A triadic model of intervention with students with learning disabilities: A case study

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Abstract

This paper aims to explore the potential of a triadic model of intervention in dealing with children with learning disabilities (LD). The triadic model proposed is based on the assumption that intervention with children with LD should focus on three interconnected domains of functioning (i.e., academic, cognitive and socioemotional) leading to the need to consider not only the individual, but also the contextual levels, in line with the bioecological model of human development.   The model was used throughout a two-year intervention with Maria, an 8 year-old, Portuguese girl, initially attending 3rd grade. Maria was referred by her regular teacher due to difficulties in reading and writing, lack of autonomy in routines, and difficulties in relating to peers. Intervention aimed to 1) promote Maria's social skills, 2) increase her autonomy in daily and school routines and 3) promote reading and writing processes. The intervention was based on three modalities: 1) individual counseling with the child, 2) psychoeducation with the parents and 3) school consultation. Academic and socio-emotional functioning was assessed before and after the intervention. An increase in the child's verbal and reading fluency, and a decrease in social-emotional problems were observed. The intervention based on the triadic model proved to be effective in promoting Maria's reading and writing skills and socioemotional adjustment of the child.

Keywords:

Learning disabilities, socio-emotional adjustment, intervention, Cognitive Behavioural Therapy

Introduction

Decades of research in children and adolescents with learning disabilities (LD) have been devoted to investigating the effects of LD on academic functioning, with research also recognizing the students diverse difficulties in cognitive and socioemotional domains (Al-Yagon, 2011; Meltzer, 2007; Sharabi & Margalit, 2011; Swanson & Zheng, 2013).

Assuming the intersection between the academic, cognitive and the socioemotional domains, it is evident that children with LD, including those with reading and writing disabilities, face added challenges to that of their peers without LD, besides generally functioning poorly at school and failing to achieve the expected results (Mammarella et al., 2016). Difficulties at school have been shown to increase the risk of children reported elevated stress. These children often show lower self-worth and are less socially accepted and more anxious than their peers without LD (Howard & Tryon, 2002). This is due to the fact that they suffer from internalizing disorders, such as depression, anxiety, and social withdrawal (Mammarella et al., 2016; Sideridis, 2007; Sourander et al., 2005). Some of these students show more avoidance in the context of peer interaction, perpetuating a cycle of isolation (Estell, Jones, Pearl, Van Acker, Farmer, & Rodkin, 2008).

LD are not only often associated with internalizing problems, as mentioned above, but also externalizing problems, both of which are at the root of many psychopathological conditions (Mammarella et al., 2014). Research shows that the majority of children with LD often have poor social skills, associated with difficulties in decoding social cues, resolving interpersonal conflicts and emerging dilemmas in peer interaction; are less cooperative and assertive; show more disruptive behaviors as well as difficulties in effective communication in peer interaction (Al-Yagon & Mikulincer, 2004; Bryan et al., 2004).Over time, the persistence of behavioral and socioemotional problems may contribute towards negative educational outcomes, such as failure to complete high school and failure to enter college (Van Ameringen et al., 2003). In the face of such dire consequences, it is crucial to identify LD at an early stage and to develop multidisciplinary interventions that respond to all difficulties effectively. In this article, we present a case study that illustrates the repercussions of LD in the academic, cognitive and socio-emotional domains and an assessment model that addresses the developmental and multidimensional nature of LD.

Reading and writing as multidimensional and reciprocal processes

Learning to read and write are complex processes, which involve many interrelated skills and stages. Writing requires three main processes: (a) transcription or coding of words, through spelling and calligraphy; (b) text planning and proofreading, that depend on executive functions to regulate focused attention, inhibitory control and mental displacement, as well as self-regulation strategies; and (c) generation of text, by translating ideas into written form (Berninger & Winn, 2006). These processes occur within a limited system of working memory capacity (Swanson & Berninger, 1996) with time constraints (Berninger, 1999). Therefore, learning to write implies making low-level processes (e.g. transcription skills) automatic

through consistent practice, so that more cognitive resources are available to be applied to more demanding and complex cognitive processes (Alamargot & Fayol, 2009), such as the process of translation.

According to Ehri (2002, 2005), reading entails several dimensions (e.g., linguistic, cognitive, affective, motivational) and relies on the following interconnected processes: a) decoding (processes that allow the recognition of written words, based on the conversion of graphemes into phonemes, according to the alphabetic principle (Byrne, 1998; Casas, 1988, Van Der Leij & Van Daal, 1999), b) reading precision (accuracy with which graphemes are transformed into phonemes that can be measured by the number of correctly read words in a given period of time (Ehri, 2002) c) reading fluency (ability to read texts quickly, automatically and without effort that can be measured by the number of words read in a minute (Hook & Jones, 2002; Lopes, Fernandes, & Moniz, 2014; Meyer & Felton, 1999) and reading comprehension (ability that combines cognitive, linguistic and general world knowledge acquired formally or informally) and allows the reader to understand the message conveyed by the text (Hudson et al., 2009). One can consider two levels of reading comprehension: literal comprehension - based on explicit information in the text - and inferential comprehension - requires knowledge beyond the text (Aptekin & Erçetin, 2010; Baker et al., 2011; King, 2007).

Reading and writing are multidimensional (Shanahan, 2006) and reciprocal (Berninger, Abbott, Abbott, Graham, & Richards, 2002) processes, that rely on cognitive processes pertaining to the oral language system, namely those involved in the processing of word sounds - phonological lexicon and its meaning - semantic lexicon (Fletcher et al., 2013). When any of these processes are compromised, the likelihood of the onset of learning disabilities is increased.

LD has been difficult to define and to operationalize. However, the conceptual basis of LD is more consensual - it involves the concept of 'unexpected', underachievement (Fletcher et al., 2007). According to the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 5ª ed.; DSM–5; American Psychiatric Association [APA], 2013), the term Learning Disability (LD) or specific learning disorder is used to describe children of average or above-average intelligence with poor school performance, showing difficulties in learning and using academic skills related to reading decoding and comprehension, spelling, written expression, and calculation and mathematical reasoning.

LD assessment

In the late 1990s, clinical research on critical early reading skills such as phonemic awareness, phonics, and explicit instruction demonstrated that earlier identification and quality instruction could make a difference for students struggling with reading and writing (e.g., Foorman et al., 1998; Fuchs & Fuchs, 2001, 2005; Fuchs et al., 2001; Torgesen, 1999, 2004).The National Joint Committee on Learning Disabilities (NJCLD) (2005) strongly supports comprehensive assessment and evaluation of students with learning disabilities by a multidisciplinary team for the identification and diagnosis of students with learning

disabilities. According to NJCLD, comprehensive assessment of individual students requires the use of multiple data sources. These sources may include standardized tests, informal measures, observations, student self-reports, parent reports, and progress monitoring. These measures yield comprehensive quantitative and qualitative data about an individual student. The purpose of a comprehensive assessment and evaluation is to accurately identify a student's patterns of strengths and needs in different domains. Assessment of the academic, cognitive and neuropsychological processes should be used not only for the identification of LD, but also for intervention purposes.

