

School Psychologists' Consistency and Confidence in Learning Disability Identification:  
The Impact of Identification Methodology and Inconclusive Student Data

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## **Dedication**

This dissertation is dedicated to my parents who somehow managed to nurture my extreme strong-will with arguably positive outcomes and to my brother who not only tolerated my ridiculous childhood antics, but so graciously took on the role of best bubby. And, to Michael.

## **Abstract**

Students with learning disabilities (LD) are a heterogeneous group of learners who exhibit below-average achievement theoretically caused by an underlying psychological processing deficit (Fletcher, Lyon, Fuchs, & Barnes, 2007). School-based identification of LD is necessary if students are to receive specialized supports and instruction through special education services (Burns & Ysseldyke, 2009; Fuchs & Fuchs, 1995; Ysseldyke, Burns, Scholin, & Parker, 2010). However, LD identification is convoluted due to variable practices and the psychometric and conceptual issues underlying identification methodologies. This study examined school psychologists' decision-making regarding LD identification.

Participants on both study 1 and study 2 included 376 practicing school psychologists from across the United States. Study 1 examined the consistency of school psychologists' LD identification decisions across three identification methods (i.e., ability-achievement discrepancy, response to intervention, and pattern of strengths and weaknesses) and across student evaluation data conclusive levels (i.e., conclusive-not LD, inconclusive, conclusive-LD). Results showed that although there were not differences in identification consistency across identification methods, there were differences in identification consistency across conclusiveness levels of student evaluation data.

Study 2 examined differences in school psychologists' confidence in their identification decisions across identification methods, student evaluation data conclusiveness level, school psychologist experience, and identification consistency. Significant differences in school psychologist confidence across identification method

and conclusiveness level were found with school psychologists reporting being the most confident using ability-achievement discrepancy and lower levels of confidence when student data were inconclusive. Significant differences in confidence were not found across school psychologists' experience or identification consistency.

The findings from study 1 and study 2 were discussed in the context of previous research as well as implications for future research, school psychological practice, and special education policy. Specifically, the need for further research regarding LD identification methods in order to ensure identification decisions are reliable and valid is discussed. Moreover, the potential impact on school psychologists' LD identification practices and consequential student special education servicing are addressed. Limitations of the current research and conclusions are also outlined.

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## CHAPTER 1

### INTRODUCTION

Prior to 1975, students with disabilities or those otherwise experiencing difficulties largely failed to have their unique learning needs met (Zigmond, Kloo, & Volonino, 2009). Students with disabilities were systematically excluded from or kept separate within public educational settings until case law set precedence that students with such disabilities had the constitutional right to an education (e.g., *PARC v. Commonwealth of Pennsylvania*, 1972); however, these rights were not codified into law until the passing of the Education for All Handicapped Children Act (EAHCA) in 1975, now the Individuals with Disabilities Education Improvement Act of 2004 (IDEA; 34 C.F.R. §). This law outlines 13 disability categories under which a student can be eligible for special education services (Pub. L. No. 108–446 § 300.8), one of which is a learning disability (LD; referred to as a specific learning disability (SLD) within the law).

Students with learning disabilities experience a range of academic difficulties in school. Although the problems these students face are largely heterogeneous, the commonality among students with learning disabilities is evidenced in achievement deficits (Fletcher, Lyon, Fuchs, & Barnes, 2007). Although the construct of LD has been fiercely debated among researchers, policymakers, and practitioners (Kavale, Spaulding, & Beam, 2009), it is clear that students with LD struggle to achieve at a level that is commensurate with their peers (Fletcher, Stuebing, Morris, & Lyon, 2013; Kovaleski, VanDerHeyden, & Shapiro). In fact, in order for a student to be identified with LD, he or she must exhibit academic deficits in at least one of eight achievement areas outlined in IDEA (Pub. L. No. 108–446 § 300.309[a][1]). Students with LD are likely to have

difficulty effectively and efficiently processing, retaining, and retrieving information (Swanson & Zheng, 2013).

Despite over 50 years of research, LD is not a well-understood disability (Hallahan, Pullen, & Ward, 2013). Psychological processing and neurological dysfunction are believed to underlie the achievement deficits that students with LD exhibit (Lyon et al., 2001). However, little is known about how such processing difficulties impact academic achievement, particularly outside of the area of reading (Torgesen, 2002). Although recent technological advances (e.g., MRIs) have shown differences in brain function in children and adults with LD (Finn, Shen, Holahan, Schelost, Lacadie; Papademetris et al., 2013; Lyon et al., 2001; Richards & Berninger, 2008), such research is still relatively new and underdeveloped. Moreover, LD identification often fails to identify students until they exhibit “severe enough” academic difficulties to qualify for services (Reynolds & Shaywitz, 2010) and fails to result in reliable or valid decision-making (Epps, Ysseldyke, & McGue, 1984; Miciak, Fletcher, Stuebing, Vaughn, & Taylor, 2013; Stuebing, Fletcher, Branum-Martin, & Francis, 2012). Consequently, LD remains an enigmatic disability, despite students with LD making up approximately 40% of the total number of students receiving special education services under IDEA (2012 IDEA Child Count).

Although the utility and effectiveness of special education services has been debated (Fuchs, Fuchs, & Stecker, 2010) and the seminal Kavale and Forness meta-analysis (2000) showed no to small effects for special education services, it is imperative that students with LD receive specialized instruction and supports. There is considerable evidence showing the effectiveness of many intervention practices for students with

disabilities (e.g., Forness, 2001; Fuchs, Fuchs, Schumacher, & Seethaler, 2013; Graham, Harris, & McKeown, 2013; Lovett, Barron, & Frijters, 2013) and the evidence suggesting the ineffectiveness of special education services is possibly reflective of a research to practice gap rather than an overall lack of effective intervention practices for students with LD (Burns & Ysseldyke, 2009). Thus, specialized instructional supports for students with LD are critical to skill development for such students.

### **Statement of the Problem**

Fortunately, educational services for students with disabilities have changed greatly since the original authorization of federal law governing the education of students with disabilities (Hardman & Dawson, 2008). Today, educators must provide specialized and individualized instruction to meet the needs of all students, including those with disabilities (IDEA, 2004; NCLB, 2001). Special education services are intended to provide the individualized instruction and support necessary for students with disabilities (Burns & Ysseldyke, 2009; Fuchs & Fuchs, 1995). However, special education is an entitlement program (Ysseldyke, Burns, Scholin, & Parker, 2010), thus requiring students with disabilities to be eligible for one of the disability categories outlined in IDEA in order to receive necessary specialized instruction matched to their individual needs (Pub. L. No. 108–446 § 300.8). Therefore, students struggling in school must be evaluated and meet the necessary criteria to receive special education services in school. In order for students to benefit from IDEA resources and specialized instruction, he or she must be identified with a disability.

Consequently, disability identification procedures must result in valid and reliable decisions regarding whether or not a student has a disability (Fletcher et al., 2007;

Torgesen 2002). Without such, special education services may be differentially withheld from students in need of additional support in school (Fletcher et al., 2007; Reschly, 2003). However, accurate and consistent identification is particularly problematic under the special education category of learning disabilities (Epps et al., 1984; Reschly & Hosp, 2004). The identification of LD has long been controversial (Kavale, Spaulding, & Beam, 2009). Experts within the field fail to reach consensus regarding appropriate LD identification methodology as well as conceptual understanding of the underlying construct of LD (Zumeta, Zirkel, & Danielson, 2014). This lack of expert consensus is in some ways reflected in the identification procedures outlined in IDEA, which allows for several methods toward LD identification (Pub. L. No. 108–446 § 300.307). Although IDEA regulations outline LD definition and some identification requirements, federal policy regarding identification does not operationalize LD identification allowing for considerable variation in state requirements and guidelines (Maki, Floyd, & Roberson, 2015; Reschly & Hosp, 2004). Consequently, significant variability in LD identification practices and therefore characteristics of the students identified is evident across states and even local education agencies (LEAs; Maki, et al., 2015). Moreover, conceptual and psychometric problems with LD identification methods are likely to result in inconsistent identification of the construct (Epps et al., 1984; Kavale & Spaulding, 2008; Miciak et al., 2013; Zumeta et al., 2014).

### **Purpose of the Studies**

The purpose of the dissertation studies was to examine learning disability identification, school psychologists' confidence in their identification decisions, and the potential variables influencing identification and school psychologist confidence.

