1

The Nature of Dyslexia

Emergence of a syndrome

Although many books and papers refer to the case histories of Hinshelwood (1900) and Morgan (1896) describing word-blind children and the recognition of acquired dyslexias from the beginning of the century, it was not really until the 1970s that dyslexia has been recognized as a specific learning difficulty in this country. Similar developments have taken place in other parts of the world, particularly in the United States.

In the United Kingdom, in the early 1970s, the 1944 Education Act was still in force. Basically, this argued for a number of categories of handicap, in which dyslexia and specific learning difficulties were not included. If you did not fall into one of these categories, you officially did not exist, and therefore, the notion of dyslexia did not exist.

What we might call 'barriers to learning', that is, factors that were seen to prevent children from acquiring literacy, fell into broad categories of problems, which were seen to be either extrinsic to the child, for example, to do with society and school teaching, or intrinsic, that is, within the child, which were to do with intelligence and gross neurological problems.

A typical child guidance centre at the time, to which children were referred if they had a variety of educational difficulties including problems with reading, included a psychiatrist, an educational psychologist, a social worker and a teacher. Problems were very

The Psychology of Dyslexia – A Handbook for Teachers, by Michael Thomson

broadly viewed within social background and intellectual and emotional spheres.

As far as social background was concerned, Table 1.1 shows the typical finding (Eisenberg, 1966) of the relationship between presented reading difficulties and socio-economic class.

The fact that children of a lower socio-economic status background had more difficulties in reading and spelling was seen to be the result of factors such as linguistic background, perceptual experience, attitudes from home towards school and so on. For example, it was felt that, if parents had fewer educational qualifications, the implication was that they discouraged their children from seeing school work as important and the children picked up that view. If there was a restricted use of language or less richness of environmental experience at home, this might prevent a child from being ready to acquire written language learning. Programmes such as Head Start (which gave us Sesame Street and the Muppets!) and others were all geared towards making a child ready to acquire reading, writing and spelling.

As far as the intellectual sphere was concerned, it was recognized that there was a good correlation between intelligence and reading ability. Children were categorized, based on intelligence test scores, into those who might fall into the 'educationally subnormal' or the 'severely subnormal' categories, which reflected the Education Act categories of handicap. Children typically falling within these cut-offs might be referred for education in special schools. In later chapters, we examine in great detail this relationship between intelligence and reading and discrepancy models of dyslexia.

If there were no explanations to be found within the child's social background (social worker) or his or her intellectual profile (educational psychologist), then an explanation was sought within the emotional sphere. Here, children might be perceived to be

Table 1.1 Percentages of children with reading difficulties in different occupational classes.

Class	*Percentage*
1 and 2	7
3	19
4 and 5	27

emotionally disturbed, which was preventing them from acquiring written language learning. The response to this might be either drug therapy or, if the child was perceived to have particular psychiatric problems, through play therapy at the child guidance centre.

There was, therefore, a reasonable set-up for the identification of children in the described areas. However, many teachers were still commenting on children who, despite not showing any of the mentioned so-called barriers to learning, were still not acquiring reading, writing and spelling. Early identification of dyslexia was therefore based on the descriptions by teachers and others working in this area, as well as exclusionary definitions. In other words, if a child was intelligent, came from a well-supported home background and did not have a primary emotional problem but was still failing to read, write and spell, he or she might be described as dyslexic.

There were, at the time, a number of these descriptions or symptomatologies and these are still produced. The British Dyslexia Association, the Dyslexia Institute, the Hornsby Centre and many other well-known organizations working in dyslexia all produced their own lists of 'symptoms'. A typical example of this is given in Table 1.2.

Table 1.2 Features of dyslexia.

A puzzling gap between written language skills and intelligence
Delayed and poor reading and spelling, often with persistent reversals and disordering of letters, syllables and words (d/b, was/saw, place/palace)
'Bizarre' spelling (raul/urchins, kss/snake, tars/trumpet) and others that are more recognizable (wayt/wait, pant/paint, boll/doll)
Confusion of left/right direction
Sequencing difficulties such as saying the months of the year in order; poor directional scan in reading; weak sequential memory
Poor short-term memory skills (repeating digits; following complex instructions)
Problems in acquiring arithmetical tables
Problems in repeating polysyllabic words (sas'tis'ti'cal for statistical, per'rim'min'ery for preliminary)
Difficulties in expressing ideas in written form

Source: from a booklet produced by East Court School (1983, 2000).