Intervention in LD

Moreover, students with LD often exhibit difficulties with one or more basic cognitive processes, such as attention, self-regulation or working memory (Graham, Harris, & McKeon, 2013). Thus, intervention for students with LD should focus on helping them acquire much needed strategies, skills and knowledge, but should also feature motivational and socio-emotional factors that likely contributed to the students' difficulties (Al-Yagon, 2012).

One of the most important findings of a meta-analysis of research on children with LD conducted by Swanson (2013) was that a combination of direct instruction and cognitive strategies instruction provided the best evidence-based instructional heuristics for improving academic performance in children with LD (Swanson, 2013). A large body of research, mainly based on case studies, describes successful outcomes for cognitive-behavioral therapy (CBT) in small numbers of people with mild-to-moderate learning disabilities presenting with a variety of emotional disorders, such as anxiety and depression (Willner, 2009). CBT techniques used in the intervention with students with LD include modeling fluent reading, corrective feedback, choral reading, repeated reading, defining performance criteria and charting student progress (Morra & Tracey, 2006; Therrien, 2004). Students should be treated as active collaborators in the learning process, and the role of effort in learning should be emphasized. The level and type of feedback and instructional support provided are adjusted to be responsive to the student's needs. Developed according to these principles, the Self-Regulated Strategy Development (SRSD) is a six step process that fosters specific writing strategies and self-regulation skills (Graham & Harris, 2000, 2003). The findings from the single-subject-designs studies supported the effectiveness of SRSD in writing (Graham et al., 2013). Though treatment research for internalizing behaviors is limited, the methods employed for treatment have been similar. For example, in the aforementioned studies (Compton et al., 2002; Kendziora, 2004), the majority of children were treated for depression and anxiety - two primary categories of internalizing behavior problems (Achenbach et al., 2014; Gresham & Kern, 2004; Merrell & Walker, 2004) - through CBT. This CBT was typically group based and administered by therapists at outpatient clinics. Despite the limited number of interventions reported, research reveals that if children and adolescents with internalizing tendencies are accurately identified and properly treated, the outcomes are favorable (Compton et al., 2002; Kendziora, 2004). However, generalization of treatment outcomes into natural settings is a concern (Skinner et al., 2002). Therefore, developing effective

intervention approaches for natural environments warrants further investigation. In fact, positive peer reporting (PPR) has received favorable reviews and recommendations as a key component for treating socially withdrawn behavior when used to enhance social interactions in residential and classroom settings (Kendziora, 2004; Skinner et al., 2002). Recent research suggests that PPR is an effective intervention to enhance peer interactions and peers' perceptions of students who are socially rejected or neglected (Bowers et al., 2000; Jones et al., 2000; Moroz & Jones, 2002). For instance, the effectiveness of PPR on the social interactions of a socially rejected 6-year-old girl in a general education classroom was investigated. The results suggest that positive interactions increased and negative interactions decreased, yet no change in peer ratings were observed. Treatment acceptability was measured in this study and the data indicated that the teacher felt the intervention was effective, easy and had future utility (Ervi et al., 1998).

Considering how long children spend at school, it is essential to see it as a critical context that can be organized toward intentionally and productively cultivating social and emotional development. The quality of development in one area can foster development in others. Students are more likely to reach their full potential and take advantage of their opportunities, both in school and in future professional settings, if they: (1) have a sense of belonging and purpose, (2) work well with classmates and peers to solve problems, and (3) are able to plan, set goals and persevere through challenges (Jones & Kahn, 2017). Therefore, it is important to develop interventions aiming at promoting not only learning processes, but also the emotional and social processes that are closely linked to them.

Triadic model of intervention with students with LD

The developmental nature of LD requires analysis of cognitive, linguistic, academic and neurobiological change over time and how such change interacts with different interventions and characteristics of students, teachers, as well as school and classroom settings (Speece et al., 2003; Vaughn & Fuchs, 2003).

The bioecological perspective views development as the integration of biological, psychological, and sociological features (Bronfenbrenner & Morris, 2006). An ecological perspective regarding the study of the process of learning requires one to consider the entire ecological system in which such learning develops. The emphasis of Bronfenbrenner's model is on the contexts within which development occurs and on the interrelations among the different levels - the microsystem (immediate contexts in which a student develops his/her knowledge, such as family and school), mesosystem (the interconnections (links) among microsystems), exosystem (settings that are not experienced directly, but may, nevertheless, affect a student's learning, such as the community setting), macrosystem (the level at which the influence of government legislation, social and educational policy is felt) and chronosystem (the temporal patterns and changes that occur over time in the interaction between a student and the environment) - that contribute to such processes. This model provides a useful basis for understanding how multiple aspects of the student's reality interact and influence his/her academic success.

Based on the bioecological perspective, the triadic model of intervention with students with LD we now propose considers the student (e.g., biological and psychological characteristics) and the main microsystems of which he or she is a part (e.g., family and, school, extracurricular activities). The main goals are to optimize the communication between microsystems and their resources, through school consultation. However, the psychologist should keep in mind the indirect influence that exosystem and the macrosystem exert on the student's learning process. In addition to school consultation, the triadic model allows the psychologist to still conduct individual counseling with the child and psychoeducation with the family (Magnuson & Norem, 2015) and, thus, foster academic performance.

Method

Case presentation

The case of Maria (fictitious name) will be presented to illustrate the triadic model of intervention in LD we propose. As previously referred, this model is based on the bioecological perspective regarding child development, thus focusing on the child and the main microsystems of which he or she is a part of (e.g., family, school, extracurricular activities).

Clinical interview with Maria's parents was performed to gather information on the reason for the child's referral, impact of the problem on the child's functioning, the history of the problem, child's development and school history, academic and socio-emotional functioning. The Portuguese version of the protocol of the Semi-structured Clinical Interview for Children and Adolescents 6-18 (SCICA 6-18) (McConaughy & Achenbach, 1994) was used with the child. Maria was an eight-year-old girl, attending 3rd grade in a public school in Porto. She was referred by her regular teacher due to her difficulties in reading and writing processes, which were identified as early as the 1st grade and had a negative impact on the child's learning and socioemotional adjustment. Maria felt ashamed of her difficulties and did not usually ask the teacher for help in the classroom, thus, significantly increasing her anxiety levels.

Besides learning difficulties, Maria's parents were worried about her lack of autonomy in daily and schoolwork routines, as well as with her poor social skills and withdrawal. Difficulties in dealing with peers had been observed since 1st grade. She was described as a shy and introverted girl and she often depended on support from her cousin. On the basis of clinical interview undertaken with Maria's parents, this relationship was used by the child as a strategy to avoid confronting more challenging social situations that she did not feel equipped to face.

