Dyslexia in a Global Context: A Cross-Linguistic, Cross-Cultural Perspective

Dislexia en un contexto global: una perspectiva interlingüística e intercultural

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ABSTRACT. Dyslexia is a global issue. It encompasses a range of language and literacy cultures with many variations regarding definitions, diagnostic measures, regulations, policies, and support procedures for dyslexic students. Considerable progress has been made in the field of monolingual dyslexia, but now there is growing interest in the multilingual, multiethnic and multicultural world of dyslexia. Provision and supports are considered broader for multilingual learners than for those who are monolingual. With cross-cultural and cross-linguistic differences among students, teachers need to implement inclusive practices to ensure successful language and content learning in the classroom. Based on an extensive search of relevant literature, the purpose of this narrative review is to explore research on dyslexia from an international, cross-cultural, and cross-language perspective. The goal is also to highlight universal or unique characteristics, to emphasize the diversity of global interest, and to discuss the training needs of educators who must support culturally and linguistically diverse students with dyslexia.

Keywords (Source: Unesco Thesaurus): Dyslexia; learning disabilities; teacher training; teacher education; inclusion; international dyslexia; multilingualism; culture.

RESUMEN. La dislexia es un problema mundial que abarca una variedad de culturas de lenguaje y alfabetización con muchas variaciones en cuanto a definiciones, medidas de diagnóstico, regulaciones, políticas y procedimientos de apoyo para estudiantes disléxicos. Si bien se ha avanzado considerablemente en el campo de la dislexia monolingüe, actualmente existe un interés cada vez mayor en el mundo multilingüe, multiétnico y multicultural de la dislexia. Se considera que los suministros y soportes son más amplios para los estudiantes multilingües que para los monolingües. Con diferencias interculturales e interlingüísticas entre estudiantes, los maestros deben implementar prácticas inclusivas para garantizar el aprendizaje exitoso del idioma y el contenido en el aula. A partir de una búsqueda exhaustiva de la literatura relevante, el propósito de esta revisión narrativa es explorar la investigación sobre la dislexia desde una perspectiva internacional, intercultural e interlingüística. El objetivo también es resaltar características universales o únicas, enfatizar la diversidad de interés global y discutir las necesidades de capacitación de los educadores que deben apoyar a los estudiantes cultural y lingüísticamente diversos que sufren de dislexia.

Palabras clave (Fuente: tesauro de la Unesco): dislexia; dificultad en el aprendizaje; formación de profesores; inclusión; dislexia internacional; multilingüismo; cultura.

RESUMO. A dislexia é um problema global que abrange uma variedade de culturas linguísticas e de alfabetização, com muitas variações em termos de definições, medidas de diagnóstico, regulamentos, políticas e procedimentos de suporte para estudantes disléxicos. Embora um progresso considerável tenha sido feito no campo da dislexia monolíngue, atualmente há um interesse crescente no mundo multilíngue, multiétnico e multicultural da dislexia. Considera-se que os suprimentos e apoios são mais extensos para os estudantes multilíngues do que para os estudantes monolíngues. Com diferenças interculturais e interlinguísticas entre os alunos, os professores devem implementar práticas inclusivas para garantir o aprendizado bem-sucedido do idioma e do conteúdo da sala de aula. A partir de uma pesquisa exaustiva da literatura relevante, o objetivo desta revisão narrativa é explorar as pesquisas sobre dislexia de uma perspectiva internacional, intercultural e interlinguística. O objetivo também é destacar características universais ou únicas, enfatizar a diversidade de interesse global e discutir as necessidades de treinamento de educadores que devem apoiar os estudantes de diversidade cultural e linguística que sofrem de dislexia.

Palavras-chave (Fonte: tesauro da Unesco): dislexia; dificuldade em aprender; formação de professores; inclusão; dislexia internacional; multilinguismo; cultura.

