Luis Alberto Maia [1][2]
Maria de Fátima Simões [1][2]
Paulo Joaquim Rodrigues [1][2]
Bruno Alexandre Santos [1]
Fábio André Monteiro [1]
Lina Cecília Castanho [1]
Mariana Matos Magalhães [1]
Paula Susana Mendes [1]
Tânia Soraia Augusto [1]
Ana Alexandra Eusébio [1]

Dyslexia: how it survived (or not) to classification alterations all over the years? Implications to assessment and intervention.

¿Sobrevivió (o no) la dislexia a la alteraciones de la clasificación con el correr de los años? Implicaciones para la evaluación y la intervención.

Dislexia: como sobreviveu (ou não) às alterações de classificação ao longo dos anos? Implicações para Avaliação e Intervenção.

[1] Universidade da Beira Interior, Portugal. Contact: Luis Alberto Maia. E-mail: lmaia@ubi.pt

[2] Laboratório de Psicologia da Universidade da Beira Interior - LaP-UBI.

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ABSTRACT

In this paper, we will approach definitions of dyslexia along history and their importance to comprehend this learning disorder. A lot of small criteria were changed in the last decades and this obeyed all clinicians, professors, or other person dealing with dyslexic people, helping to adapt to a new view of this problem. We have paid particular attention, not only to the actual and update models of classification for this dysfunction, but also to the implications of effective interventions to these patients. We also show some of the difficulties in achieving a classification agreement and why it is needed that everyone working on this field should have it in mind in order to standardize a language that could help to develop more appropriated models of assessment and intervention, particularly in order to fill the gap between the clinical field and the educational reality.

Keywords: dyslexia; specific learning disorders; diagnostic and statistical manual of mental disorders; international statistical classification of diseases and related health problems; international statistical classification of diseases; injuries; and causes of death

RESUMEN

En este artículo se propone abordar históricamente la definición de la dislexia para mostrar su importancia en la comprensión de este específico trastorno de aprendizaje. Muchos criterios cambiaron en las últimas décadas, lo cual obligó a los médicos, profesores, y a otras personas que enfrentan este tipo de casos, a adaptarse a una nueva visión de este problema. Se ha prestado especial atención no sólo a los modelos actuales de clasificación de esta disfunción, sino también a las implicaciones de las intervenciones eficaces en este tipo de pacientes. También se muestran algunas de las dificultades para lograr un acuerdo en la clasificación y por qué es necesario que todos los que trabajan en este campo las tengan en cuenta, para poder estandarizar un lenguaje que permita desarrollar modelos de evaluación e intervención más apropiados y lograr así cerrar la brecha entre el campo clínico y la realidad educativa.

Palabras clave: dislexia; trastornos de aprendizaje; clasificación; intervención; dsm.

RESUMO

Neste artigo abordaremos a definição de dislexia ao longo da história e sua importância para a compreensão deste transtorno de aprendizagem específico. Muitos dos critérios foram alterados nas últimas décadas e obrigaram a todos os clínicos, professores ou outras pessoas que lidavam com pessoas disléxicas a se adaptar a uma nova visão desse problema. Prestamos especial atenção não apenas aos modelos atuais e atualizados de classificação para esta disfunção, mas também às implicações de intervenções efetivas sobre esses tipos de pacientes. Mostramos também algumas das dificuldades em alcançar um acordo de classificação e por que é, assim, necessário, que todos os que trabalham neste campo tenham em mente a padronização de uma linguagem que possa ajudar a desenvolver modelos de avaliação e intervenção mais apropriados, particularmente para preencher a lacuna entre o campo clínico e a realidade educacional.

Palavras-chave: dislexia; distúrbios específicos de aprendizagem; manual diagnóstico e estatístico de transtornos mentais; classificação estatística internacional de doenças e problemas de saúde relacionados; classificação estatística internacional de doenças; lesões e causas de morte.

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Dyslexia is just one of many terms that have been used over the past few years to describe subjects with reading difficulties and has been the subject of much debate during its historical evolution (López-Escribano, 2007). Although the earliest reports of this disorder date back to the 19th century (Kussmaul, 1877; Morgan, 1896), the definition of the etiological causes and manifestations of dyslexia have been the subject of controversy and several revisions (Peterson & Pennington, 2015).

The discussion on this learning disability come down to a level as basic as its terminology. Since its first report, this disturbance is recognized by several nomenclatures such as "word blindness and word deafness", "congenital verbal blindness", "strephosymbolia", "developmental alexia", "constitutional dyslexia" and "part of a continuum of language disorders, characterized by a deficit in verbal processing of sounds (Kussmaul, 1877; Macdonald, 2015; Morgan, 1896; Paixão, Paixão, & Paixão, 2015). The term dyslexia was coined by the German ophthalmologist Rudolph Berlin in 1887. However, it only began to be commonly used in academic circles from the mid-30's onwards. The word dyslexia has a Greek origin, and means absence ("dys") of language ("lexia") (Richardson, 1992).

