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Cognitive and emotional aspects of language learning

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Introduction

Learning another language either in a foreign language context or in a second language environment can prove to be challenging for students with an SpLD. In this chapter we will explain how cognitive factors associated with SpLDs influence language learning, and we will also demonstrate the emotional and motivational consequences these difficulties have on language learning processes. Our discussion of the cognitive and emotional aspects of language learning mainly focuses on foreign language learners in classroom settings, but many of the theoretical considerations and research findings also apply to language learners in second language classrooms in the target language environment.

What processes are involved in language learning?

Before we discuss the language learning processes of students with an SpLD, let us see what is involved in learning a language in general. When we acquire a language, no matter whether it is another second or foreign language, we need to learn a lot of words together with their meanings, spelling (orthography) and pronunciation (phonology). We also need to be able to form phrases, clauses and sentences, and for this we need to know the rules for how words can be ordered and conjoined to make an utterance. In other

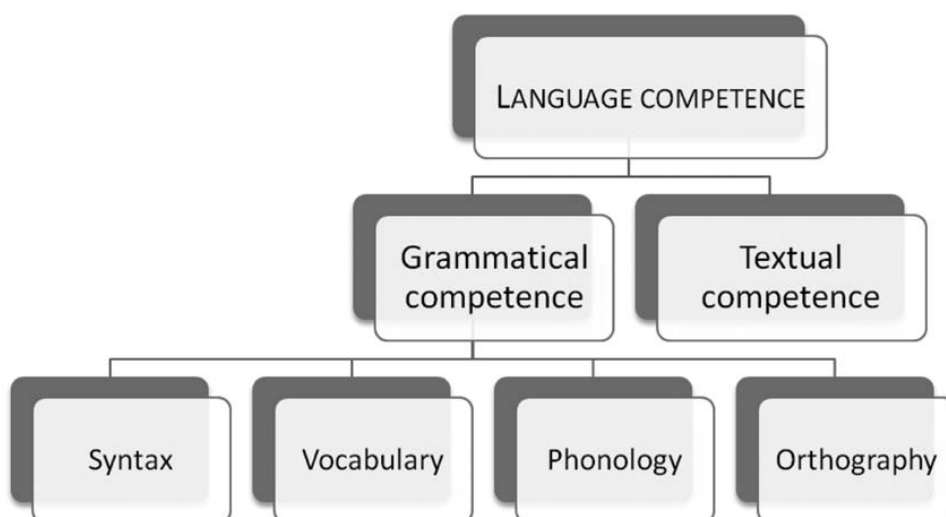


Figure 4.1 Components of language competence (based on Bachman & Palmer, 1996)

words, we have to acquire rules of syntax and morphology. Finally, we need to know how sentences are combined to form meaningful texts of different types, which helps us read and listen to longer stretches of discourse and produce texts both in writing and in speech (see Bachman & Palmer, 1996; Canale & Swain, 1980, for a more detailed discussion of these components). The graphic representation of the components of *language competence* below illustrates the most important components of language proficiency we have just listed.

Language learning, however, does not only involve the acquisition of knowledge. Speakers of the language also need to know how they can apply the knowledge they acquired because language use is a complex skill. When we read, speak, listen to others and write texts, we draw on all the types of linguistic knowledge presented above, and we use it to perform different communication tasks successfully. Therefore, it is not enough to have factual, or in other words, *declarative* knowledge of the language, but we have to be able to use this knowledge appropriately in the given context. The ability to apply knowledge is called *procedural* knowledge (for a description of how declarative knowledge becomes procedural and automatic see Chapter 2).

It is also important to note that not every type of L2 knowledge and skill is acquired through *explicit*, conscious learning. Much of L2 learning, especially in a naturalistic environment and in childhood, involves *implicit learning*. Implicit learning takes place in situations when the learner is not aware of learning, such as acquiring vocabulary through reading. The fact that students are not aware of learning does not mean, however, that implicit learning does not involve consciousness and attention. For implicit learning to take place, students need to receive a large amount of input in which they need to notice patterns of co-occurrences, from which they can draw generalizations. For example, in order to learn a new word from reading texts, students need to encounter a word several times and notice the new word and associate it with the relevant meaning based on the contexts in which it occurs (for a discussion of explicit and implicit learning in L2 learning see Hulstijn, 2003).

Cognitive abilities in language learning

Now let us consider what cognitive abilities are needed to successfully acquire all these different types of knowledge and skills. Language learning comes naturally to some people, whereas many others fail despite investing a lot of effort in studying. In layman's terms, this is called a gift for languages, but in the study of second language acquisition, the term *language aptitude* is used. Carroll, who developed the first language aptitude test, defined language aptitude as 'some characteristic of an individual which controls, at a given point of time the rate of progress that he will make subsequently in learning a foreign language' (1974, quoted by Sawyer & Ranta, 2001: 310). As the quote suggests, in Carroll's original conceptualization of aptitude, this cognitive factor was assumed to predict the rate of learning and not the actual success of second language acquisition. Carroll (1981) identified four components of language aptitude: (1) *Phonetic coding ability*, which is 'the ability to identify distinct sounds, to form association between those sounds and symbols representing them, and to retain these associations' (p.105), (2) *grammatical*

sensitivity, meaning the ability ‘to recognize the grammatical functions of words (or other linguistic entities) in sentence structures’ (p.105), (3) *rote learning ability*, which was defined as ‘the ability to learn associations between sounds and meanings rapidly and efficiently, and to retain these associations’ (p.105), and (4) *inductive language learning*, that is, the ability ‘to infer or induce the rules governing a set of language materials, given sample language materials that permit such inferences’ (p.105). Ehrman and Oxford (1995) found that among individual differences it is language aptitude that correlates most closely with foreign language performance. Moreover, Skehan (2002) also suggested that certain components of the traditional construct of aptitude such as grammatical sensitivity and deductive ability might assist L2 learning in naturalistic contexts, where learners have few opportunities to acquire L2 linguistic rules through explicit explanation, and acquisition processes tend to be mainly implicit. In sum, there seems to be evidence for the relatively strong link between language aptitude and ultimate achievement in language learning (see also Grigorenko *et al.*, 2000), and that aptitude influences the success of second language acquisition in a number of instructional settings (for a recent discussion of aptitude in language learning see Kormos & Sáfár, 2008).

Another key cognitive ability involved both in L1 and L2 acquisition is phonological short-term memory. In Chapter 2 we described the functioning of phonological short-term memory and its key role in literacy development. Phonological short-term memory is also a significant factor in L2 learning both in instructed and in naturalistic contexts. Service and her colleagues (Service, 1992; Service & Kohonen, 1995) found that the ability to repeat English-sounding pseudowords was a good predictor of English language learning success among Finnish primary school pupils during the first three years of training. Papagno and Vallar (1995) showed that phonological short-term memory and word-learning abilities are related among adults as well. In a study with university students, Speciale *et al.* (2004) also found that both phonological sequence learning and phonological short-term memory capacity contributed to the success of vocabulary learning. Phonological short-term memory not only aids the acquisition of L2 words, but also the learning of syntactic structures. Ellis (1996) argued that learning sequences of different linguistic units (such as phonemes, morphemes, words and grammatical structures) is an important aspect of second language acquisition. As phonological short-term memory is responsible for remembering sequential information, the successful acquisition of syntax is also influenced by short-term memory capacity. Furthermore, O’Brien *et al.* (2006) showed that there is a link between phonological memory and oral production skills in another language.