Introduction

Dyslexia is the most common form of learning disability and perhaps the best known. It turns up in different countries and continents, different languages and cultures and affects a large number of children and adults, with widespread consequences (Dyslexia International, 2017). According to Peterson and Pennington (2012), dyslexia has been documented in every culture studied. It is accepted that there will always be individuals who somehow struggle with reading, writing, and spelling problems, despite having sound intelligence (Shaywitz & Shaywitz, 2020; Sayeski, 2019; Snowling, 2000).

Determining the interface of dyslexia, language, and culture is subject to a wide range of factors, whether linguistic, psychological, educational, social or even political (Anderson & Meier-Hedde, 2011). How dyslexia is defined varies from country to country, as regulations, diagnostic procedures, and resource structures differ. For Mortimer et al., (2012), "The involvement internationally of so many people from so many disciplines and context has encouraged the proliferation of definitions driven by differing contexts, causal theories and purposes" (p.17). This situation is further complicated on a global scale by the large contingent of multilingual immigrants within current educational systems, many of whom receive unsatisfactory support (Peer, 2016). According to the United National Educational, Scientific, and Cultural Organization (UNESCO), students with disabilities in several countries have less chance of completing school (UNESCO, 2017). Too often, support services, assessment procedures, and identification criteria are inconsistent (Kormos & Kontra, 2008). This not only applies to less developed countries but wealthy countries also, where discrepancies in support provision can deprive students with special educational needs of proper services.

Although much of what we know about dyslexia originates in English-speaking contexts, there is increasing global awareness, encompassing a range of literacy cultures and orthographies (Verhoeven et al., 2019). Cultures, languages, and scripts are all important for understanding learning difficulties (McBride, 2019).

The aim of this narrative review is to look at dyslexia through an international lens, to offer a cross-cultural and cross-linguistic per-

spective, to highlight common international concerns, and to advocate for appropriate teacher training and practice, in the language or general classroom.

Review Process

A comprehensive literature review was conducted to understand the breath of dyslexia research from an international, multilingual and multicultural perspective. This review involved an electronic search using professional databases available through a university library including ERIC, Education Full Text (EBSCO), SAGE Journals, Elsevier, Springer, ScienceDirect, and Google Scholar. These databases were searched using key search terms such as "multilingualism and dyslexia," "dyslexia and multiculturalism," "culture and dyslexia," "symptoms of dyslexia," "causes of dyslexia," "international dyslexia " "dyslexia definition," "global dyslexia," "dyslexia assessment," "dyslexia training," and "dyslexia and inclusion." Peer-reviewed articles government reports, laws and regulations, and professional organization websites and publications were also studied. Additional research articles were located from the reference lists of previously examined articles. Although the majority of cited articles were published within the past ten years, some older peer-reviewed articles and seminal publications containing relevant information were included as well.

The Dyslexia Debate

The incidence of dyslexia depends on numerous factors including the testing age, the writing system, the type and degree, and the definitional discrepancies (Brunswick, 2010). Some studies put it at 10% or less (Lyytinen et al., 2015) of any given population while the International Dyslexia Association (IDA) estimates 15-20% of the world's citizenry is affected (IDA, 2016). It is seen as the most common learning difficulty for students (Koerte et al., 2016) although there are no reliable statistics concerning how many are actually affected by dyslexia because countless cases go underdiagnosed (Kopp-Duller & Pailer-Duller, 2011).

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The term *dyslexia* can itself be rather contentious and is even avoided in some educational settings with *learning disability* or *specific learning disability* (Grunke & Cavendish, 2016) adopted instead. Some argue that *learning disability* is an unfortunate term because it implies affected individuals are unable to learn, which is simply not the case (Redford, 2017). Countries like Australia, New Zealand and the UK favor the term *specific learning difficulty*, while the interchangeable use of all these terms persists in the public domain and in research.

A number of myths have grown up around dyslexia including a misguided association with laziness or low intelligence. The reality is that dyslexics typically possess average or above-average intelligence with increasing numbers transitioning to university or college (Tops et al., 2012). What many people consider to be common indicators of dyslexia (e. g., mirror writing, letter reversals, clumsiness, creativity, or handedness) is not supported by evidence (Elliott & Grigorenko, 2014; Fletcher et al., 2011; Ritchie et al., 2013). Educators often view dyslexia as a reading disorder or disability, but the impact on writing, speaking, and spelling cannot be denied.