One of the earliest clinical definitions of the term dyslexia is presented by the World Federation of Neurology in 1968 as "a disorder in children who, despite conventional classroom experience, fail to attain the language skills of reading, writing and spelling commensurate with their intellectual abilities" (Nicolson, Fawcett, & Dean, 2001, p. 508). Nonetheless, this definition was heavily criticized because of conceptualization of dyslexia through exclusion criteria (Fletcher, 2009). This had primed one of the central debate themes around dyslexia as its etiology. Through the last century this had been related with atypical hemisphere development where differences in parieto-temporo-occipital regions had been reported (Lyon, Shaywitz, & Shaywitz, 2003), visual deficits (Peterson & Pennington, 2015; Stein, 2001), lower auditory processing (Farmer & Klein, 1995) and, in most studies is showed a deficit at phonologic processing (Ramus et al., 2003;

Snowling, 2012; Vellutino, Fletcher, Snowling, & Scanlon, 2004).

All the heterogenic causes suggested for dyslexia etiology arise from diverse evidences collected by different studies. The hemispheric specialization hypothesis derives from neuroimaging studies showing atopic development of the right hemisphere for dyslexic population, which may explain the use of visual strategy in learning (Moll, Groth, & Schulte-Körne, 2016). Letter reversal errors, common in subjects with dyslexia, have led to the formulation of the hypothesis that the etiology of this disorder is related to the visual system, which also results from limitations in hemispheric specialization, which means that there is no inhibition of mirror images of visual stimuli in this population (Peterson & Pennington, 2015). Visual deficit theories also attribute the cause of dyslexia to a malfunction of the transient visual system (Stein, 2001).

However, in the last decades, the hypothesis of phonological deficit is the theory that collects greater consensus for dyslexia comprehension. It argues that dyslexia is a language disorder, with at least part of its etiology and manifestations explained by problems of phonological processing (processing of sounds of oral language), which later leads to problems of processing of the graphic language (Ramus et al., 2003; Snowling, 2012; Vellutino et al., 2004).

Another variable that makes it difficult to obtain a single definition of dyslexia results from its different manifestations, which vary according to the language, culture and educational systems, although the etiological causes are similar (Ramus et al., 2003), as well as the existence of comorbidity with other conditions (Lyon et al., 2003; Snowling, 2012).

Problems of classification using clinical and functional models.

Although dyslexia is currently recognized as an official category of learning difficulties, there is still a debate among researchers about the need to attribute a

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specific label to this population, or whether it should be included in the broader category of learning disability (Snowling, 1998). This problem is reflected in the use of different terminologies and the agglomeration of research data in the general category of "learning disability", which encompasses a broad spectrum of auditory, language, reading, writing and mathematical reasoning disorders (Lyon et al., 2003), which make the results of different studies to be more diffuse, and the generalization of those should be done in a careful way, especially because is important to distinguish children with specific learning disabilities from reading and subjects with reading difficulties who result from more general learning difficulties (Snowling, 1998).

Currently, dyslexia is considered to have neither a single etiology nor a clearly defined cutoff point (Snowling, 2012), which makes it a continuum rather than a distinct category (Peer, 2016). It is considered as a hereditary condition, of neurobiological origin (whereas in the past it was attributed a constitutional etiology), still, environmental factors are also found to have a role in the development of this specific learning disorder (Fletcher, 2009). More current definitions also extend the difficulties of word decoding to a unique level, limitations in accuracy and fluency in word recognition, and poor spelling abilities. It is also estimated that these difficulties typically originate from a deficit in the phonological component of language, which is unexpected if we consider other cognitive functions and the provision of adequate academic instruction. As a secondary consequence there may be difficulties in reading, comprehension and a reduced reading experience, which can be reflected in weak lexical knowledge (Lyon et al., 2003).

The historical evolution and the changes in its conceptualization and lack of consensus on most of the fundamental issues surrounding dyslexia, discussed up to this point, are well visible if we focus on two of the most used manuals for the diagnosis of mental disorders and neurodevelopment: The Manual Diagnostic and Statistical Analysis of Mental Disorders (DSM) and the International Classification of Diseases (ICD). If we consider DSM-I (APA, 1952), we find dyslexia with the terminology "Learning Disorder", inserted in a very unexpected group, taking into account the current conceptualization: "Personality Disorders". Within this group, "Learning Disorders" are inserted in the "Special Symptoms" subcategory. This category should be used on occasions when the specific symptom is expressed in isolation in the individual psychopathology. The insertion of dyslexia into the group of "Special Symptoms" is conserved in DSM-II (APA, 1968). However, this group is no longer included in the "Personality Disorders", becoming an independent category. We also saw in the DSM-II a modification of the nomenclature of "Learning Disorder", with this disturbance being termed "Specific Learning Disruption".

