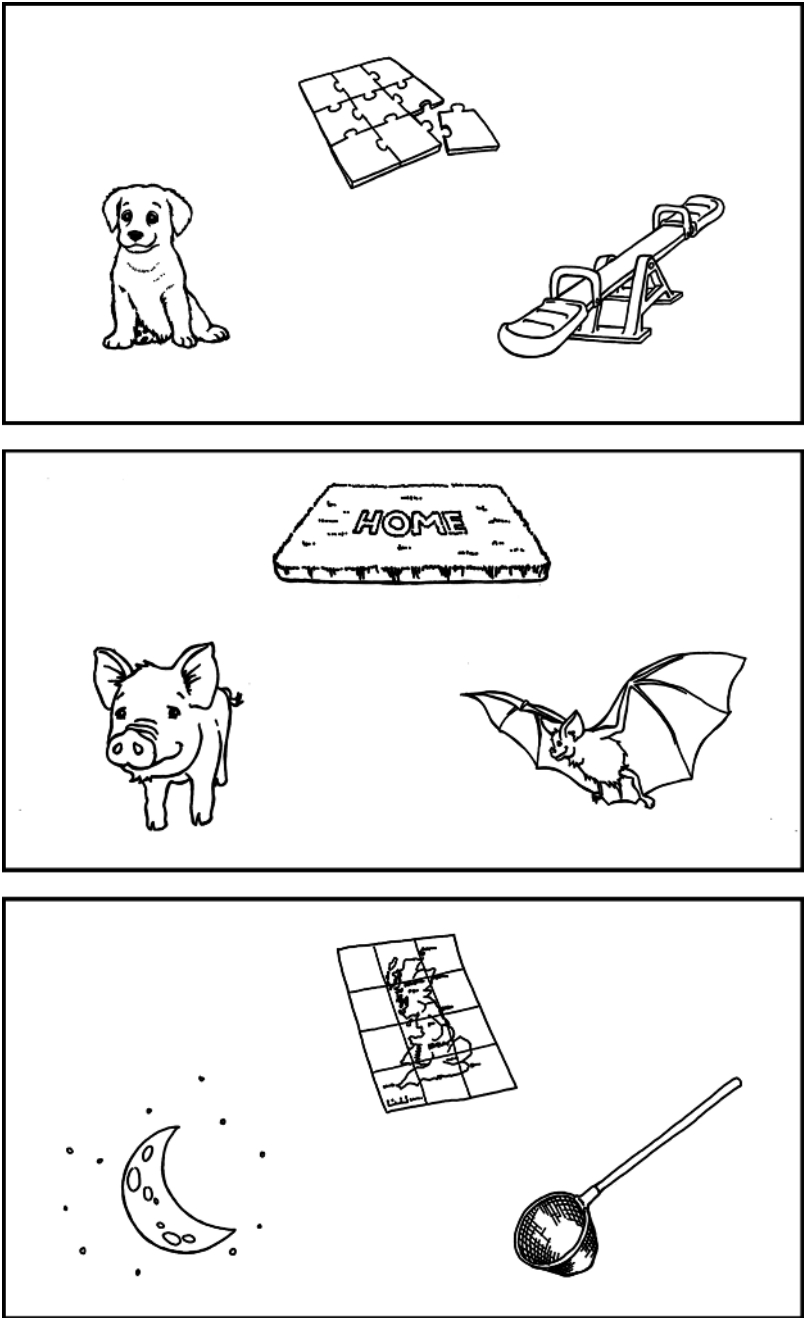
Figure 1.4 Examples from phonological awareness tasks at the level of the syllable, rime, and initial phoneme. In each item, the child sees a cue picture and is asked which of two pictures sounds a bit the same. Panel A shows a syllable level task; jigsaw and seesaw share a final syllable and puppy is the unrelated distractor. In panel B, a rhyme task is shown; mat and bat rhyme and pig is the distractor. In panel C, moon shares an initial sound, while net is a similar-sounding distractor.

pragmatics) are required to understand the meanings of words and sentences, to integrate these in texts and to make **inferences** that go beyond the printed words.

In the early stages of learning to read within an alphabetic system such as English, children's attention is devoted to establishing decoding skills (**phonics**). Later children begin to rely increasingly on word meanings to gain fluency in their reading, and they use broader language skills including vocabulary, **grammar** and **pragmatics** to appreciate both the gist and the detail of what they read. Children with poor oral language remain at risk of poor reading comprehension even though they may be able to accomplish the initial task of word-level decoding. Such children include those whose mastery of English is poor because it is not their mother tongue.