There is not yet a definitive answer as to the cause of dyslexia, but brain imaging techniques demonstrate that the brain is wired differently. This can result in various symptoms, such as slow speed of information processing, poor working memory, poor organizational skills, literacy impairment, poor attention span, poor auditory sequencing (Spafford & Grosser, 2005). Dyslexia is considered a neurobiological disorder and a phonological processing problem, operating on a continuum of mild, moderate or severe, and causing different degrees of impairment. The underlying cause of dyslexia in any country or language is the genetic, hereditary and neurological disposition which leads to different sensory perceptions being the culprit of dyslexia students' struggles with learning to read, spell, and write (Fostick & Reyah, 2018; Gori & Facoetti, 2014). These basic academic skills become unmanageable or less manageable tasks (Chakravarty, 2009; Press, 2010); nevertheless, the negative effects can be diluted by environmental accommodations, support networks, and effective instruction. Dyslexics can learn effectively with differentiated instruction that targets their learning needs—they just learn differently.

Definitions for dyslexia are varied. This can cause confusion when the focus is either too broad or too narrow. Native English-speaking countries especially tend to differ somewhat in the weight they attach to certain features. However, while different aspects may be emphasized and uncertainties arise in the research, there is convergence on a common understanding. For example, IDA adopts the following well-regarded definition:

> Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge. (Spafford & Grosser, 2005, p. 5)

Importantly, there has been more of a concerted effort in recent times to move away from discrepancy models. IDA, like other organizations, has published characteristics that also highlight strengths. It is important to emphasize that dyslexic individuals are often gifted and artistic, leading to significant accomplishments in arts, sports, and science. In fact, there is growing recognition that dyslexics can make a valuable contribution to the work force of the 21st century because of their unique thinking skills, and employers should be more cognizant of this (Made by Dyslexia, 2018).

International Dyslexia Research

Since the 19th century, dyslexia has been studied by researchers from different fields of study all over the world (Hinshelwood, 1895; Morgan, 1896). The term itself (originally in German *Dyslexie*, a made-up word borrowing from English *dys* ["difficult"] and Latin *legere* ["to read"]) was coined by Rudolf Berlin in 1887, who was an ophthalmologist practicing in Stuttgart, Germany (Berlin, 1887). As early as 1877, Adolf Kussmaul, a neurologist also from Germany, described cases of children attracting attention because of their lacking reading and writing abilities, which

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were seemingly unrelated to their intelligence (Kussmaul,1877). James Hinshelwood, a Scottish ophthalmologist, is known as one of the first Anglo-Saxon researchers to investigate dyslexia in detail and publish frequently on the topic (Hinshelwood, 1895, 1902). He described it as "word-blindness" because the students seemed to not "see" the words and letters correctly even though their vision was otherwise deemed fine. Samuel Orton, the pioneer of multisensory teaching, is considered to be the leading thinker on dyslexia from the early 20th century in the United States (Kirby, 2018).

In the 21st century, international dyslexia research abounds. Perhaps the current worldwide interest primarily stems from consensus in a diverse scientific community around its hereditary origins (Sharma & Sagar, 2017). Dyslexia affects multiple genes, albeit different ones depending on cultural specifics of the population under investigation (Chen et al., 2015; Shao et al., 2016a; Shao et al., 2016b). Research globally has shown dyslexia to be a cross-cultural problem across languages, alphabets, and scripts (Chen et al., 2015; Shao et al., 2016a; Shao et al., 2016b; Snowling & Melby-Lervåg, 2016; Venkatesh et al., 2013). Affected individuals have been identified no matter what language they speak or what alphabet (Greek, Latin, Cyrillic, Hebrew, Arabic, etc.) or script (Chinese, Japanese, etc.) they use (Shao et al., 2016a; Snowling & Melby-Lervåg, 2016). Institutions worldwide strive to create diagnostic tools in diverse socio-cultural environments. Nevertheless, because of unclear responsibilities and different approaches by various professionals, dyslexia research is still lacking a universally accepted explanation of a theoretical framework, parameters for the diagnosis of dyslexia, and research is producing greatly differing training approaches (Fostick & Reyah, 2018; Martin, 2013; Sigurdardottir et al., 2015; Stein, 2014).

