

## CHAPTER 2

# History of the Field

Since the designation of LD as a disability in U.S. federal legislation in 1968, LDs now represent approximately one-half of all students receiving special education nationally (Donavon & Cross, 2002; President's Commission on Excellence in Special Education, 2002). Yet LDs have traditionally been among the least understood and most debated disabling conditions affecting students (Bradley et al., 2002; Fuchs & Fuchs, 1998; Lyon et al., 2001). Despite the idea advanced by some individuals that LDs constitute a unitary entity (Kavale & Forness, 2000), this observation is not supported by current research. To the contrary, converging scientific evidence shows that LDs represent a general category composed of disabilities in specific academic domains (Lyon, Fletcher, & Barnes, 2003a). Indeed, the heterogeneous nature of the disability was instantiated in U.S. federal regulations dating back to 1977 that organized the different types of LDs into seven areas: (1) listening comprehension (receptive language), (2) oral expression (expressive language), (3) basic reading skills (decoding and word recognition), (4) reading comprehension, (5) written expression, (6) mathematics calculation, and (7) mathematics reasoning.

These separate types of LDs frequently co-occur with one another and with deficits in social skills, emotional disorders, and disorders of attention. Thus, a student with LDs may have a problem in more than one area—a condition referred to as “comorbidity” (Fletcher et al., 1999). Although they are frequently misinterpreted as such, LDs are not synonymous with reading disability or dyslexia (Lyon, Shaywitz, & Shaywitz, 2003b). However, it is the case that much of the available in-

formation concerning LDs relates to reading disabilities (Lyon et al., 2001), and the majority of students with LDs (80–90%) demonstrate significant reading difficulties (Kavale & Reese, 1992; Lerner, 1989; Lyon et al., 2001). Moreover, two of every five students receiving special education in the United States were identified because of difficulties in learning to read (President’s Commission on Excellence in Special Education, 2002).

The goal of understanding LDs is to provide the most effective instruction possible in order to ameliorate the disabling effects of the conditions. However, as many researchers and practitioners have learned, identifying and understanding the nature, causes, and correlates that should be considered when teaching children with LDs is difficult. As we discuss in this book, the accumulating evidence base on LDs is now playing a more explicit and prominent role in informing instruction than ever before. The field has progressed from simple explanations focusing on phenotypic behavioral and cognitive characteristics to more complex explanations that link cognitive, neurobiological, and instructional factors. From clinical and educational standpoints, the validity of the construct of LDs is directly linked to its ability to inform intervention decisions. As such, instruction is central to the concept of LDs as a disabling condition. If identifying students with LDs does not inform intervention and enhance communication among educators providing the instruction, then the concept would be virtually meaningless—except as a legal definition of a group of people with disabilities requiring civil rights protection.

To understand how these alternative perspectives have evolved, this chapter examines the historical underpinnings of LDs. Many sources are available that provide overarching reviews of the field’s scientific, social, and political history and development (Doris, 1993; Hammill, 1993; Kavale & Forness, 1985; Morrison & Siegel, 1991; Rutter, 1982; Satz & Fletcher, 1980; Torgesen, 1991). These commentaries indicate that the field of LDs developed in response to two major needs. First, the emergence of the field was linked to a need to understand individual differences in learning and performance among children and adults displaying *specific* deficits in spoken or written language, while maintaining integrity in overall adaptive functioning. Unexpected patterns of strengths and *specific* weaknesses in learning were first noted and studied by physicians and psychologists, thus giving the biomedical and psychological orientation that has always characterized the field of LDs. Second, the LD movement developed as an applied field of special education driven by social and political forces, and from a need to provide services to youth whose learning characteristics were not being adequately

addressed by the educational system. Each of these historical contexts is reviewed briefly.