A large number of studies have now followed the progress of children during the early stages of reading development. On the basis of findings from these studies we know a great deal about what predicts individual differences in reading attainment. In one such study conducted by our group (Muter et al., 2004) we followed the early reading development of 90 children between the ages of 4 years 9 months and 6 years 9 months. We assessed each of the children once a year on tests of letter knowledge, word recognition and **phonological awareness**. The tests of **phonological awareness** tapped the ability to detect rhyming relationships between words and also to identify and segment **phonemes**, the smallest units of spoken words. At 4 years of age the children were also given a test of vocabulary and a year later at 5, they completed two tests of **grammar**; one of these required the children to order words to make a sentence and one required them to add morphemes to words (e.g. to make the number 'five' into an adjective – fifth). Finally, we assessed reading comprehension at the end of the study.

The findings of our study are displayed in Figure 1.5 in what is known as a 'path model'. They were clear and quite simple: there were two predictors of individual differences in reading at age 5 – these were **phoneme** awareness and letter knowledge at age 4; and from age 5 to age 6 there were three predictors – **phoneme** awareness, letter knowledge and 5-year-old reading skills. In short, the children who had come to school knowing letters and being able to segment spoken words into speech sounds fared better in learning to read (and the same situation held for learning to spell). As Brian Byrne of the University of New
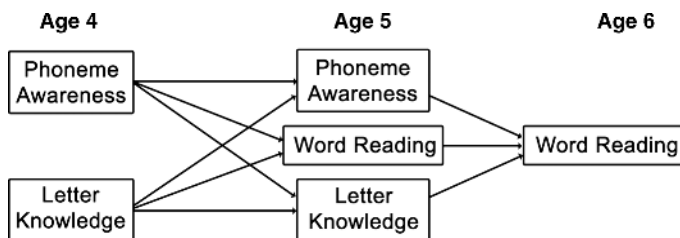

Figure 1.5   Path diagram showing the relationships between pre-school phonological awareness and later word reading skills (after Muter et al., 2004)

England, Australia has argued, these two skills are fundamental to the alphabetic principle (Byrne, 1998).

What then is the role of wider language skills beyond **phonology** in learning to read? To answer this question we can use the findings from our study to discover what predicts reading comprehension (rather than word-level reading skills). When we do this, we find that vocabulary knowledge and grammatical awareness are important predictors of individual differences in reading comprehension, once differences in word-level reading (decoding) are taken into account.

In summary, **phoneme** awareness and letter knowledge are the foundations of word-level reading skills. In turn, word level reading and wider language skills are the foundations of reading comprehension. We can conclude that a range of language skills are vital to literacy development, notably, phonological skills, (specifically **phoneme** awareness), vocabulary knowledge and grammatical ability. It therefore falls to us as educators to ensure that children have well developed spoken language in the early school years to provide a secure foundation for learning to read.

Precursors of Phoneme Awareness in Pre-School

Since this book is concerned with children who have difficulty in acquiring the alphabetic principle, it is important to look further back in development to consider the precursors of **phoneme** awareness skills. In one of the few studies to address this question, we followed the development of **phonological awareness** in 67 children between the ages of 3 years 10 months and 4 years 9 months (Carroll et al., 2003). At three points in time, in addition to a test of letter knowledge, the children completed tasks tapping syllable matching, rime matching and alliteration (first sound) matching (as shown in Figure 1.4). In each task, the child was shown the picture of a target item and then they had to select one of two pictures to match the target in terms of the phonological unit tested. Given the theory that **phonological awareness** proceeds from large to small units, we predicted that syllable matching would be easier than **rime** matching. In fact, the children in this study performed at a similar level when required to match rhymes as syllables but, as expected, they found alliteration matching (which is at the level of the **phoneme**) much more difficult.

We next investigated which early skills could tell us how well children would do on **phoneme** awareness tasks at school entry. We did this by examining the relationships between vocabulary knowledge, awareness of large sound units in words (syllable and **rime** skills), letter knowledge, and how well children could articulate words. At the end of the study we also assessed **phoneme** awareness. We found that awareness of syllables and **rimes** was related to how large a vocabulary the child had and these measures together with the clarity of their speech (**articulation**) together predicted phonemic awareness (as measured by alliteration matching, **phoneme** deletion and **phoneme** segmentation).