Maria was born at term with a healthy birth weight following an uncomplicated pregnancy and delivery. She met developmental milestones within expected age limits and there was no history of significant illness, injury, or health concerns. There were no early language or communication delays. Vision and hearing had been both recently checked, and no difficulties were detected. Maria lived with her parents, both merchants who had studied up to the 2nd cycle of basic education (6th grade). There was no history of learning disabilities

in their school trajectory. Moreover, Maria perceived her family relations as positive and supportive.

Instruments

A protocol designed to assess children attending 3rd grade was used. This protocol aims to assess reading and writing processes: 1) verbal fluency, 2) reading speed, 3) reading fluency, 4) reading comprehension, 5) written production and 6) orthography. This protocol includes a Verbal Fluency Test, a list of words with increasing length and complexity, a text adjusted to Maria's school level and age and a set of eight questions about this text.

In addition to the protocol, Wechsler Intelligence Scale for Children – 3rd edition (WISC-III; Wechsler, 2003) was administered to assess Maria's cognitive functioning.

Assessment results

Academic functioning (reading and writing)

To assess verbal fluency, Maria was asked to say words of her own choosing in the space of a minute. The number of words said was counted. The analysis of her performance in this task was based both on the number of evoked words and the number and types of categories these words belonged to. To assess reading speed, the child was asked to read out-loud a list of words with increased extension and complexity. Reading fluency was assessed with a text adjusted to Maria's age and school grade. The child was asked to read this text and her reading was timed and the errors she made while reading were recorded. The number of words correctly read per minute were calculated. To assess reading comprehension, the child was asked to answer a set of questions about the text she had previously read. To assess written production, Maria was asked to write a text based on a theme of her choice. Spelling was analyzed based on the written sample collected in the sessions (i.e., answers to the reading comprehension exercise and texts written by Maria).

Verbal fluency, reading speed and fluency results were below the mean expected at Maria's age and school level. Severe difficulties in reading comprehension processes also observed. Additionally, the following difficulties in written production were observed: 1) disorganized structure of the text, 2) punctuation problems, 3) poor vocabulary, 4) spelling mistakes, due to difficulties in accentuation and morphology rules, as well as phonological difficulties.

Cognitive functioning

Cognitive assessment was undertaken to identify difficulties and competencies in Maria's cognitive profile, as well as to understand if reading and writing difficulties could be explained by cognitive difficulties or by specific difficulties

The result of the Wechsler Intelligence Scale for Children – 3rd edition (WISC-III; Wechsler, 2003) Complete Scale was below average intelligence. Verbal scale result was also below average, while the performance scale result corresponded to the average expected for

Maria's age. Statistically significant differences were not observed between the results of these two scales.

Socioemotional functioning

The impact of learning difficulties on Maria's socioemotional functioning was assessed using: 1) clinical interviews with the child and the family, respectively; 2) the Child Behavior Checklist for ages 6-18 (CBCL 6-18; Achenbach, et al., 2014) filled out by Maria's parents and the Teacher's Report Form (TRF; Achenbach et al., 2014), filled out by the child's regular teacher.

In the clinical interview with the family, Maria's parents showed concerns regarding their daughter's difficulties in reading and writing, as well as the negative effect of these difficulties on her learning. They were also worried about Maria's introversion and social withdrawal, as she sought the support from her cousin to avoid the interaction with peers. Maria's mother said that her daughter was very quiet as the mother had been when she was a child, while the father said that Maria was very shy and socially inhibited.

In the clinical interview with Maria, she was very anxious about her difficulties in reading and writing.

In the CBCL filled out by Maria's mother, the Internalizing, Externalizing and Total Problems results were all in the normal range (score T Internalizing= 57; score T Externalizing = 50; score T Total Problems= 49). The same was found in the CBCL filled out by Maria's father (score T Internalizing = 58; score T Externalizing = 56; score T Total Problems = 51). By contrast, the Competence Scales results were in the clinical range both in the CBCL filled out by the mother (score T Activities = 22; Score T Social = 28; score T School = 22) and the father (score T Activities = 22; score T Social = 25; score T School = 22). In the TRF, the Adaptive Functioning scale result was within the borderline range.
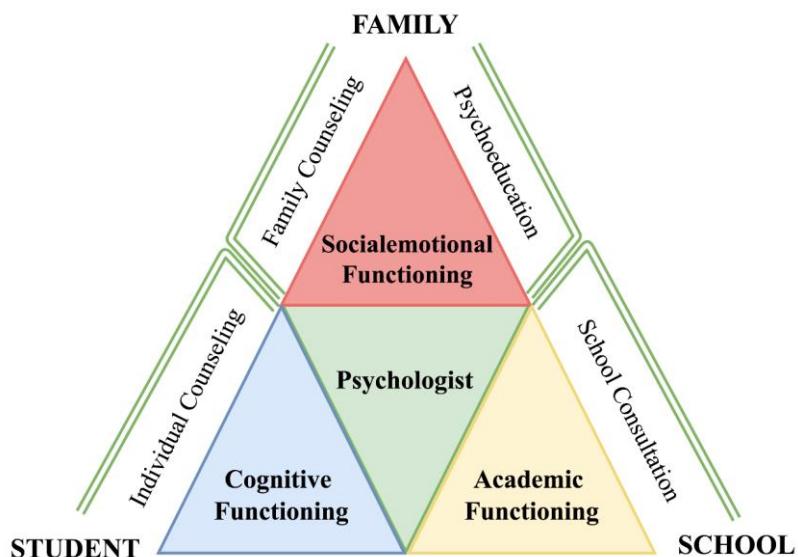
Synthesis of assessment results and diagnostic

Severe difficulties in reading and writing (i.e., reading speed and fluency below the average expected for age and school level leading to deficits in reading comprehension; poor organization and clarity of written expression, deficits in punctuation accuracy and several orthographic errors), which were compromising Maria's learning and could not be explained by cognitive difficulties, were identified in the initial assessment. These difficulties are compatible with a Specific Learning Disorder with impairment in reading [F81.0] and writing [F81.81] (DSM–5; APA, 2013).

Intervention

As the main goal of the intervention was to promote Maria's functioning at the individual and contextual levels, the intervention was based on a bioecological model of human development. Assuming the different levels of child functioning (i.e., academic, cognitive and socioemotional, the work developed focused on the intersection of the micro with the mesosystem) (see figure 1). This model is based on a triadic model of the intervention

we propose, involving the child, the school (i.e., the regular and the special education teachers) and the family (i.e., Maria's parents).

Figure 1. Triadic model of intervention with students with learning disabilities

In line with this model, the intervention aimed to: 1) promote Maria's social skills, 2) increase her autonomy in daily and school routines and 3) promote reading and writing processes. It was based on three modalities: 1) individual intervention with the child, 2) parenting counseling and psychoeducation and 3) school consultation. The work developed with Maria was based on the principles of CBT.

