

The effects of specific learning difficulties on processes of multilingual language development

Judit Kormos, Lancaster University

This paper reviews current research findings on how specific learning difficulties (SLDs) impact on the processes of multilingual language development. The review includes studies of young language learners in instructed classroom settings as well as of multilingual children in second language contexts. The paper starts with a definition of the concepts of disability and SLDs. Next, it discusses the interaction of cognitive factors with L1 and L2 literacy development and L2 learning. The paper also outlines possible ways in which SLDs can be identified in different L2 learning contexts. A detailed analysis of how cognitive factors influence the development of second language skills of young learners with learning difficulties is given in the last part of the paper.

Introduction

In many contexts, communication skills in an additional language are just as essential as literacy and numeracy skills. Individual differences that impact on second language (L2) development have been widely researched within the field of second language acquisition, but, until recently, the language learning processes of students with additional needs have received little attention (see e.g. Kormos & Kontra, 2008; Kormos & Smith, 2012; Kormos, 2017). SLDs not only influence the development of oral and literacy skills in children's first language (L1), but also have a great impact on the processes of L2 learning. Therefore, in order to ensure fair and equal opportunities in education for these learners, there is a growing need for research on how children with SLDs develop their L2 skills. Without an appropriate understanding of how children with SLDs acquire an additional language, it is impossible to

design effective instructional programs. Furthermore, there is also an acute need to develop valid and reliable tools to assess SLDs in multilingual children so that their early language and literacy development can be enhanced. In this review, I will first define the concepts of disability and SLDs. Next, I will discuss how cognitive factors interact with L1 and L2 literacy development and L2 learning and possible ways in which SLDs can be identified in different L2 learning contexts. Finally, I will describe how SLDs influence the processes of learning additional languages.

Definitions of disability and specific learning difficulties

Although in this article I use the term “specific learning difficulties,” from legal and educational perspectives, SLDs constitute a type of disability. How we describe and label disabilities and the terminology we use do not only reflect how we think about them; they also influence our relationships with and behaviors towards people with disabilities. *Deficit models* of disabilities consider disabilities as deficiencies and a series of barriers in individuals’ lives. The educational consequence of such models is that the main focus of provision is on meeting children’s individuals needs (Thomas & Loxley, 2007) and little attention is paid to how the children’s environment itself creates barriers to successful learning. The *interactional view of disabilities* (Frederickson & Cline, 2002; Norwich, 2009) highlights that disabilities hinder full participation in society because individuals’ impairments interact with barriers in the environment. Taking this perspective can allow second language researchers not only to describe the strengths and weaknesses of young language learners and multilinguals who have SLDs, but also investigate the intricate interactions between individuals and their contexts.

The labels used to describe SLDs vary greatly across contexts, and even within contexts, depending on whether SLDs are studied in psychology or education. In the 5th

Edition of the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (DSM-5, APA, 2013) the label *specific learning disorder* is used. In psychological research and legislation in Canada, Australia and the United Kingdom, the terms *learning disability* and *learning difficulty* are in use. The labels *learning disorder* and *learning disability* are appropriate within biological, medical and psychological frameworks where researchers aim to uncover the exact nature and cause of SLDs. In the field of education in the United Kingdom, individuals are often described as having *specific learning differences*, which reflects the view that if institutions meet the differing needs of students, these learning differences will lose their relevance.¹ I would argue that the term *learning difficulty* reflects an interactionist position and might serve our field best as we want to understand how individual children's characteristics and barriers in the educational system jointly influence processes of multilingual language development.

SLDs can be defined and characterized in multiple ways depending on the specific field of research and whether one aims to describe them on the biological, cognitive, behavioral, or environmental levels (for a detailed review see Kormos, 2017). For the purposes of this paper, I will adapt the definition of DSM-5 (APA, 2013) because it is the most recent conceptualization and the best empirically grounded. The novelty of characterizing SLDs in DSM-5 is that it groups various sub-types of SLDs, such as dyslexia and dyscalculia (mathematics disability), under a joint umbrella term of SLDs. This acknowledges the large overlap between these types of learning difficulties. Yet it also creates sub-categories of SLDs, two of which are particularly relevant for multilingual children: "specific learning disorder in reading" and "specific learning disorder in written expression." Within SLD in reading, DSM-5 distinguishes word-level decoding problems (dyslexia) and higher-level text comprehension problems (specific reading comprehension impairment (Cain, Oakhill & Bryant, 2004)). SLD in writing comprises problems with

spelling, punctuation and grammatical accuracy, and clarity and organization of written expression. Due to limitations in length and the fact that most previous research has investigated reading-related SLDs, these types of SLDs will be my primary focus in this article.

The definition of SLDs in DSM-5 (APA, 2013) is based on the *processing strengths and weaknesses* framework (Hale et al., 2010), which emphasises uncovering specific problems that cause difficulties in learning. As its name suggests, the framework recognizes that individuals have various strengths and weaknesses and it advocates that interventions are matched to individual profiles. In the case of SLDs, the manual highlights underlying weaknesses in the areas of working memory, executive functioning (planning, organizing, strategizing and paying attention), processing speed, and phonological processing. The diagnostic criteria stipulate that observable difficulties in learning need to be present for at least six months despite targeted intervention. Importantly, the criteria also state that difficulties in academic performance might not always be observable in early school years and might become apparent in later years when academic demands become higher. As with any manual aiming to facilitate diagnosis, DSM-5 states that “affected academic skills are substantially and quantifiably below those expected for the individual’s chronological age” (APA, 2013, p. 67).

Inter-relationship of cognitive factors in L1 and L2 literacy development and L2 learning

The study of SLDs in the field of second language acquisition is important not only because a large proportion of multilingual children exhibit signs of SLDs, but also because through research on SLDs, we can gain important insights into cognitive factors that can influence development in additional languages. Evidence accumulated over the past 25 years

seems to lend support to Geva and Ryan's (1993) *common underlying processes* framework, which claims that a key set of individual difference variables are responsible for predicting reading development in monolingual and multilingual children (for a review see Geva & Wiener, 2014). In similar vein, Sparks and Ganschow's (1993) Linguistic Coding Differences Hypothesis argues that the fundamental cognitive reasons for low achievement in additional languages are very similar to those that explain literacy-related difficulties in L1. The similarity of predictors of L1 and L2 reading outcomes and the strong link between L1 and L2 reading abilities can also be explained with reference to universalist accounts of reading (Perfetti & Harris, 2013). Although languages differ according to their scripts and the transparency of their orthographic systems - in other words, in how complex or simple sound-letter associations are - Perfetti, Zhang and Berent (1992) argue that phonological processing plays a central role in reading in all languages. Therefore, there seems to be key set of universal factors that influence the development of language and literacy skills in monolingual and multilingual children.

One of the most well-established hypotheses for the causes of reading difficulties in L1 is the Phonological Deficit Hypothesis (Stanovich, 1988; Vellutino, 1979), which attributes a central role to phonological processing problems, more specifically to impaired phonological awareness. Difficulties with phonological awareness can manifest at the level of syllabic knowledge (the ability to identify and manipulate syllables) and phonemic knowledge (the ability to divide words into sounds, and differentiate and manipulate sounds).

Although phonological processing skills explain substantial variance in word-level decoding, there are other factors such as processing speed, working memory capacity, attention control and ability to infer meaning that contribute to efficient word reading and to more complex higher-order reading processes. One of these additional cognitive determinants of reading outcomes is naming speed (Lovett, Steinbach & Frijters, 2000; Wolf & Bowers,

1999). Word-naming speed is a reflection of individuals' ability to access, activate, and phonologically encode appropriate lexical representations under time pressure. In order to execute these processes efficiently, one needs high processing speed and well-developed phonological and semantic lexical representations of words in the mental lexicon (Perfetti, 2007). Despite the central role of naming-speed measures in L1 literacy research (for a review see Kirby, Georgiou, Martinussen & Parrila, 2010), their role in L2 reading is rarely investigated in the field of second language acquisition. Notable exceptions are two recent studies in which rapid automated naming (RAN) has been found to be a strong predictor of writing performance in young Finnish learners of English (Olkkonen, 2013) and Canadian English L2 speaking children (Harrison et al., 2016).

Another underlying cognitive ability that can influence word-decoding, and more importantly, higher-order reading comprehension in mono- and multilingual children, is working memory ability, which includes both storage and processing capacity in short-term memory (Gathercole & Baddeley, 1993). Working memory assists in keeping read information active, updating it with additional information, monitoring the comprehension of information and drawing inferences based on background knowledge (Cain et al., 2004). Additionally, efficient control of attentional resources is also needed for monitoring comprehension, focusing on main ideas and ignoring distractions. For this reason, central executive processes that regulate attentional resources and inhibit irrelevant information are also associated with reading outcomes (for a review see Kendeou, van den Broek, Helder & Karlsson, 2014). Linck, Osthus, Koeth and Bunting's (2014) meta-analysis indicates that verbal working memory and executive control have a strong relationship with L2 production and comprehension.

While the role of working memory capacity and executive control in reading comprehension is relatively stable across the lifespan and in different languages, the

importance of two language-related abilities, phonological awareness and rapid automated naming, varies in different languages and depends on the age of children. Phonemic awareness, i.e. the ability to manipulate sounds, has been found to be a reliable predictor of word-level reading skills and dyslexia across a wide range of Indo-European and Finno-Ugric languages (e.g. Ziegler et al., 2010), Chinese (e.g. Wang et al., 2012), Arabic and Hebrew (e.g. Abu-Rabia, Share & Mansour, 2003). Phonemic awareness, however, often becomes a less reliable or secondary predictor of word reading as children's reading skills develop, especially in transparent orthographies, i.e. in languages with relatively simple letter-sound correspondences (Landerl et al., 2013). As children learn to read words more accurately, slow RAN can serve as a better indicator of reading difficulties than phonological awareness (Landerl & Wimmer, 2008). In some languages, an additional language-related ability, morphological awareness, i.e. the ability to recognise, understand use of parts of words that carry meaning, also influences word-level reading skills. Morphological awareness has been found to be a relevant predictor of dyslexia in Chinese (Chung & Ho, 2009), Arabic (Saeigh-Haddad & Geva, 2008) and Hebrew (Ravid & Malenky, 2001).

As can be seen in the above overview, there is a large overlap among the basic cognitive factors that account for variations in L1 and L2 language and literacy outcomes. It is also widely known that L1 skills serve as important foundations for L2 development (Dufva & Voeten, 1999; Koda, 2007). The question is then to what extent L1 and L2 learning difficulties overlap. Accumulating evidence seems to suggest that children with SLDs tend to experience difficulties in learning additional languages in instructed classroom and immersion contexts and in developing L2 literacy skills in ESL contexts (see the discussion below).

Nevertheless, there is conflicting support for the assumption that at-risk or struggling L2 learners and readers also have difficulties in their L1 in college-aged populations (see e.g.

Sparks, Javorsky, Ganschow, Pohlman & Patton, 1992; Sparks, Artzer, Patton, et al., 1998). As regards children, Alderson, Haapakangas, Huhta, Nieminen, and Ullakonoja (2015) found that 15 per cent of weak readers in English as an additional language were actually strong readers in their L1 Finnish in Grade 4 (aged 11). While none of the weak readers in Grade 8 (aged 15) were strong in Finnish reading, almost half of the students who scored low in L2 reading were in the medium range in both age groups. The L1 cognitive tasks that differentiated low and high English L2 reading ability groups were RAN in Grades 4 and 8 and word-list reading and non-word repetition in Grade 4. Ferrari and Palladino's (2007) research with Italian children aged 13 also suggests that L1 reading skills might not fully explain L2 performance in instructed classroom contexts. In the first phase of their study, low- and high-achieving English language learners did not differ significantly in L1 reading speed and accuracy, and students at risk of L2 learning difficulties did not meet the diagnostic criteria for dyslexic-type reading difficulties in their L1. These students, however, exhibited severe text-level reading comprehension problems in their L1. Erdos, Genesee, Savage and Haigh's (2014) research in a Canadian immersion context, however, obtained different results from the previously described studies, where the L2 was taught as a foreign language in the classroom. Their results indicated that early measures of L1 English skills, especially tests of phonological awareness and RAN, had very high precision (75–93 per cent) in predicting word-level and text-level reading comprehension problems of children in L2 French immersion.

The above findings suggest that low-achieving L2 learners, especially in instructed foreign language learning settings, might not always be at risk of, or diagnosed as having, SLDs. There are a number of possible explanations for this. First of all, children might have developed successful meta-cognitive strategies to overcome reading comprehension difficulties in their L1, but they might not be able to transfer these strategies to L2 reading

(Alderson et al., 2015). Second, in languages that have transparent orthographies, such as Finnish and Italian, reading speed and accuracy measures in L1 might not be sensitive enough after the initial years of learning to read to detect subtle differences among children. Furthermore, Borodkin and Faust's (2014) research indicates that, in some cases, only highly specific phonological processing tests can reliably distinguish low-achieving L2 learners and those with SLDs. They conclude that "L2 learning might be more vulnerable than L1 reading acquisition to subtle L1 phonological difficulties, as it involves a unique constellation of factors that create an additional burden on the phonological system" (p. 136). It is also important to note that cut-off points in any cognitive tests below which children are diagnosed as having an SLD are always somewhat arbitrary. The cognitive abilities described above are dimensional in nature and can be placed on a continuum. Children who score closely above cut-off points might miss identification in their L1, which does not, however, exclude the possibility that their cognitive processing problems might cause difficulties in L2 development. Moreover, in addition to a direct effect, the cognitive determinants of L1 development might also influence ultimate L2 attainment indirectly through the mediation of L1 skills. One can hypothesize that there is an additive effect of reduced cognitive abilities as they impede the development of L1 skills, which can then delay and slow down processes of SLA. Finally, as a potential explanation for the lack of exact overlap between L1 and L2 learning difficulties, one should not forget that individuals' cognitive characteristics alone cannot account for second language learning outcomes because affective, social and educational factors also play an important role in L2 development.

Assessing and identifying learning difficulties in multilingual and instructed classroom contexts

A key question, particularly in multilingual education contexts, is how one can identify learning difficulties and distinguish them from lack of L2 proficiency. The issue is highly relevant for early identification of SLDs so that children do not miss out on opportunities for support and development and for avoiding that L2 learners are inaccurately diagnosed as having an SLD. The aforementioned universalist perspective advocated by Geva and Ryan (1993) argues that a core set of individual difference variables, such as phoneme awareness, RAN, working memory and self-regulatory functions, explain literacy and general language-proficiency differences among monolingual and multilingual children. Based on this perspective, the solution to the problem of identification is the application of similar diagnostic instruments to those used for monolingual populations. If tests are available in children's L1, and one can assume that this language is indeed the child's dominant home language, SLDs can be identified using these L1 tools. In this situation, L2 learning problems can be predicted, but caution needs to be taken since, as I argue above, the lack of an official diagnosis of SLDs does not exclude the possibility of having L2 learning difficulties. In multilingual contexts, however, L1 test instruments might not be available or might not even exist, and for this reason, assessment tools in L2 are frequently used.

Tests in the children's L2 might have appropriate psychometric properties, but they are usually standardized for monolingual populations. A recent meta-analysis by Melby-Lervåg and Lervåg (2014) indicates that monolingual readers score significantly higher than bi/multilingual readers on tests of reading comprehension, and monolinguals also perform better in word-level reading tests. Research evidence also suggests that children perform worse in cognitive tests when they are administered in L2 than in their L1 (e.g. Alderson et al., 2015). If identification of SLDs is carried out using the same cut-off points as for monolingual children, learning difficulties might be over-identified (Samson & Lesaux, 2009). Under-identification can also occur because teachers often assume that multilingual

children perform below norms due to underdeveloped language proficiency and do not refer them to specialists for assessment (Limbos & Geva, 2001).

A number of studies conducted in Canada indicate that for children who have had more than two years of schooling in L2, L2-based tests of phonological awareness, phonological short-term memory capacity and RAN can reliably predict word-level decoding problems, i.e. dyslexia (e.g. Geva, 2006; Geva & Yaghoub Zadeh, 2006; Lesaux & Siegel, 2003). These tests were found to be sensitive even when the children's oral language comprehension abilities in L2 were well below those of monolinguals. The findings in the UK context in research on younger children aged between 7 and 8 years by Everatt, Smythe, Adams and Ocampo (2000) and older children (aged 10-12) by Frederickson and Frith (1998) indicate the suitability of L2 assessment tools for the identification of dyslexia in multilingual children. L2 tests used in the identification of text-level reading comprehension difficulties also proved to have high predictive value in Geva and Massey-Garrison's (2013) study in a Canadian multilingual context. Their results indicated that, regardless of language status, poor comprehenders could be characterized by a smaller range of vocabulary, a lower level of syntactic processing skills, and difficulties with oral language comprehension and making inferences.

However, the issue of assessment for students who have limited proficiency in the L2 has not been resolved yet. Unfortunately, there is limited assessment research available for participants who have not had sufficient contact with the target language. In a recent project with adult learners, Elbro, Daugaard and Gellert (2012) developed an assessment tool that was not specific to any particular language and which was found to be a good predictor of dyslexic-type word reading difficulties. In this test participants are asked to learn new sound-symbol correspondences (e.g. ^□ = /d/, □ = /o/, □ = /g/) and then use this knowledge for reading two and three-letter words (e.g. □□□ = /dog/). Smith (2013) devised a similar

comprehensive instrument, but to date there is no published research with younger multilingual populations using this tool.

Another route often taken in the assessment of SLDs of L2 learners who have limited proficiency is the application of instruments in the students' L2. Several recent studies have examined how well cognitive and linguistic tests in the L2 can provide indication of word-level reading and reading comprehension difficulties of learners instructed in classroom settings. In Alderson et al.'s (2015) research, tests assessing working memory capacity, RAN, and phonological awareness, administered in English, proved to be reliable and strong predictors of reading comprehension difficulties of Finnish learners of English in both Grades 4 and 8. Erbeli and Pižorn's (2013) study with Slovenian children aged 13 also indicated that L2 assessment tools that are adapted to the students' level of proficiency can yield reliable information about reading problems in L2 English. A recent study by Bourgoin (2014) has shown that, in a French immersion context, some, but not all, assessment tests administered in L2 French, concomitantly with the start of French immersion, can predict children's word-level and reading comprehension difficulties. Tests of pseudo-word reading and French letter-naming were good indicators of L2 French reading outcomes, but phonological awareness in L2 French was not a reliable predictor in the first year of the immersion programme. Bourgoin argues that lack of proficiency in the L2 might have hindered children performing the phoneme segmentation task. Nevertheless, she concluded that "students who need additional support in learning to read in the L2 can be identified using early literacy indicators, both in their L1 (administered before L2 learning) and in their L2 (administered concurrently to L2 learning)" (p. 376).

There are several important conclusions one can draw from available research findings on the assessment of SLDs of multilingual children and language learners in instructed and immersion classroom settings. First of all, the available evidence suggests that

it is wrong to assume that the assessment of SLDs is impossible for children who are not fully proficient in the L2 (for a comprehensive discussion of this issue see Geva & Wiener, 2014). As the aforementioned studies indicate, even in the case of children who have had limited exposure to the target language in classroom settings, cognitive tests administered in the L2 can yield relevant information. Second, a combination of L1 and L2 assessment tools is recommended (see Alderson et al., 2015) in order to gain a comprehensive overview of students' difficulties. Third, more research effort should be concentrated on developing testing instruments that require children to work with linguistic material that is not specific to any particular language. The results of such tests could be normed and standardized and then be applied in contexts where cut-off points for making decisions are needed for diagnostic, pedagogic, or legislative purposes. Finally, it is important to conduct more longitudinal research on how predictors of the reading difficulties of multilingual children and language learners change with age, and with development of proficiency. Studies in the field of L1 reading suggest that in the initial stages of reading development, children rely on their word-level decoding skills to comprehend written texts. As their word-level reading skills develop and become automatic, general language comprehension abilities gain in importance (Geva & Farnia, 2012). Therefore, predictors of literacy-related difficulties of children are also likely to change. One of the few studies available to date, by Farnia and Geva (2013), suggests that L2 reading development is non-linear and, while phonological awareness, naming speed, and working memory are important early contributors to reading comprehension outcomes, when assessed in Grade 4, they no longer explain individual variations in reading comprehension outcomes. Instead, phonological short-term memory becomes a significant contributor to reading comprehension outcomes in later years.

Effects of SLDs on learning additional languages

As discussed above, children with SLDs tend to have lower working memory capacity, reduced phonological and morphological awareness, and might experience difficulties processing linguistic input and output under time pressure. Therefore, it is reasonable to assume that due to their differential cognitive functioning, they might be less efficient in developing their L2 skills. To illustrate, one important cognitive ability which is impaired in children with SLDs is working memory. Working memory abilities were traditionally assumed to be influential in explicit learning, but not in implicit and incidental learning processes (e.g. Reber, Walkenfeld & Hernstadt, 1991), which are by-products of other cognitive operations and less prone to the influence of individual differences (Unsworth & Engle, 2005). Nonetheless, recent work in the field of cognitive psychology indicates that WM operations might be involved in implicit learning processes (Hassin, Bargh, Engell & McCulloch, 2009) and children with dyslexia show reduced ability to learn new skills implicitly (Stoodley, Harrison & Stein, 2006). Research on the implicit L2 learning processes of children with SLDs is scarce. Information is only available through interviews conducted with language learners with an official diagnosis of SLD in Hungary (Kormos & Mikó, 2010). The participants in this research gave accounts of their experiences when they found it challenging to extract patterns and regularities for grammar in implicit learning conditions and they expressed a preference for explicit explanations of syntax, morphology and spelling.

SLDs also influence the processing of written and spoken input for comprehension and subsequent L2 learning. One way of accessing input for learning is through reading. As described above, reduced phonological awareness and difficulties with rapid word naming lead to L2 word-decoding problems. Difficulties in comprehending longer texts can result from either word-level reading problems or from a global language comprehension deficit (Geva & Massey-Garrison, 2013). The reduced working memory capacity of children with SLDs might

also hinder comprehension by limiting the number of verbal units (L2 phonemes, morphemes, words, clauses) they can remember while reading a text (see e.g. Abu-Rabia & Siegel, 2002). A certain level of comprehension of texts and automaticity in lower-level decoding skills is a prerequisite for L2 development through exposure. If understanding breaks down and children's attentional resources are taken up in low-level decoding, they will find it difficult to notice and understand novel grammatical constructions and lexical items in the input.

Children with SLDs have been found to experience difficulties in L2 reading in a variety of learning contexts. Both Norwegian (Helland & Kaasa, 2005) and Hungarian children with SLDs (Kormos & Mikó, 2010) performed worse on a test of L2 English word reading than their non-dyslexic peers. Hungarian children with SLDs also scored significantly lower on a sentence comprehension test than their peers matched for age (Kormos & Mikó, 2010). In a Canadian English as an additional language context, Geva, Wade-Woolley and Shany's (1993) study obtained similar results. Crombie's (1997) findings with Scottish primary and secondary schoolchildren learning French also constitute strong evidence of the L2 reading comprehension difficulties of children with SLDs. Sparks and Ganschow (2001) found that L2 word-decoding skills were often associated with L2 learning difficulties in Spanish as a foreign language in a high school context in the United States. Hungarian children with a formal diagnosis of dyslexia reported substantial difficulties with reading comprehension in either German or English as an L2. This indicates that even reading in German with its relatively transparent orthography causes challenges for language learners with SLDs.

Another important source of input for L2 development is exposure to spoken texts. The nature of challenges that children with SLDs face in comprehending orally presented information varies depending on their phonological processing skills, phonological short-term memory, and language comprehension ability. In a Canadian context, L2-speaking children who demonstrated general language comprehension difficulties performed significantly worse

in a test of listening comprehension than children who had no such difficulties and children who had word-level decoding problems, i.e. dyslexia (Geva & Massey-Garrison, 2013). Young dyslexic English language learners in Norway and Hungary also scored at similar levels to their non-dyslexic peers in a test of sentence-level listening comprehension (Helland & Kaasa, 2005; Kormos & Mikó, 2010). Crombie's (1997) study, however, revealed significant differences in listening comprehension between dyslexic and non-dyslexic Scottish schoolchildren learning French. The evidence to date seems to suggest that, in most contexts, children whose general language comprehension skills are not impaired, and who might only have word-level decoding problems, might be as successful in comprehending oral L2 texts as their peers with no SLDs. Therefore, these children might face fewer challenges in acquiring L2 knowledge incidentally through exposure to oral texts than through reading.

Children with SLDs often find it difficult to acquire new knowledge, not only incidentally, but also intentionally. To illustrate, both language learners with SLDs and their teachers report that a high number of encounters and many practice activities are needed so that they can remember new words (Sarkadi, 2008). These difficulties of learners with SLDs to commit L2 words to long-term memory are associated with their reduced phonological short-term memory capacity (Service, 1992; Service & Kohonen, 1995). Phonological short-term memory has been found to play an important role in the learning of form-meaning associations and to assist in "forming stable long-term representations of novel phonological material" (Martin & Ellis, 2012). Phonological short-term memory and working memory are also strongly related to children's ability to infer grammatical regularities and to apply these productively (Martin & Ellis, 2012), which also explains the difficulties many children with SLDs might face in the acquisition of L2 grammar. In a study with young Hungarian English language learners, Kormos and Mikó (2010) found that children who had an official diagnosis of dyslexia scored significantly below the level of their age-matched non-dyslexic peers in a

test of L2 grammatical knowledge. Their results also revealed that the gap in performance between dyslexic and non-dyslexic children widened as the grammatical constructions increased in difficulty. In a questionnaire study, Hungarian dyslexic children also reported high levels of difficulty with L2 grammar (Kormos & Mikó, 2010).

Children with SLDs do not only find it challenging to acquire L2 comprehension skills; they have also been shown to face difficulties with productive skills, especially L2 writing. Reduced working memory and phonological awareness are key cognitive characteristics that can account for the difficulties of L2 writers who have an SLD. L2 writing requires the careful orchestration of composing and linguistic encoding processes and is highly taxing on attentional and working memory resources (Schoonen, Snellings, Stevenson & van Gelderen, 2009). Research in a Canadian context confirms that children with SLDs struggle with lower-level writing processes, such as spelling, punctuation, and the monitoring of syntax (Ndlovu & Geva, 2008). Ndlovu and Geva's (2008) study also shows that these children experience difficulties "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). In another context, Crombie (1997) also found that young learners of French in Scotland who had an official diagnosis of dyslexia scored below their peers in a test of writing. A number of studies indicate that the spelling skills of young English language learners with SLDs are also below those who do not have an SLD (Helland & Kaasa, 2005; Ndlovu & Geva, 2008; Kormos & Mikó, 2010). Results from Kormos and Mikó (2010) reveal that spelling difficulties also persist among young learners of L2 German, despite the more transparent nature of the orthography of German than English.

In certain contexts, the oral L2 language production skills of children with SLDs have been found to be at the same level as their peers. In Norway, where there is abundant L2 English

exposure through various electronic media, Helland and Kaasa (2005) found that the oral performance of children with SLDs did not differ from those who had no SLDs. In Hungary (Kormos & Mikó, 2010) and Scotland (Crombie, 1997), where less input and fewer opportunities for the communicative use of target languages (English and French respectively) are available, children with SLDs had significantly lower oral performance scores than those with no SLDs. The difference between the Norwegian findings and those obtained in Hungary and Scotland might be related to the fact that Hungarian and Scottish learners had fewer opportunities to automatize speaking skills.

In addition to cognitive abilities, and often in a complex interaction with them, affective factors also exert a significant influence on the processes of second language acquisition. Motivation, language learning anxiety, self-confidence, and self-esteem are among these affective factors that are particularly relevant in relation to young learners with SLDs. As shown above, children with SLDs might have considerable difficulties in L2 learning and, consequently, their motivation might decrease (Kormos & Csizér, 2010) while their language learning anxiety might increase (Piechurska-Kuciel, 2008). In a questionnaire survey, young Hungarian learners of English and German with an official diagnosis of dyslexia reported considerably lower levels of motivation and more negative attitudes to language learning than their non-dyslexic peers (Kormos & Csizér, 2010). The results of the survey also showed that the children had a negative self-concept in the domain of language learning. In an interview study, Csizér, Kormos and Sarkadi (2010) demonstrated that the language learning motivation of students with SLDs shows large fluctuations within relatively short time intervals, due to the influence of external (e.g. peers' and teachers' classroom behavior and attitudes to SpLDs and accommodations) and internal factors (e.g. goals and effort). Their study also showed that learners' immediate environment and the instructional setting has a significant impact on

learning goals, attitudes and motivated behaviour, with teachers' general in-class behaviour, methods of instruction and attitudes toward SLDs playing a particularly strong role.

Conclusion

This paper has reviewed the current standing of research on the language learning processes of children with SLDs. The available research to date yields insights into the cognitive, motivational, and affective characteristics of the “average” L2 speaking child and the challenges they face in developing their L2 competence. However, we have limited understanding of how varied children with SLDs are and how they develop and change longitudinally. In addition, little is known about how motivational, affective and cognitive factors and instructional contexts interact with each other and influence L2 development. Further in-depth qualitative and large-scale quantitative and experimental studies could help us understand these complex interactions better. Nonetheless, there is ample evidence to be convinced that, with adequate support and in inclusive environments, children with SLDs can become successful multilingual language users and there is no reason why they should be excluded and discouraged from learning additional languages in any context (Genesee & Fortune, 2014; Kormos, 2017).

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¹ This differentiation in terminology, however, does not affect educational provision because it is regulated by the legal requirements of different countries.