We can conclude from this study that children with better developed vocabulary in pre-school had better developed awareness of the phonological units of speech.

It is also noteworthy that children with better developed (more intelligible) speech also tended to fare better on the **phoneme** tasks.

With these findings as a back-drop, we can consider the risk of reading impairments in children who come to school with poorly developed speech and language skills. From our discussion so far it seems likely that difficulties affecting the phonological system of language will affect the development of **phoneme** awareness. Moreover, since learning letter sounds is a phonological learning task, we can expect this also to be affected in children with phonological difficulties. It follows that children with poor **phonology** will be at risk of poor word-level decoding skills, including **phonics**. Speech production difficulties are an additional risk factor for poor reading particularly if these are not resolved by school entry. On the other hand, wider language difficulties place children at risk of reading comprehension difficulties.

The 'Simple View' of Reading

The idea that proficient reading depends on oral language skill is captured in the '**Simple View**' of reading, shown schematically in Figure 1.6. According to the **Simple View** (Gough and Tunmer, 1986), reading comprehension is the product of word decoding and linguistic comprehension skills. Decoding is vital to reading comprehension; if a child cannot decode, then he or she will be unable to extract meaning from the written word. However, once words are decoded a child must fall back on his or her oral language comprehension to understand what a writer conveys. It is well recognised that children vary in the ease with which they can
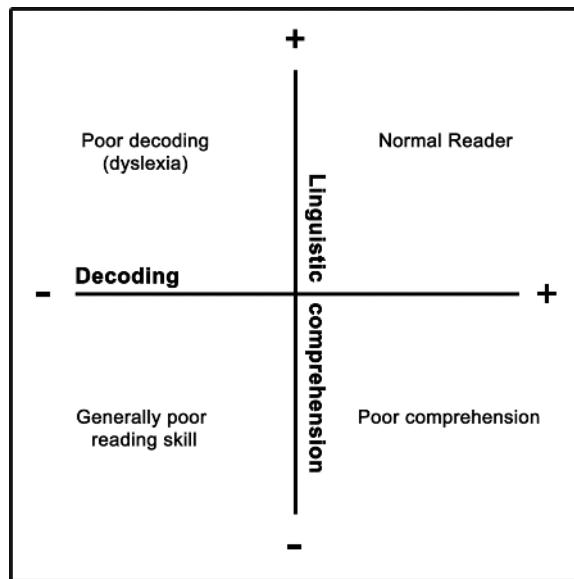

Figure 1.6   The Simple View of Reading (after Gough & Tunmer, 1986).

decode. They also vary in their linguistic comprehension, and consequently in their reading comprehension. A proficient reader has good decoding and good listening comprehension skills, as shown in the upper right quadrant of the figure. Poor reading comprehension can occur with or without poor decoding, as shown in both lower quadrants of the figure.

Decoding Deficits in Dyslexia

Children with **dyslexia** typically have word recognition deficits in the absence of poor comprehension. It is well-established that these children have phonological deficits and a recent independent review of **dyslexia** provision conducted by Sir Jim Rose for the government in England (Rose, 2009) proposed that the main signs of **dyslexia** include poor **phonological awareness**, slow verbal processing speed and verbal short-term memory limitations. By way of illustration, Figure 1.7 (Panel A) shows the performance of children with **dyslexia** on a **phoneme** deletion task in which they had to remove a **phoneme** from a spoken word. Figure 1.7 (Panel B) shows performance in a phonological memory task involving repeating nonwords. In each case, their performance was compared with that of children of the same age (CA-controls) and younger children reading at the same level (RA-controls). The children with **dyslexia** showed impairments on both tasks in relation to the comparison groups confirming they have phonological difficulties.

Surprisingly less well discussed are the phonological learning difficulties of children with **dyslexia**. Kristina Goetz (née Herden) in our group taught children with **dyslexia** a set of Greek letter-names (Herden, 2003). Each letter was shown twice paired with its name, followed by six learning trials with feedback. Figure 1.8 shows the performance of the children with **dyslexia** on the last trial of the experiment and after a short delay. Compared with children of the same age, the
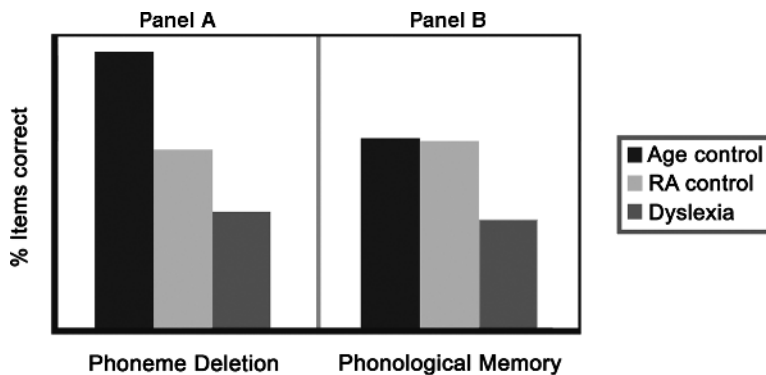

