

Diagnosis and Treatment of Developmental Dyslexia and Specific Learning Disabilities: *Primum Non Nocere*

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ABSTRACT: Specific learning disabilities (SLDs) are increasingly being addressed by researchers, schools, and institutions, as shown by the increasing number of publications, guidelines, and incidence statistics. Although SLDs are becoming a major topic in education with the final goal of inclusive schools, consistent drawbacks may emerge, resulting in disadvantages instead of benefits for some children. Overdiagnosis and unnecessary interventions may harm children's neurodevelopment and families' quality of life more than previously thought. In this commentary, we discuss recent understandings, their practical and educational applications, and some considerations of the effects of these choices on children.

(*J Dev Behav Pediatr* 40:558–562, 2019) **Index terms:** diagnosis, intervention, psychological consequences.

EPIDEMIOLOGY OF SPECIFIC LEARNING DISABILITIES AND DEVELOPMENTAL DYSLEXIA: PREVALENCE ESTIMATES AND DIAGNOSIS REPORTS

Over the last decade, a dramatic increase in the incidence of neurodevelopmental disorders in childhood has been reported.¹ For example, attention-deficit hyperactivity disorder has tripled, and autism has increased 20-fold.² Among developmental disorders, specific learning disabilities (SLDs—reading, writing, and mathematics deficits) are most frequently diagnosed in childhood. Epidemiological studies report prevalence rates of 4% to 9% for reading deficits and 3% to 7% for mathematics deficits (Diagnostic and Statistical Manual of Mental Disorders-5^{3,4}). The estimated variability in prevalence depends on definition and adopted criteria, which may differ among states, countries, and experts.^{5,6}

The UK Department for Education, in a report about special education needs in England, reported the percentage of children with special educational needs (SENs) support and SLD diagnoses as shown in Figure 1.^{7,8}

In the United States, the National Center for Education Statistics reported that between 2015 and 2016, 6.7 million students (13% of all public school students) re-

ceived special education. Among these, more were diagnosed with SLDs than any other type of disability. The percentage of children with SLDs shifted from 21.5% of all disabilities in 1976 to 1977 to 34.8% in 2014 to 2015, with a stable trend since the 1980s.⁹

In Italy, SLD diagnosis has also increased considerably; between 2010 and 2011, the percentage of alumni with SLDs reported by the National Educational Service (MIUR [Ministero dell'Istruzione dell'Università e della Ricerca]) was 0.7%, whereas between 2016 and 2017, it was 2.9% (Fig. 2). The greatest shift appears in the age range 11 to 13 (from 1.6% to 5.4%). Dyslexia diagnoses increased by 49%, certifications for dysgraphia by 90%, dysorthography by 85%, and dyscalculia by 89%.¹⁰

In the last decades, we have witnessed a global phenomenon of increased attention to pediatric mental health, learning opportunities, and challenges. A great worldwide effort has been made to implement special services and school programs with the goal of child-friendly schools that are mindful of the strengths and difficulties of children and focus on enhancing individual potential. Several countries have enacted interventions for inclusive schools, aligning with the intention of free and appropriate public school education for all children (such as the Office for Standards in Education, Children's Services and Skills in the United Kingdom, the Education for All Handicapped Children Act in the United States, and the statements on special education from the MIUR in Italy). The importance of SENs has been recognized to provide norms for diagnosis and guidelines for required support.

In this general context, SLDs have obtained special attention from specialists and education professionals. The importance of providing best-practice guidelines for literacy teaching based on evidence has been supported by government-funded reports; for a review, see Ref. 11.

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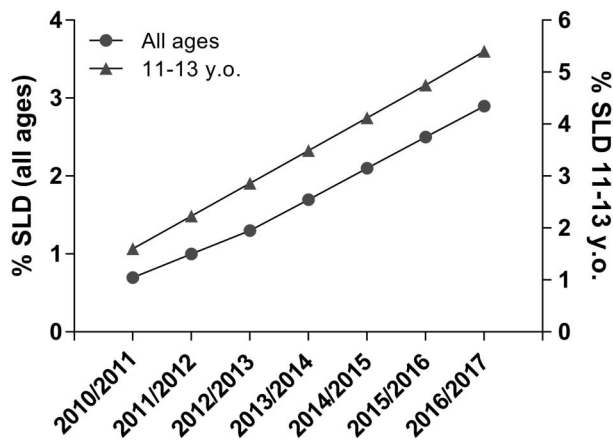


Figure 1. Percentage of children with SLDs in Italy from 2010 to 2017. The percentage considering all ages is represented as dots (left y-axis). The specific 11 to 13 years old percentage is represented as triangles (right y-axis) (see text for references). SLD, specific learning disability.

THE GAP BETWEEN SCIENCE, DIAGNOSTIC PROCESS, AND PRACTICAL OFFERS: FOCUS ON DEVELOPMENTAL DYSLEXIA

Despite great efforts to formalize the diagnostic process and understand cause, pathophysiology, and socio-environmental risk factors, several questions are unanswered, and the management of specific learning disabilities (SLDs) remains challenging.

The latest edition of the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders (DSM-5⁴) broadened the diagnostic category by using the generic term “specific learning disorder” as an overall diagnosis; difficulties in reading, writing, and mathematics, which have been classified as separate disorders in previous editions of the DSM, are aggregated (DSM-IV: 315.0; 315.2; 315.1). The adoption of a broader criterion may have a great impact on effective management of SLDs in children.

A striking example is dyslexia, defined as the failure to develop accurate, fluent reading skills in the presence of normal intelligence, teaching, environmental support, relative treatment resistance, and lack of sensorial deficits.^{12,13} Although the implicated mechanism may be different, the result is always the same: reading difficulty in accuracy and/or fluency with or without consequences on text comprehension as reported by structured tests. The focus is therefore on the behavioral manifestation of the problem, separate from the cause.

Several studies support the idea that poor phonological skills (i.e., the ability to perceive and manipulate the sounds of spoken words, as shown by poor nonword repetition in preschool and poor phoneme awareness in the school years) are the core deficit in dyslexia. However, learning to read involves multiple functions, such as linguistic,¹⁴ visual,¹⁵ and attentional¹⁶ mechanisms. Furthermore, the absence of initial automatic global processing in visual perception may be implicated.¹⁷ Such findings add to a growing body of evidence that a phonological deficit is 1 of a number of risk factors for

dyslexia that accumulate toward a threshold¹⁸ and the idea that a single deficit accounts for dyslexia appears inadequate.

Etiological and pathophysiological mechanisms may instead have a great impact on rehabilitative procedures. As expected, most studies evaluating rehabilitative processes have focused on literacy components and phonological mechanisms. Cochrane reported a review of the efficacy of these treatments, concluding that they are efficient in improving some aspects of reading skills, whereas for other aspects, data appear inconsistent, and precise information about procedures is lacking.¹⁹ Many other studies carried out intervention or training based on other cognitive functions,^{11,12} such as attention, working memory, and visual-motor abilities.

Overall, data on rehabilitative treatment of dyslexia are not definitive and, in fact, only a small percentage of publications on dyslexia evaluate rehabilitative training efficacy. Although several rehabilitative treatments have been proposed,¹¹ each intervention is typically effective insofar as the targeted functions.²⁰ Thus, interventions may be effective for many children, but there are still challenges in developing interventions that are effective for all children because the core of individuals’ problems may be not clear.¹³ Considering the remarkable incidence of dyslexia among neurodevelopmental disorders and the general population, this uncertainty regarding rehabilitative opportunities is alarming.

In the routine management of dyslexia, great importance is also assigned to phonological awareness,^{13,14} and rehabilitative programs are usually based on phonological mechanisms. Consequently, dyslexia is often relegated to a linguistic or scholastic problem to be handled by speech therapists or teachers only, without the supervision of trained psychologists with a more complete framework of the neuropsychological functioning.

To make the situation worse, treatments are highly resource-demanding, with very high costs for the families in terms of time and money. Therefore, not all children with SLDs have access to rehabilitative programs or may not have prompt and continuous service. It is

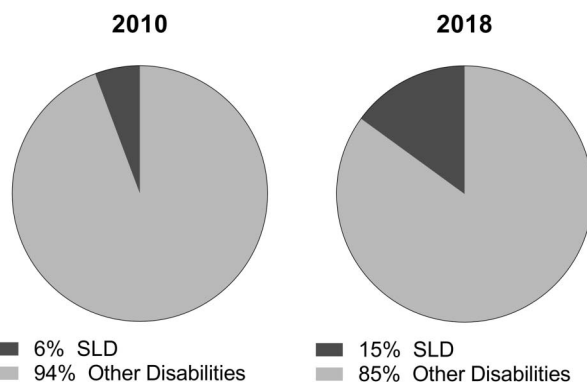


Figure 2. Percentage of children with special education needs support with a diagnosis of SLDs. Data are referred to 2 specific years from official reports of the UK Department of Education (see text for references). SLD, specific learning disability.

possible that after diagnosis—often earlier—schools activate personalized scholastic programs consisting of dispensation/compensation methods. If associated with the absence of an effective rehabilitation program, this may mean a paradoxical loss of access to an adequate education. In fact, typical public schools and special education interventions often stabilize the degree of reading failure rather than remediate (i.e., normalize) reading skills.¹³

PSYCHOLOGICAL IMPACT AND CONSEQUENCES

It has been reported that students who experience reading difficulties in the first grade have up to a 75% probability of reading poorly in high school.¹³ An initial difficulty in reading discourages children from practicing and taking pleasure in this activity; lack of practice interferes with the growth of reading skills and text comprehension and, consequently, with general knowledge.²¹ Therefore, a common belief is that if diagnosis and targeted treatment happen at an earlier stage, difficulties are more likely to be overcome. This concept has caused a great deal of attention to be focused on early indicators. Precursors of dyslexia are already identifiable in preschoolers; screening assessments for children in kindergarten and first grade are available worldwide, and their use is constantly increasing.

Even if assessments predict which children will develop dyslexia even before beginning to read, early identification poses the problems of specificity (i.e., reducing the rate of false positives) and sensitivity (i.e., reducing the rate of false negatives) for these instruments.²² It has been estimated that to identify all of the weakest 10% of beginner readers, current measures would identify 20% of children as being at high risk.¹³ Furthermore, it is not uncommon for children who show delays in the preschool years to “catch up” with peers²¹ without any intervention: in fact, most measures for preschoolers are modest predictors of reading and can account for approximately half of the variance in later reading skills.²² Considering other risk factors, such as genetic issues, accuracy reaches a rate of around 80%,^{18,22} which may appear a very high estimate; however, the psychosocial consequences for the remaining 20% of children are not minor and must be considered.

One question is, therefore, whether the best choice is to identify all the children at risk, even if this implies the cost of high false positives, or proceed more cautiously. The same problem applies to another highly prevalent neuropsychiatric disorder: attention-deficit hyperactivity disorder (ADHD). It has been shown that relative age is a significant determinant of ADHD diagnosis; the youngest children are up to 70% more likely than their classmates to receive a diagnosis of ADHD.²³ The possibility of interpreting behavioral immaturity as a hyperactive-inattentive disorder is an impressive case of excess of diagnosis and lack of awareness about developmental trajectories. Maturation is characterized by physiological

phases that are transient and unstable in children and may assume pathologic significance if decontextualized.

Another question is whether the obsessive search for a diagnosis and the orientation toward diagnosis at ever-lower ages is really the best choice. The importance of diagnosis is not in doubt. Diagnostic criteria are necessary for continuity across research, facilitating communication among professionals, planning resources, and documenting progress; diagnosis promotes understanding and awareness of particular difficulties by providing a legitimate explanation. Furthermore, without diagnosis, we may deny any role of biological risk factors in causing problems (for an interesting debate about pros and cons of diagnosis, see Ref. 24).

However, in 2010, the UK government expressed concern about the expansion of diagnostic categories in the Diagnostic and Statistical Manual of Mental Disorders-5 whereby normal variations in behavior were being treated as diseases, so that a very high proportion of the population would qualify for a diagnosis.^{7,24} The same report denounced a massive overidentification of children with special educational needs (SENs).⁷ The authors went further, suggesting that a primary reason for children’s educational failures was inadequate teaching and that schools were using the concept of SENs to disguise their limitations, shifting the responsibility from poor teaching to child weakness.

Returning to dyslexia, the question is then whether diagnosis may effectively improve children’s opportunities or simply pose a heavy social stigma for a developing personality. Did the child engage more in reading after receiving the diagnosis, or did he display helplessness and a consequent reduction of motivation? In addition, it does not appear that the prognosis for children with dyslexia engaged in reading intervention programs is significantly different from the prognosis for other poor readers.²⁵ We must accept the possibility that the great effort to assign a diagnosis to the difficulty of a child may harm instead of benefit.

The assumption that an accurate diagnosis is beneficial because more information is always better is simply not always true.²⁶ This is particularly evident for children. One subtle diagnosis by-product is psychological effects because all diagnoses, beneficial to patients or not, change the perception of the child for itself, parents, and society. Diagnoses connote abnormality—something to be remedied.²⁶ This is not just a common sense speculation; internalizing symptoms are specifically associated with dyslexia and not attributable to more general familial factors. One possible interpretation of this association is that the academic difficulties associated with reading disabilities may predispose children to become more isolated, anxious, and depressed than children without reading disorders.²⁷ Diagnoses also affect how children are treated by society: a child with a diagnosis may be bullied by their peers and have a lower quality of life.²⁸ A diagnosis may lead to stigmatization and tendency to stereotype, social disadvantages, and exclusion;

furthermore, generalizations typical of the diagnostic process may obscure important differences. Most professionals tend to think that if the label is the same, children should be treated the same.²⁴

According to these considerations, which are not new in the academic community,²⁹ a polarization between 2 extremes emerged. On 1 side, such as in the United Kingdom, there is resistance to giving children diagnostic labels because it is considered an invalidating and inappropriate procedure.²⁴ On the other side, there is an exaggerated effort to assign each problem to a specific diagnosis—the explicative “container.” This approach originated and has typically predominated medical contexts but has recently been integrated into educational and scholastic contexts, despite the fact that provision of school services should be based on educational needs, not on clinical diagnoses.