Specifically, the studies examined school psychologists' decision-making in LD identification by having school psychologists examine student special education evaluation data and determine if the student should be identified with a learning disability. School psychologists utilized one of three identification methods (i.e., Ability-Achievement Discrepancy, Response to Intervention, or Pattern of Strengths and Weaknesses) to evaluate corresponding student data. Identification decision consistency and school psychologists' confidence were analyzed to determine potential differences across LD identification method as well as conclusiveness of evaluation report (i.e., conflicting and/ or unclear evaluation data) and consistency of identification.

### **Significance of Studies**

The present studies hold important implications regarding identification of students with learning disabilities. It seeks to inform practice, research, and policy regarding LD identification. Consistency in LD identification is necessary to ensure that struggling students are accurately identified and consequently receive the instructional supports and services needed to become proficient learners. If LD identification decisions are not reliable and valid, support services may be differentially withheld from students in need, resulting in further academic difficulties. Both general and special education should address the needs of diverse learners; however, special education services are typically necessary in order to meet the unique learning needs of students with learning disabilities. Thus, the present study seeks to contribute to the field of learning disabilities by expanding upon knowledge regarding identification accuracy to ensure students' academic needs are adequately met.

## Research Questions

The following research questions guided the studies:

1. What LD identification procedures do school psychologists most commonly use in practice; which LD identification procedures do school psychologists prefer to use; and which LD identification procedures are school psychologists taught in graduate school training?
2. To what extent do school psychologists adhere to state learning disability (LD) identification criteria?
3. To what extent does learning disability identification consistency differ across three identification methods?
4. To what extent does identification consistency differ by student LD evaluation report level of conclusiveness?
5. How confident are school psychologists in their evaluation decisions?
6. To what extent does school psychologist confidence differ across identification method?
7. To what extent does school psychologist confidence differ across level of conclusiveness? and
8. To what extent does school psychologist confidence differ across degree level and years of experience?
9. To what extent does school psychologist confidence difference across identification decision consistency?

## Definitions

Learning disabilities (LD): One of 13 disability categories outlined in IDEA under which a student may receive special education services. LD is believed to be a psychological processing disorder affecting how students process incoming information consequently impacting student achievement (Fletcher, et al., 2007). Under federal law, LDs may manifest in eight achievement areas: basic reading, reading fluency, reading comprehension, mathematical calculation, mathematical reasoning, written expression, oral expression, and listening comprehension (Pub. L. No. 108–446 § 300.8[c])

Ability-achievement discrepancy: A method used to identify students with learning disabilities, which requires a “severe” discrepancy between one’s cognitive ability and achievement (Pub. L. No. 108–446 § 300.307).

Response to intervention (RtI): An LD identification method, which requires a student demonstrate inadequate response to scientifically based intervention and instructional supports. RtI models are not exclusively used for LD identification but on a larger scale are frameworks of tiered service delivery to match instruction and intervention to student need. RtI within this paper, however, will refer to the LD identification method unless otherwise stated (Pub. L. No. 108–446 § 300.307).

Pattern of strengths and weaknesses (PSW): A method used to identify LD, typically referred to as the most common third alternate approach to LD identification. IDEA does not explicitly allow for this approach within its regulations; however,

it does allow for “alternative, research-based methods” (Pub. L. No. 108–446 § 300.307) under which supporters of this approach assert this approach fits.

Individuals with Disabilities Education Improvement Act (IDEA; 34 C.F.R. §): The federal law governing the provision of special education services for students with disabilities.

Psychological processing disorder: Disorders believed to distort one’s ability to acquire new knowledge and skills and theoretically caused by dysfunction in the central nervous system. Learning disabilities are defined as psychological processing disorders (Lyon et al., 2001).

Inconclusive Student Evaluation Data: Student special education evaluation data with which some participants in the current study were provided. Inconclusive data were operationally defined as student data that very closely surrounded the identification cut-point for the specific identification criteria (i.e., within 2 standard score points or .05 WRCM growth rate of expected growth rate). Under strict adherence to identification criteria and considering only obtained student scores, these student data would not be identified with LD but would be identified with LD if test score confidence intervals were taken into consideration.

Conclusive-Not LD Student Evaluation Data: Student special education evaluation data with which some participants in the current study were provided. These data were operationally defined as evaluation data when strictly adhering to the identification criteria the student would not be identified with LD considering both the observed score and confidence intervals (e.g., average student

achievement, no severe discrepancy, appropriate responsiveness to intervention, no relative or normative strengths and weaknesses).

**Conclusive-LD Student Evaluation Data:** Student special education evaluation data with which some participants in the current study were provided. These data were operationally defined as evaluation data when strictly adhering to the identification criteria the student would be identified with LD considering both the observed score and confidence intervals (e.g., inadequate student achievement, severe discrepancy according to criteria, inadequate responsiveness to intervention, relative or normative strengths and weaknesses).

**School Psychologist Identification Decision Confidence:** A rating scale containing four levels was used to examine school psychologist confidence-very confidence, somewhat confident, somewhat not confident, and not very confident.

**Identification Decision Consistency:** Consistent identification decisions were operationally defined as a match between the participant identification decision and the study identification decision. The researchers utilized strict adherence to identification criteria using student obtained scores to make identification decisions.

### **Delimitations**

The following limitations were placed on the study:

- a) Participants were sampled from state school psychology associations.
- b) Participants were from 22 states within the U.S.
- c) Participants were practicing, licensed or certified school psychologists.

- d) Participants regularly participated in multidisciplinary teams making special education identification decisions.
- e) School psychologists reviewed one student evaluation report.
- f) Student evaluation data were comprised primarily of student test scores in order to focus primarily on empirical LD identification methods.
- g) Use of the term “identification” in these studies refers to the application of LD identification criteria to student cognitive, achievement, and academic data while ruling out LD exclusionary criteria and behavior difficulties.

### **Organization of the Dissertation**

This dissertation is organized around four remaining chapters. Chapter 2 provides a comprehensive review of the literature pertaining to (a) definitions of learning disabilities, (b) disability classification frameworks and issues in LD classification, (c) learning disabilities identification methods, (d) the problem of inconclusiveness in LD identification and (e) decision-making confidence. Chapter 3 describes study 1 including a brief introduction, methodology, results (including tables for data interpretation), and brief discussion. Chapter 4 describes study 2 following the same format as chapter 3. Chapter 5 includes an overall discussion of the two studies presented in chapters 3 and 4 within the context of previous research and current practices as well as implications for future research and policy.

## **CHAPTER 2**

### **LITERATURE REVIEW**

Students with learning disabilities (LD) represent a heterogeneous group of learners who exhibit achievement difficulties across several academic areas (Fletcher, Lyon, L. Fuchs, & Barnes, 2007). The field of LD itself is also rather heterogeneous with varying viewpoints regarding conceptual understanding, theoretical underpinnings, and identification of LD (Kavale & Forness, 2000). In spite of, and perhaps in part due to, such disagreement and ambiguity surrounding LD, prevalence of the disability increased by over 200% from 1977 to 2005 (Bradley, Danielson, & Doolittle, 2005), although prevalence has decreased since the 2004 reauthorization of IDEA (Data Accountability Center, DAC; [ideadata.org](http://ideadata.org)). However, LD still represents the largest IDEA disability category by far with approximately 40% of all students receiving special education services under the LD label (DAC; [ideadata.org](http://ideadata.org)). Moreover, the decrease in LD prevalence as a result of the allowance of response to intervention (RtI) and alternative identification procedures reflects the dependence of identification likelihood on identification methodology (Burns & Senesac, 2005; Epps et al., 1984; Fletcher, Denton, & Francis, 2005; Miciak et al., 2013) and underscores the necessity of consistent identification decision-making.

#### **Organization of the Chapter**

This chapter provides an overview of research related to defining and identifying LD. The first section discusses both historical and current definitions of LD. Components of these definitions and identification criteria including unexpected underachievement, exclusionary criteria, and processing disorders are also addressed. The next section

discusses disability classification frameworks, including Cromwell, Blashfield, & Strauss's (1975) framework outlining criteria for disability classification systems and Fletcher et al.'s (2007) framework, which highlights several levels of factors underlying LD. This section also outlines difficulties in LD identification. The third section reviews three LD identification methods including ability-achievement discrepancy, response to intervention (RtI), and pattern of strengths and weaknesses (PSW). Implementation and criticisms of as well as empirical support for these three identification methods are discussed. The final section provides an overview of the potential impact of inconclusiveness in identification decision-making and decision-maker confidence. The need for research examining inconclusive student data in LD identification is also addressed.