At the core of the above listed individual difference variables that can potentially influence the success of second language acquisition, we can find basic cognitive capacities that are also necessary to successfully acquire one’s mother tongue and literacy skills in the first language. Memory for verbal material, which is primarily associated with phonological short-term memory (see Chapter 2), helps us remember words in our first language as well as in a second language. Phonological short-term memory aids in decoding sequences of sounds and associating them with words and their meanings, which is essential in learning reading and spelling both in L1 and in L2. Verbal reasoning skills are related to grammatical sensitivity and inductive language learning ability, both of which

play an important role in the acquisition of syntax and morphology by helping students to discover rules and regularities of the language. The phonological deficit account of dyslexia argues that dyslexia is a type of learning difference, which is caused by the impairment of the speech processing system (Frith, 1985; Snowling, 2000; Stanovich, 1988; Vellutino, 1979). A number of studies (e.g. Fletcher *et al.*, 2006; Snowling, 2000) have found that students with dyslexia show problems in phoneme awareness and word-recognition and have significantly smaller ranges of vocabulary in their L1 than children with typical reading achievement. Accordingly, it is expected that students with dyslexia would score lower on tests of language aptitude than non-dyslexic students. Indeed, empirical research on the language aptitude of language learners with dyslexia also shows that these students tend to achieve consistently lower scores on all the components of tests of foreign language aptitude than those with no apparent signs of an SpLD (e.g. Downey *et al.*, 2000) (see Figure 4. 2). The phonological short-term memory capacity of students with an SpLD is also smaller than that of their peers (Fletcher *et al.*, 2006; Snowling, 2008;). As we will show below, problems with phonological short-term memory might cause difficulties in a number of areas of L2 learning.

In their Linguistic Coding Differences Hypothesis, Ganshow and her colleagues argue that ‘the primary causal factors in successful or unsuccessful FL learning are linguistic; that is, students who exhibit FL learning problems have overt or subtle L1 deficiencies that affect their learning of a foreign language’ (Ganschow *et al.*, 1998, pp. 248–9). It is widely acknowledged that linguistic skills in one’s first language provide the basic foundation for foreign language learning (Spolsky, 1989). We have to note, however, that

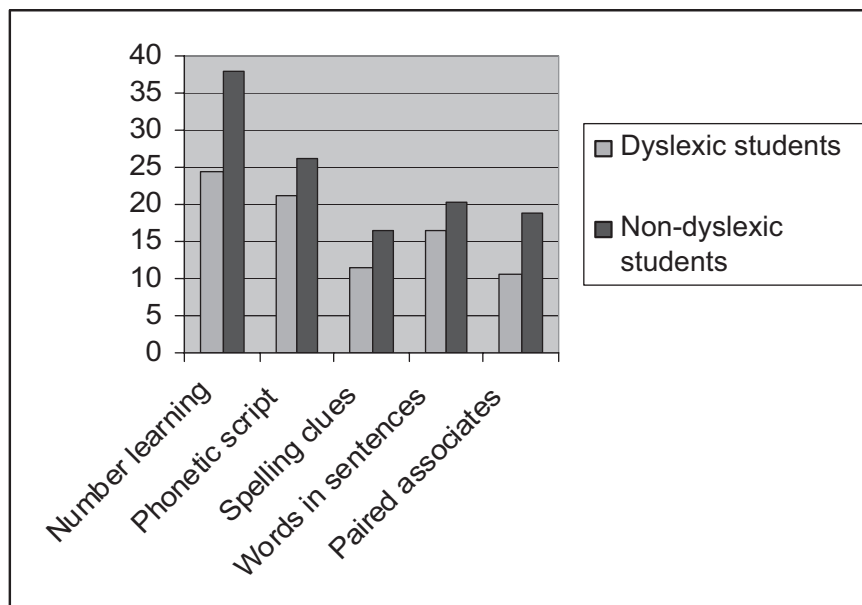


Figure 4.2 Differences between dyslexic and non-dyslexic students in the components of Modern Language Aptitude Test (Downey, Snyder and Hill, 2000)

while it is certainly true that the foreign language learning difficulties of students with an SpLD primarily stem from the different functioning of their L1 processing skills, not all unsuccessful language learners have an SpLD. Failure to acquire another language might be explained by several other reasons in the case of students with no apparent signs of SpLD, such as lack of motivation or high levels of anxiety (MacIntyre, 1995).

So far we have only discussed how dyslexia affects the cognitive abilities necessary for second language acquisition. There is very little empirical research on how students with other types of SpLD learn another language. Fletcher *et al.*'s (2004) study, however, shows that students with dyscalculia also score somewhat lower than the expected standard on tests of phoneme awareness and word-recognition. Jeffries and Everatt's (2004) research also indicates that children with different types of SpLD such as dyspraxia and ADHD might exhibit very similar cognitive profiles to children with dyslexia. Thus it can be assumed that learners with other types of SpLD might also have lower language aptitude scores and experience difficulties in language learning. In addition, children with ADHD, dyslexia and dyscalculia were found to have difficulties in sustaining attention (Fletcher *et al.*, 2006; Snowling, 2008). As described above, attention is key to both explicit and implicit language learning; therefore the reduced attentional capacities of these students are expected to influence the success of second language acquisition, which has important implications for language teaching and assessment (see Chapters 7 and 8). Finally, we also have to consider that different types of SpLDs often occur in combination and have different degrees of severity, which can result in varying levels of cognitive abilities underlying L2 learning.

Affective factors in language learning

In addition to cognitive abilities, affective factors also play an important role in second language acquisition. Motivation, language learning anxiety and self-confidence are generally listed among affective factors that might potentially influence language learning outcomes. 'Motivation explains why people decide to do something, how hard they are going to pursue it and how long they are willing to sustain the activity' (Dörnyei, 2001: 7). The acquisition of a complex skill such as mastering another language is hardly possible without sustained effort and persistence, as well as strong goals. As a consequence, motivation has a significant effect on attainment in language learning (for a review see Dörnyei, 2005). Languagelearning anxiety is usually defined as 'a distinct complex of self-perceptions, beliefs, feelings, and behaviours arising from the uniqueness of the language learning process' in the classroom (Horwitz *et al.*, 1986: 128). In other words, languagelearning anxiety is situation-specific and occurs in classroom language learning contexts. Anxiety has significant effects on cognition. Due to worry and intrusive thoughts, the working memory capacity of anxious students is reduced, which can slow down the processing of input and the production of output as well as increase the error-rate in these processes (Eysenck & Calvo, 1992; MacIntyre & Gardner, 1994; Tobias & Everson, 1997). Anxiety might also hinder the encoding of new information in long-term memory. Self-confidence may be defined here as one's perception of the chances of succeeding in learning another language. Without a positive appreciation of one's abilities and chances of success, effective learning is unlikely to happen (Bandura, 1986).