## **LDs AND THE STUDY OF INDIVIDUAL DIFFERENCES**

### **Gall's Influence**

Torgesen (1991) pointed out that interest in the causes and outcomes of interindividual and intraindividual differences in cognition and learning can be traced to early Greek civilization. However, the first work that has clear relevance to today's conceptualizations of LDs was conducted by Gall in the context of his work on disorders of spoken language in the early 19th century (Wiederholt, 1974). In describing the characteristics of one patient with brain damage, Gall recorded the following:

In consequence of an attack of apoplexy, a soldier found it impossible to express in spoken language his feelings and ideas. His face bore no signs of a deranged intellect. His mind (*esprit*) found the answer to questions addressed to him and he carried out all he was told to do; shown an arm-chair and asked if he knew what it was, he answered by seating himself in it. He could not articulate on the spot a word pronounced for him to repeat; but a few moments later the word escaped from his lips as if voluntarily. It was not his tongue, which was embarrassed; for he moved it with great agility and could pronounce quite well a large number of isolated words. His memory was not at fault, for he signified his anger at being unable to express himself concerning many things, which he wished to communicate. It was the faculty of speech, alone, which was abolished. (quoted in Head, 1926, p. 11)

The relevance of Gall's observations to present conceptualizations of LDs was accurately summarized by Hammill (1993). Hammill postulated that Gall noted that some of his patients could not speak but could produce thoughts in writing, thus manifesting a pattern of relative strengths and weaknesses in oral and written language. In addition, Gall established that such patterns of strengths and weaknesses were a function of brain damage, and that brain damage could selectively impair one particular language capability but not affect others. Thus, the clinical roots were established in the area of brain injury for the present-day observation that many children with LDs manifest "specific" deficits rather than pervasive or "generalized" deficits. Finally, Gall argued that it was essential to rule out other disabling conditions, like mental retardation or deafness, that could impair a patient's performance. Within

this context, the origin for the “exclusion” component of current definitions of LDs is evident.

### **Early Neurology and Acquired Language Disorders**

A number of other medical professionals also began to observe and report on patients demonstrating intraindividual strengths and weaknesses that included specific deficits in linguistic, reading, and cognitive abilities. For example, Broca (1865) provided important observations that have served to build the foundation of the “specificity” hypothesis in learning disabilities. Broca (1865) reported that “expressive aphasia,” or the inability to speak, resulted from selective (rather than diffuse) lesions in the anterior regions of the left hemisphere, primarily localized in the second frontal convolution. The effects of a lesion in this area of the brain were highly consistent in right-handed individuals and *did not* appear to affect receptive language ability (listening) or other nonlanguage functions (e.g., visual perception, spatial awareness).

Similarly, Wernicke (1894) introduced the concept of a “disconnection syndrome,” predicting that the aphasic syndrome termed “conduction aphasia” could result from a disconnection of the receptive (sensory) speech area from the motor speech zone by a punctate lesion in the left hemisphere. Wernicke’s observations have also been relevant to theory building in LDs. Wernicke reported that a complex function such as receptive language could be impaired within an individual who did not display other significant cognitive or linguistic dysfunctions. Hence, the concept of intraindividual differences in information processing was born, primarily using observations and clinical studies with adults with specific brain damage.

In the late 1800s and early 1900s, additional cases of unexpected cognitive and linguistic difficulties within the context of otherwise normal functioning were reported. These cases were unique because they did not seem to have the same neurological characteristics as acquired disorders of language occurring with impairment of sensory or motor functions. Kussmaul (1877) described a patient who was unable to read despite having sufficient intellectual and perceptual skills. Additional reports by Hinshelwood (1895, 1917), Morgan (1896), and others (Bastian, 1898; Clairborne, 1906) distinguished a specific type of learning deficit characterized by an inability to read against a background of normal intelligence and adequate opportunity to learn. Hinshelwood (1917) described a 10-year-old youngster as follows:

The boy had been at school three years and had got on well with every subject except reading. He was apparently a bright and in every respect

an intelligent boy. He had been learning music for a year and had made good progress in it. In all departments of his studies where the instruction was oral he had made good progress, showing that his auditory memory was good. He performs simple sums quite correctly, and his progress in arithmetic has been regarded as quite satisfactory. He has no difficulty in learning to write. His visual acuity is good. (pp. 46–47)