In what concerns the individual intervention with the child, the intervention was carried out with Maria, from 3rd to 5th grade. While Maria was attending the 3rd grade until the first term of the 4th grade, weekly individual sessions were conducted by the psychologist with the child to promote reading fluency, and cognitive processes. These were interrupted during the school holidays.

To improve reading processes, the following strategies were used:

1. *Modeling*. The psychologist read the lists of words, passages of the text or the entire text, asking Maria to read them afterwards.
2. *Corrective feedback*. Mispronunciations or omissions were corrected while the child was reading or after she had read. Maria was either provided with correct pronunciation or prompted to sound out or reread the word.
3. *Charting*. Maria's progress in reading fluency was charted.

To improve executive functions, tasks encompassing memorization, cognitive flexibility, prioritizing and note-taking were used. In what concerns the socio-emotional dimension, self-monitoring of thoughts, feelings, and behavior, as well as cognitive restructuring were used to decrease Maria's anxiety levels and social withdrawal.

During the 4th grade, bimonthly sessions were held. The intervention mainly focused on the promotion of reading comprehension, due to the increase observed in Maria's reading

fluency, and on writing. To improve reading comprehension, modeling, corrective feedback, reading comprehension exercises and charting were used. Self-Regulated Strategy Development was used to promote writing processes. Strategies aiming to promote executive functions were used: memorization, cognitive flexibility, prioritizing, note-taking, self-monitoring and self-checking.

In what concerns social skills promotion, as the child attended a dance academy, strategies were put into place to help Maria develop positive relationships with her peers. The dance classes aimed to enlarge the peer group and to challenge the child to deal with more complex social situations. Modeling, role-playing and systematic desensitization were used to help the child dealing with more challenging she was confronted in this context. Additionally, Positive Peer Reporting (PPR) strategies were used to help Maria improve her social interactions using rewards and positive social attention. PRP is a classroom-based intervention involving: (a) teaching students to identify positive peer behavior, (b) teaching students to report positive peer behavior and (c) reinforce the students for reporting these behaviors (Skinner et al., 2002).

As of the 5th grade, follow-up sessions began to be held quarterly. These sessions mainly focused on the promotion of the executive functions based on the strategies of note-taking, self-monitoring and self-checking.

To aid Maria with challenges of transition to the 5th grade, a program to promote study skills was used. Additionally, Maria's parents were advised to find a study center so Maria could have individual pedagogical support to promote reading and writing processes, as well as study skills.

Concerning school consultation, the work developed with the regular and special education teachers aimed to support them in applying the educational strategies necessary to enhance the child's learning and reduce her difficulties. During the 3rd grade, Maria was referred by the regular teacher to be assessed by the Special Education team. After this assessment, the child's tests were adapted and she began to receive the support from the Special Education teacher. The work developed by this teacher mainly focused on the promotion of reading and writing skills.

In the 5th grade, the child did not receive direct support from the Special Education Team, but she attended portuguese and english individual support classes. Additionally, Maria also had weekly 45 minutes tutoring sessions by the Special Education Teacher to help the child organizing her school material and to manage her study. The test adaptations were maintained until the end of this school year, as this educational measures were no longer needed.

To monitor Maria's progress and the operationalization of educational strategies, quarterly meetings were held with the regular and Special Education teachers. In the transition to the 2nd cycle of basic education, specific educational measures were designed to respond to Maria's needs in this new stage of schooling.

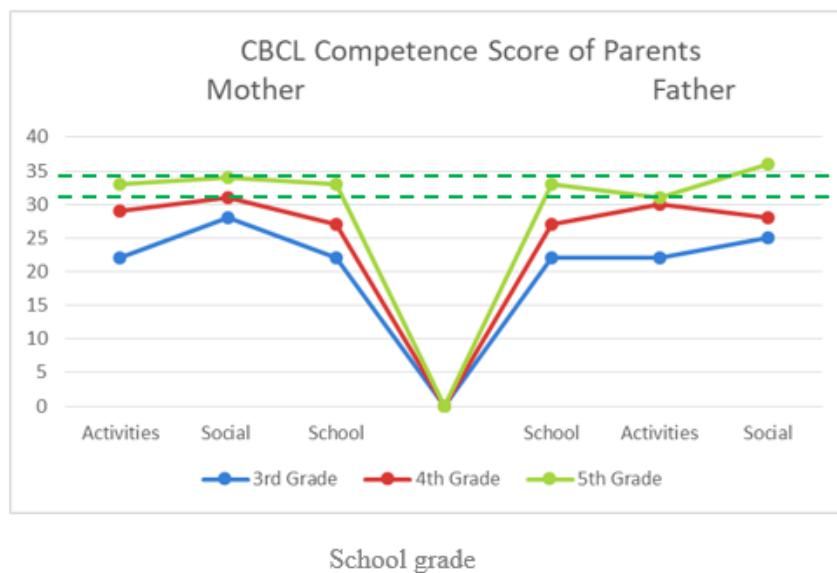The strategies applied in the intervention conducted with Maria are described in Table 1.

Table 1. Summary of the intervention

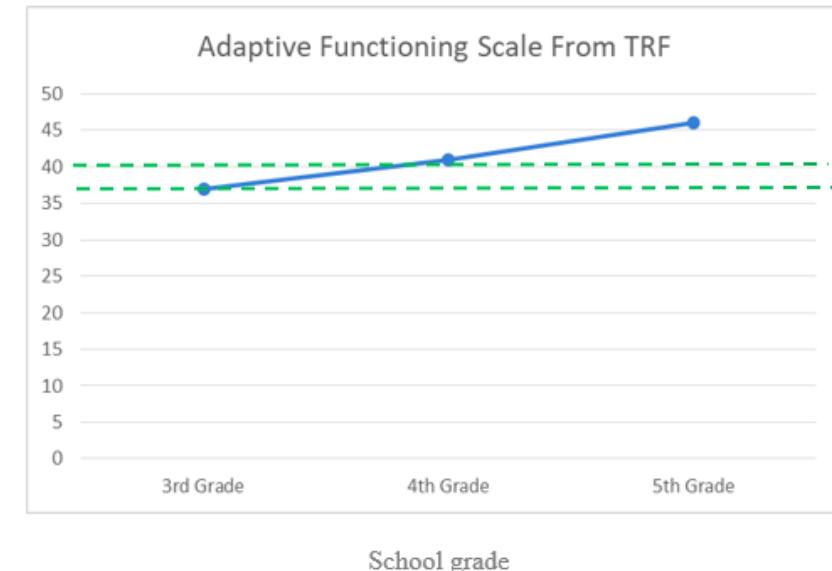| Goals	Promoting reading and writing skills		Promoting social skills and autonomy
Domain	Academic Functioning	Cognitive Functioning	Socioemotional Functioning
3rd grade	Improving Reading Fluency *Modeling; Corrective feedback and Charting.* Improving academic achievement *Support of Special Education*	Improving Executive Functions *Memorization* *Cognitive Flexibility* *Prioritizing* *Note-taking*	Decreasing anxiety symptoms - Social withdrawal and isolation *Self-monitoring of thoughts, feelings, and behavior* *Cognitive restructuring*
4th grade	Improving Reading Comprehension *Modeling, Corrective feedback, Comprehension component, Charting* Improving writing *Self-Regulated Strategy Development* Improving academic achievement Support of Special Education	Improving Executive Functions *Memorization* *Cognitive Flexibility* *Prioritizing* *Note-taking* *Self-monitoring and self-checking*	Increasing social skills and autonomy *Modeling* *Roleplaying* *Systematic desensitization* Positive Peer Reporting (PPR) in school Attending a dance academy
5th grade	Improving academic achievement Portuguese and English individual support classes Tutoring sessions in school	Improving Executive Functions *Note-taking* *Self-monitoring and self-checking*	Increasing study skills and autonomy Study center
Modalities	Individual Counseling Psychoeducation School Consultation	Individual Counseling Family Counseling School Consultation	Individual Counseling Family counseling Psychoeducation School Consultation