Figure 1.7 Performance of children with dyslexia compared with CA- and RA-controls on tests of phoneme deletion and nonword repetition, showing that the children with dyslexia are impaired (data from Marshall, C. M., Snowling, M. J., & Bailey, P. J. (2001). Rapid auditory processing and phonological ability in normal readers and readers with dyslexia. *Journal of Speech Language & Hearing Research, 44*, 925–940).
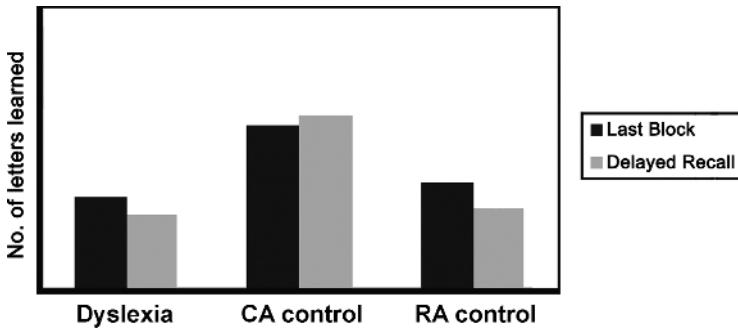
Figure 1.8 Performance of children with dyslexia on the last block of trials of a letter learning experiment and after a short delay; the children with dyslexia learned fewer letters than age-matched (CA) controls (after Goetz, 2003)

children with **dyslexia** learned fewer letters and performed only as well as younger controls. Given the problems children with **dyslexia** have in the two basic components of alphabetic skill (letters and **phonemes**), it is not surprising that they have difficulties developing decoding skills.

Poor Comprehenders

In contrast to **dyslexia**, some children show a reading impairment that specifically affects text comprehension while decoding is unaffected – these children are often referred to as '**poor comprehenders**'. In a series of experiments conducted in our lab (Nation, 2005) we have shown that, while **poor comprehenders** perform normally on phonological tasks, they have problems in the semantic domain of language. Figure 1.9 and 1.10 show data depicting their performance on parallel tasks tapping **phonology** and **semantics**. In Figure 1.9 are the findings of oral fluency in tasks in which they are given a target word (e.g. *man*) and have to generate either rhyming words (*pan*, *ran*, *van*) or semantically related words (*boy*,
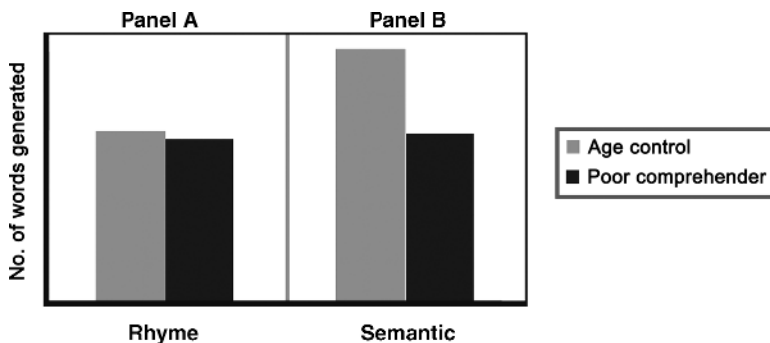