By the beginning of the 20th century, evidence from several sources contributed to a set of observations that defined a unique type of learning difficulty in adults *and* children—specific rather than general in presentation, and distinct from disorders associated with sensory handicaps and subaverage general intelligence. As Hynd and Willis (1988) have summarized, the most salient and reliable early observations of individuals with learning difficulties included the following: (1) the children had some form of congenital learning problem; (2) more male than female children were affected; (3) the disorder was heterogeneous with respect to the specific pattern and the severity of deficits; (4) the disorder might be related to a developmental process affecting primarily left-hemisphere central language processes; and (5) typical classroom instruction was not adequate in meeting the children’s educational needs.

### **Orton and the Origins of Dyslexia**

During the 1920s, Samuel Orton extended the study of reading disabilities with clinical studies designed to test the hypothesis that reading deficits were a function of a delay or failure of the left cerebral hemisphere to establish dominance for language functions. According to Orton (1928), children with reading disabilities tended to reverse letters such as *b/d* and *p/q*, and words such as *saw/was* and *not/ton*, because of the lack of left-hemispheric dominance for the processing of linguistic symbols.

Neither Orton’s theory of reading disabilities nor his observation that reversals were symptomatic of the disorder has stood the test of time (Torgesen, 1991). However, Orton’s writings were highly influential in stimulating research, mobilizing teacher and parent groups to bring attention to reading disorders and other LDs, and on the development of instructional techniques for teaching children with reading disabilities.

Moreover, Orton’s influence on present-day conceptualizations of LDs can be seen indirectly in his early attempts to classify a range of language and motor disabilities in addition to reading disabilities (Doris, 1993). More specifically, in 1937, Orton reported a number of cases in which children of average to above-average intelligence manifested one of these six disabilities: (1) “developmental alexia,” or difficulty in

learning to read; (2) “developmental agraphia,” or significant difficulty in learning to write; (3) “developmental word deafness,” or a specific deficit in verbal understanding within a context of normal auditory acuity; (4) “developmental motor aphasia,” or motor speech delay; (5) abnormal clumsiness; and (6) stuttering. Orton (1937) was the first to stress that reading disabilities manifested at a symbolic level appeared to be related to cerebral dysfunction rather than a specific brain lesion (as postulated by Hinshelwood and others) and could be identified among children with average to above-average intelligence.

### **The Straussian Movement and the Concept of Cerebral Dysfunction**

Whereas Orton’s contributions are linked primarily to the development of scientific and clinical interest in reading disabilities (particularly dyslexia), it was the work of Strauss and Werner (1943) and their colleagues (Strauss & Lehtinen, 1947) after World War II that led directly to the emergence of the general category of LDs as a formally recognized field (Doris, 1993; Rutter, 1982; Torgesen, 1991). This work built on earlier attempts to understand the behavioral difficulties of children who subsequently were described as hyperactive. In this series of clinical observations, children’s overactivity, impulsivity, and concrete thinking were attributed to brain damage in the absence of physical evidence of injury to the nervous system.

Strauss and Werner expanded this concept in research involving children with mental retardation. They were particularly interested in comparing the behavior of children whose retardation was associated with known brain damage, with that of children whose retardation was not associated with neurological impairment but was presumably familial in nature. Strauss and Lehtinen (1947) reported that children with mental retardation and brain injury manifested difficulties on tasks assessing figure–ground perception, attention, and concept formation in addition to hyperactivity. However, children without brain damage but with mental retardation performed in a manner similar to children who were not mentally impaired and were less likely to show behavioral overactivity.

Within the context of these studies, Strauss’s group subsequently observed what they believed were similar patterns of behavior and performance in children with average intelligence who displayed behavioral and learning difficulties. They attributed the behavior of all these groups of children to a syndrome they called “minimal brain injury” (MBI). From these studies, the concept of “minimal brain dysfunction” (MBD) emerged in the 1960s (Clements, 1966), with an emphasis on the

Straussian thesis that MBI or MBD could be identified solely on the basis of behavioral signs, even when physical and neurological examinations were normal.

When no mental retardation exists, the presence of psychological disturbances can be discovered by the use of some of our qualitative tests for perceptual and cognitive disturbances. Although the [physical] criteria may be negative, whereas the behavior of the child in question resembles that characteristic for brain injury, and even though the performances of the child on our tests are not strongly indicative of brain injury, it may still be reasonable to consider a diagnosis of brain injury. (Strauss & Lehtinen, 1947, p. 112)

The Straussian movement had a profound influence on the development of the field of LDs (Doris, 1993; Hammill, 1993; Kavale & Forness, 1985). Torgesen (1991) concluded that three concepts emerging from the Straussian movement provided a rationale for the development of the field of LDs separately from other fields of education: (1) Individual differences in learning could be understood by examining the different ways that children approach learning tasks (the processes that aid or interfere with learning); (2) educational procedures should be tailored to patterns of processing strengths and weaknesses in the individual child; and (3) children with deficient learning processes may be helped to learn normally by employing teaching methods that focus on their processing strengths rather than their weaknesses. Expanding on this list, Kavale and Forness (1985) included (1) The locus of an LD is within the affected individual, and thus represents a medical (disease) model; (2) LDs are associated with (or caused by) neurological dysfunction; (3) the academic problems observed in children with LDs are related to psychological processing deficits, most notably in the perceptual–motor domain; (4) the academic failure of children with LDs occurs despite the presence of normal intelligence; and (5) LDs cannot primarily be due to other handicapping conditions.

### **Cruickshank, Myklebust, Johnson, and Kirk and the Concept of LDs**

Among the most significant behavioral scientists involved in the early conceptualization and study of LDs were William Cruickshank, Helmer Myklebust, Doris Johnson, and Samuel Kirk, all of whom propelled the field away from a focus on etiology toward an emphasis on learner characteristics and educational interventions to address learning deficits. For example, Cruickshank and his colleagues (Cruickshank, Bice, & Wallen, 1957) studied and recommended modifications in classroom environ-

ments to reduce stimuli hypothesized to be distracting for children with learning and attention deficits. Helmer Myklebust and Doris Johnson at Northwestern University conducted numerous studies of the effects of different types of language and perceptual deficits on academic and social learning in children. They were also among the first to develop well-designed intervention procedures for the remediation of disabilities in skills related to school learning (Johnson & Myklebust, 1967). However, it was Samuel Kirk who proposed the term “learning disabilities” in a 1963 conference devoted to exploring problems of perceptually handicapped children. Kirk (1963) stated:

I have used the term “learning disabilities” to describe a group of children who have disorders in the development of language, speech, reading, and associated communication skills needed for social interaction. In this group, I do not include children who have sensory handicaps such as blindness, because we have methods of managing and training the deaf and blind. I also excluded from this group children who have generalized mental retardation. (pp. 2–3)

By 1963 the new field was moving toward the formal legislative designation of LD as a specific disability with entitlements for civil rights protections and special services. This movement was based largely on the arguments of Kirk and others that children with LDs (1) had different learning characteristics than children diagnosed with mental retardation or emotional disturbance; (2) manifested learning characteristics that resulted from intrinsic (i.e., neurobiological) rather than environmental factors; (3) demonstrated learning difficulties that were “unexpected,” given the children’s strengths in other areas; and (4) required specialized educational interventions. Note that in this insightful definition, no mention is made of intelligence. Rather, the focus is on social interaction and “normal” adaptive behavior. Exclusionary conditions are identified on the basis of differential intervention needs, not simply defining LDs in terms of what conditions are not LDs. What is interesting is that the field received its initial momentum on the strength of clinical observation and advocacy.

### **THE INFLUENCE OF ADVOCACY ON DEFINITIONS AND THE RECOGNITION OF THE FIELD**

Not uncommonly, in both the educational and public health domains, LDs were initially and formally identified as disabilities on the basis of advocacy rather than systematic scientific inquiry. In fact, in the United

States, the majority of scientific advances are typically stimulated by vocal critics of the educational or medical status quo. It is rare that a psychological condition, disease, or educational problem is afforded attention until political forces are mobilized by parents, patients, or other affected individuals expressing their concerns about their quality of life to their elected officials. Clearly, this was the case in the field of LDs, in which parents and child advocates successfully lobbied Congress to enact legislation in 1969 through the Education of the Handicapped Act (Public Law 91-230). This law authorized research and training programs to address the needs of children with specific LDs (Doris, 1993).

The diagnostic concept of LDs gained significant momentum during the 1960s and 1970s. As Zigmond (1993) explained, the proliferation of children diagnosed as having LDs during these two decades was related to multiple factors. First, the label “LDs” was not a stigmatizing one. Parents and teachers were more comfortable with the term than with etiologically based labels such as “brain injuries,” “MBI,” and “perceptual handicaps.” Moreover, receiving a diagnosis of an LD did not imply low intelligence, behavioral difficulties, or sensory handicaps. On the contrary, children with LDs manifested difficulties in learning *despite* “normal” adaptive behavior and intelligence, and intact hearing, vision, and emotional status. The fact that youngsters with LDs displayed strong intelligence gave parents and teachers hope that learning difficulties could be surmounted, given that the right set of instructional methods, conditions, and settings could be identified. Advocacy efforts fueled a series of consensus conferences, two of which are noteworthy: one on MBI and the other on LDs. Both attempted to identify a single overarching diagnostic category that could define the disabilities widely believed to hamper the educational and behavioral performance of many children.

### **MINIMAL BRAIN DYSFUNCTION**

In the 1960s, the twin strands of individual differences and social and political advocacy joined together through a common endeavor to define unexpected behavioral difficulties and underachievement dependent on factors intrinsic to the child. The first significant effort involved the development of a definition of MBI in 1962. A formal definition of a syndrome called “minimal brain dysfunction” was formulated in a meeting between the Easter Seals Society and what is now the National Institute of Neurological Disorders and Stroke:

The term “minimal brain dysfunction syndrome” refers to children of near average, average, or above average general intelligence with certain

learning or behavioral disabilities ranging from mild to severe, which are associated with deviations of function of the central nervous system. These deviations may manifest themselves by various combinations of impairment in perception, conceptualization, language, memory, and control of attention, impulse, or motor function. (Clements, 1966, pp. 9–10)

This definition essentially substituted the term “dysfunction” for “injury,” recognizing the etiological implications of terms like “injury.” It stressed that MBD was a heterogeneous category, encompassing both behavioral and learning difficulties. As noted earlier, this definition stipulated that brain dysfunction could be identified solely on the basis of behavioral signs. However, the definition of MBD was controversial (Rutter, 1982; Satz & Fletcher, 1980). Educators objected to the concept, despite the fact that this definition was based on over half a century of clinical observation and research in clinical neurology, as well as empirical support from emergent psychophysiological methods to study brain function (Dykman, Ackerman, Clements, & Peters, 1971). To the educational community, MBD was closely connected to a medical model and implied that psychologists and physicians would have to work in schools in order to make a diagnosis. Others found the concept fuzzy and too broad (Rutter, 1982). The latter concern was magnified in the 1970s with the development of checklists for MBD that included more than 30 symptoms (Peters, Davis, Goolsby, & Clements, 1973). These symptoms ranged from difficulties with academic skills to aggressive, acting-out behavior. The syndrome encompassed such a broad range of symptoms that the treatment implications of identifying a child with MBD were unclear (Rutter, 1982; Satz & Fletcher, 1980).

### **American Psychiatric Association**

When the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) was published by the American Psychiatric Association (1980), the concept of MBD was dropped and the learning and behavioral characteristics were separately defined as “specific developmental disorders” and “attention deficit disorder.” This division aptly solved the classification problem of the comorbidity of learning and attention disorders that plagued those interested in MBI and MBD. Although many children with LDs also meet criteria for attention-deficit/hyperactivity disorder (ADHD), these are separate disorders (Rutter, 1982). However, both require intervention. Heritability, neurobiological correlates, and intervention needs are different, so unifying them as a single syndrome did not facilitate research or practice.

### **U.S. Federal Definition of LDs**

Not surprisingly, the development of the definition of MBD led to reactions among educators and other professionals working in schools. In 1966, the U.S. Office of Education organized a meeting in which the participants formally defined Kirk's (1963) concept of "learning disability" 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 may manifest itself in an imperfect ability to listen, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning disabilities, which are primarily the result of visual, hearing, or motor handicaps, or mental retardation, or emotional disturbance, or of environmental, cultural, or economic disadvantage. (U.S. Office of Education, 1968, p. 34)

The resemblance of this 1966 definition of LD to the 1962 definition of MBD is striking (Satz & Fletcher, 1980). Reflecting more than 60 years of work, the notion of MBD as an "unexpected" disorder not attributable to mental deficiency, sensory disorders, emotional disturbance, or cultural or economic disturbance was retained. Etiological terms were dropped and replaced by educational descriptors. The definition acknowledged intrinsic factors within a child and intended to be inclusive of minimal brain dysfunction and other formulations derived from neurology and psychology (Doris, 1993; Rutter, 1982; Satz & Fletcher, 1980). However, the pivotal importance of this definition is that it continues to serve as the U.S. federal statutory definition of LDs. It has persisted through a series of parental and professional advocacy efforts that led to the provision of special education services for children with LDs. This occurred initially through the 1969 Learning Disabilities Act. The statutory definition of LDs in the 1969 Act appeared in the Education for All Handicapped Children Act of 1975 (Public Law 94-142) and is currently in IDEA 2004. This definition has endured despite the fact that it does not specify any inclusionary criteria for LDs. It essentially says that LDs are heterogeneous, reflect problems with cognitive processing, and are not to be commingled with other disorders that represent exclusionary conditions. In a sense, LDs became legitimized and codified in U.S. public law mostly on the basis of what they were not.

The absence of inclusionary criteria became an immediate problem in 1975, with passage of Public Law 94-142 and the expectation that the

states would identify and serve children with LDs. In response to this problem, the U.S. Office of Education (1977) published recommendations for procedures for identifying LDs that included the notion of a discrepancy between IQ and achievement as a marker for LDs, as follows:

a severe discrepancy between achievement and intellectual ability in one or more of the areas: (1) oral expression; (2) listening comprehension; (3) written expression; (4) basic reading skill; (5) reading comprehension; (6) mathematics calculation; or (7) mathematic reasoning. The child may not be identified as having a specific learning disability if the discrepancy between ability and achievement is primarily the result of: (1) a visual, hearing, or motor handicap; (2) mental retardation; (3) emotional disturbance; or (4) environmental, cultural, or economic disadvantage. (p. G1082)

The use of IQ–achievement discrepancy as a marker for LDs has had a profound impact on how LDs are conceptualized. There was some research at the time validating an IQ–achievement discrepancy model (Rutter & Yule, 1975), which has not stood up over time (Fletcher et al., 2002). However, researchers, practitioners, and the public continue to assume that such a discrepancy is a marker for specific types of LDs that are unexpected and categorically distinct from other forms of underachievement. Some researchers continue to use IQ–achievement discrepancy as a key aspect of the identification process (Kavale & Forness, 2000), despite the fact that the evidence base for its validity as a central feature of LD classification is weak to nonexistent (see Chapter 3). But the impact of IQ–achievement discrepancy was clearly apparent in the regulations concerning LD identification in the 1992 and 1997 reauthorizations of IDEA. The statute has maintained the definition of LDs formulated in the 1966 meeting, and the regulations maintained the 1977 procedures until the 2004 reauthorization.

### **Other Definitions of LDs**

The federal definition of LDs has been widely criticized (Fletcher et al., 2002; Kavale & Forness, 1985; Lyon, 1987, Lyon et al., 2001; Senf, 1987). As Torgesen (1991) has pointed out, this definition has at least four major problems that render it ineffective: (1) It does not clearly indicate that LDs are a heterogeneous group of disorders; (2) it fails to recognize that LDs frequently persist and are manifested in adults as well as children; (3) it does not clearly specify that, whatever the cause of LDs, the “final common path” consists of inherent alterations in the way

information is processed; and (4) it does not adequately recognize that persons with other handicapping or environmental limitations may have an LD *concurrently* with these conditions. Other formal attempts to tighten the federal definition of LDs have not fared significantly better, as can be seen in the revised definition produced by the National Joint Committee on Learning Disabilities (NJCLD, 1988; see also Hammill, 1993):

*Learning disabilities* is a general term that refers to a heterogeneous group of disorders manifested by significant difficulty 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 behavior, 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 handicapping conditions (for example, sensory impairment, mental retardation, social and emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of these conditions or influences. (p. 1)

Although the NJCLD definition addresses the issues of heterogeneity, persistence, intrinsic etiology, and comorbidity discussed by Torgesen (1991), it continues to reflect a vague and ambiguous description of multiple and heterogeneous disorders. These types of definitions cannot be easily operationalized or empirically validated and do not provide clinicians, teachers, or researchers with useful information to enhance communication or improve predictions. There are no inclusionary criteria, and the definition is based on exclusion. Given this state of the field, many scholars have called for a moratorium on the development of broad definitions and advocate definitions that address LDs only in terms of coherent and operational domains. For instance, Stanovich (1993) has stated:

Scientific investigations of some generically defined entity called “learning disability” simply make little sense given what we already know about heterogeneity across various learning domains. Research investigations must define groups specifically in terms of the domain of deficit (reading disability, arithmetic disability). The extent of co-occurrence of these dysfunctions then becomes an empirical question, not something decided a priori by definition practices. (p. 273)

Both the DSM-IV (American Psychiatric Association, 1994) and the *International Classification of Diseases*, 10th revision (ICD-10; World

Health Organization, 1992), have defined, classified, and coded learning disorders and specific developmental disorders of academic skills into specific deficit domains. For example, DSM-IV provides criteria for the diagnosis of “reading disorder” (315.00), and ICD-10 provides identification criteria under the term “specific reading disorder” (F81.0). DSM-IV and ICD-10 refer to disabilities in mathematics as “mathematics disorder” (315.1) and “specific disorder of arithmetical skills” (F81.2), respectively. Finally, disabilities involving written language skills are classified and coded by DSM-IV as “disorder of written expression” (315.2) and by ICD-10 as “specific spelling disorder” (F81.1). These definitions implicitly support the heterogeneity and exclusion components of most definitions.

Interestingly, the definitions invoke IQ–achievement discrepancy as an inclusionary criterion. But the definitions in DSM-IV and ICD-10 are essentially the same definitions applied to each domain, thus lacking any real specificity. The problems with the federal definition of LDs also apply to the DSM-IV and ICD-10 definitions. Regardless of whether one approaches the task of defining LDs in a general fashion as has been traditionally done at the federal level, or whether one seeks to define domain-specific LDs (e.g., reading disability) as advocated by Stanovich (1993), the definitional process must be informed by and constructed within a classification system that ultimately has communicative and predictive power (Chapter 3). The logic underlying the development of such a classification system is that identification, diagnosis, treatment, and prognosis cannot be addressed effectively until the heterogeneity across and within domain-specific LDs is addressed, and until subgroups are delineated that are theoretically meaningful, reliable, and valid. Of utmost importance is the validity of the three classification hypotheses (discrepancy, heterogeneity, exclusions) implicit in most definitions of LDs.

### **2004 Revision of the U.S. Regulatory Definition of LDs**

In the 2004 reauthorization of IDEA, the U.S. Congress passed statutes that permitted alterations of the 1977 regulations, indicating specifically that (1) states could not require districts to use IQ tests for the identification of students for special education in the LD category, and (2) states had to permit districts to implement identification models that incorporated response to instruction (RTI) (IDEA, 2004). In addition, the statute clearly indicated that children could not be identified for special education if poor achievement was due to lack of appropriate instruction in reading or math, or to limited proficiency in English. In response to the statute, the Office of Special Education and

Rehabilitative Services (OSERS) within the U.S. Department of Education (2006) published federal regulations in response to IDEA 2004 to revise rules for the identification of LDs. What is noteworthy is that the statute and regulations are based on the converging scientific evidence bearing on the limited value of IQ–achievement discrepancies in identifying LDs, while at the same time underscoring the value of RTI in the identification process. Although issues surrounding the validity of IQ–achievement discrepancies and RTI are discussed in detail in Chapter 3, the regulations relevant to LDs are summarized here. In essence, regulations indicate that states:

1. May not require local education agencies (LEAs) to use a discrepancy model for determining whether a student has LDs.
2. Must permit the use of a process that determines if the student responds to scientific research-based intervention.
3. May permit other alternative research-based procedures.

Although a number of advocacy and practitioner groups questioned specific provisions of the regulations, what is encouraging is that all organizations have acknowledged the critical importance of using research to guide policies and practices concerning students with LDs, which is clearly reflected in the IDEA 2004 statutes and regulations. Equally significant in the new statute and regulations is the more explicit recognition that LDs should not be identified in the absence of evidence of appropriate instruction. The statute indicates that LDs may not be identified if the cause of poor achievement is inadequate instruction in reading or math, or limited proficiency with English by requiring:

1. Evidence of appropriate instruction in reading and math in general education.
2. Data-based documentation at repeated intervals of the student's response to this instruction.

This information must be provided to parents and included in team decisions determining whether the child has an LD, that the LD is a disabling condition, and that special education services are warranted. Thus, the IDEA 2004 statute moves toward the accumulating research base on LDs by reducing the focus on IQ tests and emphasizing the critical role of instruction both for preventing LDs and for their identification.

## CONCLUSIONS

The field of LDs emerged from a genuine social and educational need. LDs constitute a diagnostic category of interest to clinical practice, law, and policy. Historically, parents, educators, and other advocates for children have successfully negotiated a special education category subsuming LDs as a means of protecting civil rights and procedural safeguards in law (Lyon & Moats, 1997; Zigmond, 1993). In many respects, however, LDs have been legitimized and codified in public law on the basis of what they are not, that is, through a focus on definition by exclusion. Moreover, the concept of LDs is based on what is now a century of attempts to define it as an overarching classification applicable to a wide segment of childhood difficulties involving learning (and behavior). Only in the past 30 or so years have systematic research efforts emerged that make progress toward understanding the causes, developmental course, treatment conditions, and long-term outcomes of LDs a reality. Despite significant research advances, many of these efforts have not led to more precise definitions and interventions for those with LDs. However, the revisions in the 2004 reauthorization of IDEA could ensure that policies and practices will be based on converging scientific evidence.

If the field of LDs is to progress and result in positive outcomes, it has little choice. The reification of historically unsupported assumptions about LDs that collapse under scientific scrutiny may hinder the successful application of what we have learned from the significant advances in research that have occurred over the past 30 years. This is unfortunate. The groups of advocates who successfully implemented essential educational reforms legitimizing the concept of LDs and helped make a systematic research program possible may be continuing to support components of the definition that are outdated, indefensible, and not aligned with research. In doing so, they may be promulgating identification and intervention practices that are not effective, making it difficult to implement practices that have emerged from research (Fletcher et al., 2003; Lyon et al., 2001). These practices have the potential to ameliorate some of the adverse long-term outcomes often associated with LDs (Bruck, 1987; Satz, Buka, Lipsitt, & Seidman, 1998; Spreen, 1989).

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