Students with an SpLD, especially those with dyslexia, frequently experience failures in language learning, and hence are at a risk of losing their motivation to learn foreign languages (Kormos & Csizér, 2010; Csizér *et al.*, 2010; Kormos & Kontra, 2008), develop symptoms of foreign language anxiety (Piechurska-Kuciel, 2008; Sparks & Ganschow, 1991) and have low self-esteem and self-confidence (Crombie, 2000). In a recent questionnaire survey conducted with Hungarian dyslexic learners of English and German, Kormos and Csizér (2010) found that dyslexic language learners displayed significantly less positive motivational characteristics than their non-dyslexic peers. They argued that, 'language learners with dyslexia might easily get caught in a vicious circle because due to their problems in language learning, they lose their motivation, which then might lead to experiencing further failures' (p.247). The findings of the study also indicated that dyslexic students have a negative self-concept in the academic domain of language learning. Kormos *et al.* (2009) also conducted interviews with dyslexic language learners to examine their motivational characteristics. The interviews revealed that the motivation and language learning attitude of students with dyslexia were influenced by the instructional setting. The teachers' general in-class behaviour, method of instruction and attitude to dyslexia were found to have an important effect on the students' language learning attitudes and the effort they were willing to invest in language learning. These findings point to the high importance of instructional factors in creating favourable motivational conditions for students with an SpLD in learning foreign languages. This conclusion pertaining to language learning is also supported by Burden and Burdett's (2005) study in the general academic domain. In their research they convincingly demonstrated the positive effect of a supportive and dyslexia-friendly learning environment on learners' academic self-concept and self-efficacy.

An SpLD is often the cause of students' anxiety in academic contexts and in their private lives (McNulty, 2003; Riddick *et al.*, 1999). Piechurska-Kuciel (2008) investigated the language learning anxiety of dyslexic students in a Polish secondary school context and found that dyslexic students displayed significantly higher levels of anxiety throughout their language learning career than their non-dyslexic peers. The cognitive effects of anxiety might further aggravate the language learning difficulties of students with dyslexia. Moreover, due to the anxiety factors associated with foreign language classrooms, when having the choice, students with an SpLD might decide to opt out of language learning.

An overview of the language learning difficulties of students with a SpLD

As shown above, among the different types of SpLDs, it is dyslexic tendencies that cause the most serious problems in language learning because of the association with reduced phonological short-term memory capacity, slow and inaccurate word-recognition skills and

difficulties with phoneme awareness. These are key abilities in the successful acquisition of another language regardless of the environment in which the language is learnt. Dyslexic students, however, can show great differences in their phonological short-term memory and phonological processing skills. The fact that dyslexic students have different ability profiles is also reflected in their achievement in language learning. In a study conducted in Norway, Helland and Kaasa (2005) found that dyslexic children with good auditory processing skills performed worse only in tests of L2 spelling, grammar and word reading, whereas dyslexic participants with poor speech perception abilities scored lower on all the components of the test including L2 listening, speaking, vocabulary, grammar and sentence reading. This shows that dyslexic language learners cannot be regarded as a homogeneous group of students, and their individual cognitive profiles have to be considered carefully in instructional programmes and in assessment practices.

Among the other types of SpLDs, it is only ADHD that has been researched in the field of L2 learning. Sparks *et al.* (2005) found that if ADHD was not associated with dyslexia, students in US colleges with attention deficit performed just as well in language learning as their peers with no apparent signs of ADHD. Therefore, it would seem that ADHD alone has little effect on the success of second language acquisition. We have to note, however, that in the case of younger children with ADHD, reduced attentional capacities might have a more significant impact on how much attention they can devote to various aspects of the linguistic input, and these students might experience problems in language learning. An additional factor to consider with regard to Sparks *et al.*'s (2005) research is that many students with ADHD do not succeed in academic performance and do not receive college and university education. Thus, it might not be possible to generalize Sparks *et al.*'s findings to adult language learners outside university settings, whose attainment in learning another language might be negatively influenced by reduced attentional capacities.

Unfortunately, to our knowledge there is no research to date on the influence of dyspraxia and dyscalculia on L2 learning. However, as pointed out above, the high co-occurrence of dyslexia with dyscalculia means that learners with dyscalculia might also have problems with phoneme awareness, word recognition and sustained attention (see also Chapter 3), which might negatively influence the success of second language acquisition. Additionally, they might find it challenging to express number and quantity concepts and dates and, due to their sequencing difficulties, to understand and apply word-order rules. Dyspraxia commonly co-occurs with dyslexia; hence it is often difficult to separate the effects of these learning differences. It can be hypothesized that dyspraxia might cause problems in acquiring spelling and writing skills in another language and in learning how to articulate sounds particular to the L2.

An important question with regard to the general language learning processes of students with an SpLD concerns the extent to which difficulties in a first language that uses a different orthography are manifested in learning another language. It seems that because dyslexia is primarily associated with difficulties in phonological processing, the script system of the language does not influence whether students exhibit dyslexic problems in L2 learning. Ho and Fong (2005) provided evidence for this when they showed that

students in Hong Kong whose dyslexia manifested itself in their first language, Chinese, also had serious difficulties in acquiring English as an L2.

Certain languages might be easier to learn than others for students with an SpLD. For example, English has *non-transparent orthography*, which means that the same sound can be spelt in different ways and a letter can stand for different sounds. On the other hand, some languages, such as Italian, Spanish and Latin, have *transparent orthography*, in which one sound is usually denoted by one letter or letter combination. Based on the findings from comparative studies on reading acquisition in languages with different orthographies (e.g. Spencer & Hanley, 2003), languages with transparent orthography might prove easier to learn for students with an SpLD as reading and spelling cause fewer problems. To date, however, no studies have been conducted that have systematically investigated the difficulty involved in acquiring foreign/second languages with different orthographic systems (see Ziegler and Goswami (2006) on the discussion of the acquisition of reading skills in different L1s). Nevertheless, it is to be noted that although the nature of the orthographic system of the language is an important factor in making recommendations about foreign language learning, students' motivation should also be considered. Kormos and Csizér (2010) found that even though German seems to be an easier language to study in terms of its spelling system, Hungarian dyslexic learners were still more motivated to learn English because of its international status.