Results

To monitor Maria's evolution, she was reassessed again in 5th grade. An increase in verbal and reading fluency was observed. The child also developed strategies to better structure and link ideas in his texts and to monitor orthography, leading to a significant decrease in orthographic mistakes. She also appeared to be more confident when dealing with reading and writing, as a decrease in the anxiety levels was observed.
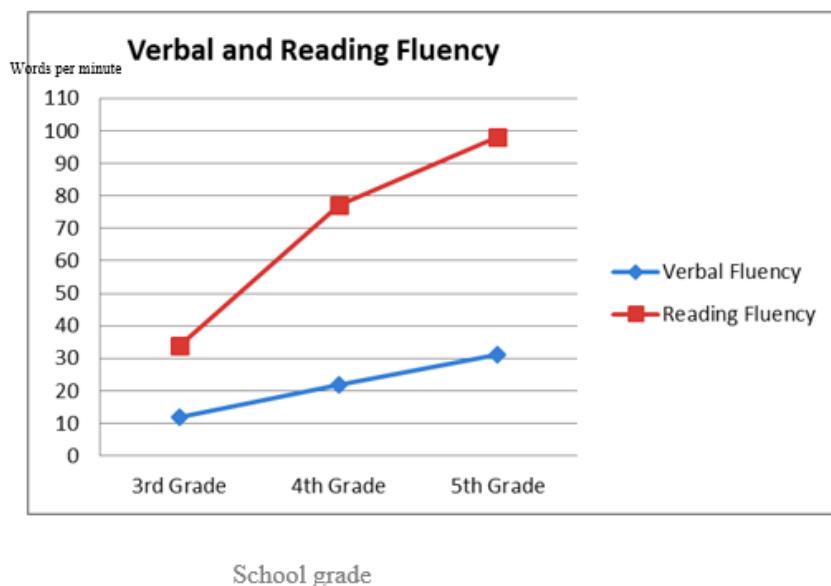
Additionally, CBCL Problems and Competence Scales and TRF Adaptive Functioning Scale scores were in the normal range (see figures 2 to 4).

Figure 2. Progress of parents' CBCL competence score (academic and socioemotional functioning)

Figure 3. Progress of TRF adaptive functioning scale (academic and socioemotional functioning)

Figure 4. Progress of verbal and reading fluency (academic functioning)

Discussion

The intervention proved to be effective in improving reading and writing processes, as an increase in verbal and reading fluency was observed (Shanahan, 2006). These results support the assumption that the early foundations for reading fluency are laid by attention to powerful instruction in the alphabetic principle and the establishment of reading accuracy (Byrne, 1998; Ehri, 2005). They also emphasize the importance of early intervention with

children with LD, as children who do not read large amounts of text will not enlarge their vocabulary sufficiently to be fluent readers by 3rd grade, nor will their fluency continue to expand as they are required to read increasingly complex text after 3rd grade (Hudson et al., 2009). Beyond the progress observed in reading and writing, an improvement in Maria's socio-emotional adjustment was also observed.

This case highlights the multiplicity of weak domains in LD (Al-Yagon, 2011; Meltzer, 2007; Sharabi & Margalit, 2011; Swanson & Zheng, 2013) and the importance of assuming a comprehensive analysis of children and adolescents' developmental profile. Thus, the importance of considering the different levels of children's functioning when conducting intervention with students with LD, both in clinical and school contexts.

In fact, in accordance to what the literature often refers, Maria, a young primary school student with LD, also reported elevated stress, suffering from internalizing disorders, namely social withdrawal (Mammarella et al., 2014; Sourander et al., 2005). She showed a diminished sense of self-worth and more avoidance in the context of peer interaction than would be expected, perpetuating a cycle of isolation and anxiety that her peers without LD did not experience (Howard & Tryon, 2002). Besides, Maria was less cooperative and assertive, had poor social skills and difficulties in effective communication in peer interaction (Al-Yagon & Mikulincer, 2004; Bryan et al.,2004; Estell et al., 2008).

Maria's reading fluency was often lacking because she had difficulty decoding words accurately, monitoring her performance to ensure that she was tracking the text correctly, and summarizing the content in order to build meaning. She needed to learn to coordinate the dual process of shifting flexibly from retrieving and interpreting background knowledge to attending to and interpreting print and new content, integrating known information with new content (Swanson & Zhen, 2013).

Regarding academic performance, for Maria the writing process was seldom automatic. She experienced difficulties in using accurate syntax at sentence level, organizing arguments in order to persuade the reader, and using the traditional structure of introduction, main body, and conclusion in an essay (Graham & Harris, 20033; Graham et al., 2003).

This clinical case illustrated a comprehensive assessment that included standardized tests (e.g. WISC-III), informal measures, observations, student self-reports (e.g., SCICA), parent reports (e.g., interview and CBCL), and progress monitoring (e.g., reading and writing reassessments and ASEBA). These measures yielded comprehensive quantitative and qualitative data about Maria and made it possible to accurately identify Maria's patterns of strengths and needs in different domains - academic, cognitive and socioemotional. Additionally, the combination of a categorical with a dimensional perspective, when assessing the association between cognitive processes and reading and writing skills, proved effective for a good understanding of the case (Fletcher et al., 2013).

The case also underlines the importance of early assessment and intervention Fuchs & Fuchs, 2001, 2005; Fuchs et al., 2001; Torgesen, 1999, 2004) and a comprehensive analysis of children and adolescents' developmental profile, as learning processes and academic performance are very closely linked to socio-emotional adjustment.

As regards intervention, first and foremost, the work conducted with Maria underlines the importance of assisting children within their natural contexts - in this case, the application of PPR at school and the promotion of better parental and pedagogic practices within the family and school, respectively. In doing so, the child's progress can be fostered and more easily generalized to a greater variety of situations, through the empowerment of other professionals or family members that have more frequent contact with the child.