## **Defining Learning Disabilities**

### **Current and Historical Definitions**

Despite the dissidence within the field, the federal definition of LD has remained stable since the original authorization of federal law (i.e., EAHCA, 1975) governing educational services for students with disabilities (Kavale & Forness, 2000; Pub. L. No. 108–446 § 300.8[c]). Moreover, the definition has not changed in spite of theoretical and empirical advances (Kavale, Spaulding, & Beam, 2009). The federal statute states:

“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 an imperfect ability to listen, speak, 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.” (Pub. L. No. 108–446 § 300.8[c])

Three broad components constitute the federal definition of LD: processing weaknesses manifesting in achievement deficits, inclusionary conditions, and exclusionary conditions. The definition is a somewhat vague description of the disability as evidenced by language such as “imperfect” as well as the indeterminate psychological processing deficits, their origins, and their impact on achievement.

Federal policy governs how LD is defined in educational settings; however, other stakeholders in the field have also developed definitions. The National Joint Committee on Learning Disabilities (NJCLD) is a multi-organizational committee, composed of several organizations holding stake in the field of LD, including but not limited to the National Association of School Psychologists, International Dyslexia Association, and Council for Learning Disabilities (NJCLD, 2012; Hammill, 1990). The 1990 NJCLD definition of LD states:

“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 handicapping conditions (for example, sensory impairment, mental retardation, serious emotional disturbance), or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences.” (NJCLD, 1994).

Similar to the federal definition, the NJCLD definition describes how LD negatively impacts one’s functioning in several key areas and describes the disorder as resulting from psychological processing weaknesses (NJCLD, 1994). Also, like the federal definition in IDEA, the NJCLD definition describes exclusionary symptoms and disorders. However, unlike the federal definition, NJCLD’s definition describes LD as being a general disability affecting a diverse group of individuals. Additionally, the

NJCLD definition specifically links LD to “central nervous system dysfunction” coinciding with the neuropsychological theory of LD (Semrud-Clikeman, 2005) while the federal definition does not. Although the federal definition and the NJCLD definition exhibit several similarities, the differences between these two widely cited definitions create discrepancies within the LD field.

These present day definitions have roots in Samuel Kirk’s 1962 original conceptualization of the disability. He coined the term “learning disability” and described the disorder as,

“a retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subject resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioral disturbances. It is not the result of mental retardation, sensory deprivation, or cultural and instructional factors.” (p. 263)

The similarities between the IDEA and Kirk definitions are evident in the descriptions of achievement difficulties due to disturbances in psychological processing as well as exclusionary factors. Shortly after Kirk’s original definition of LD, Barbara Bateman (1965) conceptualized a new definition of LD:

“Children who have learning disorders are those who manifest an educationally significant discrepancy between their estimated intellectual potential and actual level of performance related to basic disorders in the learning process, which may or may not be accompanied by demonstrable central nervous system dysfunction, and which are no secondary to generalized mental retardation, educational or cultural deprivation, severe emotional disturbance, or sensory loss.” (p. 220)

Kirk’s influence on Bateman is evident in their cognate characterizations of processing disorders due to possible central nervous dysfunction. However, Bateman made a significant contribution to the field of LD, particularly with respect to identification, by introducing the foundational concept of unexpected underachievement, which has since served as a basis for LD identification (Kavale & Forness, 2000).

## **Unexpected Underachievement**

Since Bateman introduced the concept of unexpected underachievement, it has essentially become synonymous with the construct of LD itself (Fletcher et al., 2007), which is underscored by the argument that unexpected underachievement is caused by psychological processing deficits (Mastropieri & Scruggs, 2005). The concept of unexpected underachievement suggests that a student with LD does not achieve as would be predicted by average or near average cognitive ability (Batsche, Kavale, & Kovalesski, 2006; Fletcher, 2008), contrasting with the expected underachievement of students exhibiting low achievement that is commensurate with low cognitive ability (Fletcher, 2012; Mastropieri & Scruggs, 2005). Kavale and Forness (2000) posit that unexpected underachievement is the critical marker of LD and that low achievement alone is not a sufficient indicator of LD. Rather, significant discrepancy between expected (i.e., based on cognitive ability) and actual achievement is necessary to define unexpected underachievement, and therefore, to identify LD. Although unexpected underachievement was originally operationalized through the ability-achievement discrepancy approach to LD identification, this arguably fundamental LD concept is tenably evident in RtI and PSW approaches to LD identification. RtI frameworks demonstrate unexpected underachievement by comparing student responsiveness to evidence-based intervention to peer achievement and growth rates (Batsche et al., 2006). PSW models establish unexpected underachievement through patterns of cognitive strengths and weaknesses, in conjunction with achievement weaknesses (Hale, Kaufman, Naglieri, & Kavale, 2006). Thus, despite significant changes in how LD is identified in schools, this axiom still underlies the LD construct as well as LD identification.

### **Exclusionary Criteria**

The exclusionary criteria required within LD identification procedures further highlight unexpected underachievement as a conceptual basis of LD (Fletcher et al., 2007). The presence of such criteria (e.g., inadequate instruction, emotional disturbance, economic disadvantage, language differences) suggests that student underachievement is expected rather than unexpected because such factors could adversely impact student achievement. Therefore, when one or more of these exclusionary factors cannot be ruled out, the student should not be identified with LD because the student would be expectedly underachieving.

Exclusionary criteria in LD identification are not intended to prevent students from receiving special education services. Rather, such criteria are intended to provide more accurate identification by differentiating between students who have LD and students who have learning difficulties due to other factors (Fletcher, 2012). Such a proposition therefore assumes that students with LD and students with other learning difficulties require different intervention (Fletcher et al., 2007). However, research shows that evidence-based interventions are equally effective for academic skill deficits, but are not related to the underlying cause of such skill deficits (Vaughn & Fuchs, 2006). Moreover, LD identification in schools is made based on behavioral observations of student performance (e.g., test scores, growth, classroom observations), which are the assumed consequence of an underlying cognitive deficit. However, underlying cognitive deficits do not differ between LD and other factors related to achievement difficulties (e.g., emotional behavioral disorder, economic disadvantage) and intervention needs and effectiveness do not differ across such disabilities and correlates (Fletcher et al., 2005).

Economic disadvantage and lack of appropriate instruction are ruled out in LD identification because these variables could result in achievement difficulties but not be indicative of LD. However, economic disadvantage can impact cognitive development, which can consequently result in achievement deficits. Thus, similar cognitive correlates are evident both in children who have LD and in children who come from disadvantaged backgrounds (Phillips & Lonigan, 2005). Similarly, lack of appropriate instruction must be ruled out because it is logical for a student to exhibit low achievement if he or she has not received quality instruction (Fletcher, et al., 2005). Moreover, it is then assumed that the student's inadequate achievement is consequently due to the inappropriate instruction rather than an underlying processing weakness as is the case with LD (Fuchs, Fuchs, & Compton, 2004; Gresham, 2002). However, lack of appropriate instruction can impede cognitive development thus impacting student achievement (Ceci, 1991). Thus, simply finding that a student did not receive appropriate instruction does not necessarily rule out an underlying psychological processing weakness. It is therefore difficult to adequately rule out such exclusionary criteria in LD identification because the underlying cognitive correlates with achievement difficulties are similar between LD and other contributing factors to inadequate achievement.

### **Psychological Processing**

Although there is much disagreement regarding the definition of LD, it has largely come to be known as a basic psychological processing disorder (Torgesen, 2002). These disorders in psychological processing distort one's ability to acquire new knowledge and skills and are theoretically caused by a dysfunction in the central nervous system. Consequently, these dysfunctions negatively impact a child with LD's academic

performance (Lyon et al., 2001). Overall cognitive abilities are thought to remain intact for individuals with LD and the psychological processing disorder is theorized to only impact a *specific* area of functioning (Torgesen, 2002). Such a definition seeks to differentiate individuals with LD from those who have overall general learning difficulties.

LD continues to largely be defined as a psychological processing disorder both within federal policy as well as the research literature (Kavale et al., 2009; Lyon et al., 2001; Pub. L. No. 108–446 § 300.8[c]). However, there has been a significant shift in measurement of psychological processing in LD identification procedures. Prior to the reauthorization of IDEA in 2004, 17 states required direct measurement of psychological processing disorders in LD identification (Mercer et al., 1996). Currently, only 4 states require that psychological processing be measured as one component of a comprehensive evaluation for LD (Maki et al., 2015). There is little consensus concerning the specific processing deficits and how to measure them (Johnson et al., 2010). Moreover, current assessment approaches of psychological processes lack appropriate psychometric properties to ensure that valid conclusions are drawn from assessment findings (Torgesen, 2002).