Nevertheless, the launch of the third version of the DSM-III (APA, 1980) brought a revolution to the classification system used to date. In this version diagnostic criteria for describing disturbances are presented, for the first time, by means of 5 axes. Dyslexia appears in DSM-III (APA, 1980) in the group "Primary Disorders in Childhood and Adolescence", which is subdivided into 5 main subgroups. These include "Specific Learning Disorders", which include disorders of specific areas of development that cannot be explained by other disorders. It is in this category that we find the "Developmental Reading Disorder". In this version of the DSM (APA, 1980) is stated that this disorder can also be classified as dyslexia, and that this condition is defined by a significant impairment in the development of reading skills, which translates into a discrepancy between the actual reading performance and the performance of expected reading for chronological age and the general intellectual capacities of the subject. This discrepancy cannot be explained by the lack of adequate academic conditions. The subjects diagnosed with this disorder present a reading characterized by omissions, additions and distortions of words. Reading tends to be slow, often accompanied by poor understanding, although the ability to write and copy printed words is typically preserved. Still according to this version of the DSM-III (APA, 1980),

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In the seventh review of the International Classification of Diseases (WHO, 1957), dyslexia is included in the category of "Other and unspecified character, behavior, and intelligence disorders" and is referred to as "specific learning defects". According to ICD-7, in order for a subject to be diagnosed with a specific learning defect (whether for reading, math or strephosymbolia), this should evidence alexia (or blindness to words) of an inorganic or unspecified nature.

The 8th revision of the International Classifications of Diseases (ICD) was published in 1965 and is a more radical version than the previous one. Nevertheless, the philosophy and basic structure of disease classification more directed to its etiology than to manifestations remained unchanged. Dyslexia is in the category "Special symptoms not elsewhere classified" considered as "Specific learning disturbance" (WHO, 1967).

In the International Statistical Classification of Diseases, Injuries and Causes of Death, the 9th revision of the ICD of the World Health Organization (1977), "Developmental Dyslexia" belongs to the group "Specific Delays in Development", considered as "Specific Reading Disorder".

In the 10th review of the ICD of the World Health Organization (2004), it is mentioned that dyslexia is included in the group "Specific disorders of the development of school skills", which in turn translates into "Specific Reading Disorder".

This refers to a specific and significant impairment in the development of reading skills, which is not justified solely by mental age, visual acuity problems or inadequate schooling. The ability to understand reading, word recognition, oral reading and reading tasks can all be compromised. Spelling difficulties are often associated with a specific reading disturbance. These often remain in adolescence, even after some progress has been made in reading (WHO, 2004).

There is another very important model of classification for disorders: International Classification of Functioning, Disability and Health (WHO, 2001). The International Classification of Functioning, Disability and Health, is usually known as ICF, comprises the classification of health and health-related domains. Once operational reality and incapacity of an individual happens in a context, ICF likewise comprises a list of environmental factors.

"ICF is the WHO framework for determining health and disability at both individual and population levels. ICF was officially endorsed by all 191 WHO Member States in the Fifty-fourth World Health Assembly on 22 May 2001(resolution WHA 54.21) as the international standard to describe and measure health and disability. ICF is operationalized through the WHO Disability Assessment Schedule (WHODAS 2.0). WHODAS 2.0 was developed through a collaborative international approach with the aim of developing a single generic instrument for assessing health status and disability across different cultures and settings" (WHO, 2017).

The aspects related with Learning Disabilities in ICF will be briefly approached ahead.

Implications in evaluation.

As already mentioned, the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) was published for the first time in 2013. This new edition of DSM-V brought some new features, among others, the emergence of the new concept, Specific Learning Disorder – Reading (APA, 2013; Purushothaman & Rout, 2015). This concept, in addition to the new nomenclature, has brought some changes into the diagnostic criteria, which consequently generates an adaptation in the evaluation and the psychological intervention (APA, 2013; Mousinho & Navas, 2016; Purushothaman & Rout, 2015).

In Criterion A (A. Difficulties in learning and using academic skills, as indicated by the presence of at least 1 of the following symptoms, which persisted for at least 6 months, despite the provision of targeted interventions to these difficulties (APA, 2013)) is where we can find the greatest update. Prior to this new edition, patient

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assessment was performed and, as soon as possible, a diagnosis of the presence or absence of dyslexia was given (Snowling, 2013). However, there is now another method: responsiveness to intervention (RTI). This method aims not to give the patient an immediate diagnosis, but rather to establish a diagnostic hypothesis and proceed immediately to the intervention (Cavendish, 2013; Fuchs & Vaughn, 2012; Mousinho & Navas, 2016). This is because criterion A established a minimum of 6 months of difficulties. Thus, if the same difficulties persist during the intervention, the final diagnosis is given. However, if there is a positive evolution of the patient during the intervention, then the diagnosis is rethought.

The criteria that specify the difficulties in reading, writing or mathematics are, in this new Manual, very specific and detailed. Previously, one of the difficulties associated with this diagnosis was to find criteria that were objective for this type of difficulties (Tamboer, Vorst, & Oort, 2014). This change in the criteria improves unquestionably the psychological evaluation, since it gives examples and is much more focused on the objective of detecting alterations in the learning of the individuals (see exactly how is made in ICF (WHO, 2001)). For example, for reading the current criteria addresses the type of difficulty that the subject can demonstrate (Reading is inaccurate or slow and strenuous (e.g., reads aloud single words incorrectly or slowly and hesitantly, often assumes words, has difficulty in pronouncing words)), whereas in the previous manual, it was only stated that the individual's performance would be lower than expected for his Intelligence Quotient (IQ), age and schooling (Mousinho & Navas, 2016). Another of the changes seen in the new Handbook is the elimination of the requirement for the discrepancy between performance and IQ. Thus, in psychological assessment, this relationship between IQ performances is no longer considered as a factor (Ferrer, Shaywitz, Holahan, Marchione, & Shaywitz, 2010). Currently, both subjects with low IQ and also above average IQ can be diagnosed with Specific Learning Disorder (Mousinho & Navas, 2016). As Gus and Samuelsson

(1999) point out, the discrepancy requirement may at first sight make sense, yet the concepts inherent in such ideas are in themselves impractical. Intelligence is a concept whose definition is very broad and still generates some discussion in the scientific community. As well as the term dyslexia, because it is a disorder whose identification is not easy and the criteria inherent to it is the object of changes and questionings on the part of professionals of psychology and education. Several studies have already shown that the exclusion of the discrepancy requirement is a sensible choice due to the low correlation between IQ and performance/abilities (Aaron, 1997; Gus & Samuelsson, 1999; Høien, Lundberg, & Johansson, 1992; Stanovich, 1996).