In the case of Maria, the intervention focused simultaneously on three domains (reading and writing, cognitive and socio-emotional skills), as it was clear that improvement in one area would positively affect another. Indeed, fostering cognitive processes and reading and writing skills helped improve Maria's overall academic performance, contributing, in turn, to a higher sense of self-worth on her part, more confidence in her social interactions, and less social withdrawal and avoidance. Moreover, focusing on social aspects, in particular peer relationships (Kendziora, 2004; Skinner et al., 2002) was crucial, leading Maria to experience more successful social interactions, in part due to the success of the PPR element of the intervention that allowed this improved interaction to be generalized within the classroom context, by promoting peer acceptance.

In line with the bioecological perspective of human development, the need to consider different levels of influence on the child - namely the microsystem, mesosystem, exosystem, macrosystem and chronosystem (Bronfenbrenner & Morris, 2006; Vaughn & Fuchs, 2003; Speece et al., 2003) was taken into account. Therefore, the work carried out with the child was based on a triadic model of intervention, involving the child, the regular and/or special education teacher and the psychologist, who supervised the process and was a mediator at the intersection of the micro- with the mesosystem, through consulting work, which led to the use of previously untapped resources, afforded by the legislation (macrosystem). Through individual and family counseling, as well as psychoeducation, the resources of the school, the family and Maria herself were strengthened (at a microsystem level) and the use of the resources of the community was optimized (at a exosystem level). Moreover, the encouraging results of the CBT intervention applied in this case emphasize the potential benefits of CBT in intervention with students with LD to promote their academic performance and their adaptive functioning (Achenbach et al., 2014; Compton et al., 2002; Gresham & Kern, 2004; Kendziora, 2004; Merrell & Walker, 2004).

Finally, the triadic model based intervention proved to be effective in promoting Maria's reading and writing processes and socio-emotional adjustment. Though the model was applied to a single case in Portugal, which is one of the limitations of this study, it reflects

some important points in the literature regarding LD and offers a practical, comprehensive approach for clinical or school practitioners, in general, to consider when addressing LD in children.

The case of Maria reinforces many research findings in which LD are associated with other problems - e.g., cognitive and socio-emotional. However, it is important to note that not all people with LD experience socio-emotional and behavioral difficulties, alongside their academic problems, due to predictors such as resilience and adjustment (Al-Yagon & Mikulincer, 2004; Meltzer, 2004; Wong, 2003). Therefore, identifying socio-cognitive skills and protective processes will further the paths available to promote the social adjustment among individuals with LD.

Single case design researchers have produced a database on effective intervention for individuals in the field of LD. Some researchers have offered recommendations that incorporate relaxed structural elements in a single-case designs (e.g. without replication procedures in the sophisticated design measurement in research methodology) to allow practitioners to participate in developing practice-based evidence (Kratochwill et al., 2012), contributing towards a more comprehensive view of LD and a finer grasp of the specific needs children with LD show, within the different domains the triadic model considers, and how to address them in the most thorough and effective manner.

References

Achenbach, T. M., Rescorla, L., Dias, P., Ramalho, V., Lima, V., Machado, B., & Gonçalves, M. (2014). *Manual do Sistema de Avaliação Empiricamente Validado (ASEBA) para o Período Pré-Escolar e Escolar*. Braga: Psiquilíbrios.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Author.

Alamargot, D., & Fayol, M. (2009). Modeling the development of written transcription. In R. Beard, D. Myhill, M. Nystrand, & J. Riley (Eds.), *Handbook of writing development* (pp. 23-47). London: Sage.

Al-Yagon, M., & Mikulincer, M. (2004). Socioemotional and academic adjustment among children with learning disorders: The mediational role of attachment-based factors. *Journal of Special Education*, *38*, 111-123. https://doi.org/10.1177/00224669040380020501

Al-Yagon, M. (2011). Fathers' emotional resources and children's socioemotional and behavioral adjustment among children with learning disabilities. *Journal of Child and Family Studies*, *20*, 569–584. https://doi.org/10.1007/s10826-010-9429-9

Al-Yagon (2012). Adolescents with learning disabilities: Socioemotional and behavioral functioning and attachment relationships with fathers, mothers, and teachers. *Journal Youth Adolescence*, *41*, 1294-1311. https://doi.org/10.1007/s10964-012-9767-6.

Aptekin, C., & Erçetin, G. (2010). The role of L1 and L2 working memory in literal and inferential comprehension in L2 reading. *Journal of Research in Reading*, *33*, 206-219. https://doi.org/10.1111/j.1467-9817.2009.01412.x.

Baker, L., Dreher, M. J., Shiplet. A. K., Beall, C. L., Voelker, A. N., Garrett, A. J., Schugar, H. R., & Finger-Elam, M. (2011). Children's comprehension of informational text: Reading, engaging, and learning. *International Electronic Journal for Leadership in Learning*, *4*, 197-227.

Berninger, V. W. (1999). Coordinating transcription and text generation in working memory during composing: Automatic and constructive processes. *Learning Disability Quarterly*, *22*(2), 99-112. https://doi.org/10.2307/1511269.

Berninger, V. W., Abbott, R. D., Abbott, S. P., Graham, S., & Richards, T. (2002). Writing and reading: Connections between language by hand and language by eye. *Journal of Learning Disabilities*, *35*, 39–56. https://doi.org/0.1177/002221940203500104.

Berninger, V. W., & Winn, W. (2006). Implications of advancements in brain research and technology for writing development, writing instruction, and educational evolution. In C. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of Writing Research* (pp. 96- 114). New York: The Guilford Press.

Bowers, F. E., Woods, D. W., Carlyon, W. D., & Friman, P. C. (2000). Using positive peer reporting to improve the social interactions and acceptance of socially isolated adolescents in residential care: A systematic replication. *Journal of Applied Behavior Analysis*, *33*, 239–242.

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In Lerner R. (Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (6th ed., pp. 793–828).). Hoboken, NJ: Wiley.

Bryan, T., Burstein, K., & Ergul, C. (2004). The social-emotional side of learning disabilities: A science-based presentation of the state of the art. *Learning Disability Quarterly*, *27*, 45-51. https://doi.org/10.2307/1593631

Byrne, B. (1998). *The foundation of literacy*. Psychology Press.

Casas, A. M. (1988). *Dificultades de aprendizaje de la lectura, escrita y cálculo*. Valencia: Promolibro.

Compton, S. N., Burns, B. J., Egger, H. L., & Robertson, E. (2002). Review of the evidence base for treatment of childhood psychopathology: Internalizing disorders. *Journal of Consulting & Clinical Psychology*, *70*, 1240–1266.

Ehri, L. C. (2002). Reading processes, acquisition, and instructional implications. In Reid, G. & Wearmonth J. (Eds.), *Dyslexia and Literacy* (pp. 167-185). Chichester: John Wiley & Sons.