Many language teachers and education policy makers believe that students with an SpLD, especially those with dyslexia, only have difficulties in acquiring spelling and reading in another language. Helland and Kaasa's (2005) research mentioned above, however, shows that in foreign language contexts students with severe symptoms of dyslexia seriously lag behind their non-dyslexic peers in almost every component of language proficiency. Kormos and Mikó (2009) replicated Helland and Kaasa's study in Hungary and found that dyslexic students performed significantly worse in almost every component of an English as an L2 test than their non-dyslexic peers. In an interview study conducted in Hungary, Kormos and Kontra (2008) asked language teachers with a wide range of expertise in teaching students with an SpLD what difficulties they noticed their students experience in language learning. They mentioned writing and spelling with the highest frequency, but they also gave accounts of problems in acquiring reading and listening skills, vocabulary and grammatical knowledge. Kormos and Mikó (2010) interviewed Hungarian dyslexic language learners, who reported the most serious difficulties in writing and spelling and also told the researchers that they had problems with learning how to read in an L2 and remembering words and understanding grammatical rules (see Figure 4.3).

In second language learning contexts, students with an SpLD might also experience difficulties with literacy related activities such as writing, spelling and reading, and might find it challenging to acquire vocabulary and grammatical constructions both in the classroom and from naturalistic input. The acquisition of pronunciation of new sounds and syllable patterns might also pose problems for these learners, but they may not face the same type or severity of problems with listening and speaking in L2 if they have extensive exposure to the target language and have to communicate in the L2 on a daily

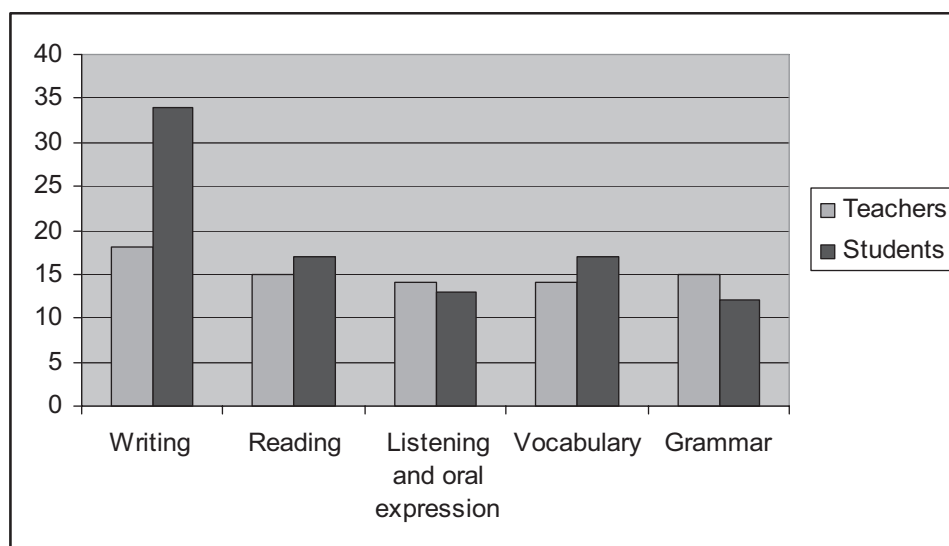


Figure 4.3 The number of times language learning difficulties were mentioned in teacher and student interviews (Kormos & Mikó, 2010)

basis (for a review see Martin, 2009). It is important to note, however, that second language learners, especially adult immigrants, can be quite isolated and might function almost exclusively in their L1 communities, in which case they share a large number of similarities with foreign language learners in their home countries.

Vocabulary learning

Learning a new word entails acquiring a number of different types of information: the knowledge of the meaning, spelling and pronunciation of the word, as well as all the grammatical information related to it (Nation, 1990). Committing words to long-term memory is often challenging for language learners even without an SpLD. For most learners with an SpLD who exhibit phonological processing problems, learning words in another language is a particularly demanding task. In acquiring L1 and L2 vocabulary, phonological short-term memory capacity plays an important role (Gathercole, *et al.*, 1997). The phonological short-term memory of learners with an SpLD, however, can process and store considerably less information than that of students with no SpLD (Jeffries & Everatt, 2004; Snowling, 2008), which impedes vocabulary acquisition. For this reason, children with an SpLD usually have smaller vocabularies in their L1 (Fletcher *et al.*, 2007) and find it especially difficult to acquire words in L2 (Service, 1992; Speciale *et al.*, 2004). In the following we will examine how these difficulties manifest themselves in learning L2 vocabulary.

In learning another language, one can acquire words in two different ways: through *intentional learning*, when the learner pays conscious attention to establishing a link between the form and meaning of words, and through *unintentional learning*, which

might take place, for example, while reading or listening to texts (Hulstijn, 1997). This latter type of learning is called *incidental learning*. Incidental learning of vocabulary, however, is very difficult for foreign learners and adult second language acquirers with an SpLD due to their phonological processing problems, which means that they have to rely on conscious and intentional learning in acquiring L2 vocabulary (Schneider & Crombie, 2003). Some research evidence also suggests that learners with an SpLD tend to have difficulties with incidental learning (for a discussion see Jeffries & Everatt, 2004). Although in instructed foreign language settings, most L2 vocabulary is learnt explicitly, incidental vocabulary learning also takes place both in and outside the classroom when students acquire words through listening or reading texts. The fact that most students with an SpLD seem to have difficulties in learning L2 vocabulary incidentally restricts their learning opportunities and makes studying L2 words an effortful process for them. Difficulties related to the reduced capacity of phonological short-term memory might also have an impact on the vocabulary acquisition of bilingual second language children and adult second language learners.

The reduced phonological short-term memory capacity of students with an SpLD also makes the memorization of the word forms in another language difficult. Several tests of dyslexia use non-word repetition tasks, that is, tasks, in which students have to repeat non-existing words after listening, as one of the diagnostic instruments to assess the presence of dyslexia (see Chapter 5). Repeating non-existent words in one's L1 is similar to trying to memorize the phonological form of a word in another language with the added difficulty that, unlike L1 non-words, L2 words do not conform to L1 phonological rules. In memorizing the phonological form of an L2 word, one has to remember the sounds that constitute it and the order in which these sounds occur. This requires the appropriate functioning of phonological short-term memory and phoneme awareness. These abilities, however, often function differently in the case of students with an SpLD, which might cause several problems for these learners. Firstly, in order to successfully encode an L2 word in memory, students need more exposure to the word than learners with no apparent SpLD, and they need frequent revision. Secondly, not only is the memorization of words a slow process for students with an SpLD, but due to their phonological processing problems, they often mix up sounds while learning the words or leave out sounds from words. The quotes below illustrate teachers' and students' views of difficulties in learning L2 words.

They do not have this net in their memory, we have to teach the words again and again because there are holes in their nets, and we have to revise the material regularly because they forget it (quote from a teacher of English in Kormos & Kontra's (2008) study, p.203).

I simply cannot learn words properly. I have tried different methods, and I just do not remember the words (quote from a dyslexic learner in Kormos & Mikó's (2010) study, p.71).