Dyslexia is often associated only with children. However, one of the novelties of the DSM-V changes is the presence of a criterion that focuses on the same problem in adults. Criterion C (Learning difficulties begin during the school years but may not manifest completely until the requirements for such academic skills exceed the individual's limited capacities...) (APA, 2013), demonstrates that the problems of learning originate from childhood, but may not be manifested at this stage, which means that adulthood can be marked by these difficulties. This change produces changes in the psychological evaluation because the diagnosis of this pathology becomes part of the evaluation of the adult, if it fits the criteria (Mousinho & Navas, 2016).

Discussion of integration of DSM, ICD and International Classification of Functionality – problems in classification and intervention on Specific Learning Disabilities (SLD)

When we try to use different models of classification of the same construct, sometimes it creates a great problem - the question is: are we assessing the same reality or the different classification of that realities (Arduini, Capellini, & Ciasca, 2006; Rotta, Ohlweiler, & Santos, 2015)?

Sometimes is very difficult to diagnose a unique SLD, and decide if it is comorbidly related with current psychopathological characteristics, like depression, anxiety and others (Artigas-Pallarés, 2009; Poznanski,

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Mokros, Grossman, & Freeman, 1985). Is possible to say at this point that there is a great difficulty in diagnoses purposes, once the spectrum of dyslexia as a SLD is different when conducted by a clinician or by a multidisciplinary team of special education in a school.

When the diagnoses are made by a clinician, the constructs assessed are more related with clinical characteristics (see classifications of DSM-V (APA, 2013), and ICD-10, (WHO, 2004)). When the same student is evaluated with the statements of International Classification of Functionality, the highlight is not to stress clinical issues; instead, the functionality of the subject in the several dimensions that constitutes a human being are the privileged one (International Classification of Functioning, Disability and Health – ICF (CIF CJ, in Portuguese version – Classificação Internacional de Funcionalidade, Incapacidade e Saúde (WHO, 2004; WHO, 2001)). DSM and ICD are more adjusted in the clinical aspects that every clinician, pedopsychiatrist, neuropsychologist or developmental psychologist are well used to deal. ICF, is more centered in terms of functionality, related generally to the student's life, but, in terms of LSD assessment, in scholar realities. This creates a strong gap whether the first assessment of the student is made by a clinician or by a specialized teaching team in school. More than that, based on our experience, when the first signalization of the student is made by a clinical professional, there is a strong difficulty to put together the two forms of assessment. It is not rare (in fact, is very usual), based on our experience, that the clinical reports are not completely understood if the clinician classifies a given student with, for instance, three conditions (SLD): dyslexia, disortographia and dyscalculia.

In a recent real report for a school, about a student aged 11 years, in the 7th grade, we diagnosed the student with dyslexia, disortographia and dyscalculia. Once the school needs to classify the student according to ICF, we had to clarify, making the bridge from DSM/ICD assessment to ICF, that the conditions presented by the student were like follows (report translated and adapted from the Portuguese):

"Item 1) Dyslexia, dyscalculia and disortographia

The student presents inability in functions: a b167 mental Functions of language), with degree 3 of extension (qualifier 3 - severe Difficulty-50-95%); b) b172 calculation functions, with degree 3 of extension (qualifier 3 - severe Difficulty-50-95%)."

"Item 2)

When asked to clarify the diagnosis of dyslexia, dyscalculia and disortographia - severe subtype, invoking that the same does not match the type used by you (in CIF CJ), I must stress that, as a clinician, I use specific diagnostic criteria (like DSM V (APA, 2013), International Statistical Classification of Diseases and Related Health Problems – ICD (WHO, 2010), and others) in my area of intervention/assessment, and such diagnoses presented should be subsequently framed in specific functions presented by CIF-CJ (WHO, 2001) (which the regiments considers that are the school responsibility).

However, and as required, make it clear that dyslexia and disortographia presents themselves, in CIF CF (WHO, 2001), as mental disorders of language: namely, and respectively, b16701 receiving written language, mental functions of decoding written messages for their meaning, and b16711 expression of written language, mental functions needed to produce written messages with meaning (with qualifier 3 - severe Difficulty - 50-95%). As for dyscalculia, classified as b1721 complex calculation, mental functions of translation problems formulated verbally in arithmetic procedures, translation of mathematical formulas on arithmetic procedures and other complex manipulations involving numbers (with qualifier 3 - severe Difficulty-50-95%)."