Ehri, L. C. (2005). Learning to read words: Theory, findings, and issues. *Scientific Studies of Reading*, *9*, 167-188. https://doi.org/10.1207/s1532799xssr0902_4

Ervin, R. A., Johnston, E. S., & Friman, P. C. (1998). Positive peer reporting to improve the social interactions of a socially rejected girl. *Proven Practice: Prevention and Remediation Solutions for School Problems*, *1*, 17–21.

Estell, D. B., Jones, M. H., Pearl, R, Van Acker, R., Farmer, T. W., & Rodkin, P. C. (2008). Peer group, popularity, and social preference trajectories of social functioning among students with and without learning disabilities. *Journal of Learning Disabilities*, *41*, 5-14. https://doi.org/10.1177/0022219407310993

Fletcher, J. M., Lyon, G. R., Fuchs, L., & Barnes, M. (2007). Learning disabilities: from identification to intervention. New York: Guilford Press.

Fletcher, J. M., Stuebing, K. K., Morris, R. D., & Lyon, G. R. (2013). Classification and definition of learning disabilities: A hybrid model. In H. L. Swanson & K. Harris (Eds.) *Handbook of Learning Disabilities* (pp. 33–50). New York: Guilford.

Foorman, B. R., Francis, D. J., Fletcher, J. M., Schatschneider, C., & Mehta, P. (1998). The role of instruction in learning to read: Preventing reading failure in at-risk children. *Journal of Educational Psychology*, *90*, 37-55. https://doi.org/10.1037/0022-0663.90.1.37

Fuchs, L. S., & Fuchs, D. (1999). Monitoring student progress toward the development of reading competence: A review of three forms of classroom-based assessment. *School Psychology Review*, *28*, 659-671.

Fuchs, L. S., & Fuchs, D. (2001). Principles for sustaining research-based practice in the schools: A case study. *Focus on exceptional children*, *33*, 6, 1-14.

Fuchs, D., & Fuchs L. S. (2005). Peer-assisted learning strategies: Promoting word recognition, fluency, and reading comprehension in young children. *Journal of Special Education*, *39*, 34-44. https://doi.org/10.1177/00224669050390010401

Graham, S., & Harris, K. R. (2000). Helping children who experience reading difficulties: Prevention and intervention. In L. Baker, J. Dreher, & J. Guthrie (Eds.), *Engaging young readers: Promoting achievement and motivation* (pp. 43–67). New York: Guilford Press.

Graham, S., & Harris, K. R. (2003). Students with learning disabilities and the process of writing: A meta-analysis of SRSD studies. In L. Swanson, K. R. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 323–344). New York: Guilford.

Graham, S., & Harris, K.R. (2004). Writing instruction. In B. Wong (Ed.), *Learning about learning disabilities* (3rd ed., pp. 281–313). San Diego, CA: Elsevier Science.

Graham, S., Harris, K. R., & McKeown, D. (2013). The writing of students with learning disabilities, meta-analysis of self-regulated strategy development writing intervention studies, and future directions (Second edition). H. L. Swanson, K. R. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (pp. 405-438). New York: The Guilford Press.

Gresham, F. M., & Kern, L. (2004). Internalizing behavior problems in children and adolescents. In R.B. Rutherford, Jr., M.M. Quinn, & S.R. Mathur (Eds.), *Handbook of research in emotional and behavioral disorders* (pp. 262–281). New York: Guilford Press.

Hook, P. E., & Jones, S. D. (2002). The importance of automaticity and fluency for efficient reading comprehension. International Dyslexia Association Quarterly Newsletter. *Perspectives*, *28*, 9-14.

Howard, K. A., & Tryon, G. S. (2002). Depressive symptoms in and type of classroom placement for adolescents with LD. *Journal of Learning Disabilities*, *35*(2), 185 - 190. https://doi.org/10.1177/002221940203500209

Hudson, R. F., Pullen P. C., Lane, H. B., & Torgesen, J. K. (2009). The complex nature of reading fluency: A multidimensional view. *Reading & Writing Quarterly*, *25*, 4-32. https://doi.org/10.1080/10573560802491208

Jones, K. M., Young, M. M., & Friman, P. C. (2000). Increasing peer praise of socially rejected delinquent youth: Effects on cooperation and acceptance. *School Psychology Quarterly*, *15*, 30–39. https://doi.org/10.1037/h0088776

Jones, S. M., & Kahn, J. (2017). The evidence base for how learning happens - A consensus on social, emotional, and academic development. *American Educator*, 16-44. Retrieved from https://files.eric.ed.gov/fulltext/EJ1164389.pdf

Kendziora, K. T. (2004). Early intervention for emotional and behavioral disorders. In R.B. Rutherford, Jr., M.M. Quinn, & S.R. Mathur (Eds.), *Handbook of research in emotional and behavioral* disorders (pp. 327–361). New York: Guilford Press.

King, A. (2007). Beyond literal comprehension: A strategy to promote deep understanding of text. In D. S. McNamara (Ed.), *Reading comprehension strategies: Theories, interventions, and technologies* (pp. 267–290). New York: Erlbaum.

Kratochwill, T. R., Hoagwood, K. E., Kazak, A. E., Weisz, J. R., Hood, K., Vargas, L. A., & Banez, G. (2012). Practice-Based Evidence for Children and Adolescents: Advancing the Research Agenda in Schools. *School Psychology Review*, *41*, 215-235.

Lopes, J., Fernandes, C., & Moniz, A. (2014). Reconhecimento de palavras e velocidade de leitura de texto: Um estudo com medidas repetidas no ensino primário. *Revista Portuguesa de Psicologia*, *43*, 9-29.

Magnuson, S., & Norem, K. (2015). Essential counseling skills: Practice and application guide. Thousand Oaks, CA.

Mammarella, I., Ghisi, M., Bomba, M., Bottesi, G., Caviola, S., Broggi, F., & Nacinovich, R. (2016) Anxiety and Depression in Children With Nonverbal Learning Disabilities, Reading Disabilities, or Typical Development. *Journal of Learning Disabilities*, *49*(2), 130 - 139. https://doi.org/10.1177/0022219414529336.

McConaughy, S. H., & Achenbach, T. M. (1994). *Manual for the Semistructured Clinical Interview for Children and Adolescents*. University of Vermont Department of Psychiatry.

Meltzer, L. (2004). Resilience and learning disabilities: Research on internal and external protective dynamics. *Learning Disabilities Research & Practice*, *19*, 1-2. doi: 10.1111/j.1540-5826.2004.00083.x

Meltzer, L. (2007). *Executive function in education-from theory to practice*. New York: The Guilford Press.

Merrell, K., & Walker, H. (2004). Deconstructing a definition: Social maladjustment versus emotional disturbance and moving the EBD field forward. *Psychology in the Schools*, *41*, 899–910. https://doi.org/10.1002/pits.20046

Meyer, M., & Felton, R. (1999). Repeated reading to enhance fluency: old approaches and new directions. *Annals of Dyslexia*, *49*, 283-306.