It is not enough for me to learn a word once, I have to revise words at least ten times before I can say that I really know them (quote from a dyslexic learner in Kormos & Mikó's (2010) study, p.71).

Table 4.1 Words frequently mixed up by an intermediate level dyslexic student in Sarkadi's (2008) study

Word intended	Word used
waist	wrist
caught	cough
split	spoil
protect	practice
waiter	water

An additional problem in vocabulary learning might be that, when retrieving words from their memory, learners with an SpLD might mix up similar sounding words and words with similar meanings (see Table 4.1). This stems from the problem of homogeneous inhibition, that is, the tendency to mix up similar looking, sounding and meaning items (words, letters and sounds), which was first described by the Hungarian researcher, Ranschburg (1939).

Teachers in Kormos and Kontra's (2008) interview study also noted that students with an SpLD find it more difficult to memorize abstract words than concrete nouns, and that they find it easier to learn nouns than verbs and adjectives. They also reported that, in the case of compound words, it is sometimes the case that students either remember the first or the second part of the word, but are unable to segment compound words. Learning the gender and plural form of nouns in languages such as German might also cause difficulties for students with an SpLD.

It is well documented in the field of second language acquisition research that L1 skills and knowledge are important foundations in L2 learning (Sparks and Ganschow, 1993; Spolsky, 1989). The L1 vocabularies of students with an SpLD are generally smaller than that of their peers with no apparent SpLD. Thus it is understandable that sometimes teachers working with learners with an SpLD first have to teach words in the students' L1 before the students can be expected to learn them in L2. The case study below illustrates the vocabulary learning difficulties of a dyslexic student.

Case study of dyslexic learner's vocabulary learning difficulties – Sarkadi (2008)

In her study, Sarkadi (2008) reported the vocabulary learning difficulties of a dyslexic Hungarian learner of English, called Anna, whom she had been observing as her private tutor for a number of years. The student, who could be considered a relatively successful learner, told the researcher that she did not like learning new English words and considered it a very difficult and tiring task. In the interview she reported that when studying words, she primarily concentrated on their spelling and she found it more challenging to learn the pronunciation of a word: 'I think learning the correct pronunciation is more difficult than learning the spelling. I can see the spelling in my vocabulary notebook, but I cannot see the pronunciation. If I write the pronunciation next to the word, it helps a bit' (Sarkadi, 2008: 117).

Sarkadi also noted that Anna tended to confuse similar looking and sounding words with each other. She observed that confusions were caused by both phonetic (e.g. *waist-wrist*, *caught-cough*, *split-spoil*) and semantic similarity (e.g. *bruise-sprain*). Anna often mixed up words both in speaking and in writing (e.g. she said *Practice the environment* instead of saying *Protect the environment*). Anna also reported in the interview that, 'I often forget what distinguishes *water* and *weather* and *waiter* and *weather* [...] Now I can pronounce them, and I know what they mean because I practiced them a lot. But I am not sure about their spelling' (Sarkadi, 2008: 119).

As the student's tutor, Sarkadi also observed another problem that aggravated Anna's difficulties with vocabulary acquisition. Anna sometimes misread the words she was studying and then memorized the misread versions (*electricat* for *electrician*, *preoparti* for *prepare*). Sarkadi found that this frequently happened in the case of longer words consisting of several syllables.

Acquisition of grammar

Students with an SpLD might also face challenges in acquiring and using grammatical knowledge. First of all, these learners find it difficult, even in their L1, to understand certain grammatical concepts, such as what nouns and verbs are. Therefore, especially in the case of younger learners and adult immigrants in second language settings, teachers cannot rely on students' awareness of grammatical concepts and relations in their L1 when trying to explain L2 rules. Another problem causing difficulties in L2 learning is related to the ability to remember verbal material in the order presented, which is called *serial processing*. This might explain why students with an SpLD find it demanding to learn and apply word-order rules. SpLDs are also frequently associated with difficulties in implicit learning mechanisms. Although rules and regularities in syntax and morphology are often presented explicitly in an instructed foreign language setting, L2 learners also acquire these rules implicitly through reading or listening input both inside and outside the classroom. Problems with implicit learning might thus restrict grammar learning opportunities for students with an SpLD, which can also hinder the development of accuracy in the use of linguistic constructions in naturalistic language learning contexts.

Certain languages such as German, Russian and Italian have elaborate noun suffixation and verb conjugation systems. Suffixation and conjugation require the manipulation of morphemes in the appropriate order, which might cause difficulties to students with an SpLD due to their phonological working memory capacity limitations. Table 4.2 below summarizes the difficulties students with an SpLD might have in acquiring L2 grammar.

Table 4.2 Overview of grammar learning difficulties

Understanding grammatical concepts
Acquiring word order rules
Learning suffixation and conjugation
Difficulties in acquiring rules implicitly
Difficulties in applying grammatical rules (procedural knowledge)

In Kormos and Mikó's (2010) interview study, some dyslexic foreign language learners also explained that they do not have problems understanding grammatical structures and rules, yet it causes difficulties for them to apply these rules when they have to speak or write texts. This suggests that, for students with an SpLD, it is not only challenging to learn the rules of grammar in the form of factual or declarative knowledge, but also to use this knowledge in communicative situations (procedural knowledge). This might be related to the general cognitive difficulties students with an SpLD tend to experience in acquiring procedural knowledge (Fletcher *et al.*, 2004) and in automatization (Nicolson & Fawcett, 2008).

Kormos and Mikó (2010) investigated differences between dyslexic and non-dyslexic students concerning their knowledge of grammatical structures. They found that after four years of study in primary school, Hungarian learners of English with a diagnosis of dyslexia seriously lagged behind their non-dyslexic peers in terms of grammatical knowledge. None of the dyslexic students could construct a passive sentence. Making positive statements (declaratives) was less problematic for dyslexics than forming questions and using negation (see Figure 4.4). These findings show that as syntactic structures become more complex, dyslexic students have more difficulties in learning them.

Reading in L2

Reading in another language is even more difficult and complex than reading in one's L1. Orthographic differences between the L1 and L2 might cause problems in letter recognition, insufficient knowledge of morphology and syntax might hinder word recognition, and even when words are recognized, their meaning might not be available to L2 readers (for a review see Grabe, 2009). Understanding L2 texts is hardly possible

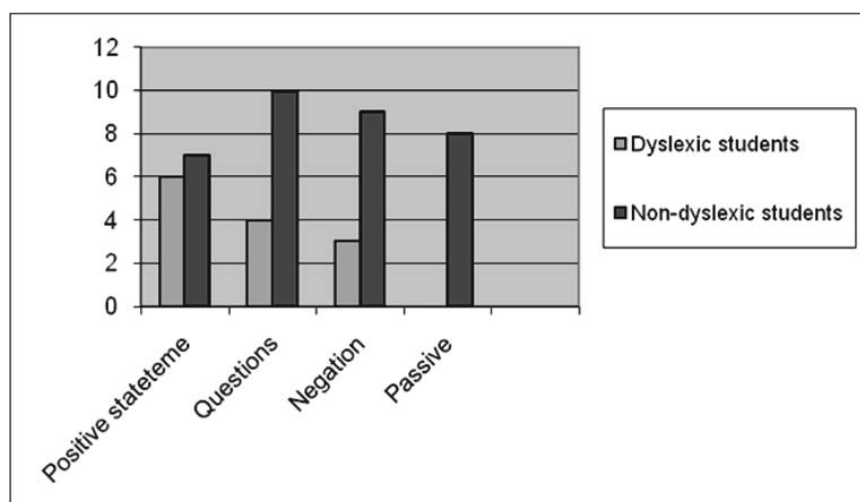


Figure 4.4 Comparison of the grammatical knowledge of dyslexic and non-dyslexic students (Kormos & Mikó, 2010)

without adequate knowledge of syntactic structures and knowledge about how cohesion is created in L2. Lack of relevant cultural background knowledge might also make interpreting L2 texts difficult. Recent research theorizing the interaction of L1 and L2 reading skills suggests that although certain lower level reading abilities get transferred from L1 to L2, sufficient knowledge of the L2 is a prerequisite for skilled L2 reading performance (Alderson, 1984; Grabe, 2009). Comparative research on monolingual and bilingual children with dyslexia indicates that phonological processing and word-naming skills seem to be very highly related in L1 and L2, and these skills indeed transfer from L1 to L2, causing reading difficulties in both languages (Geva *et al.*, 1997).

Due to the fact that the basic cognitive mechanisms involved in L1 and L2 reading are similar (Grabe, 2009) and that reading in every language, even in Chinese, requires phonological processing and phoneme awareness (Chow *et al.*, 2005), language learners with an SpLD experience similar types of reading problems in L1 and L2. The severity of the problems in L2 reading, however, might be greater than in L1.

In L2 reading, the primary source of the problems for students with an SpLD is reduced phoneme awareness and phonological short-term memory capacity. Therefore, learners with an SpLD whose phonological processing skills might be impaired have problems with establishing letter-sound correspondences in L2 reading and in recognizing the phonological form of words. If the learners' L1 is a language with a transparent orthographic system, such as Italian, reading in another language, such as English or French, can be particularly challenging for students with dyslexia. These difficulties might slow down their speed of reading and take away attentional resources from decoding the meaning of the text, and this might result in students either not recognizing the L2 word at all, or in retrieving another word instead of the intended one. The phonological short-term memory problems of learners with an SpLD might also hinder reading by limiting the number of verbal units (L2 phonemes, morphemes, words, clauses) that the learner can hold in memory while reading the text. The quote below illustrates these difficulties from a student's perspective.

I have to read a longer text several times. At least three or four times until I understand it. If there are a few words I do not know I often panic and give up on understanding the text. But usually after several attempts I manage to get the main message (quote from a dyslexic learner in Kormos & Mikó's (2010) study, p.72).

Sufficient knowledge of L2 vocabulary is of key importance for successful reading comprehension (e.g. Schoonen *et al.*, 1998; Verhoeven, 2000). As we pointed out above, learners with an SpLD tend to experience serious problems in acquiring L2 words and tend to have smaller vocabularies in L2 than their peers who have no SpLD. Thus their phonological processing difficulties do not only influence their L2 reading processes directly, but also indirectly through their vocabulary learning difficulties. In L1 reading research, Stanovich (1986, 2000) argued that L1 vocabulary and reading have a reciprocal relationship; namely, students who have larger vocabularies understand texts more easily, but also students who read more acquire more words. Consequently, students with an SpLD seem to be disadvantaged in two ways: due to their smaller vocabularies, they read

less while expending more effort than students without an SpLD, and because they read less, they have fewer chances to encounter and learn new words.

The understanding of grammatical relations among words is also necessary in L1 and L2 reading. In comprehending L2 texts, grammatical knowledge seems to play a highly important role (Alderson, 1984; van Gelderen *et al.*, 2004). Therefore the difficulties of learners with an SpLD in acquiring complex grammatical structures in L2, which we described above, can also hinder their reading processes. For example, in Kormos and Mikó's (2010) research, dyslexic students were generally successful in understanding declarative sentences, but they scored very low on comprehending questions, negations and passive structures. Table 4.3 below provides an overview of L2 reading problems of students with an SpLD.

Despite these differences, learners with an SpLD can also overcome some or even most of their reading problems if they use appropriate reading strategies. Studies about good readers indicate that they rely on metalinguistic awareness, that is, on their knowledge of how language works (for a review see Grabe, 2009). As shown above, learners with an SpLD have reduced phoneme awareness and might have problems in morphological, word level and syntactic awareness, which might prevent them from using linguistic strategies to work out the meaning of L2 texts. There are, however, higher levels of metalinguistic awareness such as the ability to reflect on the discourse and informational structure of texts, which might be more readily available for learners with an SpLD. Readers also have other strategies at their disposal to help them understand L2 texts, such as reading selectively according to goals, reading carefully in key places, monitoring comprehension, using information about text-structure and background knowledge to guide understanding, and so on (Pressley, 2006). These strategies can be taught explicitly to learners with an SpLD to help them overcome their reading comprehension problems in L2.

Writing in L2

Writing both in one's L1 and in L2 is one of the most complex literacy activities. Although writing is unique in that it requires 'language use by hand' (Berninger, 2000), it shares some underlying cognitive and linguistic processes with reading, especially in the domain of lower-order processes (Berninger *et al.*, 2002, 2006). When writing, students

Table 4.3 Overview of L2 reading difficulties

Slow reading speed
Difficulties in establishing letter-sound correspondences
Not having enough attention for decoding meaning
Inaccurate word recognition
Small L2 vocabulary
Insufficient knowledge of syntax and morphology

express their thoughts on paper, and they usually do it with the mediation of (silent) speech. In order to be able to write, one needs complex motor-coordination skills to be able to form letters. Phonemic awareness, that is, the ability to segment words into phonemes and convert them into letters, is a key ability in spelling and word writing (for a recent review see Berninger *et al.*, 2006). When learning to write, children also need to acquire morphological knowledge to help them spell the morphological variants of words. Syntactic knowledge is essential for constructing sentences from words and establishing clausal and sentence boundaries in writing. Once these lower-order writing processes are acquired, L1 writers can learn how to construct texts in different genres. Many L2 writers, especially in foreign language classrooms, bring their L1 writing experience and skills to the task of constructing L2 texts. In second language contexts, however, both younger and adult learners might lack writing experience in their L1. Furthermore, not all L1 writing skills can be transferred to L2 automatically. L2 writers might need to acquire a new script system and learn new motor-coordination skills. They also have to learn new sound-letter correspondences and phonological and morphological rules to be able to write down L2 words. Sufficient L2 vocabulary and syntactic knowledge are the prerequisites for constructing texts at and above the sentence level (for a recent review of the cognitive mechanisms involved in L2 writing, see Schoonen *et al.*, 2009). In addition to this, L2 writers need to be familiar with cohesive devices in the L2 and the culturally specific characteristics of different types of texts.