"Item 3)

Dyslexia presents itself, in CIF CF (WHO, 2001), as a mental disorder of language: namely, and respectively, b16701 receiving written language, mental functions

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of decoding written messages for their meaning, and b16711 expression of written language, mental functions needed to produce written messages with meaning (with qualifier 3 - severe Difficulty - 50-95- According to language (bearing in mind the serious difficulties at the level of writing and comprehension of texts), presents typical mistakes such as: adding letters or syllables, split, join, difficulty in the use of coordination/subordination of phrases, clumping or undue separation of words, omissions, changes, substitutions, production of very small texts, low awareness and low consciousness in articulatory phonology.

In the face of all the above, I think that the special education multidisciplinary team is, within the existing legislation, prepared for, if your educated understanding allows your excellences, as it is the will of the student and her parents, to proceed with the development of a PEI (Individual Education Program) for the student in question, thus fulfilling the shed in Law Decree No. 3/2008 of January, 7th, of Portuguese Republic for Public Education" ("Decreto-Lei n.º 3/2008 de 7 de Janeiro," 2008).

At this point of the article, we will try to finish endorsing aspects as Integration of Classification Models in Specific Learning Disorder, particularly the problems that arise when we try to "read" these realities following different views like DSM – V (APA, 2013), ICD 10 (WHO, 2010), other clinical/developmental methods of analyses and the International Classification of Functioning, Disability and Health (WHO, 2004). With the conjugation of all previous points of this article, we will briefly approach the efforts to reach a commitment between different areas and how it is possible to develop the best assessment model as well as rehabilitation intervention in patients with Specific Learning Disorder (it is important to understand that a lot of usual conditions are presented comorbidly in SLD, as ADHD and other comorbidities (APA, 2013; Carroll, Maughan, Goodman, & Meltzer, 2005; Cavendish, 2013).

The first step that we think that is necessary is to develop is a practice based on the assessment of dysfunctionalities of the student, rather to give a certain name that is stated in a major category system (like DSM and ICD). With this effort, we suggest that any technician that deal with the students should be aware of a functional diagnosis, rather than a clinical one. Supported by all the points presented in this article we sustained that, even when proceeded by a clinician, the diagnoses of a SLD could create irreparable gaps between clinicians and school technicians.

In fact, in terms of intervention or rehabilitation of the student, it is more important to state what every diagnosis means than just signal that diagnoses. For instance, in the real practical example that we presented, is more important for the multidisciplinary school teams that are specialized in teaching to know what are the exact deficits of each student that they will have to work.

It is obviously important to diagnose Dyslexia (for instance), but it is also as important to operationalize this and state that this condition is related with (from the same report cited earlier):

"According to language (bearing in mind the serious difficulties at the level of writing and comprehension of texts), presents typical mistakes such as: adding letters or syllables, split, join, difficulty in the use of coordination/subordination of phrases, clumping or undue separation of words, omissions, changes, substitutions, production of very small texts, low awareness and low consciousness in articulatory phonology."

This kind of interdisciplinary language allows us to join the bridges of the two fields pointed here to create conditions for a systematic and ecological program of rehabilitation. More than looking to the child as a sick person, it should be seen as a person that present some specific difficulties and a whole program of rehabilitation must be developed (parting from the school and spreading to his whole life) ("Decreto-Lei n.º 3/2008 de 7 de Janeiro," 2008; Siqueira & Gurgel-Giannetti, 2011).

According to the portuguese law for special education there are a lot of measures to implement in these cases that invite clinicians, teachers and others members of educative community to ensure that those measures will be applied. But if we think well, all this is only possible if

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the diagnoses processes start to be made involving all the technicians that deal with the student ("Decreto-Lei n.º 3/2008 de 7 de Janeiro," 2008; Fukuda & Capellini, 2012).

With this paper we wanted to put the student in the center of the assessment and rehabilitation process and stop with some gaps and pitfalls that lay ahead in the practice of clinicians and community, scholar and other interventions.

For that, all people that deals with SLD must be familiarized with the legis artis concerned in DSM, ICD and ICF, not to compartmentalize interventions (assessment and rehabilitation) but in a common sense of understanding of how to help students with SLD and their families.

Conclusion

According to Tannock (2014), a member of the DSM-Vwork group, it is expected that changes in the evolution of the concept of dyslexia, (for example) from DSM IV to DMS V, have implications over the intervention on this pathology. As already mentioned, the identification of a single comprehensive category of Learning Difficulties (LD) is compatible with several educational systems. Therefore, this change is expected to create a better alignment of practices among the communities of clinicians and educators. In other words, these implications are not only for clinicians but also for school psychologists, special education teachers, researchers and for interdisciplinary professional communities in many parts of the world. All of them must work in a collaborative model for interdisciplinary decision making in order to have a clinical synthesis of developmental, medical, family, and educational reports (Al-Yagon et al., 2013; Cavendish, 2013; Tannock, 2014).

Since a requirement for a neuropsychological assessment of cognitive processing skills for diagnosis has been eliminated, this assessment may be more useful to guide the development of intervention plans and unnecessary for diagnosis of dyslexia. Therefore, psychologists can change their view from "assessment

for diagnosis" to "assessment for intervention", and they probably have more time to provide psychopedagogy training and counselling to parents and teachers (Tannock, 2014).