Although direct measurement of psychological processes could provide a “true” indication of the presence of LD, current knowledge of the specific psychological processes underlying learning disabilities is limited (Torgesen, 2002). While theory supports basic psychological processing deficits as the underlying cause of LD, in order to accurately identify LD, the specific psychological process underlying the achievement area deficit (e.g., basic reading, math reasoning, etc.) must be measured (Torgesen,

2002). Although considerable evidence supports phonological processing deficits in reading disabilities (e.g., Stanovich, 2000; Torgesen, 2006), empirical evidence regarding psychological processes underlying other achievement areas is lacking (Torgesen, 2002). Despite the fact that some research is being conducted regarding underlying psychological processing deficits in mathematics disabilities (e.g., Geary, 2013; Geary, Hamson, & Hoard, 2000) and writing disabilities (e.g., Richards & Berninger, 2008; Berninger, 1994; Swanson & Berninger, 1996), these lines of research are underdeveloped at the current time.

### **Making Classifications**

Disability classifications are essential to the functioning of state special education systems because federal monies are tied to state adherence to federal special education policy (Hardman & Dawson, 2008). Classifications serve to create subgroups based on similar characteristics of group members and dissimilar characteristics with members of other groups (Norwich, 2008). LD identification, therefore, is grounded in congruity in achievement deficits not due to other causes (e.g., intellectual disability, lack of appropriate instruction, emotional disorders, cultural factors, language differences). Reliability and validity of LD identification decisions are essential to ensure consistent and appropriate identification. Therefore, identification cannot be dependent upon the method used in identification, but rather decisions should be consistent across methodologies to ensure valid identification (Fletcher et al., 2007).

### **Classification Frameworks**

**Cromwell, Blashfield, and Strauss (1975) Framework.** The seminal work of Cromwell and colleagues (Cromwell, Blashfield, & Strauss, 1975) provides a useful and

influential framework for understanding diagnostic classifications. Within this framework, classifications (e.g., LD) are defined by historical-etiological underpinnings (i.e., underlying causes) and/or assessable characteristics (i.e., observable manifestations), which can then be assessed for identification. The utility of classifications is dependent upon the extent to which treatment (i.e., instruction and intervention) results in a desired level of prognosis (Cromwell et al., 1975). Therefore, in order to be meaningful, classifications should be intertwined with intervention, which should then result in adequate student growth.

The etiology of a disorder is differentially useful in classification depending upon the disorder itself. If classification based on disorder etiology leads to treatment and consequently improved prognosis, then etiology is useful in classification (Cromwell et al., 1975). However, measurement of etiology is often difficult in educational settings (Thorndike & Thorndike-Christ, 2010) and does not frequently result in improved student outcomes (Melby-Lurvag, & Hume, 2013; Torgesen, 2002). Therefore, classification based on observable characteristics is often more practical and useful, particularly within schools (Cromwell et al., 1975). Developing appropriate classification frameworks should also be empirically based and dependent upon the framework's relationship with treatment and prognosis (Cromwell et al., 1975). This issue is particularly relevant for LD classification because there are no clear links between etiology (i.e., psychological processing weaknesses due to neurological impairment) and identification with treatment and outcome (Fletcher et al., 2007; Lyon et al., 2001; Torgesen, 2002).

Cromwell and colleagues (1975) outline several necessary criteria for classification systems. To begin, classification systems must be reliable. Disability

identification must be consistent across student cases, across individuals making classification decisions, and over time. Second, classification systems must adequately cover characteristics of the disability to ensure all students with the disability are identified. Third, the classification must possess “logical consistency” meaning that it is clearly defined and decision rules are clear, explicit, and precise. Fourth, classification systems should hold “clinical utility” thus resulting in appropriate treatment matched to student need and hypothesized prognosis. Finally, classification systems should be acceptable to users to promote appropriate utilization (Cromwell et al., 1975). Adherence to such criteria in developing classification frameworks ensures that individuals are appropriately identified and receive appropriate treatment therefore resulting in improved outcomes.

**Levels of Analysis Framework.** Fletcher, et al. (2007) proposed a conceptual framework of LD describing how within-child and environmental factors influence academic outcomes in children with LD. Although the authors do not explicitly title the conceptual model, it will be referred to as the Levels of Analysis framework here. The framework outlines how multiple levels of variables including, cognitive processing weaknesses, psychosocial, neurobiological and environmental factors influence academic skill outcomes resulting in LD. The authors argue that academic skill deficits are the foundation of the framework because assessment of such deficits arguably results in valid decision-making in LD identification (Fletcher et al., 2007).

This framework also accounts for the influence of intrinsic and extrinsic factors on the measured academic deficits (Fletcher et al., 2007). Core cognitive processes comprise the second level of analysis (following academic skill deficits). Cognitive

processes such as phonological awareness, orthographic skills, working memory, and rapid naming all predict student academic skill performance (Johnson et al., 2010; Swanson & Alexander, 1997). Also within this level are psychosocial factors affecting student academic skills (Fletcher et al., 2007). Such factors include anxiety, attention, depression, and motivation. Students with LD exhibit higher patterns of poor psychosocial functioning and social emotional skill deficits (Tsatsanis et al., 1997; Kavale & Forness, 1996). Psychosocial deficits impact student academic performance by interfering with a student's ability to adequately process incoming information (Fletcher et al., 2007; Tsatsanis et al., 1997). The Levels of Analysis framework describes a bidirectional relationship between cognitive processes and psychosocial factors indicating that deficits in one domain can lead to deficits in the other and vice versa (Fletcher et al., 2007).

The third level of analysis includes both neurobiological factors and environmental factors (Fletcher et al., 2007). Neurobiological factors either directly impact academic performance or indirectly impact academic performance through influence on cognitive processes and/or psychosocial factors (Fletcher et al., 2007). Innate neurobiological dysfunction is theorized to cause learning disabilities (Lyon et al., 2001). Brain imaging studies show that individuals with learning disabilities exhibit reduced activation in areas of the left hemisphere responsible for language production (Lyon et al., 2001) as well as decreased connectivity within the left hemisphere (Richards & Berninger, 2008). Moreover, children with parents with LD are eight times more likely to also have LD, suggesting an underlying genetic component of LD (Lyon et al., 2001; Olson, 1999).

Environmental influences are also represented within the third level of analysis (Fletcher et al., 2007). Social, economic, and schooling circumstances all impact a student's academic skill performance. The Levels of Analysis framework explicitly accounts for environmental influences on the manifestation of LD, including the quality of instruction/intervention thus contrasting with federal identification criteria (Fletcher et al., 2007). A bidirectional relationship is evident between environmental and neurobiological factors indicating that these two factors not only influence student achievement, but can impact the other factor as well. The interrelationship between neurobiology and environmental factors affects cognitive functioning (Pennington et al., 2009; Olson, 2001). Thus, one's environment influences the development of neural circuitry, which consequently impacts academic performance (Lyon et al., 2001).

### **Difficulties in the Identification of LD**

Despite the static nature of the LD definition over the last five decades, there is little consensus within the field regarding an appropriate LD classification framework. Identification of LD within schools is important for perhaps one overarching reason: appropriate intervention through special education servicing. However, because LD is an unobservable latent construct, it is particularly problematic to identify (Fletcher et al., 2005). Thus, identification decisions are primarily based on observations of the achievement (and cognitive) deficits students with LD exhibit (Francis, Fletcher, Stuebing, Lyon, B. A. Shaywitz, & S. E. Shaywitz, 2005) and measurement of unexpected achievement in the absence of the variables believed to cause such unexpected underachievement (Fletcher et al., 2007). Random and systematic error always impact measurement precision in identification, but latent constructs are

particularly difficult to measure due to measurement inconsistencies and the inability to capture all aspects of the construct with a single measure (Fletcher et al., 2007). These measurement inconsistencies consequently result in identification disparities.

Another difficulty in LD identification is that LD is not a dichotomous disability, but rather is dimensional in nature, occurring along a continuum (Shaywitz, 2004; Stanovich, 1988). Although early research (i.e., Rutter & Yule, 1975) suggested that there was a clear cut-point separating children with reading disabilities from children without reading disabilities, research now indicates that no such specific demarcation value exists (Fletcher et al., 2012). In contrast, research shows that the LD population largely mirrors the population as a whole. Markers typically used to identify LD (e.g., achievement levels and cognitive ability) are normally distributed both within individuals with LD and the overall general population (Francis et al., 2005; Shalev, Auerbach, Manor, & Gross-Tsur, 2000), thus underscoring the multidimensionality of the construct. LD represents a continuum of severity with no clear delineations between those with LD and those without LD (Fletcher et al., 2012).