Writing is usually not constrained by time and is a recursive process in which writers plan, linguistically encode their plans and revise them cyclically (see Grabe & Kaplan, 1996). Therefore one might assume that, unlike in speech, the division of attention between different levels of writing processes is not as important as in speech. Research evidence from studies with writers with an SpLD (Geva & Ndlovu, 2008) and L2 writers (Silva, 1993), however, suggests that if writers struggle with lower-order writing processes such as spelling, the overall quality of the text will suffer and students will not be able to create elaborate and cohesive discourse. Just as in the case of other complex verbal skill performances, phonological short-term memory also plays an important role in writing by helping writers to keep pieces of verbal information (letters, morphemes, words, clauses) in working memory. As a consequence, writing cohesive texts in another language might be challenging for learners who have an SpLD associated with phonological short-term or working memory problems.

Due to their problems with phonemic awareness, learning the orthography (spelling) of words in another language is especially difficult for most learners with an SpLD. This can prove even more problematic in the case of languages such as English, which does not have a transparent orthography. Learners of English with an SpLD might find it particularly challenging to cope with the fact that, in English, specific sounds can be spelt in many different ways and letters might be pronounced differently. It might be demanding for learners with an SpLD to remember and recall letter-sound correspondences not only in L1 but also in L2. In a case study of a dyslexic language learner, Sarkadi (2008) asked her participant to list some features in English that made spelling difficult for her. The student mentioned the presence of vowel and consonant clusters in words, and explained

that in words containing vowel or consonant clusters she often leaves out or reverses letters.

I think words which contain *th* are very problematic, for everyone... I still do not really hear the difference between words that contain *th* and words that contain *t* . . . Well, I can hear the difference if I concentrate on it a lot, and someone pronounces it, but I cannot pronounce it myself, and I cannot hear the difference when I am writing (Sarkadi, 2008: 118).

The difficulties students experience in acquiring L2 spelling skills, especially in the case of English, can often be so serious that the learners might feel that their learning efforts are doomed to failure because no matter how much they learn, they still make mistakes. This might frequently happen in traditional language classrooms where there is a strong emphasis on written production, and students are mainly assessed in writing. These quotes from learners with an SpLD and their teachers illustrate how students can lose their motivation and self-confidence in language learning when their spelling difficulties are not taken into consideration, but also how students can be helped to overcome this problem.

I misspelt the words in my notebook, and I memorized the incorrectly spelt word at home. Of course I did not get the word right in the test, and this started a chain of negative reactions in me (quote from a dyslexic learner in Kormos & Mikó's (2010) study, p.73).

So if your spelling is not assessed, it will be easier for you, and you don't have butterflies in your stomach anymore that you have to get this right. Once you are relieved of this stress, you will do better. It will be much better (quote from a dyslexic language learner in Kormos *et al.*'s (2009) study, p.123.).

Just as in their first language, language learners with an SpLD often mix up and leave out letters in spelling. In addition, the frequently associated learning difference of dyspraxia can make students' handwriting difficult to read. Table 4.4 below shows some examples of how learners of English with an SpLD might spell some common words.

We have already shown that at the word level, learners with an SpLD often have spelling problems and frequently lack sufficient L2 vocabulary. At the sentence level, problems with serial processing and difficulties with grammar might hinder written expression. Due to seriality problems, students might also find it challenging to order their ideas in writing.

Table 4.4 *Example of spelling mistakes by dyslexic learners (Kormos & Mikó, unpublished data)*

Word intended	Examples of spelling by dyslexic learners
SHOULD	shut, shod, shout
MOUTH	maufe, mauf, mouns
HIGH	hy, hig
COULD	cude
BEAUTIFUL	butiful, buitful, beautyful

Students with an SpLD are frequently exempted from producing longer written texts, and writing extended texts in a foreign language might not form part of the curriculum in many countries until secondary school. Thus there is little research available on the specific writing difficulties of L2 learners with an SpLD. The only exception is Ndlovu and Geva's (2008) study, in which the authors compared the writing skills of L1 and L2 speaking children in Canada, assessed as being reading disabled or non-reading disabled. They found that regardless of language background, the students identified as being reading disabled had difficulty with spelling, punctuation and the monitoring of syntax. The results also indicated that these students struggled 'with higher level aspects of writing such as sentence structure constraints and the generation and coordination of vocabulary, as well as with aspects of the overall structure of their compositions including the ability to compose stories with interesting plots and story lines.' (p.55)

Producing and understanding oral texts

Speaking and listening abilities in L1 and L2 seem to be less affected by different types of SpLD than literacy based skills such as reading and writing. If we examine the psychological processes involved in speaking and listening, the reason for this becomes clear.

Speech production has four important components, which follow each other in this order: (1) *conceptualization*, that is, planning what one wants to say, (2) *formulation*, which includes the grammatical, lexical and phonological encoding of the message, (3) *articulation*, in other words, the production of speech sounds and (4) *self-monitoring*, which involves checking the correctness and appropriateness of the produced output (Levelt, 1989). In L1 speech production, planning the message requires attention, whereas formulation and articulation are automatic. Processing mechanisms can therefore work in parallel, which makes L1 speech generally smooth and fast. From this description of L1 speech production, it is clear that phoneme awareness is not directly involved in speech production and, because L1 speech is largely automatic, phonological short-term memory also plays a limited role in it (although, as shown in Chapter 3, dyspraxic learners might also experience difficulties in L1 speech). L2 speech production, however, requires attention in the grammatical, lexical and phonological encoding phases, and as a consequence, part of the speech output can only be processed serially. In other words, encoding mechanisms are only partially automatic even in the case of advanced L2 learners. Hence attentional resources play a very important role in L2 speech production because L2 speakers have to pay attention to the content of the message as well as to selecting the right words, formulating correct grammatical units and phonologically encoding the utterance (Kormos, 2006). In L2 speech, different units of verbal material have to be kept in working memory to be able to create a sentence, as a consequence of which phonological short-term memory capacity also influences the quality of speech output in L2 (O'Brien *et al.*, 2006).

SpLDs that are associated with reduced attention span and phonological short-term memory capacity might cause difficulties in producing L2 speech. L2 speech production also requires sufficient levels of lexical and grammatical competence and not only in the

form of declarative knowledge, but also as procedural knowledge, because if the learners cannot access and use their knowledge in real-time, communication cannot be successful. Therefore the fact that students with an SpLD might have a narrow range of vocabulary and restricted knowledge of grammatical structures in L2 might cause speech production problems. Additionally, problems in proceduralizing knowledge, which are also frequently associated with SpLDs, might hinder fluent expression in L2 speech. Further difficulties in oral interaction can be caused by learners' problems in understanding and applying social conventions of language use in the L2, which is often characteristic of students with Asperger's syndrome (see Chapter 3).

Understanding speech is a complex interactive process, in the course of which listeners attend to the acoustic sound signals and associate them with the abstract representations of speech sounds, that is, phonemes. Having identified a string of phonemes, listeners retrieve words and construct meaning from the utterance by analysing the grammatical relations among words, using their background and textual knowledge. In L1 speech comprehension all of these processes are automatic and run parallel. L2 comprehension is often effortful partly due to learners' difficulty in identifying phonemes in the incoming string of sounds. They can also have problems associating phoneme sequences with words and, as a consequence of their limited syntactic and textual knowledge in the L2, the students might not be able to decode the meaning of the text they have heard. As we have shown, the major underlying problem causing reading problems is associated with phoneme awareness and phonological processing skills. These phonological difficulties are also apparent in the global speech comprehension rate of children with SpLDs in their L1 (Bowers & Swanson, 1991; Wolf, 1991), and they might present additional problems in L2 listening when students have to identify phonemes in another language and associate a string of phonemes with an L2 word. Phonological short-term memory is also a key cognitive component in understanding speech because it holds different units of auditory material in working memory for further processing. The reduced phonological short-term memory capacity of students with an SpLD might also account for the fact that the learners might not be able to remember a series of verbally presented information accurately or in the appropriate order.

The nature of problems students with an SpLD experience in understanding spoken L2 texts depends on their phonological processing skills and phonological short-term memory. Some learners find it easy to comprehend orally presented information, whereas others struggle with processing L2 listening texts because they perceive them to be too fast. Research evidence also suggests that students with an SpLD have varying degrees of difficulty with producing and understanding L2 speech. Learners with an SpLD who show smaller degrees of phonological processing problems and no associated auditory processing difficulties may not exhibit problems in speaking and listening in L2 (Helland & Kaasa, 2005). Those students who have serious difficulties in speech perception, however, might find it challenging to understand longer spoken texts and speak in an L2. In Kormos and Kontra's (2008) study, teachers' views also varied as regards the students' problems in producing continuous stretches of oral discourse. One of the German teachers interviewed said that her learners could only speak by using given sentence

frames, whereas other teachers remarked that some of their students could express themselves fluently but with a large number of mistakes. Other teachers noted that they had students with an SpLD who could not express themselves in long sentences, and that there were learners who were unwilling to say anything in a language class.

In an interview study by Kormos and Mikó (2010), some dyslexic students also reported that they can express themselves easily and successfully in English, whereas others said that they find speaking in another language challenging. One of the students explained that she finds it demanding to recall the appropriate words under the time pressure of oral communication, which indicates difficulties with word retrieval from memory. Another participant noted that, when constructing sentences in speaking, she cannot put words in the right order, a problem that stems from the difficulty, often associated with SpLDs, of activating and using verbal information in the required sequence (Fletcher *et al.*, 2007).

Towards success in language learning

In this chapter we have summarized how the cognitive and affective correlates of SpLDs might affect the success of second language acquisition. The readers were presented with difficulties in all major areas of language learning and, having read this chapter, they might think that the language learning efforts of students with an SpLD are doomed to failure. Although we must not underestimate the difficulties involved in learning another language, we have to note that a large number of students with an SpLD become competent L2 users. In our view, three factors are essential for the successful attainment of L2 skills. First of all, learners need a supportive classroom environment in which the teaching and assessment methods are adapted to their needs (see Chapters 6, 7 and 8). Second, students themselves must be aware that they can only overcome their difficulties if they invest sufficient energy and effort into the process of language learning. In many cases, the level of effort and persistence needs to be higher than for students with no SpLD in order to compensate for the differential functioning of cognitive abilities needed for language learning. Finally, the notion of success might need to be reconsidered in the case of learners with an SpLD, and realistic educational objectives in language learning have to be established for these students. For example, depending on the academic context, these learners might not need to attain high levels of writing skills in L2 but can be expected to communicate successfully in speech. The following chapters of the book will outline general principles and specific methods in order to ensure that language learners with an SpLD are not left behind and are ensured appropriate opportunities in language learning.

Summary of key points

- Phonological short-term memory, phonemic awareness and verbal reasoning skills are key cognitive abilities for the successful acquisition of both L1 literacy skills and L2 competence. These abilities, however, often function differently in the case of students with an SpLD.
- Attention to linguistic input and for monitoring output is very important in L2 learning. Students with an SpLD often have problems with sustained attention, which might hinder the noticing of new linguistic information in the input.
- Dyslexic tendencies cause the most serious problems in language learning because many dyslexic students have phonological processing difficulties.
- Students with an SpLD have different ability profiles, and hence have varying degrees of difficulties in language learning.
- Languages with transparent orthography might be easier to learn for students with an SpLD, but in the selection of foreign language motivational factors also need to be considered.
- Language learners with an SpLD might have difficulties in acquiring various aspects of an L2, not just spelling and reading.
- The memorization of words is difficult for learners with an SpLD, and they need repeated encounters with words and conscious effort to successfully encode them in memory. Students with an SpLD frequently mix up similar sounding words and words with similar meaning.
- Learners with an SpLD find it difficult to understand grammatical concepts. Due to their problems in serial processing, these students tend to have difficulties in learning and applying word-order rules. For learners with an SpLD it is not only challenging to understand the rules of grammar but also to apply this knowledge in communicative situations.
- The reading speed of learners with an SpLD tends to be slow and they frequently experience word recognition problems in L2. Lack of automaticity in low level reading processes, insufficient vocabulary and grammatical knowledge also hinder text comprehension.
- Learners with an SpLD find it demanding to produce longer written texts in L2 because of their spelling problems and lack of sufficient L2 vocabulary. Due to their difficulties with serial processing, they have problems in ordering their ideas and applying word order rules.
- Learners with an SpLD whose auditory processing skills are not affected seem to have fewer problems in speaking and listening in L2. Students with speech perception problems, however, find it challenging to understand longer spoken texts and speak in an L2.

Activities

1. Interview a student with an SpLD about his/her language learning experiences, difficulties and the strategies applied to overcome the difficulties.
2. Collect a piece of writing from a learner with an SpLD and one with no apparent SpLD on the same topic. Compare the type and frequency of errors in the students' compositions.
3. Ask a learner with an SpLD to read aloud a shorttext in L2. Make a note of the inaccuracies in reading. Check the comprehension of the text with a few questions. Observe how the difficulties associated with SpLDs might influence the L2 reading process in terms of low level reading skills and high level text comprehension.
4. Prepare a brief information sheet for language teaching colleagues on the most important difficulties learners with an SpLD might experience in the classroom.
5. Interview a language teacher working with students with SpLDs. Ask him/her about what difficulties s/he perceives that students with SpLDs experience in language learning.
6. Interview a parent who has a child with SpLDs. What difficulties does the parent notice that the child is having in learning another language? How does the parent try to help to overcome these difficulties?

Further reading

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