Specifically, in the school context, this change (elimination of the IQ - Realization discrepancy DSM criteria) may result in the possibility of providing special education services not only to children with Specific Learning Difficulties (SLD) but also to children with lower IQ without intellectual disability (Tannock, 2014).

In general, in the operational changes of DSM-V is possible to identify positive advances for clinical performance and the promotion of educational adaptations, although there is still a need for scientific discussion in this matter (Mousinho & Navas, 2016).

The same could be referred if we consider ICD and ICF, but the most important aspect that we would like to stress is that a great field of knowledge about these three types of classification is opened and it is very important in terms of assessment and intervention amongst all scholar community.

We would like to conclude this article raising some of our own concerns, not only about the diagnosis of dyslexia (as seen, with more than 100 years of formal classification – Bravo, 1993), but also with the use of standardized classification models, such as DSM - V, among others. We share the concerns presented by Martín Fernández (2013) in his most interesting article about the implication of the use of models such as DSM in the understanding of "mental disorders". The author recalls well that, since version III of DSM, mental disorders was almost always seen as cerebral pathologies, with the great advent of psychiatry and neurology as explainers for most of the mental and behavioral disorders that affect the individual. The same author recalls that, for example, in the case of dyslexia, it is framed in a large set of specific learning disorders that, to a certain extent, would be strongly related to any type of neurodevelopmental disorder (see also Rodríguez, 2009; Galaburda, Lo Turco, Ramus, Fitch & Rosen, 2006). We think that these concerns should be always in a psychologist mind, never forgetting the strong

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Dyslexia: survive to classification changes / L. A. Maia; M. F. Simões;
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possibilities that many of these conditions do not have necessarily to be considered from a purely psychiatric and neurological point of view. Polanco-Carrasco (2016) also drew attention to the fact that psychology professionals should develop themselves to deepen a psychological perspective that could not be lost on the tendency to consider exclusively biomedical categorizations. Thus, Martín Fernández (2013) points out the danger of increasing exponentially the number of children and young people diagnosed with dyslexia and other disorders, since the criteria become broader and easily framed in terms of comorbidities with other learning problems, thus forgetting the true triggers that could underlie each child with specific problems such as dyslexia, and then losing the opportunity to better understand their situation and, hence, to present a better evaluation program and subsequent psychopedagogical help.

Bearing in mind the words of Polanco-Carrasco (2016, 2015), we as authors, and with this article, wish to draw the attention of all the colleagues who work in this area of intervention in the sense that our concerns about quasi-static models of classification can be discussed (already well debated by hundreds of researchers), but also the implications that this may have, in our particular interest, on the study, evaluation and intervention in dyslexia (as also stressed by other investigators and professionals that deals directly with this population of subjects – Fumagalli, Barreyro, Jacubovich, Olmedo & Jaichenco, 2016; Soriano & Miranda, 1997).

A neuropsychological assessment and intervention on possible dyslexic patients seems to be mandatory (as referred by several authors, like Riveroll-Romero, Matute-Villaseñor, Ricardo-Garcell, Cruz-Ares, Azanza-Ricardo & Harmony, 2016; Landerl, Fussenegger, Moll & Willburger, 2009; Matute, Rosselli, Ardila y Ostrosky, 2007) and, as advocated by Luque-Parra, Elósegui-Bandera, and Casquero-Arjona (2016), if concern is placed more on the nosological understanding of dyslexia, then psychological science will most likely assist the development of special education and educational measures that are idiosyncratically related to children with dyslexia.

Since it is known that dyslexia is considered to be one of the most (if not the most) prevalent epidemiologically specific learning disorder (Alberto Galaburda & Susana Camposano, 2006), then it would be important to try to understand how a better consensus can be reached in its diagnostic classification and, finally, in the development of evaluation and intervention programs more suitable for each children who need the contribution of the knowledge from a psychology technician, in order to receive the best possible help, according to the best present legis artis.

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REFERENCIAS

Aaron, P. G. (1997). The impending demise of the discrepancy formula. Review of educational research, 67(4), 461-502.

Alberto Galaburda, D. & Susana Camposano, W. (2006). Dislexia evolutiva: Un modelo exitoso de neuropsicología genética. Revista Chilena de Neuropsicologia 1 (1), 9-14.

Al-Yagon, M., Cavendish, W., Cornoldi, C., Fawcett, A. J., Grünke, M., Hung, L.-Y., . . . Lucangeli, D. (2013). The proposed changes for DSM-5 for SLD and ADHD: International perspectives—Australia, Germany, Greece, India, Israel, Italy, Spain, Taiwan, United Kingdom, and United States. Journal of Learning Disabilities, 46(1), 58-72.

APA. (1952). Diagnostic and Statistical Manual of Mental Disorders (1st ed.). Washington: American Psychiatric Association.

APA. (1968). Diagnostic and Statistical Manual of Mental Disorders-II (2nd ed.). Washington: American Psychiatric Association.

APA. (1980). Diagnostic and Statistical Manual of Mental Disorders-III (3rd ed.). Washington: American Psychiatric Association.

APA. (1994). Diagnostic and Statistical Manual of Mental Disorders-IV (4th ed.). Washington: American Psychiatric Association.

APA. (2000). Diagnostic and Statistical Manual of Mental Disorders-IV-TR (4th ed. Text Revision). Washington: American Psychiatric Association.

APA. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington: American Psychiatric Association.

Arduini, R. G., Capellini, S. A., & Ciasca, A. M. (2006). Estudo comparativo das avaliações neuropsicológicas e de neuroimagem em crianças com dislexia. Arquivos de Neuro-Psiquiatria, 64, 369-375.

Artigas-Pallarés, J. (2009). Dislexia: enfermedad, trastorno o algo distinto. Revista de neurología, 48(2), 63-69.

Bravo, L. (1993). La dyslexia: cien años después. Investigación, antecedentes históricos y definiciones. PSYKHE, 2 (1), 95 – 105.

Carroll, J. M., Maughan, B., Goodman, R., & Meltzer, H. (2005). Literacy difficulties and psychiatric disorders: Evidence for comorbidity. Journal of child psychology and psychiatry, 46(5), 524-532.

Cavendish, W. (2013). Identification of learning disabilities: Implications of proposed DSM-5 criteria for school-based assessment. Journal of Learning Disabilities, 46(1), 52-57.

Decreto-Lei n.º 3/2008 de 7 de Janeiro, Ministério da educação, Diário da República 1ª série - Nº4 154-165 (2008).

Farmer, M. E., & Klein, R. M. (1995). The evidence for a temporal processing deficit linked to dyslexia: A review. Psychonomic bulletin & review, 460-493.

Ferrer, E., Shaywitz, B. A., Holahan, J. M., Marchione, K., & Shaywitz, S. E. (2010). Uncoupling of reading and IQ over time: Empirical evidence for a definition of dyslexia. Psychological science, 21(1), 93-101.

Fletcher, J. M. (2009). Dyslexia: The evolution of a scientific concept. Journal of the International Neuropsychological Society, 501-508.

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ORIGINALES / ORIGINAL PAPERS

Fuchs, L. S., & Vaughn, S. (2012). Responsiveness-to-intervention: A decade later. Journal of Learning Disabilities, 45(3), 195-203.

Fukuda, M. T. M., & Capellini, S. A. (2012). Programa de intervenção fonológica associado à correspondência grafema-fonema em escolares de risco para a dislexia. Psicologia: Reflexão e Crítica, 783-790.

Fumagalli, J., Barreyro, J. P., Jacubovich, S., Olmedo, A. & Jaichenco, V. (2016). Phonological skills, reading accuracy and speed in Dyslexic patients. Cuadernos de Neuropsicología/Panamerican Journal of Neuropsychology, 10 (1), 71-87.

Galaburda, A. M., Lo Turco, J., Ramus, F., Fitch, R. H. & Rosen, G. D. (2006). Developmental dyslexia: Gen, Brain and Cognition. PSYKHE, 15 (2), 3-11.

Gus, S., & Samuelsson, S. (1999). Intelligence and dyslexia: Implications for diagnosis and intervention. Scandinavian journal of psychology, 40(2), 127-134.

Høien, T., Lundberg, I., & Johansson, M. (1992). Dyslexi: Natur och kultur.

Kussmaul, A. (1877). Word deafness and word blindness. Cyclopaedia of the practice of medicine, 770-778.

Landerl, K., Fussenegger, B., Moll, K., & Willburger, E. (2009). Dyslexia and dyscalculia: Two learning disorders with different cognitive profiles. Journal of Experimental Child Psychology, 103(3), 309-324.

López-Escribano, C. (2007). Contribuciones de la neurociencia al diagnóstico y tratamiento educativo de la dislexia del desarrollo. Revista de neurología, 173-180.

Luque-Parra, D. J., Elósegui-Bandera, E. & Casquero-Arjona, D. (2016). Specific needs in educational support for students with borderline intellectual capacity: factors for psychoeducational intervention. Summa Psicológica UST, 13 (2), 33-44.

Lyon, R. G., Shaywitz, S. E., & Shaywitz, B. A. (2003). A definition of dyslexia. Annals of dyslexia, 1-14.

Macdonald, S. J. (2015). Dyslexia: the government of reading. Disability & Society,, 162-163.

Martín Fernández, J. (2013). La (no) decepción del DSM-5. Cuadernos de Neuropsicología / Panamerican Journal of Neuropsychology, 7 (1), 9-21.

Matute E., Rosselli M., Ardila A. & Ostrosky-Solis F. (2007). Evaluación Neuropsicológica Infantil (ENI). Guadalajara: Manual Moderno.

Moll, H. K., Groth, B. K., & Schulte-Körne, G. (2016). Letter-sound processing deficits in children with developmental dyslexia: An ERP study. Clinical Neurophysiology, 1989-2000.

Morgan, W. P. (1896). A case of congenital word blindness. British medical journal, 1378.

Mousinho, R. (2015). Transtornos específicos de aprendizagem - dislexia. In I. Q. Marchesan, H. J. Silva & M. C. Tomé (Eds.), Tratado das especialidades em fonoaudiologia. Rio de Janeiro: Roca.

Mousinho, R., & Navas, A. L. (2016). Mudanças apontadas no DSM-5 em relação aos transtornos específicos de aprendizagem em leitura e escrita. revista debates em psiquiatria, 38-46.