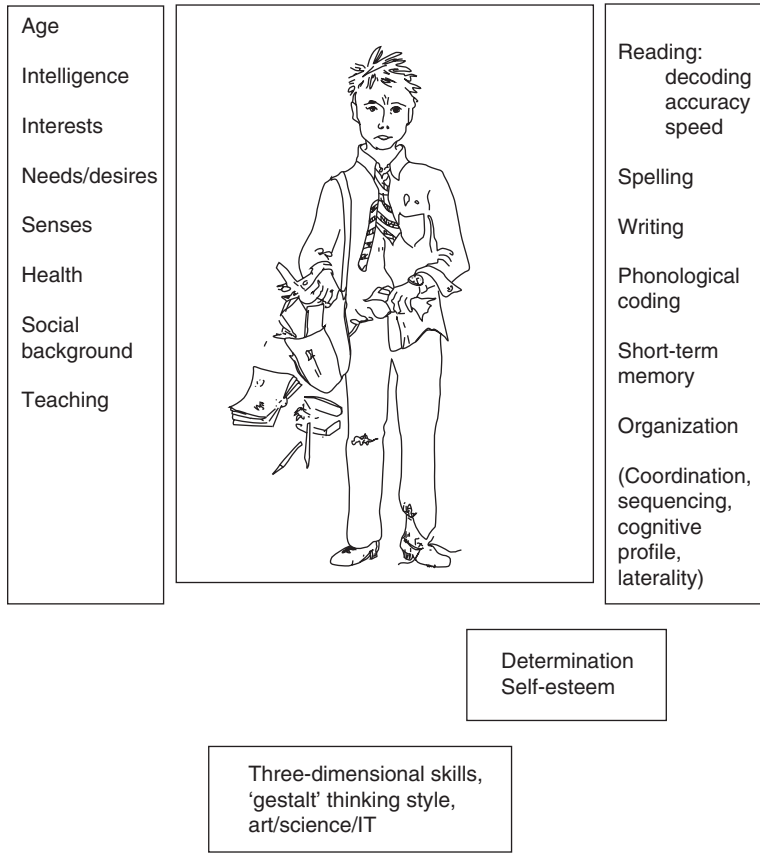

Figure 1.1 'Charlie', a dyslexic 11-year-old.

Other associated factors may include late language development and continued pronunciation difficulties; ambidexterity or mixed-handedness; similar problems in other members of the family; clumsiness; poor graphic (writing) skills; and dyspraxia.

We can make this a little more concrete by looking at case histories and examples of actual and hypothetical children. Let us look at 'Charlie', shown in Figure 1.1.

Charlie is a young man aged 11 years who has just started his secondary school and is dyslexic. On the left-hand side are a number of characteristics that are similar to those in other children of his

age, and on the right-hand side and the bottom are a number of characteristics that are different from those of other children. The right-hand side shows those skills that Charlie does less well than his peers, and at the bottom are those items that he might do rather better than his peer group.

If we look at Charlie himself, we get some clues about some aspects of dyslexia. He is looking rather worried and anxious. He has not been sleeping very much. This results partly from the fact of starting a new school where he is rather lost. Children with dyslexia sometimes have difficulty with orientation, and he finds it very difficult to know where he is at any given time. Particularly important, he finds it difficult to read his timetable. This is a very long and complicated document. He is not sure whether he is supposed to be reading it across the top or down the side, and does not understand the abbreviations. He also finds it difficult to read some of these. As a result of this, he not only has problems in finding out where he is supposed to be, but he also does not know what lessons he is having either in the morning or in the afternoon on a given day. To solve the problem, he takes all the books he needs for all of his classes around with him! This results in a huge bag full of all the books and papers that he needs. Inevitably, as a result of his weak organizational skills, a lot of the contents fall out. You will notice that he is carrying lots of pencils because he forgets them and does not want to get into trouble for losing them. He often gets shouted at by teachers or told off for not having the right materials or equipment at any given time. As he has weaknesses in short-term memory, this forgetfulness is inevitable.

Many, but not all, children with dyslexia are somewhat more clumsy than their peers, and therefore, he has problems in doing up his tie and his shoelaces even at the age of 11. At the present time, he is looking at his watch, not just to see what time it is but actually to work out which direction is left and which right, as he has been told to go down the left-hand corridor, followed by the right-hand corridor, straight along for two or three doors, and go up the stairs and turn left towards the science block where he will find his next lesson! He has problems in processing all this information as well as, of course, remembering it. It is not surprising that he is looking worried and lost!

On the left-hand side are things in which he is similar to other children. He is the same age as the other children and he is of the same general intellectual background. It is a misnomer to say that all dyslexic children are intelligent – sometimes reported erroneously in the media. It is obviously easier to spot a dyslexic child if his attainment skills are well below his intelligence. Nevertheless, people with dyslexia have just as wide a range of intelligence as the rest of the population. He may be bright, he may be less able on intelligence tests or he may be of average ability. Charlie's interests are the same as those of other children. Currently, as I write, these are scooters and 'yo-yoing' at my school, but there will be something different next term, I am sure. He has the same needs and desires – he wants to be successful; he needs to be loved; he needs to be secure; he needs to have all those things that make a child of 11 feel comfortable and happy in his environment and school.

By and large, his senses are the same as those of other children – he can see (he might have glasses, he might not) and on the whole, he can hear well. There may have been some slight hearing losses when he was younger – grommets and such like – which are often more common in dyslexic children. Charlie's health, social background and the received teaching he has had are all the same as for other children, and yet he has problems in reading and spelling.