The methodology used to identify LD therefore contrasts with the underlying multidimensional nature of the disability. LD identification utilizes cut-points to determine the presence of the disability; however, such cut-points are arbitrary because it is not possible to systematically dichotomize (i.e., LD or not LD) a continuous, normally distributed construct (Fletcher et al., 2007). Moreover, scores fluctuate around cut-points due to measurement error regardless of the nature of the construct being measured (i.e., continuous versus dichotomous) and therefore do not represent one's true score or ability (Francis et al., 2005). Thus, making identification decisions based on one or a few scores

at a single time point undermines the meaning and utility of such arbitrary cut-points because comparisons between the observed score and cut-point are not necessarily reflective of true differences. Creating arbitrary groups within continuous distributions also minimizes variability and measurement range thus affecting the power of statistical analyses used to make classification decisions (Cohen, 1983). Instability of LD identification highlights such technical problems with the use of cut-points in identification (Francis et al., 2005; Shaywitz et al., 1992).

### **LD Identification Methods**

Despite the conflict between the underlying nature of LD and dichotomous identification, several prominent LD identification methods are evident in both the research literature as well as in practice including, ability-achievement discrepancy, Response to Intervention (RtI), and Pattern of Strengths and Weaknesses (PSW). IDEA 2004 requires states to allow for RtI in LD identification and forbids requirement of ability-achievement discrepancy (Pub. L. No. 108–446 § 300.307[a]). Although IDEA does not explicitly authorize the use of PSW, it is commonly accepted as the third “alternative approach” (Hale, Flanagan, & Naglieri, 2008), although there is considerable variability in how this approach is implemented (Miciak, Fletcher, Stuebing, & Vaughn, & Tolar, 2014). Valid decisions regarding LD identification should result in a unique subgroup of individuals exhibiting unexpected underachievement (Fletcher et al., 2007). Thus, the LD identification methods should all identify students with distinctive qualities characteristic of LD both within and across methods.

### **Ability-Achievement Discrepancy**

Bateman's (1965) LD definition introduced the concept of unexpected underachievement, which was consequently operationalized through the ability-achievement discrepancy approach to LD identification (Hallahan & Mercer, 2001). Ability-achievement discrepancy served as the sole means of identifying LD from the initial operationalization in the 1977 EAHCA regulations until the 2004 reauthorization of IDEA. The concept of unexpected underachievement was thus explicitly operationalized within LD identification.

**Identification.** Although operationalization of ability-achievement discrepancy can differ, it is most commonly evidenced by achievement that is significantly below overall cognitive ability. A full-scale composite score on an IQ test serves as the student's overall cognitive ability and one (or more) of several achievement composite scores are used to determine unexpected underachievement (Kavale, et al., 2009). Because students with achievement scores that are significantly discrepant from cognitive ability are not achieving as would be predicted by IQ, they are identified as *unexpected* underachievers and thus, LD. However, students without such discrepancies are *expected* underachievers and therefore not identified with LD (Lyon et al., 2001). Similar to the construct of LD itself, IQ is a latent construct and thus presents difficulties for measurement (Floyd, Clark, & Shadish, 2008). Utilization of IQ composite scores in LD identification assumes that such scores represent one's ability and therefore capacity to learn (Fletcher et al., 2007). Although scores derived from IQ tests are reliable (Floyd, 2009), the validity of identification decisions based on such scores is debatable (Francis et al., 2005; Kamin, 1974; Stuebing et al., 2002).

IDEA outlines identification of LD, including through ability-achievement discrepancy; however, it does not operationalize severe discrepancy thus leaving interpretation and operationalization up to individual states (Maki et al., 2015). Severe discrepancy has therefore been operationalized in several different ways, including standard score differences (e.g., discrepancy greater than 15 standard score points), standard deviation unit differences (e.g., discrepancy greater than 1.5 SD units), or a regression-based difference (i.e., discrepancy considering correlation between cognitive and achievement tests through the use of a regression formula). Such differences in the operationalization of “severe discrepancy” results in identification disparities and therefore differences in the students identified as LD (Kavale, 2002; Reschly & Hosp, 2004).

**Criticisms of Ability-Achievement Discrepancy.** Although ability-achievement discrepancy was used almost exclusively until 2004 and is still widely used (Maki et al., 2015; Reschly & Hosp, 2004), psychometric and conceptual problems underlie its use (Aaron, 1997; Francis et al., 2005; Vaughn & Fuchs, 2003). Relying on IQ test scores to serve as a proxy for cognitive ability assumes that there is a finite upper limit to what one can learn or achieve, but such assumptions are unsupported (Fletcher et al., 2007; Share, McGee, & Silva, 1989). Moreover, the correlation between IQ scores and achievement is moderate, thus minimizing the predictability of achievement level from “ability” (Aaron, 1997). The statistical phenomenon of regression to the mean influences student scores because when two or more tests are given, additional scores are likely to be closer to the mean thus reducing the likelihood of severe discrepancies (Francis et al., 2005). Furthermore, difference scores are less reliable than the individual scores used in

determining the discrepancy (Vaughn & Fuchs, 2003). Thus, calculating discrepancies between cognitive ability and achievement does not produce consistently significant differences.

The unreliability of ability-achievement discrepancies affects the validity of LD identification decisions and therefore the utility of this approach. Ability-achievement discrepancy lacks treatment validity (Vaughn & Fuchs, 2003). Assessments should be conducted in order to inform instruction and intervention (Salvia, Ysseldyke, & Bolt, 2012); however, ability-achievement discrepancy does not provide educators with useful information regarding the necessary skills to teach a particular student (Elliot & Fuchs, 1997; Vaughn & Fuchs, 2006). Research does not suggest that ability-achievement discrepancy is indicative of an underlying intrinsic processing weakness (Lyon et al., 2001). Moreover, there are no underlying neurobiological differences between low achievers exhibiting a discrepancy and low achievers not exhibiting a discrepancy (Mayes, Calhoun, Bixler, & Zimmerman, 2009). The achievement of low achievers with and without discrepancies is comparable (Algozzine et al., 1995; Ysseldyke et al., 1982; Gresham, 2002; Willcutt, et al., 2010) and students benefit from the same instruction regardless of ability-achievement discrepancies (Algozzine et al., 1995; Fletcher, 2012; Lyon et al., 2001).

**Empirical Investigations of Ability-Achievement Discrepancy.** Prior to the most recent reauthorization of IDEA, ability-achievement discrepancy served as the primary means of identifying students with LD (Pub. L. No. 108–446 § 300.307[a]). However, extensive research conducted at the Institute for Research on Learning Disabilities at the University of Minnesota in the 1980s showed considerable

inconsistency in the decisions made regarding LD identification. In a study examining multidisciplinary teams' use of evaluation data in LD special education identification decisions, Ysseldyke, Algozzine, Richey, and Graden (1982a) showed that these teams were more likely to identify students as LD when more information and data were presented. However, they did not find a relationship between the type of data discussed at meetings and the legal mandates regarding identification suggesting a lack of team reliance on formal criteria when making identification decisions. Moreover, Algozzine & Ysseldyke (1981) found that school psychologists relied more heavily on referral information than on evaluation assessment data to make identification and placement decisions suggesting potential identification bias based on referral concerns. However, these findings have been criticized which will be discussed in further detail within the context of inconclusive data.

Although Ysseldyke et al.'s (1982a) study suggested that multidisciplinary teams do not heavily rely on specific student data related to identification criteria, additional research has investigated how school psychologists and others apply such criteria to make decisions. Epps, Ysseldyke, & McGue (1984) examined the consistency of LD identification decisions across school psychologists, special education teachers, and novices (i.e., undergraduate students). Participants were provided with 18 student evaluation reports, 9 of whom had been identified with LD and 9 of whom were low-achieving students who were not identified as LD. Participants used the student data and LD identification criteria to determine whether or not each student should be identified with LD based upon both low achievement and discrepancy decision-rules. Participants made LD identification decisions across four decision rules: low achievement 1 SD

below the norm, low achievement 1.5 SDs below the norm, discrepancy of 1 SD between ability and achievement, and discrepancy of 1.5 SDs between ability and achievement. Epps and colleagues (1984) also determined consistency of LD identification decisions by examining whether participant decisions aligned with the school-based decision for each student evaluation report. Results showed that participant decisions were not consistent with school-based decisions, with only approximately 50% decision consistency. Moreover, there were no significant differences between participant groups with novice undergraduate students exhibiting the same overall level of consistency as school psychologists and special education teachers. However, novice undergraduate students demonstrated higher consistency when using the 1.5 SD low achievement decision rule but the school psychologists and special education teachers were more consistent when utilizing the discrepancy criteria, although they were still only consistent with school-based decisions about 50% of the time. Such inconsistent decisions regarding LD identification greatly impacts who is identified with LD and consequently, who receives special education services.