Figure 1.9 Performance of poor comprehenders on a test of oral fluency. The poor comprehenders showed normal rhyme fluency (Panel A) but impaired semantic fluency (Panel B).
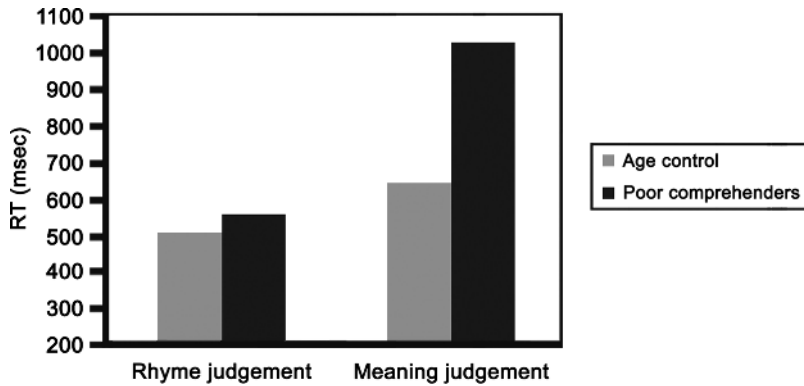
Figure 1.10 Performance of poor comprehenders on tests of rhyme and meaning judgement. The poor comprehenders showed normal rhyme but impaired semantic judgement (data reported in Nation, K., & Snowling, M. J. (1998). Semantic processing and the development of word recognition skills: evidence from children with reading comprehension difficulties. *Journal of Memory & Language, 39*, 85–101).

girl, *lady*, *woman*), in a 30-second interval. Although they did fine when generating rhyming words, they produced fewer semantically related associates than typically developing children. In a similar vein, Figure 1.10 shows the findings from a task requiring them to judge whether pairs of spoken words rhymed (e.g. *boat – coat*) or were similar in meaning (e.g. *boat – ship*). Again they performed within the normal range on the rhyme tasks but were impaired in terms of speed and accuracy on the meaning judgement task.

Findings like these have led to the view that **poor comprehenders** have difficulties with language skills beyond **phonology**. We have seen that **poor comprehenders** have poor semantic knowledge, plausibly linked to limitations in their vocabulary knowledge; they also have difficulty with figurative language and the impact of these difficulties is readily observed in their limited use of context during reading. Importantly however, as colleagues Kate Cain and Jane Oakhill (2006) have shown, **poor comprehenders** also have poor knowledge of story structure and conventions and they fail to monitor their own comprehension (for example, they may fail to look back to resolve ambiguities or to correct their reading). Further, a key area of difficulty for **poor comprehenders** is in making **inferences** and integrating information at the level of the text to form a coherent understanding of what they read.

Children at Risk of Reading Difficulties

Although studies of children with **dyslexia** and **poor comprehenders** show that relatively specific difficulties with reading are possible, it is more usual for children to have difficulties with several components of language (and hence literacy). A family study of **dyslexia** conducted by our group (Snowling, Gallagher and Frith, 2003) emphasizes this point. In this study, we followed the progress of pre-school

children, recruited just before their fourth birthday up until the teenage years but here we will focus on their early literacy development. The children in the study were considered to be 'at risk' of **dyslexia** because they had a parent with a history of reading difficulties (and it is interesting to note that some 38% of these children were late talkers). We assessed the children at the ages of 4, 6 and 8 years on a large battery of tests of language and reading-related tasks (and later in early adolescence (Snowling, Muter and Carroll, 2007)). At each point in time they were compared with children in a control group from families who had no history of reading impairment but were similar in terms of their social background and economic circumstances.

At 8 years of age, there were more children with poor reading and spelling in the group at family risk of **dyslexia** than in the comparison group. We defined poor literacy here as having literacy skills significantly below the average of the control group. In relation to this norm, 66% of the family sample were affected (only about 10% of the control group showed such difficulties). We then proceeded to look retrospectively at the patterns of early language that characterized the different groups, namely, the at-risk poor readers (who we will refer to as dyslexic), the 'at risk' children who became normal readers, and the control group (removing four cases of **dyslexia**). At 4 years, the oral language development of the dyslexic children was slow compared with that of the two normal reader groups, and at 6 years, they were already showing difficulty with phonological awareness tasks. Figure 1.11 shows performance of the three groups on tests of early literacy skill at age 4 and 6 years. Here the picture is different. As expected, the children with **dyslexia** were impaired in letter knowledge and on a test of phonic skill (literally the number of words they were able to write correctly in a spelling test). However, the performance of the 'at risk' children who went on to be normal readers was also less good than that of controls; it was midway between that of the controls and the children with **dyslexia** on the test of letter knowledge and as poor as the dyslexic group on the phonetic spelling test.
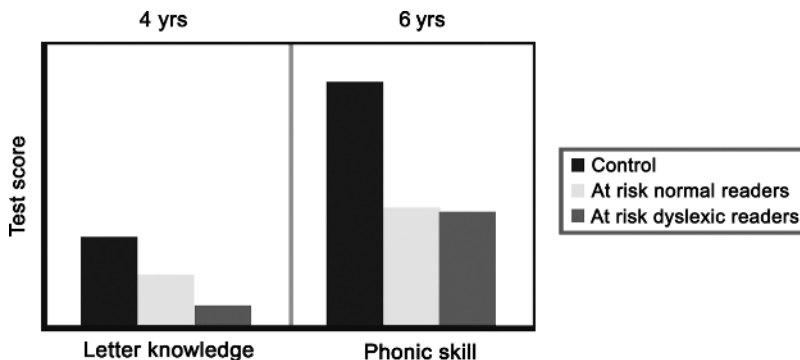

Figure 1.11   Performance of children from 'at risk' and control groups on tests of early literacy. The 'at-risk' children who went on to be normal readers at 8 showed early literacy problems; their letter knowledge was moderately impaired at 4 years and they were impaired in translating between graphemes and phonemes at 6 years (Snowling et al., 2003).

In summary, children from 'at risk' families who went on to be classified as 'dyslexic' had difficulties during the early years on a wide range of language measures including **phonological awareness**, vocabulary and expressive **grammar**; they were also slow to learn their letters, arguably the first sign of '**dyslexia**'. The 'at risk' children who went on to be normal readers were almost as poor as the children with **dyslexia** in tasks tapping phonological skills and they were moderately impaired in letter knowledge, but their (non-phonological) oral language development was normal. We think that the reasons these children did not succumb to reading difficulties at 8 years was because they were able to use their good language skills to get around the phonic decoding deficit they experienced, and hence to 'compensate'.

It follows that the risk of reading impairment is not all or none. Among the children we studied whose parents were dyslexic, there were a number of different outcomes which ranged from a global reading impairment affecting both word-level decoding and reading comprehension to normal fluent reading. It seems that the developmental outcome for a child at risk of poor reading depends not only on how severe their phonological difficulties are, but also on the other language skills they bring to the task of learning. Those who have good vocabulary and wider language skills are likely to be able to compensate better, modifying the risk they carry of becoming dyslexic.

Children with English as a Second or Additional Language

One particularly disadvantaged group in the English education system is children learning English as an additional language. In England, Government statistics published in 2009 (DCSF, 2009a) indicate that 15.2% of pupils in UK primary schools and 11.1% of pupils in UK secondary schools were learning English as an additional language (EAL). For many of these children there is a persistent attainment gap relative to peers who have English as a first language (DCSF, 2009b). Researchers investigating the literacy development of children learning EAL consistently report a profile similar to that of **poor comprehenders** – in other words, they tend to have difficulties with both listening and reading comprehension in spite of adequate decoding skills. As such their difficulties can go largely unnoticed in the classroom. The work of researchers including Jane Hutchinson from the University of Central Lancashire, Helen Whiteley from Edge Hill University and Kelly Burgoyne from Down syndrome Education International suggest that the difficulties experienced by children learning EAL largely stem from weak vocabulary skills. In a longitudinal study following children with EAL from Year 2 to Year 4, Jane Hutchinson and colleagues (Hutchinson et al. 2003) consistently found lower levels of reading and listening comprehension, **expressive** and receptive vocabulary, and grammatical skills for children with EAL compared to their monolingual peers. Importantly, **expressive** vocabulary in Year 2 significantly predicted performance in reading and listening comprehension in Year 4 for children with EAL but not their monolingual peers.

CONCLUSIONS

We began by considering the structure of language and distinguished the role of speech and of language skills in the development of reading. We argued that speech skills (**phonology**) are the foundation of word recognition processes in reading while broader language skills are critical to reading comprehension. At the core of reading difficulties are phonological problems, though children with good language skills beyond **phonology** may be able to use these to 'bootstrap' their ineffective phonic skills. In contrast, children with poor language are at high risk of reading comprehension impairments (Bishop and Snowling, 2004).

The intervention programme described in this book aims to foster skills at the foundations of literacy in the hope of enabling children who enter school 'at risk' of reading difficulties to close the gap between themselves and their peers. It builds on research conducted over a number of years by our group, initially pioneered by Peter Hatcher (Hatcher, Hulme and Ellis, 1994) in a county-wide study in Cumbria, and subsequently developed for implementation in mainstream classrooms, as a catch-up programme and for small group teaching for children with reading difficulties. We review the findings of these background studies in the next chapter, before turning to the current research.