On the right-hand side are the things with which he has difficulty. Obviously dyslexic children are seen to have problems with reading, but we should note here that this is not all aspects of reading. If we are able to help the dyslexic child work out what the words are in reading, his comprehension can be quite good. The problem is not in higher order skills – we shall be looking in some detail at these later – but in decoding the words; so decoding, accuracy and speed of reading are all weak, as are spelling, writing, phonological or sound coding, short-term memory and the other items listed. We look at all of these in more detail later Chapters 3 and 9. Sometimes, dyslexic children will have problems with coordination, sequencing, language and laterality. Again, we examine all of these in greater detail (Chapter 6).

At the bottom of the diagram are areas that some people with dyslexia do well on. My clinical, research and teaching experience suggest that many people with dyslexia are rather better at three-

dimensional skills, that is, they have what we might term 'gestalt' thinking. Within families, one gets good skills in engineering, architecture, dentistry, medicine, art, design and so on. At school, they tend to do rather better at science (the experimental part, not the copying from board and writing!), art and Information Communication Technology (ICT). An anecdote that I have written elsewhere illustrates this point. Some time ago, we had a craze for remote-controlled cars at the school, and I bought a kit for one of my own children (but, in reality, to make for myself!). I tend to be a very linear thinker and I like to read the instructions and follow step 1, step 2 and so on. After months of trying to construct this model, burning the midnight oil, I still could not make it work. One day, I brought it over to the school and the children looked at the cogs and gears and said, 'You've got them all the wrong way round, sir!' and like magic rearranged the whole of the gearing so that it worked. They were able to look at the exploded diagram, understand the spatial relationships involved and how the whole thing worked, and construct it in that way – a much more relevant skill than mine. Of course, I am lucky that linear/verbal skills tend to be tapped in the early part of a child's school career as opposed to those skills that many people with dyslexia have, which tend to be in the visualization and three-dimensional area.

You will notice that Figure 1.1 talks about self-esteem and determination. Children with dyslexia who are not given help have very low self-esteem and we also look at this in a little more detail later. However, given the right sort of help, they can build up a strong determination to succeed. If they can overcome the 'I am dyslexic and I can't do it' approach, they can do very well. Again, our experience is that many of our children who go on to their senior schools can do rather better at 'A' levels than their nondyslexic peers. This is because, if you have never had a problem with reading and spelling in education, you sail through your GCSEs with no problem. There is a big gap between GCSE and 'A' level standard. Some students find it very hard work and are not sure how to deal with it. The child with dyslexia who has been given good study skills and knows how to work, metaphorically says, 'Oh, more hard work – no problem' at 'A' level and just gets on with it.

Although this is not a book about how to recognize dyslexia as such and we are focussing on the psychological background, it is

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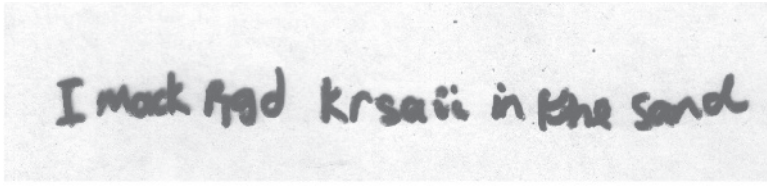

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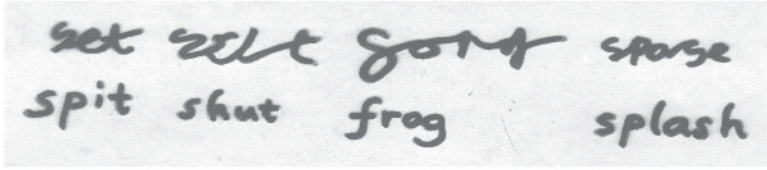

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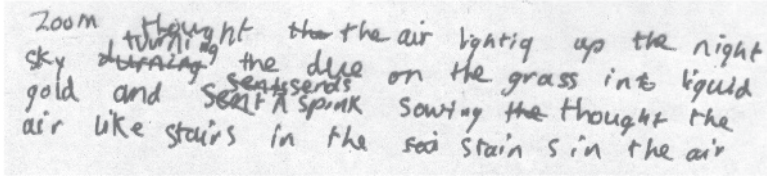

Figure 1.2 Examples of dyslexics' writing.

always useful just to note a few examples of writing, particularly in the context of describing dyslexia.

If the reader is interested in more detailed case histories, there is an example in Chapter 3 and also the CD-ROM accompanying this book has many examples of different case histories including background, detailed breakdown of reading and spelling errors and so on.

There are three examples of writing detailed here (Figure 1.2).

Dyslexia used to be defined very much in terms of a child's reading, writing and spelling difficulties, rather than a more systematic diagnostic approach as is used nowadays. The first piece of writing (Figure 1.2a) says, 'I made sandcastles in the sand.' Secondly (Figure 1.2b), there are examples of spellings of single words. There are obvious errors, such as omissions of consonants, confusion of vowels, letter order errors, repetition of words, approxima-

tions to sounds and all of the other errors that are typically associated with dyslexia. These two examples were by a 10-year-old boy with reading levels of approximately a six-year-old.