Moroz, K. B., & Jones, K. M. (2002). The effects of positive peer reporting on children's social involvement. *School Psychology Review*, *31*, 235-245.

Morra, J., & Tracey, D. (2006). The impact of multiple fluency interventions on a single subject. *Reading Horizons*, *47*(2), 175-199. https://doi.org/ 10.1177/0022219416638028

National Joint Committee on Learning Disabilities. (2005). Responsiveness to Intervention and Learning Disabilities. *Learning Disability Quarterly*, *28*(4), 249–260. https://doi.org/10.2307/4126964

Shanahan, T. (2006). Relations among oral language, reading, and writing development. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds). *Handbook of Writing Research* (pp. 83-95). New York: The Guilford Press.

Sharabi, A., & Margalit, M. (2011). The mediating role of internet connection, virtual friends, and mood in predicting loneliness among students with and without learning disabilities in different educational environments. *Journal of Learning Disabilities*, *44*, 215-227. https://doi.org/10.1177/0022219409357080

Sideridis, G. D. (2007). International Approaches to Learning Disabilities: More Alike or More Different? *Learning Disabilities Research & Practice*, *22*, 210-215. https://doi.org/10.1111/j.1540-5826.2007.00249.x

Skinner, C. H., Neddenriep, C. E., Robinson, S. L., Ervin, R., & Jones, K. (2002). Altering educational environments through positive peer reporting: Prevention and remediation of social problems associated with behavior disorders. *Psychology in the Schools*, *39*, 191–202. https://doi.org/10.1002/pits.10030

Speece, D. L., Case, L. P., & Molloy, D. E. (2003). Responsiveness to general education instruction as the first gate to learning disabilities identification. *Learning Disabilities Research & Practice*, *18*, 147–156. https://doi.org/10.1111/1540-5826.00071

Sourander, A., Multim.ki, P., Nikolakaros, G., Haavisto, A., Ristkari, T., Helenius, H., & Almqvist, F. (2005). Childhood predictors of psychiatric disorders among boys: A prospective community-based follow-up study from age 8 years to early adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry*, *44*, 756–767. https://doi.org/10.1002/pits.10030

Swanson, H. L. (2013). Meta- analysis of research on children with learning disabilities. In H. L. Swanson, & K. Harris (Eds.), *Handbook of Learning Disabilities* (pp. 627–642). New York: Guilford.

Swanson. H. L. & Zheng, X. (2013). Memory Difficulties in Children and Adults with Learning Disabilities. In H. L. Swanson, & K. Harris (Eds.), *Handbook of Learning Disabilities* (pp. 214–255). New York: Guilford.

Swanson, H. L., & Berninger, V. W. (1996). Individual differences in children's working memory and writing skill. *Journal of Experimental Child Psychology*, *63*(2), 358-385. http://dx.doi.org/10.1006/jecp.1996.0054.

Torgesen, J. K. (1999). Phonologically based reading disabilities: Toward a coherent theory of one kind of learning disability. In R. J. Sternberg, & L. Spear-Swerling (Eds.), *Perspectives on learning disabilities* (pp. 231-262). New Haven: Westview Press.

Torgesen, J. K. (2004). Lessons learned from research interventions for students who have difficulty learning to read. In P. McCardle, & V. Chhabra, (Eds.), *The Voice of Evidence in Reading Research* (pp. 355 – 382). Baltimore MD: Paul H. Brookes.

Therrien, W. J. (2004). Fluency and comprehension gains as a result of repeated reading: A meta-analysis. *Remedial and Special Education*, *25*(4), 252-261. https://doi.org/10.1002/pits.10030

Van Ameringen, M., Mancini, C., & Farvolden, P. (2003). The impact of anxiety disorders on educational achievement. *Journal of Anxiety Disorders*, *17*(5), 561-71. https://doi.org/10.1016/S0887-6185(02)00228-1

Van Der Leij, A., & Van Daal, V. (1999). Automacity, automatization and dyslexia. In I. Lundberg, F. E. Tonnessen, & I. Austad, *Dyslexia: Advances in theory and practice* (pp. 75-89). Dordrecht: Kluwer Academic Publishers.

Vaughn, S., & Fuchs, L. S. (2003). Redefining learning disabilities as inadequate response to instruction: The promise and potential problems. *Learning Disabilities Research & Practice*, *18*, 137–146. https://doi.org/10.1111/1540-5826.00070

Wechsler, D. (2003). *Escala de Inteligência de Wechsler para Crianças* – Terceira Edição (WISC-III) [Manual]. Lisboa: Cegoc.

Willner, P. (2009). Psychotherapeutic intervention in learning disability: focus on cognitive behavioural therapy and mental health. *Psychiatry*, *8*(10), 416-419. https://doi.org/10.1016/j.mppsy.2009.06.018

Wong, B. Y. L. (2003). General and specific issues for researchers' consideration in applying the risk and resilience framework to the social domain of learning disabilities. *Learning Disabilities Research and Practice*, *18*, 68-76. https://doi.org/10.1111/1540-5826.0006

Modelo triádico de intervenção com alunas(os) com dificuldades de aprendizagem: Um estudo de caso

Resumo

Este artigo tem como objetivo explorar o potencial de um modelo triádico na intervenção com crianças com dificuldades de aprendizagem (DA). O modelo triádico proposto baseia-se na assunção de que a intervenção com crianças com DA deve centrar-se em três domínios de funcionamento que se encontram conectados entre si (i.e., académico, cognitivo e socioemocional), o que leva à necessidade de considerar não só o indivíduo, como os contextos em que este se insere, na linha do modelo bioecológico do desenvolvimento humano. O modelo foi implementado ao longo de uma intervenção ao longo de dois anos com a Maria, uma criança de nacionalidade portuguesa de 8 anos, que frequentava o 3º ano de escolaridade, no início da intervenção. A Maria foi sinalizada pela Professora Titular de Turma, devido às dificuldades por ela evidenciadas na leitura e na escrita, reduzida autonomia nas rotinas quotidianas e dificuldades de relacionamento com os pares. A intervenção teve como objetivos: 1) promover as competências sociais da Maria, 2) potenciar a sua autonomia nas rotinas diárias e escolares e 3) promover os processos de leitura e de escrita. A intervenção baseou-se em três modalidades: 1) consultas individuais com a criança, 2) psicoeducação com os pais e 3) consultadoria no contexto escolar. O funcionamento académico e socioemocional foram avaliados antes e depois da intervenção. Foi observado um aumento da fluência verbal e leitora da criança, e uma diminuição dos problemas socioemocionais por ela apresentados. A intervenção baseada no modelo triádico mostrou ser eficaz na promoção das competências de leitura e de escrita, e do ajustamento socioemocional da criança.

Palavras-chave: