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# Concepts and Ambiguities in the Field of Learning Disabilities

*Maria Tzouriadou*

## Abstract

Scholars and researchers have constantly argued due to the ambiguity and a lack of consensus in the scientific community in defining what constitutes a learning disability. The difficulty in identifying a universal term is reflected in the multiple terms that are used interchangeably (e.g. learning disabilities, specific learning disabilities, dyslexia, minimal brain dysfunction). Most commonly accepted and used definitions (e.g. IDEIA) can be considered ambiguous as it excludes certain conditions and describes characteristics in terms of abilities, processes, and achievement without discrimination between these terms. The only constant criterion (across definitions) is the discrepancy criterion that is the discrepancy between ability and achievement. In this context, it is important to note the differences in conceptualizing ability and academic achievement. Currently, the scientific community appears to agree that (a) learning disabilities are a distinct disability manifesting in students with low academic achievement, (b) it is a developmental disability that impacts individuals across their lifetime, and (c) it is a product of the interaction between genetic and environmental contributing factors, with environmental factors being determining by sociocultural conditions. Interventions addressing learning disabilities are not always evidence-based; interventions can be influenced by socioeconomic circumstances and policy decisions. Consequently, it is necessary to approach learning disabilities with a holistic and system-based approach rather than try to differentially diagnose them.

**Keywords:** learning disabilities, dyslexia, discrepancy criterion, evidence-based intervention RTI PSW

## 1. Introduction

Over the past years, learning disabilities (LD) or specific learning disabilities (SLD) have emerged as the most studied upon and renowned classification of special education with the term becoming synonymous with special education itself due to how frequently students are placed under this category. Nonetheless, it is also the special education category which has brought the most disagreement between scholars, researchers, and educators to this day, given that LD have not been established as a distinct discipline; that is, until now no causal relationship has been determined between the phenomenology of LD and the factors which cause them. Despite formal definitions, a lack of understanding of their nature and their interpretation exists, which indicates that the main goal of a distinct discipline is not fulfilled [1]. Without the understanding of their nature and interpretation, scientific standpoints regarding learning disabilities remain “into question” or “unfounded”, and this constitutes the very root of the “identification problem” that

is the lack of consensus on how to better define a classification category for LD [2]. Over a course of more than 100 years of studies, we have been unable to provide a unanimous and conclusive answer to a simple question: What are learning disabilities? Today, we believe that we know a lot about their characteristics and the implemented practices, but we have not yet answered the question whether they represent a distinct category of students with low academic achievement or they are a construct into which all low-performing students can be classified under. These two aspects have been meticulously studied over time, albeit not cohesively; consequently, even today some claim that LD represent a specific difficulty, since these children have high intelligence, while others believe that this category includes every child who is unable to learn. Since the beginning of the twenty-first century, scientists from various disciplines, but mostly educators, often come across parents' questions such as "My child, who goes to kindergarten, writes backwards, is this dyslexia?", "Will my child be a future Einstein?", "My child has trouble understanding meanings. Could this be dyslexia?", or "My child is distract and performs poorly at school. Could he or she be having learning disabilities?" These scientists have attempted, through international organizations, such as the Learning Disabilities Association (LDA), to functionally operationalize the field—that is, to answer whether it is a scientific discipline with particular characteristics or a "pseudoscience", which covers all and nothing—and they have tried to identify the operational characteristics that would help children reach their full potential within the context of school and society.

## **2. Epistemological ambiguities of the field**

Up until the 1960s, education had shown no interest in learning disabilities. Nevertheless, legislated compulsory education, the study of the school drop-out phenomenon, and the development of school's knowledge-based character have led to the creation of a new classification category, none other than LD. The fact that school success was associated with an individual's subsequent social and professional success contributed also to the creation of this distinct category given that LD pertained to individuals who had the potential of success due to their attributed higher cognitive skills. Over the course of time, this perception has consolidated, and learning disabilities have become the most important category of special education. An important indicator of this is the following: programs for children with LD congregate the highest number of students with special educational needs. 2.5 million of American school students approximately 5% from the total public school enrolment identified with learning disabilities in 2009. These students represented 42% of the 5.9 million school-age children. This percentage varies across states [3]. For example, in Kentucky, 3.18% of students belong in the specific learning disabilities category, while in Massachusetts and Port Island, the corresponding figures are 9% and 9.6% [3]. Similar differentiations are currently observed both in Canada and in certain European countries [4]. The variety of prevalence reflects various factors, like the diversity of the population belonging in this category; the increasing school pressure for higher achievement, which has led to higher standards; the different criteria used for the assessment of achievement; as well as the criteria applied to delineate the field of learning disabilities. The presence of such determining factors has resulted in LD student rates to fluctuate among US states. Consequently, LD represents the largest field within special education.

Across time, various definitions have been formulated, attempting to demonstrate the field's key characteristics. However, each one of them has been vague, figurative, negative instead of affirmative, and tautological or excessively broad

or restrictive. Each subsequent definition attempted to correct the preceding ones. Therefore, their analysis is imperative, not with the objective of formulating a new definition but to broaden the description and notably the understanding of what learning disabilities actually are.

The term learning disabilities was coined by Kirk, who also devised their first definition [5]. This definition introduced for the first time the concept of disorders in the psychological processes involved in academic learning. Nevertheless, ambiguities in the field's delineation can still be found in this definition. For example, it mentions that disabilities refer to *retardation, disorder, or delay* but does not proceed to determine any difference between these terms. The definition also introduces the element of exclusion from other conditions of deficit, suggesting the case of differential diagnosis. Exclusion, however, is not a criterion for specifying the characteristics that differentiate LD from other conditions. Despite its ambiguities, Kirk's definition marked the establishment of the new field of LD and became the basis for every formal definition in the USA.

The acknowledgement of LD as an independent scientific field demanded the adoption of an operational definition, which would delineate its scope as a distinct category of special education. Such a definition was suggested by the US National Advisory Committee of Handicapped Children in 1968 [6]; it formed the basis for educational policies regarding children with LD and was included in the Individuals with Disabilities Education Act (IDEA) in 1997 [7]. Respectively, research in Europe and mainly in Britain focused on specific reading difficulties—dyslexia—and, even since the 1960s, there was the development of associations and treatment centers for children with this disorder [8, 9]. An important figure in the study of dyslexia in Britain was Critchley, who devised a definition for developmental dyslexia; according to his definition, it is a learning disorder which is initially manifested with difficulties in reading and later with “odd” spelling and difficulties in the use of written language. It is of cognitive nature and genetically determined. It is not caused by intellectual disability or lack of social and cultural chances, wrong instruction techniques, or emotional factors. Moreover, it is not due to any obvious structural cerebral insufficiency. Finally, Critchley did not agree with the use of the term “learning difficulties”, because he believed that the children's only difficulty had to do with language [10]. Miles had another important scientific contribution in the study of dyslexia in Britain by conducting a large diachronic study during 1970–1980 on 14,000 children. According to the findings of this study, 3% of students showed severe symptoms of dyslexia and 6% mild symptoms. Miles also accepted that it was a hereditary disorder [11]. Rutter and his colleagues carried out epidemiological studies on children with reading difficulties and through them exhaustively highlighted specific reading difficulties. He argued that the terms and identification process used for dyslexia were chaotic and confusing, which is caused by the inability to interpret the nature of learning problems and may be confused with general reading retardation [12, 13]. In 1978, the British Department of Education and Science commissioned a committee to introduce a special education law in Britain, Wales, and Scotland in the spirit of normalisation and integration, a study that resulted in the Warnock Report (1978) which was adopted and became a law in 1983 [14]. In this law, it seems that an approach of low performance has been adopted under the term special educational needs regarding LD, with more than 18% of the student population being represented under this category. In this case dyslexia was not included as a category in special education, despite it being recognized as one. This is due to the fact that Britain adopted a purely pedagogical model at the administrative and practical level to address any educational needs of children. Most European countries have adopted Kirk's LD definition using the terms dyslexia or learning disabilities [4].



In the USA, on the other hand, studies on better understanding the nature of LD and determining best practices in their identification continued. In 1989, the National Joint Committee on Learning Disabilities, based on new evidence and scientific findings, attempted to eradicate inherent ambiguities in the identification of the field, by formulating the following definition:

Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other disabilities (e.g. sensory impairment, intellectual disabilities, emotional disturbance) or with extrinsic influences (such as cultural or linguistic differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences [15]. Regarding this definition, Kavale et al. [16] highlights that the term “in general” is vague, much like the term “specific” in the IDEA’s definition, thus allowing various interpretations.

In 2004, the IDEA regulation maintained the same definition of SLD as previous versions of the law and regulations. Notably, an attempt to expand the identification process occurred by including both a process based on the child’s response to scientific, research-based intervention, such as response to intervention (RTI), and the use of other alternative research-based procedures, such as the Patterns of Strengths and Weakness (PSW) model. The IDEA definition, found in US Code (20 U.S.C. & 1401 [17]), reads as follows:

*“The term ‘specific learning disability’ means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations.*

*Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.*

*Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage” [18].*

This official definition introduces the “specific” aspect of the disorder for the first time, through the ambiguous distinction “in one or more”, without specifying how many problems there could be in order for the disorder to be considered specific. Moreover, it provides no clarification of what specific means, if, for example, it refers to particular traits in the relevant subjects and the psychological structure or whether the term “specific” suggests that the disorder is idiopathic [19] that is of unknown cause. This definition also seems to introduce a hierarchy of processes, with language being dominant, whether oral or written. Furthermore, the disorder is not connected with difficulties in academic achievement alone but also with cognitive deficits (reasoning disorders), a trait that reflects what we nowadays call “metacognitive function”. No mention of central nervous system dysfunctions appears yet, but there are references to similar cases deriving from neurological disorders.

Based on this legislation, educators are asked to identify if student suspected of SLD fails to show sufficient progress in achievement according to age-based

and grade-level standards. This procedure provides important information and highlights a model of strengths and weaknesses in achievement and aptitudes. Intra-individual differences or variability are sometimes cited as an indication of SLD. The ability-achievement discrepancy is also taken into account as part of the process.

It is also argued that qualified staff should provide appropriate instruction. Students who have not received it cannot be considered as having SLD. Key instruction elements mainly regard reading, which, according to age, should be taught systematically:

- Phonemic awareness
- Phonics
- Vocabulary development
- Reading fluency, including oral reading skills
- Reading comprehension strategies

\*Source: National Institute of Child Health and Human Development (NICHD) [20].

Schools also need to make frequent assessments of students' progress and inform parents. The gathered data might show the effectiveness of an instruction strategy or program. If the student does not exhibit any signs of progress, an extension may be granted—with the consent of the parents—which may not exceed 60 days.

Finally, the reauthorization regulations (NCLB) [21] included the statement that it is necessary to apply approaches to the instruction of reading that are supported by scientifically based reading research, mainly based on social construction. Concerning the instruction of reading, it has been argued that it may also be due to the over-representation of minorities in special education [22]. The reauthorized definition allowed US states to not use the IQ-achievement discrepancy or not provide intelligence tests as part of the diagnostic procedure and to include the RTI criterion as part of the diagnostic procedure.

The DSM uses the term “specific learning disorder”. Revised in 2013, the current version, DSM-5, broadens the previous definition to reflect the latest scientific understanding of the condition.

The diagnosis requires persistent difficulties in reading, writing, arithmetic, or mathematical reasoning skills during formal years of schooling. Symptoms may include inaccurate or slow and effortful reading, poor written expression that lacks clarity, difficulties remembering number facts, or inaccurate mathematical reasoning. Current academic skills must be well below the average range of scores in culturally and linguistically appropriate tests of reading, writing, or mathematics. The individual's difficulties must not be better explained by developmental, neurological, sensory (vision or hearing), or motor disorders and must significantly interfere with academic achievement, occupational performance, or activities of daily living. Specific learning disorder is diagnosed through a clinical review of the individual's developmental, medical, educational, and family history, reports of test scores and teacher observations, and response to academic interventions [23].

There was intense research on an international level—but mostly in the USA—and millions of dollars were spent in the pursuit of the field's delineation [24]. However, as of yet there is no crystallized description of the condition but rather a generalized depiction of a group of school children with difficulties in learning. We may know a lot about the condition, but we do not know why LD exist.

Even the definitions' points of convergence do not lead to a uniform interpretation of their nature. For this reason, in numerous studies and research, SLD are approached from different perspectives, and different terms are used to describe them, such as learning disabilities, specific learning disabilities, dyslexia, specific language impairment, attention deficit hyperactivity disorder, etc. But in all formal definitions, the element of ability-achievement discrepancy appears constantly.

The problem of discrepancy raises a reasonable question: "What is the meaning of concepts such as intelligence or general cognitive ability, learning or cognitive processes, and academic achievement—concepts that are included in every definition of SLD—and what is the causal relationship between them?" [4]. Unless this question is resolved, the identification of the field will remain vague and contentious. Since conceptual and scientific definitions did not facilitate the identification of the SLD field, an operational description of the condition was required for practical implementation. The phenomenon of intra-individual differences was first studied, particularly the possibility of some "malfunctioning" of certain abilities in contrast to the normal development of others. These developmental imbalances could become apparent in discrepancies of intelligence functions, which are included in intelligence testing, such as the Wechsler Intelligence Scale for Children (WISC). WISC composites can be used to identify profiles of strengths and weaknesses, which can distinguish students with SLD from other groups of students with average or low overall intelligence function scores. This analysis method of developmental discrepancies led to controversy regarding the nature of SLD. Is the profile of these students unique among this entire population? Does the profile of SLD subtests significantly differ from other cases with normal intelligence quotients? [25].

In a meta-analysis of studies, Kavale and Forness [17] could not determine a specific WISC-based profile for students with LD, because, despite the imbalances among the subtests or between the verbal and practical part of the criterion, the differences were deemed statistically insignificant. Thus, they argued that "specific" profiles could only be indicative of the children's competencies and incompetencies, an element useful in the planning of pedagogical treatment. Studies with similar results also came to the same conclusion [26]. Failure to identify intra-individual discrepancies of cognitive abilities reinforced the notion that discrepancies could be identified between intelligence and performance indices, a feature that is first introduced in the field's delineation by Bateman's definition [27].

Gradually, this criterion of ability and achievement has become a dominant feature in the identification of SLD. The main problem with this approach was that, while the WISC test remained the constant criterion for the intelligence quotient (IQ), achievement was being assessed with various formal and informal criteria. For this reason, the discrepancy criterion was disputed [28]. A further reason of doubt was that meta-analyses of studies determined a change in the rate of students with LD when different criteria were applied. For example, analyses of findings in the state of Colorado showed that 26% of students did not meet the criterion, while 30% only did so in reading and maths. By applying a different criterion for achievement among the same sample, 5% of students met the criterion in maths and 27% in reading [28]. In another meta-analysis of findings, Cone, Wilson, and Bradley found that, in the state of Iowa, 75% met the discrepancy criterion [29]. In a similar study, Kavale and Reese [30] noted discrepancy rates between 33% and 75% depending on the tests being used. Thus, Lyon et al. came to the conclusion that discrepancy as a primary criterion of determining LD is more harmful than beneficial for children, because achievement criteria involve various external factors, such as the educator, the infrastructure, the curriculum, etc.; these factors can neither be isolated nor interpret the complex interactions between "deficit" and pedagogical/social factors, which need to be taken into consideration during the diagnostic procedure [31].



About 50 years ago, Cruickshank described a vague picture of students with LD as students who are classified differently in each state [32]. The lack of definition of the nature of LD and the ambiguity regarding the causal relationships between learning abilities and academic achievement, but also the question of whether they represent a specific disorder and what that means, led to overgeneralisations of the term, with all children with difficulties in academic achievement to be thought of presenting LD or, on the contrary, to sub-generalizations of the term based on one symptom, which appears in most cases of LD, usually in reading difficulties. It is a fact that 90% of students with LD exhibit reading difficulties [30]. But is this problem primary or secondary? Which cases of reading difficulties might fall within the range of LD? According to studies, children with reading difficulties of various causes are impossible to be distinguished from children who fall within the category of SLD (dyslexia), as stipulated in IDEA's definition [33, 34]. But even in cases of specific reading difficulties, namely, dyslexia, it has been argued that students with this disorder find themselves at the lowest point of the normal distribution of reading ability [35]. Ysseldyke et al., in their study of students who were diagnosed as having LD and students who were not diagnosed but were at the lowest level of the reading ability distribution, found no psychometric differences in the performance of the two groups [36]. Based on these results as well as other studies, Algozzine concluded that in general, LD as a category is "non-existent and useless" [33]. Also, the fact that the majority of these children exhibit reading difficulties has led—mainly in Europe—to the equation of LD with dyslexia, which, while representing one of their symptoms, according to IDEA's definition, has ended up becoming an autonomous scientific field. Thus, mainly in Europe, LD have been equated with dyslexia on the basis of the unclear criteria of low reading performance and the exclusionary elements included in all LD definitions.

The lack of consensus has led to the development of two trends on an international professional and administrative level. On the one side stand, those who accept SLD as a distinct group [37–40] and, on the other, those who relate them to every student of low academic achievement [41]. In most countries, though, educators apply solely the criterion of excluding low intelligence quotients; that is, they aim to differentiate between students who have an intellectual ability and associated adaptive skill deficits and those who have SLD [42].

In summary, it seems obvious that lack of consensus among scholars, researchers, and practitioners regarding the key elements which distinguish the LD category from other low-achievement categories, as well as the lack of common understanding of their nature and causes, has led the field to stagnation. Two contradictory positions in the general debate exist. One identifies disabilities with the innate-specific learning inadequacies of these students, while the other considers them an "umbrella" category, which covers a wide range of students with low achievement without developmental specificities. For those supporting the "umbrella" characterization, LD is a construct of the modern educational system, which, according to Senf [38], has tried to purify general education like a sociological sponge, which is most "absorbing" when academic demands are rigid or the parents' pressure for achievement is higher. This sponge also absorbs not only the individual differences of students but also a variety of pedagogical, behavioral, and psychosocial problems, which can impede school learning. However, with no scientific delineation of the field, LD cannot represent a scientific entity.

### **3. Contemporary frameworks to identify LD**

For this reason, researchers today try to redefine the field of SLD in order to answer the question whether SLD constitute a scientific category or they represent



one of the groups with lower achievement, not in need of a special treatment or specially designed instruction. As recently argued [43, 44], the field delineation should summarize all the pre-existing knowledge reflected in the various definitions and the applied pedagogical practices; this will help identify the degree of the deficiency's contribution as well as the contribution of influences by a variety of exogenous factors.

In the USA, educational reform efforts have placed emphasis on the application of evidence-based instructional approaches with the aim of improving the instruction of reading, which has been the focus of research both in the USA and internationally for over 30 years. A major concern that emerged from research was the failure of educational systems to close the gap between children, particularly those with disabilities and those belonging to minorities [45].

Despite the redefinitions and educational regulations, there are still ambiguities and contradictions regarding the conceptualisation and identification of LD. Although there have been attempts to determine why they exist, and many neurobiological researchers have tried to attribute them to disorders of the central nervous system (CNS), so far their causes have not been established [18, 46]. The identification framework of intelligence-achievement discrepancy is still used internationally by those who view LD as a distinct disorder, while the low-achievement model is applied by those who talk of a non-distinct group of low achieving students.

In the USA, school districts in various states have started supplementing the traditional model of testing (e.g. intelligence-achievement discrepancy) with RTI. As aforementioned RTI is considered a viable method for identifying students with LD. In a national survey, 72% of teachers and 54% of parents were in favor of this decision, mainly because RTI's approach facilitates early intervention and pre-referral services [47]. This way, inappropriate referrals to special education are reduced, and at the same time preventative intervention model is created for students who otherwise been referred for special education services after they demonstrated school failure. In recent years, another framework—the pattern of strengths and weaknesses (PSW)—has emerged with the tendency to prevail; although not covered by federal law regulations, it is widely accepted and used in the USA because it supports research-based practices [40, 48].

Thus, depending on the theoretical approaches toward LD, today there are four framework models that can be used for the conceptualisation and identification of SLD, especially in the USA [41]. Proponents of the non-distinctive nature of the disorder have adopted the *low-achievement framework*, which does not take into account the element of unexpected underachievement. Proponents of the distinctive nature of the disorder use one or more of the three remaining frameworks: *intelligence-achievement discrepancy*, *response to instruction-intervention*, and *intra-individual differences* (PSW) [49]. A key element to the disorder's distinctive character is the concept of unexpected underachievement; this is presented by children which should be able to learn but cannot demonstrate scholastic success, without the existence of other learning obstacles, and while receiving adequate instruction. Therefore, the key aspect in assessing the identification's validity is to determine which of the frameworks produce a unique group of low achievers [31]. A valid classification should reflect measurements that provide functionality to the construct of unexpected underachievement [50].

The traditional framework of intelligence-achievement discrepancy (IAD) remains dominant in the identification both in the USA and internationally, despite the controversy it has provoked. It is a determining method of identifying students with SLD when they present significant discrepancy between cognitive ability, as typically measured by IQ, and academic achievement, as measured by standardized

reading, writing, and mathematical tests [51]. This framework has been criticized for its reliability both in terms of aptitude tests and achievement tests, due to the multidimensional nature of LD and the errors in psychometric measurements.

Response to intervention (RTI) is another framework which, as mentioned, facilitates instruction both in general education and specific interventions for students who do not meet the core curriculum level. In order for a student to be considered at risk for academic difficulties, the student's assessments are compiled, and his or her progress is monitored after specific interventions. Following the implementation of interventions, when there is still discrepancy in achievement and growth, then the student is considered to have LD [52]. This model is used in the USA, while another similar pedagogical model of dynamic assessment is used in Britain. This framework has also received criticism, on the grounds that the use of multiple assessments in class to identify students with lower achievement in each subject is an unstable method, always depending on the group comprising the class. With the use of either a single test or the scores in multiple tests, it is hard to notice the latent of a student's abilities and determine the cut-point that would place him or her in the LD group.

As it has been said that the framework of the pattern of strengths and weaknesses is allowed under the provision of alternative research-based practices in the IDEA. There are different PSW models, like the concordance-disconcordance model [44], the dual discrepancy/consistency model (also referred to as cross-battery assessment; [40]), and the discrepancy/consistency model [48]. These three models differ in methodology, but they converge on the fact that students can be identified as having SLD when they demonstrate unexpected academic underachievement and corresponding weakness in one or more specific cognitive abilities related to the area of the academic deficit [53]. However, in practice, students can be often identified with SDL through demonstration of a pattern of strengths and weaknesses only in academic achievement domains [49]. Moreover, multiple individual differences might be present, which accumulate the errors of measurements and render them unreliable.

In a recent survey regarding the frameworks being used by school psychologists in the USA, Cottrell and Barrett [54], looking at a sample of 471 school psychologists, found out that 63.1% were almost always using the intelligence-achievement discrepancy (IAD) framework. 49.3% were using the RTI framework in most cases, and 29.4% were using the PSW framework in almost every case. However, they could not determine which framework was being primarily employed. For instance, 31.5% reported that they had been using the RTI framework most of the times, while only 17.8% reported that they were using this framework exclusively. In order to find out which one is being primarily employed, Maki and Adams surveyed 461 school psychologists in 2017 [55]. They discovered that only 30.4% reported primarily using the IAD framework, while they were primarily using almost equally the RTI (34.5%) and the PSW (35.1%) framework, respectively.

Benson et al. [56], in another national-level US-based survey with 1317 school psychologists, found out that 37% were using IAD, even in states where it is not included in the diagnostic procedure. Fifty-one percent were using RTI [56]. Finally, approximately 53% reported that they were using PSW. In the same survey, 49.2% reported that they were participating in academic screening procedures, which include monitoring of early literacy, oral reading fluency, reading comprehension, early numeracy, math computation, math concepts and applications, spelling, and written expression prompts, according to the age of the students. Many of the participants reported a combined use of RTI and PSW, RTI and IAD, and PSW and IAD. This last survey confirms the lack of consensus regarding identification procedures among professionals in the identification of SLD.

## 4. Conclusions

In order to summarize the international research effort, it seems that scientists concur that LD represent a distinct group of students with low academic achievement, regardless of the terms used to describe them (dyslexia, learning difficulties, special learning difficulties, special reading difficulties, etc.). They also agree that it is a matter of developmental disorder with implications across the life span. As a developmental problem, LD follow a course from the beginning of life and are determined by the interaction of innate factors with the environment, much like development itself. LD do not comprise a distinguishable entity like other developmental phenomena but a combination of traits; their common element is the existence of discrepancies in cognitive function and achievement, and they appear to be incompatible with social and cultural demands and expectations. The source of their heterogeneity is not exclusively biological or environmental but rather a product of synergy between biological and social processes, which promote development and contribute to the formation of these functional systems. It may never be possible to find a dividing line or a criterion that distinguishes students with SLD from those with an overall low performance. The controversy between scientists may carry on. Decisions are not always based on scientific but mainly social, economic, and political reasons. It is widely accepted that the root of LD is a disorder that already exists within the child; however, it is the child's interaction with the world around him or her that shapes how this disorder manifests. Such a systemic perspective demands an exhaustive understanding and an interdisciplinary approach. A lot remains unresolved before we can answer the questions regarding the nature and interpretation of LD. We know a lot from empirical data, but we are not in the position to complete the puzzle and provide an answer to the main question which has to do with the field's identification. Until then, we must continue to assess and fully understand the developmental path of each child and to take into account all the factors involved in the development of learning disabilities.

### Author details

Maria Tzouriadou  
School of Early Childhood Education, Aristotle University of Thessaloniki,  
Thessaloniki, Greece

\*Address all correspondence to: tzour@nured.auth.gr

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