Cultural and Linguistic Diversity

Any learning disability needs to be considered within the context of the individual's cultural world. Although dyslexia is viewed as a language-based learning disability, it has variable manifestations particular to a given culture because of different linguistic properties, with

different languages spoken and alphabets and scripts used (Verpalen & van de Vijver, 2015). Investigations into multi-cultural aspects of dyslexia show it can produce a multitude of symptoms in the various written languages. For example, variations in language pronunciation that are characteristic of the culture can create dyslexic difficulties (Orosco & O'Connor, 2013). Also, phonetic and semantic cues in verbal learning and memory can be impacted by cultural differences, which is attributed to the variation in transparency of orthographies (Asbjørnsen et el., 2014; Lyytinen et al., 2015).

Transparency

Transparency of orthographies refers to the consistency of similarities between sounds or phonemes in speech and the graphemes (letters, letter clusters) used in writing. Some alphabetic orthographies, including Finnish, German, Italian, and Spanish, Dutch, Greek, and Italian are considered transparent, orthographically-shallow languages with less deviation in their grapheme-to-sound association, so the phonetic features are more predictable (Verhoven & Perfetti, 2017). For example, in Finnish, the consistency at the grapheme-phoneme level is 100 percent (e.g., the letter *a* always represents the sound *a*) (Lyytinen et al., 2015). The more transparent a language is, the easier the language is to read and write because the letters correspond to the sounds. Assembling and manipulating letters to form the words of the language is more straightforward. These languages have simpler grammatical structures, smaller lexicons, etc. Therefore, progress in mastering literacy for fluent reading and writing is achieved more quickly (Lyytinen et al., 2015).

This is not to suggest that dyslexia does not emerge to the same extent in countries with "easier" transparent languages. It may be more easily hidden, but dyslexics still struggle with organization, concentration, short-term memory, under performance, or self-esteem. Dyslexia is also often manifested by reduced reading rate in more transparent orthographies (Suárez-Coalla & Cuetos, 2012). According to Goulandris (2003), problems in moderately transparent orthographies may arise in accuracy and lower reading speed though not to the same degree

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as in opaque orthographies. Fluency and decoding can be an issue in German given the demand on working memory.

In languages that are orthographically deep and opaque, the grapheme-to-sound correspondence is less consistent. These languages have complicated language conventions, for example grammatical genders, silent letters, lack of uniformity, complex grammar rules, which may be problematic for dyslexic learners. Difficulties with slow reading, reading accuracy, and phonemic awareness are commonly reflected in studies on these orthographies (Katzir et al., 2004; Ziegler & Goswami, 2005). Orthographic depth can also be applied to languages with non-alphabetic writing scripts such as Chinese or Hebrew which are deemed opaque. For example, the manifestation of dyslexia in Hebrew is quite similar to that in English, though comprehension may be less of an issue because less decoding time is required (Verhoven et al., 2019). The degree of consistency, opaqueness or phonological depth associated with a particular writing system determines how prevalent dyslexia is going to be (Brunswick, 2010). This makes it challenging to compare people cross-linguistically because the diagnostic methods used to diagnose dyslexia are not the same across orthographies (Landerl et al., 2013; Wydell, 2012).