Nicolson, R. I., Fawcett, A. J., & Dean, P. (2001). Developmental dyslexia: the cerebellar deficit hypothesis. Trends in neurosciences, 508-511.

Paixão, W. S. B., Paixão, R. C. B., & Paixão, V. M. (2015). Dislexia: construir-desconstruir-reconstruir. Encontro internacional de formação de professores e fórum permanente de inovação educacional, 1-14.

Peer, L. (2016). Definitions. Bristish Dyslex!a Association Retrieved February 7th, 2017, from http://www.bdadyslexia.org.uk/dyslexic/definitions

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Peterson, R. L., & Pennington, B. F. (2015). Developmental dyslexia. Annual review of clinical psychology, 283-307.

Polanco-Carrasco, R. (2015). Alter to Disrupt. Cuadernos de Neuropsicologia / Panamerican Journal of Neuropsychology, 9 (3), 16-17.

Polanco-Carrasco, R. (2016). O que a demência ainda espera da psicologia. Cuadernos de Neuropsicologia / Panamerican Journal of Neuropsychology, 10 (1), 11-13.

Poznanski, E., Mokros, H. B., Grossman, J., & Freeman, L. N. (1985). Diagnostic criteria in childhood depression. The American journal of psychiatry.

Purushothaman, G., & Rout, N. (2015). Specific learning disorder in DSM 5 and speech language pathologist. International Journal of Applied Research, 207-211.

Ramus, F., Rosen, S., Dakin, S. C., Day, B. L., Castellote, J. M., White, S., & Frith, U. (2003). Theories of developmental dyslexia: insights from a multiple case study of dyslexic adults. Brain, 841-865.

Richardson, S. O. (1992). Historical perspectives on dyslexia. Journal of Learning Disabilities, 40-47.

Riveroll-Romero, R., Matute-Villaseñor, E., Ricardo-Garcell, J., Cruz-Ares, G., Azanza-Ricardo, J. & Harmony, T. (2016). Neuropsychological subtypes in two groups of Mexican children: with specific learning disability or good academic performance. Revista Chilena de Neuropsicologia, 11 (2), 13-21.

Rodríguez, F. (2009). Explanatory aspects of comorbidity in PDD, Asperger syndrome and ADHD: the current state. Revista Chilena de Neuropsicología, 4 (1), 12-19.

Rotta, N. T., Ohlweiler, L., & Santos, R. R. (2015). Transtornos da aprendizagem: abordagem neurobiológica e multidisciplinar: Artmed Editora.

Siqueira, C. M., & Gurgel-Giannetti, J. (2011). Mau desempenho escolar: uma visão atual. Revista da Associação Médica Brasileira, 57(1), 78-87.

Snowling, M. J. (1998). Dyslexia as a phonological deficit: Evidence and implications. Child Psychology and Psychiatry, 4-11.

Snowling, M. J. (2012). Changing concepts of dyslexia: nature, treatment and comorbidity. Child Psychology and Psychiatry Review, e1-e3.

Snowling, M. J. (2013). Early identification and interventions for dyslexia: a contemporary view. Journal of Research in Special Educational Needs, 13(1), 7-14.

Soriano, M. & Miranda, A. (1997). Dislexia Evolutiva: Validez como Entidad Diagnóstica y Bases Biológicas. PSYKHE, 6 (2), 13-21.

Stanovich, K. E. (1996). Toward a more inclusive definition of dyslexia. Dyslexia, 2(3), 154-166.

Stein, J. (2001). The sensory basis of reading problems. Developmental Neuropsychology, 509-534.

Tamboer, P., Vorst, H. C. M., & Oort, F. J. (2014). Identifying dyslexia in adults: an iterative method using the predictive value of item scores and self-report questions. Annals of dyslexia, 64(1), 34-56.

Tannock, R. (2014). DSM-5 Changes in Diagnostic Criteria for Specific Learning Disabilities (SLD): What are the Implications? International Dyslexia Association.

Vellutino, F. R., Fletcher, J. M., Snowling, M. J., & Scanlon, D. M. (2004). Specific reading disability (dyslexia): What have we learned in the past four decades? . Journal of child psychology and psychiatry, 2-40.

WHO. (1957). Manual of the international statistical classification of diseases, injuries, and causes of death. Geneva: World Health Organization.

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WHO. (1967). Manual of the international statistical classification of diseases, injuries, and causes of death - Based on the recommendations of the eighth revision conference. Geneva: World health organization.

WHO. (1977). Manual of the international statistical classification of diseases, injuries, and causes of death - Based on the recommendations of the ninth revision conference. Geneve: World health organization.

WHO. (1993). Classificação de transtornos mentais e de comportamento da CID-10. Porto Alegre: Artmed.

WHO. (2001). ICF - World Health Organization. International Classification of Functioning, Disability and Health (ICF). Geneva: World Health Organization.

WHO. (2004). International Statistical Classification of Diseases and Related Health Problems 10th Revision. Geneva: World Health Organization.

WHO. (2010). International Statistical Classification of Diseases and Related Health Problems 10th Revision. Geneva: World Health Organization.

WHO. (2017). Classifications. World Health Organization Retrieved February 7th, 2017, from http://www.who.int/classifications/icf/en/