Because the federal LD identification criteria do not operationalize empirical criteria for identification decisions, practices greatly differ across states (Maki et al., 2015) and likely even across school districts within the same state (Haight, Patriarca, & Burns, 2002). Epps, Ysseldyke, and Algozzine (1983) investigated the impact of different operationalizations on LD identification. Data from student evaluation reports (some LD and some low-achieving) were used to examine the impact of different operationalizations including discrepancy, low achievement, and scatter (i.e., discrepancies between verbal and performance IQ scores on the WISC-R). Results

showed considerable variability in the percentage of students identified across operationalizations. Moreover, decisions made based on the operationalizations used within the study were not consistent with the school-based decision. Such findings underscore the variability in LD identification caused by differing decision rules.

LD identification decisions made using ability-achievement discrepancy and low-achievement are not reliable as evidenced by inconsistent decisions across decision rule operationalizations and across participant and school-based decisions. However, in order for identification methodologies to be useful, they must also result in valid decisions (Fletcher et al., 2007; Kane, 1992). Ysseldyke, Algozzine, Shinn, & McGue (1982b) examined the validity of such decisions by comparing the achievement of students identified as LD and low-achieving students not identified as LD. Results showed considerable overlap (96%) in the achievement distributions of students with and without LD and that more than half of the students in each group had the same achievement score as a student in the opposite group. The authors therefore argued that these similarities among students with and without LD undermine the validity of decisions made through ability-achievement discrepancy because it does not identify a unique group of low-achieving students. However, this argument has been questioned because both Ysseldyke et al.'s (1982b) analysis and re-analysis by Kavale, Fuchs, and Scruggs (1994) showed that students identified with LD largely exhibited lower achievement than low-achieving students without LD despite the overall overlap of achievement scores.

More recent research has also investigated the reliability and validity of ability-achievement discrepancy LD identification decisions. Francis and colleagues (2005) used both simulated and real student data to investigate the stability of decisions over time.

Findings showed that both simulated and real student data were not stable when imposing identification decision rules at multiple time points suggesting that the same decisions are not made at various evaluation time points. Thus, not only were identification decisions not reliable over time, but such decisions were not valid either because students with and without disabilities were not differentially identified. Meta-analytic work has also examined the validity of ability-achievement discrepancy identification decisions and shows negligible, if any, differences on achievement and behavior between students identified as LD and low-achieving students not identified as LD (Stuebing, et al., 2002).

### **Response to Intervention**

The considerable psychometric and conceptual issues associated with ability-achievement discrepancy facilitated the use of RtI models for LD identification. Whereas prior to 2004, states exclusively used ability-achievement discrepancy (Reschly & Hosp, 2004), the reauthorization allowed for use of “a process that determines if the child responds to scientific, research-based intervention as a part of the evaluation procedures” (Pub. L. No. 108–446 § 300.307[a][2]). This allowance did not outlaw use of ability-achievement discrepancy; however, allowance and utilization of RtI has considerably impacted use of ability-achievement discrepancy in LD identification (Maki et al., 2015).

**Identification.** Although the 2004 reauthorization of IDEA was the first time RtI could be used for LD identification, many schools were already implementing RtI frameworks as a means to provide additional academic and behavioral support for students struggling in schools (Burns & VanDerHeyden, 2006). RtI models are preventative, data-driven service delivery models, which provide tiered instruction and intervention supports based on student needs (Batsche et al., 2005). Resources are

allocated in conjunction with student responsiveness to intervention with greater resources (e.g., time, personnel) being utilized at higher tiers (Burns & VanDerHeyden, 2006).

The ability-achievement discrepancy method has frequently been termed a “wait to fail” approach to LD identification because a student must exhibit a “severe” enough discrepancy between ability and achievement before he or she can be identified which typically is not evident until later elementary years (Fuchs, Mock, Morgan, & Young, 2003). In contrast, proponents of RtI models for LD identification assert that this approach allows for effective and early identification because it utilizes a systematic method to ensure that students receive timely and effective support as soon as student difficulties are evident (Kavale, Kauffman, Bachmeier, & LeFever, 2008). RtI models are typically comprised of three tiers with quality core instruction for all students representing tier 1, targeted interventions for students struggling in the general curriculum representing tier 2, and intensive intervention supports for students continuing to struggle with tier 2 supports representing tier 3 (Burns & Gibbons, 2012). Universal screening is conducted seasonally (e.g., fall, winter, and spring) and is used to determine the effectiveness of tier 1 instruction and to identify struggling students. Student progress is frequently (e.g., weekly or biweekly) monitored at tiers 2 and 3 and these assessment data are used to make instructional decisions (Reschly, 2008; Marston, 2005).

Students are identified as LD and provided special education services if they do not adequately respond to the increasingly intensive interventions and instructional supports (Vaughn & Fuchs, 2003). Unexpected underachievement is therefore operationalized through inadequate response to generally effective instruction based on

peer comparisons or research-based criteria (Gresham, 2002). Moreover, RtI models link assessment to treatment, an integral component of any valid classification decision-making system (Cromwell et al., 1975; Fletcher et al., 2007). Although there is variability in RtI framework implementation and LD identification decision-making, a common method for determining student responsiveness to intervention is the dual discrepancy approach (Gresham et al., 2005). In this method, student achievement levels and growth rate are compared to expected achievement levels and expected student learning rate. If student performance is below expected performance, he or she may be identified with LD (Hauerwas, Brown, & Scott, 2013; Kovaleski et al., 2013). Expected student performance is determined either through research-based criteria or through comparison to student peers, although no research-based criteria is widely accepted in the literature. L. S. Fuchs and D. Fuchs (1998) proposed utilizing a 1 standard deviation difference between a student and peers' performance to determine LD identification. However, practices differ considerably (Berekeley, Bender, Peaster, & Saunders, 2009; Hauerwas et al., 2013).

**Criticisms of RtI.** Much like ability-achievement discrepancy, IDEA does not outline specific criteria regarding use of RtI in LD identification. Thus, operationalization of RtI identification procedures is left up to individual states resulting in considerable variability across states (Maki et al., 2015). Because there is no widely accepted inadequate response criterion, the level of inadequate response that states and local school districts use will greatly impact student LD identification. A low level of inadequate response could result in too many students identified as LD whereas a high level of inadequate response could prevent students in need of additional services from receiving them (Ysseldyke, 2005). Although federal law does not provide operationalized

RtI identification criteria, research on appropriate identification criteria is being conducted (e.g., Fuchs & Fuchs, 1998; Fuchs, Fuchs, & Speece, 2002; Gresham, 2001; Burns & Senesac, 2005), but universally accepted criteria are not evident at this time.

RtI utilizes evidence-based intervention and assessment methods to make instructional and LD identification decisions. Instructional decision-making within RtI frameworks was in place in schools for many years prior to the use of RtI in LD identification, and evidence showed that use of RtI models resulted in valid identification of students in need of additional support (Gresham et al., 2005). However, LD identification decisions within RtI frameworks utilize RtI for decisions that have not been validated (Burns, Jacob, & Wagner, 2008). Moreover, it is unknown if RtI truly identifies LD or simply all low achieving students (Kavale & Spaulding, 2008).

Moreover, using RtI for LD identification may inherently change conceptual understanding of the construct (Kavale & Spaulding, 2008; Scruggs & Mastropieri, 2002). Lack of responsiveness to evidence-based instruction and intervention is not necessarily indicative of the historical markers defining LD (i.e., psychological processing deficits; Batsche et al., 2006). It is clear that RtI identifies underachievers through below-expected achievement and growth. However, it is less clear if RtI differentiates between expected and unexpected underachievement because it does not assess individual student abilities (Kavale & Spaulding, 2008). Arguably, without cognitive assessments, LD merely measures low achievement and therefore does not differentiate between LD and other disabilities (Mastropieri & Scruggs, 2005).