The third example (Figure 1.2c) not only illustrates difficulties, but also demonstrates the tremendous difference between the imagery and the, sometimes, rich use of language that dyslexics have in contrast to their ability to express it in writing. This says, 'Zoom! Through the air, lighting up the night sky, turning the dew on the grass to liquid gold and sending a spark soaring through the air like stars in the satin stained (the) air.' Although overwritten for a modern taste, do bear in mind this is an 11-year-old, trying to express his observations of the firework display at the school!

While there is evidence that dyslexia is a broad language disorder, particularly in the phonological area, one should not forget that this does not necessarily apply to vocabulary and the semantic component of language, and indeed, many children have produced wonderful poetry at my school.

To return to the main theme of this first chapter, the general realization of dyslexic problems tended to be based on descriptions of children such as Charlie and symptomatologies as listed in Table 1.2. I do not propose to present a whole series of case histories here. There is a psychometric case history in the next chapter, which will be referred to when we look at the assessment, but many books give case histories, my own (Thomson, 1990) and many others included. I would assume that the reader will be familiar with such books; the purpose of this book is to look at the underlying psychological constructs of dyslexia.

The next development in recognition of the dyslexia syndrome was the Government Green Paper, the Tizard Report, Department of Education and Science (1972). This was based on the Isle of Wight study of Rutter, Tizard and Whitmore (1970). The Isle of Wight was taken as a representative sample of the social background of the United Kingdom, and a number of educational, social and medical details were looked at. A brief technical digression is needed here. This study, along with that of Yule (1967) and Yule *et al.* (1974), examined the relationship between intelligence and reading in the general population, using regression equations. Regression here refers to the interrelationship of variables, in this case, between

intelligence and reading, and what they were able to do was to make a prediction of what a child's reading and spelling should be like, based not only on his or her chronological age but also on his or her intelligence. The reader should not confuse 'regression' as a correlation with 'regression to the mean'. This is the tendency for population characteristics (e.g. height or intelligence) to tend towards the average of that population. We shall be examining this later when discussing discrepancy models, but there is this potential confusion based on the technical terms used in statistics and psychometrics.

The following is an example of a regression equation, looking at the relationship between reading and intelligence, which predicts reading accuracy for a child of a given age:

$$\text{Reading accuracy} = 3.87 + (0.93 \times \text{IQ}) + (0.68 \times \text{CA}).$$

Here, the IQ refers to the sum of the scaled scores from the short form of Wechsler's Intelligence Scale for Children (range 4–76, average 40) (Wechsler, 1992), and the reading is the Neale Analysis Accuracy score in months (Neale, 1997). (The chronological age or CA is also in months.) The other figures were derived from the way in which reading and intelligence were correlated in that particular population. For any individual child in the Isle of Wight, therefore, and also when they undertook similar work looking at the effects of lead on IQ in the then Inner London Education Authority, we can look at what their expected reading should be. On the basis of this, they found that children could be divided into those who had a general reading difficulty (e.g. a 10-year-old who had an IQ of around 80 and who might be reading at the eight-year-old level) and those who had a specific difficulty (e.g. a 10-year-old who had an IQ of 115 and would be expected to be reading at, say, the 10.5-year-old level but who was only reading at the 8.5-year-old level). We look at this issue in more detail when we look at criticisms of the notion of discrepancy and its actual use in educational psychology practice nowadays (see p. 47). However, Rutter, Tizard and Whitmore (1970) presented data that showed the differences between those children with general reading difficulties and those who had specific reading difficulties. These are presented in Table 1.3.

Table 1.3 Children with general and specific retardation.

General	*Specific*
Mean IQ 80	Mean IQ 102
General development delays	Speech/language delays
54% male	76% male
Better prognosis	Very poor prognosis
Overt neurological deficits: for example, 11% cerebral palsy	No organic, fewer neurological deficits
High incidence of large families	Lower incidence of large families
High number of low status homes	Low number of low status homes

It may be seen that those with a general reading difficulty had general developmental delays, that is, late in walking and talking, came from social backgrounds that might be expected to cause problems in literacy learning and had more neurological dysfunctions that were organic. However, the children with specific difficulties had only language/speech delays; there were many more boys than girls, and their problems have much more to do with reading and spelling rather than general educational failure. The children with specific difficulties were also more difficult to help, despite, on average, being brighter; in other words, they make less progress in reading.

Based on this, the Green Paper identified children who had 'specific reading retardation'. Those of us working in dyslexia at the time said, 'These are the dyslexic children.' We also argued that, because dyslexia was not just about reading but included spelling, difficulties in writing and a number of other things, some of which we have delineated in Charlie and some of which are tabled later in this chapter, there was a considerable overlap between these groups. However, at least this was the first official recognition that there were children who had specific difficulties, and it laid the foundation for an acceptance of dyslexia as a learning problem.