CONCLUSIVE CONSIDERATIONS

We are assisting in a global phenomenon that unites professionals, scholastic personnel, and institutions in a common goal to make schools inclusive and respectful of everyone’s difficulties and strengths. The impact of undiagnosed specific learning disabilities (SLDs), largely due to global lack of awareness and knowledge about these learning differences, may be dramatic for children. Teachers trained in early SLD identification and intervention may correctly address the issues of a high percentage of children. However, several by-products of this remarkable project are becoming evident.

Given the importance of early indicators of risk and learning prerequisites, schools implement even earlier, more demanding programs; children’s skills are tested and monitored as early as kindergarten. Concerns about academic performance are passed to children unavoidably and too soon; the concept of normal performance and deficits assumes a characterization of stability, as if they were qualitatively different concepts. Weaknesses are remediated with an increased learning workload, which in turn can cause an overload on working memory with deleterious effects on flexibility and long-term retaining (approximately 66% of American children with learning disabilities spend more than 80% of the day in general education).³⁰ At an age crucial for the development of the personality by means of experiences, play, and the use of imagination, children spend a large portion of the day in highly demanding, structured contexts. The tendency to align all children to a standard is strong; a child who does not meet standards because of lack of effort, difficulties, or simply a different temperamental predisposition is considered “different” or pathological. Diagnosis may be used to label these situations regardless of a child’s ability to benefit from it.

When starting a diagnostic and intervention process, one must never forget the individuality of the child, who may have some peculiarities that are beyond diagnostic labels and who may react in various ways to what is happening. Furthermore, the real possibilities that the

overall context can offer—as well as its limits—must be considered. A flexible approach is necessary when working in the pediatric field. Each professional should keep in mind the words of Sheldon H. Horowitz, Director of LD Resources National Center for Learning Disabilities: “Learning disabilities are not a prescription for failure. With the right kinds of instruction, guidance and support, there are no limits to what individuals with learning disabilities can achieve.”

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Book Review

Bullying, School Violence, and Climate in Evolving Contexts

By Ron Avi Astor, Rami Benbenishty. Oxford University Press, New York, NY, 2019, 288 pp, \$49.95, Hard cover.

In the past decade, bullying and school violence has been brought to the forefront of national media attention. Clinicians are encouraged to talk to their patients about school violence and bullying. Although most school violence literature looks at bullying on an individual level, this scholarly yet user-friendly volume frames the issue of school violence at the school level. This is a sequel to a highly regarded book that is written by two nationally recognized experts in the field of school violence. The purpose of this follow-up book is to provide an update of the current literature surrounding school violence, to expand on the authors' previous model of school violence based on their recent research findings, and to provide ideas for ongoing research in the field of bullying and school violence. Astor and Benbenishty propose a novel theoretical model of bullying and school violence that places the school, rather than the individual child, at the center of the model. This book also features longitudinal research conducted by the authors in both the United States and Israel, looking at rates of bullying, school violence, and teacher-student victimization across multiple schools, while also looking at how school context and climate interact to affect these rates.

Readers will appreciate the logical flow between chapters that address varying aspects of school violence. There are chapters discussing expanding the definition of bully, weapons and school violence, cyberbullying, and both teacher-student and student-teacher victimization. Each chapter begins with an anecdotal story to engage readers and seamlessly moves them through the previous literature. Results from the authors' most recent studies tie everything back to the conceptual model of school violence that is proposed in the first chapter. Clear and concise figures and tables describe the results from the authors' most recent study. How these results can influence the ways clinicians and policy makers view the issues of bullying and school violence is described. Researchers will appreciate the thoughtful and interesting recommendations for further research.

The gaps in this otherwise excellent volume reflect current limitations in the science in the field of school violence and bullying. For example, although developmental issues and their relationship to bullying are briefly touched on, rates of bullying and school violence in this population were not significantly reviewed. In addition, this volume is more theoretical in nature and is more focused on review of the previous and current literature and new questions

for further research than on providing clinical or policy implications.

In sum, Astor and Benbenishty have provided a definitive, updated review of the current research in bullying and school violence and, with their own novel research, have expanded on their theoretical model of school violence in which the school rather than the individual is at the center. This book will be of special interest to graduate students and fellows from a range of professional disciplines who are interested in reviewing the current literature on school violence and/or who are thinking of pursuing their own research in this area because this book gives excellent ideas for further research. Pediatricians would find this book an excellent resource to provide material for giving a teaching session on bullying and school violence, and it would be a thought-provoking read for an office or departmental book club.

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