**Empirical Investigations of RtI.** Research examining use of RtI in LD identification has largely focused on the effectiveness of tiered instruction and

intervention supports for students struggling in school and the relationship between identification decision rules and student achievement. The Minneapolis Public Schools (MPS) have served as an early model for effective RtI implementation in LD identification even prior to IDEA 2004. MPS uses a problem-solving model to identify appropriate general education interventions, special education referral, and LD special education identification. Implementation of such models in MPS has resulted in improved pre-referral interventions, early special education servicing (decreasing problems surrounding “wait-to-fail”), reductions in disproportionality for African-Americans, increased pre-referral intervention but decreased identification, and improved intervention effectiveness demonstrated through improved student achievement (Marston, Muyskens, Lau, & Canter, 2003). Moreover, decision-making within problem-solving models demonstrate discriminate validity because average student growth decreases as students move through tiers thus reflective of non-responsiveness and therefore LD (Marston et al., 2003).

Additional research examining RtI in LD identification has investigated the criteria used to determine non-responsiveness and therefore possible LD identification. Although there is not a largely agreed upon definition of adequate student progress (Torgesen, 2000), there are several approaches to determining non-responsiveness evident in the literature typically including inadequate achievement levels, inadequate student growth or dual discrepancy. McMaster, D. Fuchs, L.S. Fuchs, and Compton (2005) examined the validity of decisions made using the DD approach to identify students who were not responsive to tiered intervention. Students who were not responsive to a classwide reading intervention (Peer Assisted Learning Strategies; PALS;

Fuchs & Fuchs, 2008; Fuchs, Fuchs, Mathes, & Simmons, 1997) were randomly assigned to receive reading intervention, to continue receiving only PALS, or to participate in a modified PALS intervention. Results showed that pretreatment achievement measures significantly differentiated average readers from at-risk readers. Moreover, there were statistically significant differences in both achievement level and reading growth between at-risk students who responded and did not respond to intervention (McMaster et al. 2005), suggesting that DD approaches adequately identified students who were very low-achieving and non-responsive to intervention and thus likely LD.

Burns and Senesac (2005) further examined the utility of the DD approach in LD identification by comparing different DD criteria. They examined how four DD criteria (i.e., 25<sup>th</sup> percentile, 33<sup>rd</sup> percentile, 50<sup>th</sup> percentile, and 1 SD below the mean) differentiated student reading skills on a norm-referenced reading achievement test. Findings showed that the three percentile rank DD criteria significantly differentiated at-risk from non-responsive students on the norm-referenced achievement test with particularly large effect sizes for the 25<sup>th</sup> and 33<sup>rd</sup> percentile criteria. Moreover, although not directly examined in the study, the findings suggested a non-biased approach to determining non-responsiveness because there was no racial or gender bias (Burns & Senesac, 2005). Although LD identification was not directly examined, this study provided support regarding the validity of DD approaches to LD identification as evidenced by the differentiation of student reading skills through DD criteria.

One criticism of the ability-achievement discrepancy approach to LD identification is that it lacks treatment validity because it does not guide instruction to improve student learning (Aaron, 1997; Vaughn & Fuchs, 2003). Conversely, RTI models

have been shown to result in improved student outcomes including, increased student learning (Burns, Appleton, & Stehouwer, 2005; Kovaleski et al., 2013) and reductions in the number of students receiving special education services (Kovaleski et al., 2013; Marston et al., 2003; Sornson, Frost, & Burns, 2004; Tilly, 2003). Moreover, critical components of RtI models used in LD identification have been shown to result in improved student outcomes including use of screening data (Kovaleski & Pedersen, 2008), monitoring student progress (Fuchs & Fuchs, 1986; Hosp, Hosp, & Howell, 2007), and tiered intervention supports (Elbaum, Vaughn, Hughes & Moody, 2000; Piasta & Wagner, 2010). Research also demonstrates achievement and cognitive differences between students who are responsive and non-responsive to intervention (Fletcher, Simos, Papanicolaou, & Denton, 2004; Vaughn, Linan-Thompson, & Hickman, 2003; Vellutino, Scanlon, & Jaccard, 2003) thus suggesting a psychological processing correlate underlying non-responsiveness to intervention.

Despite the positive outcomes associated with the use of RtI in LD identification, some argue that this approach to LD identification does not result in valid decisions because cognitive ability is not assessed (Kavale et al., 2008). Because LD is defined as a psychological processing disorder, it is argued that LD identification decisions cannot be validated without assessment of such processes. Rather, RtI may simply result in identification of low achievement or even other disabilities (Mastropieri & Scruggs, 2005).

### **Pattern of Strengths and Weaknesses**

Under federal law, states also have the option to use “alternative, research-based methods,” allowing for some flexibility and use of alternative LD identification methods

based on developing research (Pub. L. No. 108–446 § 300.307[a]). The wording within IDEA legislation is very vague as the additional LD identification methodology is only described as a “research-based approach” (Lichtenstein & Klotz, 2007). However, intraindividual approaches examining cognitive processing strengths and weaknesses are generally considered the most commonly utilized alternative methodologies in LD identification (Hale et al., 2008), although there is considerable debate surrounding these approaches.

**Identification.** Federal legislation defines LD as a disorder of the basic psychological processes (Pub. L. No. 108–446 § 300.8[c]) and research shows that students with LD exhibit cognitive processing impairments (Torgesen, 2002). Proponents of PSW methods therefore assert that these approaches to LD identification capture this essential marker of LD through direct measurement of cognitive processing weaknesses (Hale et al., 2006). Students are identified with LD when they exhibit deficits in an academic area that theoretically aligns with deficits in a cognitive processing area (Flanagan, Alfonso, & Mascolo, 2011; Flanagan, Fiorello, & Oritz, 2010.) For example, students who show deficits in basic reading achievement should also show deficits in phonological processing.

PSW methods are often discussed interchangeably because they all measure consistency between cognitive and academic deficits as well as severe discrepancy between cognitive strengths and cognitive weaknesses (Hale et al., 2006). However, the PSW methodologies vary in important ways, including determination of cognitive discrepancies, determination of theoretical links between cognitive and achievement deficits, and determination of achievement deficits criteria (Miciak et al., 2014a). For

instance, the cross-battery approach uses normative comparisons to determine cognitive and achievement deficits (Flanagan et al., 2011) whereas the concordance/discordance approach uses intraindividual comparisons to determine discordance between cognitive strengths and academic deficits, discordance between cognitive strengths and cognitive weakness(es), and concordance between cognitive and achievement deficits (Hale & Fiorello, 2004).

Unexpected underachievement is therefore demonstrated through an uneven pattern of cognitive strengths and weaknesses in light of average overall cognitive functioning (Flanagan, Alfonso, & Mascolo, 2011; Hale & Fiorello, 2004). Moreover, in order to measure the core underlying feature of LD (i.e., psychological processing weaknesses), proponents assert that measures of student cognitive and neuropsychological functioning must be utilized to differentiate children with LD from other low-achieving children (Hale et al., 2006; Semrud-Clikeman, 2005). Research shows that students with LD process information differently due to psychological processing deficits contrasting with the delays evidenced by other low-achieving students (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996). PSW proponents therefore assert that such deficits must be measured in order to adequately capture unexpected underachievement (Flanagan et al., 2011; Hale et al., 2008).

**Criticisms of PSW.** Despite proponents' assertions that PSW methods provide a true indication of LD by measuring cognitive processing deficits (Hale et al., 2008), many issues are evident with these approaches to LD identification. There is no empirical research supporting the reliability and validity of LD identification decisions utilizing PSW methods and research does not support the need to assess cognitive skills to identify

LD (Reschly & Tilly, 1999). Moreover, findings from studies examining real student test score data showed inconsistencies in LD identification across the different PSW models (Miciak et al., 2014). PSW methods require comparisons across multiple subtests of cognitive and achievement assessments, often resulting in more than 100 analyses and thus distortion of p-value interpretation. Without correction of Type 1 error rates, these multiple analyses are likely to result in false positives and thus identification of students with LD when they in fact do not have LD (Stuebing et al., 2012).

PSW approaches have not been validated as diagnostic frameworks linking assessment to intervention. Although proponents of PSW methods argue that information gathered through PSW assessments can be used to plan and guide intervention (e.g., Hale & Fiorello, 2004; Hale, Fiorello, Bertin, & Sherman, 2003; Naglieri & Bornstein, 2003; Naglieri, 2003), findings regarding such arguments are at best inconsistent (Fletcher et al., 2012; Kearns & Fuchs, 2013). Moreover, training of cognitive skills does not result in improved student outcomes (Burns, 2011a; Kavale & Forness, 2000; Kearns & Fuchs, 2013; Melby-Lervag & Hulme, 2013) and there are no evident achievement differences between students identified as LD and students not identified as LD using PSW methods thus undermining the validity of such identification decisions (Miciak et al., 2014a).