Moving on very rapidly in the development of dyslexia as a concept, we pass the Warnock Report, and to date with the abolition of the 1948 Education Act and the introduction of the Special Educational Needs Acts of 1981, 1983 and 1994. Here, statutory assessments can take place, giving rise to a Statement. Special

educational needs (SENs) are defined as a learning difficulty requiring special educational provision. This involves a learning difficulty, which can be defined as the following:

1. There is significantly greater difficulty in learning than for others of the same age.
2. The disability prevents or hinders the use of educational facilities for children of the same age in local education authority (LEA) schools.
3. If a child is aged under 5 years, (1) and (2) would apply if the child was at school.

There are a number of key features in this list that should be examined. One is that these are essentially normative assumptions – in other words, there is some recognition that a child is being compared with his or her peer group, and there should be some expectations of what 'normal' children should be doing at a given age. This is important because it implies some form of psychometric analysis and comparing children across norms, something that is very variably applied in schools and by educational psychology practice. Also, there is an implication for some developmental context, that is, we are looking at children changing and developing over time – a key feature – as children learn and grow. Finally, there is an underlying assumption that these learning difficulties are preventing a child from accessing the curriculum. Table 1.4 shows how the Special Educational Need Act applies to a dyslexic child.

We now have a situation in which children are defined as having SENs, and if we look at the Code of Practice, specific learning difficulties are one of these.

The current Code of Practice is rather vaguer than the early pronouncements from the 1982 (and following) Education Acts. Table 1.5 illustrates the position of specific learning difficulties in relation to all the other various 'barriers to learning' that are given in the current Special Needs Code of Practice. 'Specific learning difficulties' are under the speech and language and cognition and learning categories and are highlighted.

I wish that I could now say that we now have a clear historical development of the emergence of dyslexia as a syndrome from the

Table 1.4 Code of Practice with regard to a specific learning difficulty.

i.	There are extreme discrepancies between attainment in different core subjects of the National Curriculum or within one core subject, particularly English/Welsh. LEAs should be especially alert if there is evidence that, within the core subject of English/Welsh, a child has attained average or high levels in Attainment Target (AT) 1, speaking and listening (oral in Welsh) but significantly lower levels in AT2, reading, and/or AT3, writing.
ii.	Expectations of the child, as indicated by a consensus among those who have taught and closely observed him or her, supported, as appropriate, by appropriately administered standardized tests of cognitive ability or oral comprehension, are significantly above his or her attainments in National Curriculum assessments and tests and/or the results of appropriately administered standardized reading, spelling or mathematics tests.
iii.	There is clear, recorded evidence of clumsiness; significant difficulties of sequencing or visual perception; deficiencies in working memory; or significant delays in language functioning.
iv.	There is evidence of problems sometimes associated with specific learning difficulties, such as severe emotional and behavioural difficulties, as indicated by clear, recorded examples of withdrawn or disruptive behaviour, an inability to concentrate or signs that the child experiences considerable frustration or distress in relation to his or her learning difficulties. LEAs should be particularly alert if there is evidence of such difficulties in some classes or tasks such as reading or writing but not in others.

LEAs, local education authorities.

early 1970s to the twenty-first century. Unfortunately, some have attempted to turn the clock backwards to nonrecognition of dyslexia. So, despite the British Psychology Society's Division of Educational Child Psychology recognizing dyslexia in their working party report of 1999 (see more details of this in Chapter 4), we have Elliott (2005) commenting at conferences and a Channel 4 documentary discussing the so-called 'Myth of Dyslexia', stating that not only did dyslexia not exist and was a myth, but also that identifying dyslexics took resources away from other children.

Ironically, the television programme actually presented some of the current research findings, which we will review later, on

Table 1.5 Special educational needs in the United Kingdom.

Communication and interaction (speech, language and communication):
• language delay
• **specific learning difficulties**
• sensory impairment
• general learning difficulties
• autistic spectrum disorders
Cognition and learning:
• moderate, severe or profound learning difficulties
• **specific learning difficulties**
• (sensory impairment, autistic spectrum)
Behavioural, emotional and social development:
• withdrawn/isolated
• disruptive/challenging
• hyperactive (attention deficit disorder/attention deficit hyperactivity disorder)
Sensory and/or physical needs:
• visual/auditory impairment
• physical/physiological
• multi-sensory (medical conditions)

phonological deficits in children and magnetic resonance imaging brain scans indicating differential brain processing in children with specific learning difficulties, that is, dyslexia, and then carried on to rubbish the concept. We shall return to this issue of resources in a little bit more detail in Chapter 4, when we talk about definitions and discrepancies. I can do no better than to quote from Snowling (2005) in reaction to the Channel 4 programme.

> No one in the field of education would deny that there are myths surrounding dyslexia. But this does not mean that dyslexia is a myth. On the contrary, there is strong scientific evidence concerning the nature, causes and consequences of dyslexia. Thus, dyslexia can be readily identified by educational professionals and its potentially negative effects can be ameliorated.
>
> A crucial questions therefore is whether, if appropriate procedures for the identification, assessment and intervention of children at risk of reading problems were put in place in all schools, would dyslexia

> go away? The answer is quite simply no. Dyslexia is a brain-based disorder with consequences that persist from the pre-school years through to adulthood. (*From There are myths about dyslexia, but dyslexia is not a myth*)

I include these rather depressing controversies just to illustrate that, as always, recognition of special needs in education is not static and to further illustrate the point that dyslexia will not go away. Later in the chapter, I share with you some data on the lack of progress made by children with dyslexic difficulties, if not given the appropriate help.

Before finishing this section, it is useful to look at some of the other features of dyslexia that are not subsumed by the LEA notion of 'specific learning difficulty'. Tables 1.5 and 1.6 show some comments that reflect a dyslexic child's difficulties, both at home and at school.

Most of the features mentioned in Tables 1.6 and 1.7 are self-explanatory, but some comments may be helpful. Children with dyslexia will often miss out on assignments, resulting partly from short-term memory difficulties because the teacher quickly says, at the end of the lesson as the children are leaving, something like, 'Oh yes, homework on Wednesday, Chapter 6, pages 29 to 35. Don't bother with question 3, and by the way use last week's notes for question 2 and don't forget I want at least a page of summary at the end.'

There will be similar problems in copying from the board and speed of work as a result of difficulties with visual memory (board to book) and speed of processing. Children with dyslexia may be still on an earlier piece of work when the teacher is moving on or giving out instructions! Note the comment about parents. It is easy to blame parents for not helping children to organize themselves, but they may also be dyslexic – in fact, this is highly likely, given the genetic predisposition that occurs.

In Table 1.7, there is a reference to attitude to others. This can refer to taking it out on a younger sibling who can read, as well as other secondary reactions to a primary learning difficulty that I explore in Chapter 10 on the social psychology of dyslexia.

Before leaving this introduction, it is worth spending a little time looking at other SENs that overlap with dyslexia.

Table 1.6 Some difficulties facing children with dyslexia around the school.

Organization
- timetables; homework and assignments; completion of work
- finding the way around school
- personal organization
- (parents' organization!)

Coordination
- ball games: cricket/squash, and so on, for some (see below)
- fine motor versus gross motor skills

Note taking
- from blackboard
- from dictation

Project work
- extraction of information from source
- time to complete assignment

Positive features

Good skills in:
- work effort and determination
- global 'gestalt' thinking; logically applied, sometimes maths
- computer studies
- CDT, including technology/design/art skills/engineering
- games ability, namely 'balance', three-dimensional skills
- science, especially experimental laboratory skills, but see note taking!

Table 1.7 Difficulties shown by the dyslexic child around the house.

Disorganization
- Bedroom – tidiness
- Planning life – events, times, activities
- Out and about on own – buses, finding way
- Time keeping!

Memory
- Homework
- Objects/clothes
- Events/time keeping!
- Instructions

Personal
- Hair/teeth/dressing!
- Attitude to others
- Homework!

The notion of related specific difficulties or a 'dys-' constellation is described by Habib (2003). The notion is that many different learning difficulties are interrelated and are sometimes described by the rather clumsy term 'comorbidities'.

Overlapping SENs or comorbidities

The term comorbidity in this context is sometimes used to describe the overlap between dyslexia and other SENs and learning difficulties. Often, this just gives children additional labels to dyslexia, when a lot of the behaviour is actually part of the dyslexia problem or maybe a secondary reaction to that. You will know from my earlier comments and throughout the book that I feel that 'dyslexia' is a useful label to describe a syndrome or pattern of learning difficulties that affects children. The label is useful diagnostically as it implies certain treatment programmes and, in my experience, very helpful indeed to the child and their families (see comments earlier and in Chapters 3, 4 and 10).

However, it is certainly the case that behaviours or aspects of this dyslexia syndrome overlap into other areas, which are sometimes also given labels. Table 1.8 gives examples of particular SENs that are described and recognized in literature and in educational contexts.

While it is clear that the descriptions in the table refer to SENs in their own right, you can see that some dyslexics do show some of these features. It is almost a truism to say that dyslexic children have difficulties with tables and certainly problems with arithmetic (as opposed to mathematical concepts, for example) are very common to dyslexics. However, not all dyslexics, by any means, have what one might describe as dyscalculia. Indeed, some teachers find the concept of dyscalculia rather daunting in the implication that the child will never learn to do arithmetic – rather like some of the objections to the term 'word blind' in the past.

In relation to dyspraxia, some, but not all, dyslexics do also have difficulties with fine motor control and can be clumsy. As you will see in later chapters, there is a specific theory of dyslexia relating to cerebellum function, which does argue that most dyslexics' difficulties have their origins in motor development function. I certainly do not have any concerns about describing both 'dyscalculia' or

Table 1.8 Summary description of special educational need categories overlapping with dyslexia.

Dyscalculia

This can describe a discrepancy between a person's cognitive ability and maths ability, rather like dyslexia and literacy or a total inability to process abstract concepts and numbers.

Dyscalculia can include difficulties in learning to count by rote, poor mental maths, sometimes problems with remembering concepts, rules and formulae, problems with time and sequence and sometimes poor sense of direction and difficulty with layouts, as well as, of course, with basic mathematical computational difficulties.

Dyspraxia

This is sometimes known as developmental coordination disorder. This is a weakness in motor functions. It can affect speech and language as in verbal dyspraxia, where words are formed poorly with the mouth. It could also be in gross motor movements, such as walking, balance or gym. It can be in fine motor movements, such as writing or tying laces. In addition, there can be problems in visual perceptual difficulties such as jigsaws, spatial concepts, getting dressed and in other gross motor aspects of games.

Attention deficit hyperactivity disorder (ADHD)

This includes attention deficit disorder (ADD) and ADHD. It is important to distinguish the two in a practical situation. The former is being easily distracted and forgetful, often difficulties in following instructions and sticking to an activity, whereas ADHD will also include being restless, not being able to sit still, interrupting others, not being able to stop talking, being impulsive and not thinking about the consequences. Other problems include the inability to wait your turn, being distracted by external stimuli, not listening or oppositional behaviour.

Asperger's syndrome

This is seen as a mild form of autistic spectrum disorder. The main characteristics are difficulties with communication, social relationships and imaginative ability. The notion is that this is a problem with taking notice of other people's reactions and being over literal in your jokes, for example. In relationships, difficulties include picking up the cues that other people do and sometimes there is a high level of skills in learning facts, but finding it hard to think in abstract ways.

Table 1.8 *Continued*

The severely autistic child really has a very large overlap with severe learning difficulties, whereas Asperger's is seen to be more of a difficulty in forming relationships and in language processing. There can be avoidance of eye contact, obsessive repetitiveness routines or preoccupations, speaking in exaggerated tones or being slightly compulsive although not necessarily all features are present.
Specific language difficulty These can include aspects of the speech apparatus such as stammering or dis-fluency, but is mainly described in terms of phonology, syntax, semantics and pragmatics. There is also a general difference between receptive or expressive language function. Each of these can be described as having a particular difficulty independent of overall intelligence. In other words, a child is not generally slow learning, but has very specific weaknesses in any of these areas. This can affect many different aspects depending on which area is weak. There might be problems in understanding sentence structure, for example, different situations, meaning or perhaps being able to understand but not being able to express your ideas very well.
Semantic pragmatic disorder Although this has some overlap with language impairment and Asperger's, it is seen to be mainly in the nonverbal communicative function of language, although some speech and language therapists prefer not to use the term. This also relates to information processing, particularly in knowing what to say and when to stop talking when the listener is not listening to you, interpreting facial expressions, difficulty in giving specific information and difficulties to do with abstract concepts.

'dyspraxia' as difficulties within the individual dyslexic child, but again, many dyslexic children do not show such problems.

I think it becomes a little more complex with the remaining descriptions given in the table. For example, as far as attention deficits are concerned, it is very difficult to sort out the chicken and the egg. For example, any of us presented with a task that we could not do, would soon begin to develop alternative behaviours in class, such as looking out of the window, not engaging as it 'is not worth

it because you cannot do it anyway' and so on. I find that many children who have a supposed severe attention or even hyperactivity difficulty soon do not display these symptoms with the right structure and support for literacy. An important observational point in the checklists used to diagnose these sorts of attention deficit conditions is not only the frequency in which the behaviours occur, but also the context in which they do so. A child who is able to focus detailed attention while doing a scientific experiment, as opposed to writing it up, does not have a primary attention deficit disorder – it is a function of the task that they are asked to do. It is unfortunate that even definitions of hyperactivity result from questionnaires that are undertaken by both teachers and parents, and behaviours in different contexts can be very different. For me, the true attention deficit disorder (ADD) or attention deficit hyperactivity disorder (ADHD) child (and in the case of the extra 'H', i.e. hyperactivity – additional impulsivity and not being able to sit still, etc.) is the inability for the child to control it and the fact that it occurs across all contexts, subjects and activities.

The other three descriptions do shade into elements of language difficulty. It is true that dyslexic children can do less well on aspects of language, particularly vocabulary development, which can be so dependent on learning to read. However, by and large, the dyslexics' difficulty focuses on the written language, albeit the phonological component; many dyslexics can have excellent verbal reasoning, comprehension or other language skills. It comes a moot point as to which is language and which is written language.

People who complain about labels of dyslexia are often, on the other hand, very happy to apply the label of Asperger's syndrome or autistic spectrum disorder (ASD), or more recently termed autistic spectrum condition on children. This seems to be used with less evidence than dyslexia, where at least you have some cognitive objective information about reading and spelling levels, and even if you do not like a discrepancy model, you can actually make some clear definitions. Autism diagnosis refers to the so-called 'triad of impairments' and can be very vague. The triad refers to (i) difficulties in social *communication* – facial expressions, jokes, literal interpretation, (ii) difficulties with social *interaction* – not recognizing others feelings, prefer to be alone, not understanding unwritten social rules, and (iii) difficulty with social *imagination* – predicting what might happen, new situations, lack of imaginative empathy.

My personal experience has found many children being labelled 'autistic' or 'Aspergers' who have come to us for an assessment or to the school, clearly have difficulties with social communication, because of their learning problems and not because of a primary communication dysfunction.

I should clarify that I am not arguing against the concept of a diagnostic category within SEN of ASD, but that one must be clear to apply careful criteria, which would include the 'triad' as well as aspects of rigidity of routines, sensory sensitivity, special interests and some times general learning difficulties. Furthermore, while aspects of dyscalculia, dyspraxia and ADD can be helped by a 'dyslexic-friendly' teaching programme, helping a genuinely autistic child requires a completely different programme.

Semantic pragmatic disorder is a label which is open to dispute. Here we have overall some generalizations about processing information, particularly as it relates to personal communication. The idea that language consists of syntax (grammar), semantics (meaning), phonology (sounds) and then additionally pragmatics, that is, the nonverbal and interactive communication aspects, is well established in language theory. On the other hand, what is one person's Asperger's syndrome or semantic pragmatic disorder, is another person's eccentric behaviour, creativeness, alternative world view or reaction to their difficulties in communicating in writing!

In summary, research shows a good deal of overlap in the so-called dyscalculia and dyspraxia among dyslexics. There are certainly language difficulties that a few dyslexic children show that shade into Asperger's, specific language difficulties and semantic pragmatic disorders, and there are also some dyslexic children who have ADHD. However, as with all ranges of learning difficulties in children, none are either mutually exclusive or all are required to be present!

A useful further review of this may be found in Brown and Rack (2004).

Written language expectations

Finally, a comment on the severity of reading, writing and spelling difficulties in children with dyslexia should be given. Going back to Table 1.3, one of the important differences between the general

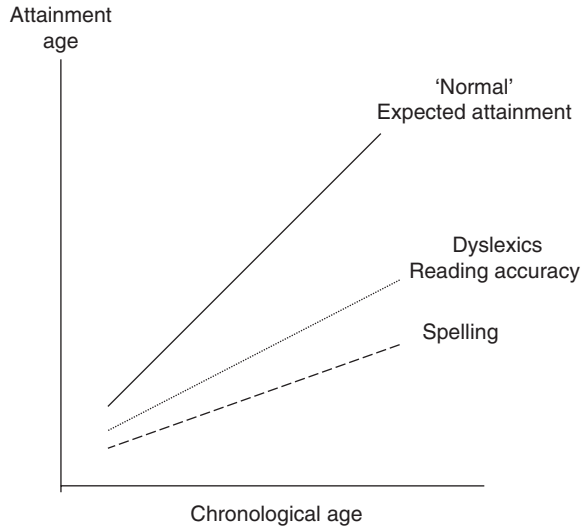

Figure 1.3 Observed attainments in dyslexic children. Normal improvement ratio = 12 months in 12 months = 12/12 = 1.0. Improvement ratio in dyslexics not receiving help: reading = 0.40 (5 months in 12); spelling = 0.27 (3 months in 12). (Data based on 500 case studies in Aston University.)

and specific retardation was the prognosis. Despite being of generally higher intelligence, children with specific learning difficulties made less progress in reading, writing and spelling in a follow-up study undertaken in the Isle of Wight. If we look at what children with dyslexia can be expected to achieve without being given help, we find something rather like Figure 1.3.

These data are taken from the University of Aston and have been presented elsewhere (Thomson, 1990), but they are essentially from a cross-sectional study, which shows children's performances seen on assessment for the first time and at various different age levels thereafter. Obviously, one would normally expect children aged 8 years to be reading at the eight-year-old level, those aged 9 to be reading at the nine-year-old level and so on, in which case, one would get a straight graph. This is, of course, on average (children and adults do vary, and what is 'normal' can be debated at length!). Children with dyslexia who are not given help make, on average, progress of 5 months in reading per year and of 3 months in spell-

ing. Thus, as they get older they get further and further behind in reading, writing and spelling. What may be a 1-year retardation at age 7 becomes one of 3 or 4 years at age 10 and of 5, 6 or 7 years at age 15. The whole notion of 'do not worry, children will grow out of it' is something we need to resist. Our task as educators is to stop that gap widening and ideally, to increase the rate of the reading and spelling improvement so that children get up to a competent standard of literacy.

Further reading

For a detailed overview of the historical context of dyslexia, see the following:

Miles, T.R. and Miles, E. (1998) *Dyslexia 100 Years On*, 2nd edn, Open University Press, Buckingham.

Pumfrey, P.D. and Reason, R. (1991) *Specific Learning Difficulties*, NFER–Nelson, Windsor.

Thomson, M.E. (1990) *Developmental Dyslexia*, 3rd edn, Whurr, London.

For a general guide including some history:

Ott, P. (2007) *Teaching Children with Dyslexia: A Practical Guide*, Routledge, Oxford.