Literacy & Multilingualism

The educational landscape is increasingly impacted by growing immigration and the spread of multilingualism. A requirement for literacy acquisition in multiple languages with distinct writing systems is now prevalent. Literacy acquisition in the L1 (native language) and L2 (second language) may pose considerable challenges for many students with dyslexia. Dyslexic individuals experience problems with L1 processing that vary in scope and intensity depending on the transparency of the orthographic system of a language. Such problems are mainly identified at the phonological level and manifested by poor word-level decoding and spelling. These are often coupled with difficulties in L2 literacy development. In alphabetic languages, word recognition and decoding are strongly related to phonological awareness (Duncan, 2010). The transfer

of phonological awareness across alphabetic languages is also evident (Durgunoğlu et al.,1993). In fact, the underlying processes (e.g., phonological processing, processing speed, working memory, and attention control) in L1 and L2 literacy development seem to be interrelated (e.g., Kormos, 2017a, 2017b; Nijakowska, 2010; Peer & Reid, 2016; Tsagari & Spanoudis, 2013). Hence, any cross-linguistic analysis of dyslexia needs to contemplate the distinct criteria of each language in question.

In general, difficulties in the L1 will transfer to the L2. Reading, writing or spelling problems in Italian, for example, will be evident in English though probably more acutely (Schwarz & Terrill, 2000). Languages like English require a lot more visual attention (Nassaji & Geva, 1999; Hayne & Hook, 2001; Stanovich & West, 1989). For different reasons, dyslexia may manifest very strongly in the L2 but very mildly in the L1. The L2 could have a more extensive vocabulary with less word repetition (Geva, 1993). Many of the challenges caused by dyslexia in the L1 are surmounted when an individual acquires compensatory strategies over time, but a new language and culture requires beginning this process again (Schwarz & Terrill, 2000).

Accumulating evidence confirms that many students with dyslexia experience difficulties in learning additional languages (Kormos, 2017a). This raises an argument that dyslexics should not be required to learn additional languages. Certainly, for some with dyslexia, learning to read and write in multiple languages is a struggle, but not for all. The key is to consider language learning skills and motivation for each language separately and not simply to assume that reading and writing in one language will either negatively or positively impact reading and writing in another. When language-learning is motivating and useful, everyone, including individuals with dyslexia, can optimize their strategies for doing so. At the same time, there are those either with or without dyslexia for whom learning an additional language may be a particular burden. If additional language facility is required for learning other subjects such as science or history, this is particularly problematic. For example, in many places, including large sections of Asia, Africa, and Europe, English is learned not just as a standalone school course but as the medium of instruction for additional subjects. Then, it is desirable to screen separately for difficulties associated with dyslexia in the native language and in the additional language.

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Foreign language learners with dyslexia should benefit from a positive and motivating learning environment. They need to be exposed to differentiated, inclusive teaching practices that can only be provided by well-trained teachers (Kormos & Nijakowska, 2017). Inclusive teaching involves recognizing and meeting diverse learning needs and characteristics, creating and expanding opportunities for active learning and participation, and securing equal rights of these students for high-quality education (Forlin, 2013; Loreman et al., 2011; Sharma et al., 2013). Therefore, appropriate inclusive teacher training and teacher preparedness to implement inclusive instructional practices are crucial (European Agency for Development in Special Needs Education, 2012; Forlin, 2010, 2012; Hettiarachchi & Das, 2014; Robinson, 2017).

Teachers' self-confidence in the inclusive classroom is dependent on their knowledge of inclusive practices, effective intervention programs, and their underlying theoretical principles (Kahn-Horwitz, 2015; McCutchen et al., 2009; Podhajski et al., 2009). Research findings also affirm that language teachers' language-based content knowledge, namely knowledge of language and literacy concepts, knowledge concerning explicit reading instruction, phonological awareness, orthographic awareness, and phonics, translates into greater teacher self-confidence when dealing with students with dyslexia. Background knowledge and understanding of the nature of dyslexic learning difficulties form the bases of the appropriate instruction offered to dyslexic individuals (Aladwani & Al Shaye, 2012; Washburn et al., 2011a, 2011b).

Nijakowska (2014, 2015) examined the professional training required by foreign language teachers on dyslexia and inclusion and found out that English as a Foreign Language (EFL) teachers have limited background knowledge concerning language learning processes of students with dyslexia and inclusive instructional practices and are not offered appropriate initial and in-service training opportunities. Russak (2016) studied EFL teachers' practices and attitudes towards the inclusion of pupils with Special Educational Needs (SEN) in Israel, and the findings indicate that the majority of EFL teachers felt that pupils with SEN should be placed and taught in special education environ-

ments with specialized materials rather than in regular mainstream education settings. This state of affairs not only exerts impact on EFL teachers' beliefs about their preparedness for inclusion but also, potentially threatens the provision of high-quality, inclusive foreign language teaching to dyslexic students. A study of Polish, Greek and Cypriot EFL teachers demonstrated that, where teachers teach or study to teach and the level of training (pre-service vs. in-service) impact EFL teachers' beliefs on preparedness to include dyslexic EFL learners. The findings illustrate how teacher professional training can be improved in terms of the content, methods, and delivery modes to better meet teachers' needs and to allow them to better respond to the challenges set by the global inclusive education trends. Enhancing teachers' preparedness to include dyslexic learners requires boosting their knowledge of dyslexia, SEN, specific learning disabilities, and inclusion, as well as increasing their self-efficacy in implementing inclusive teaching practices. Because there is no one-size-fits-all remedy for students with dyslexia, teachers need to be free to rely on their professional expertise and judgment (Coyne et al., 2013; Simmons, 2015).

Future Research

The English language still dominates educational research on screening, diagnosis and treatment for dyslexia, leading to non-native English speakers being sidelined. However, since culture and language features may heighten problems associated with dyslexia, these should also be carefully studied. More research on the different language combinations will help disentangle the proficiency and orthographic depth effects and perhaps create more sensitive diagnostic and remedial procedures, while cross-cultural or cross-linguistic research should not just focus on the language itself or closely related languages. Research into universal characteristics of literacy acquisition, including comparisons of multilingual dyslexics studying languages that are typologically different, will be paramount to our knowledge of collective and language-specific characteristics of dyslexia and literacy (Kornev et al., 2010). Further studies in the L2 context are needed to investigate

LACLIL ISSN: 2011-6721 e-ISSN: 2322-9721 VOL. 13, No. 1, JANUARY-JUNE 2020 DOI: 10.5294/laclil.2020.13.1.6 PP: 92-113

the factors that influence teachers' ability to face the challenges of accommodating dyslexic L2 students in mainstream classes, teachers' professional training needs, and the structure of the most effective professional training programs regarding the nature of dyslexia and inclusive instructional practices in the foreign language context.

Future dyslexia research should include far-reaching regional and international studies on countries that are effectively providing services and adopting inclusionary policies for students with dyslexia. Such findings, widely disseminated and explained, might inform policy and practice in countries that are currently behind. The current gap between research and practice must also be narrowed. In addition, legislators, researchers, and educators would benefit from more collaboration and guidance from international organizations on how best to meet the needs of students with dyslexia (Agrawal et al., 2019).

Conclusion

Dyslexia is an international issue that crosses borders and generations. Yet, despite advances in identification, understanding, and teaching methodologies, too many dyslexics are left to fall through the cracks without fulfilling their potential in school or in life. In the case of those with a multilingual background, the situation gets even more complicated, as different languages present different characteristics and different demands. Because most nations around the world have rich and diverse populations, culturally and linguistically responsive practices should be prevalent in the decision-making and instruction of all students. This is of particular importance in planning educational services for instruction of students with dyslexia. In particular, we cannot expect teachers to be able to address the needs of dyslexics when they are not provided the education, training and resources to do so. Appropriate pre-service and in-service teacher training opportunities on the nature of dyslexia and inclusive practices are particularly vital.

In order to move forward, there is a need for clear guidelines and information to be distributed among all countries to better serve their dyslexic population. Emerging developments in research, policy and

practice should be distributed internationally because what works in one place will likely be of benefit in others. In a global community, there is greater promise in addressing dyslexia collectively rather than any one country standing alone.

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