Despite assertions that PSW methods directly measure the core underlying feature of LD (i.e., psychological processing weaknesses), PSW methods do not differentiate children with LD from other low-achieving students (Miciak et al., 2014; Dean & Burns, 2002). Phonological processing deficits have been shown to underlie reading disabilities (Shaywitz & Shaywitz, 2005; Stanovich, 1988; Torgesen, 2002) and there is emerging research suggesting that working memory deficits may be implicated in LD in general

(Swanson et al., 2009). However, poor readers not identified as LD also demonstrate poor phonological processing (Vellutino, Scanlon, Small, & Fanuele, 2006) and working memory deficits are moderated by cognitive abilities (Hasselhorn & Mahler, 2007) confounding the argument that LD is attributable to such deficits. Therefore, because such deficits are evident in both children with and without LD, measurement of such processes within PSW methods does not provide “true” identification of LD as argued by proponents of these approaches.

**Empirical Investigations of PSW Methods.** PSW approaches to LD identification are far less researched than ability-achievement discrepancy and RtI. Moreover, there are currently no empirical studies supporting the reliability and validity of decisions made using these approaches. There are, however, several studies suggesting that these approaches do not result in reliable or valid decisions in LD identification. Stuebing and colleagues (2012) used simulation techniques to examine the reliability and validity of LD identification decisions across three PSW approaches (i.e., Concordance/Discordance model, Discrepancy/Consistency model, and Cross-Battery Assessment). Results showed very low base rates across all three models, with only 1 to 2% of students being identified with LD. Moreover, all three models demonstrated high specificity and negative predictive power suggesting that these models generally correctly identify students as not having LD. However, all three models also had low sensitivity and positive predictive power indicating that students with LD were not appropriately identified (Stuebing et al, 2012). Such findings suggest that students in need of special education services will likely not receive those services if these PSW approaches are used.

Miciak and colleagues (i.e., Miciak et al., 2014a; Miciak, Taylor, Denton, & Fletcher, 2014b) have used real student data to examine the reliability and validity of decisions made across PSW approaches as well as the reliability of one approach (i.e., Concordance/Discordance Model; C/DC) across achievement tests. Findings showed that different PSW approaches do not result in the same identification decisions regarding whether or not a student has LD. Moreover, there were no achievement differences among students identified as LD and students identified as not LD, suggesting that these approaches do not result in valid identification decisions (Miciak et al., 2014a). Miciak et al. (2014b) also showed that although the Concordance/Discordance (C/DC) model resulted in similar numbers of students identified across different achievement tests, there was low agreement ( $k = .29$ ) regarding identification decisions thus suggesting that the reliability and validity of LD identification decisions using C/DC is further affected by the specific achievement tests used.

### **The Problem of Inconclusiveness**

It is well established that the vague LD federal definition and identification criteria result in inconsistent identification practices across states (Klinger et al., 2005; Maki et al., 2015) and therefore variability in the students identified with LD (Reschly & Hosp, 2004). State legislative bodies are thus charged with development of policies concerning LD identification resulting in considerable variability in not only the type of identification procedures required, but also the breadth and depth of information provided (Maki et al., 2015; Mercer et al., 1996; Reschly & Hosp, 2004), which is likely to result in variability within states as well (Haight, Patriarca, & Burns, 2002). Moreover, many state departments of education provide additional guidance on identification procedures,

but similarly, such guidance varies across states (Zirkel & Thomas, 2010) and the extent to which local education agencies (LEAs) follow such guidelines is largely unknown (Maki et al., 2015).

Lack of consensus within the field regarding appropriate LD identification is likely to continue to result in ambiguous federal identification criteria, which is likely to continue to result in variable state practices (Reschly, 2005). Inconsistent identification practices and variable prevalence rates undermines the validity of LD identification decisions as well as the conceptual understanding of LD as a whole (Reschly & Hosp, 2004). Without consistent identification of the disability, the extent to which the concept of LD exists is largely unknown. It is difficult to reconcile the presence of a “true” disorder with the measurement issues underlying consistent identification.

Despite the evidence showing the impact of ambiguous LD definition and identification criteria on identification (Reschly & Hosp, 2004), the extent to which student data impact LD identification consistency is largely unknown. Although many studies have examined the reliability of identification decisions, there are no known studies directly examining the effect of inconclusive student data on the consistency of LD identification. Although state regulations typically describe LD identification and seek to provide an objective component to identification, professional judgment nonetheless plays a role in LD identification (Mather & Gregg, 2006). Identification decisions made by multidisciplinary teams allow for some level of professional subjective decision-making as well as team override when a student is not eligible for special education under LD (Pub. L. No. 108–446 § 300). It is likely that it would be difficult to justify LD identification when student data are clearly indicative of the

student not having LD (e.g., student demonstrates average achievement). However, if student data are inconclusive (e.g., confidence interval overlap of assessment scores used in decision-making), multidisciplinary teams may be more likely to identify a student with LD even if he or she does not qualify when strictly adhering to identification criteria. Therefore, the combination of subjective professional judgment with the level of student data clarity or conclusiveness could impact the consistency of LD identification.

Due to the statistical phenomena underlying the normal distribution of student ability and achievement, most student scores are likely to surround the cut-point used in LD identification (Brown Waesche, Schatschneider, Maner, Ahmed, & Wagner, 2011). Additionally, due to the inherent measurement error in assessment data and regression to the mean, student scores are likely to fluctuate around the cut-point with additional testing (Schatschneider, Wagner, & Crawford, 2008). Use of confidence intervals helps to minimize the influence of error in identification decision-making and is considered best practice (Fletcher et al., 2007). However, when student data are close to the identification cut-point, identification decisions are less transparent and could differ depending on whether or not confidence intervals or measurement error are taken into account (Brown Waesche et al., 2011).

Huebner (1991) argued that Algozzine and Ysseldyke's (1981) findings that referral concerns biased school psychologists' identification decisions were potentially misleading and influenced by the presentation of the student information. He asserted that the participants viewed student data with highly inconclusive grade-equivalent scores, which likely influenced the consistency of identification decisions. Perhaps when school psychologists and multidisciplinary teams are making identification and special education

identification decisions, they are less likely to rely on assessment data when such data are inconclusive (Huebner, 1991). However, other research has suggested that school psychologists do in fact rely on evaluation assessment data in LD (and other disability) identification decisions (Burns, 1990; Huebner, 1987). Although it is possible that Algozzine and Ysseldyke (1981) inadvertently utilized inconclusive data thus confounding results, student evaluation data have not been experimentally manipulated and therefore the effect of such inconclusiveness is largely unknown.

### **Identification Decision Confidence**

Professional judgment plays a significant role in special education identification decisions (Watkins, 2009). Because professional judgment is inherent within identification decisions, personal characteristics of the decision-makers could impact identification decisions, including decision-maker confidence. However, very little research within the field of school psychology or special education has examined school psychologist confidence in identification decisions. There is some research within the medical field suggesting that confidence in diagnostic decisions is inversely related to diagnostic accuracy (Norman & Eva, 2010) with diagnostic accuracy decreasing as decision confidence increases.

Some researchers have suggested that confirmation bias may play a role in this inverse relationship between confidence and decision accuracy (Mamede, Schmidt, & Rikers, 2007) because decision-makers may make identification decisions based on preconceived beliefs regarding the presence of a disorder (Berner & Graber, 2008). Such findings coincide with Algozzine and Ysseldyke's (1981) findings that pre-referral information unduly influenced identification decisions compared to evaluation data.

Some research within special education has suggested that confirmation bias influences decision confidence consequently resulting in lower identification accuracy (Barnett, 1988). However, this argument has not been examined experimentally, was conducted prior to the reauthorization of IDEA in 2004, and did not specifically examine LD identification, which is particularly problematic (Francis et al., 2005; Miciak et al., 2014a). Research in psychological diagnostic decisions also showed that decision-maker confidence increases with the number of diagnostic decisions made (Arkes, Hackett, Boehm, 1989; Dunning, Heath, & Suls, 2004) suggesting that years of experience influences decision-maker confidence. However, this research has not been conducted specifically within the field of school psychology or special education.

Limited research has systematically investigated school psychologists' confidence in special education identification decisions. There is some research to suggest that school psychologists report medium (de Mesquita, 1992) to high levels of confidence (Aspel, Willis, & Faust, 1998; Gnys, Willis, & Faust, 1995) when viewing student evaluation data and making special education identification decisions based on such data. However, Aspel et al. (1998) and de Mesquita (1992) did not experimentally examine decision confidence. Moreover, de Mesquita (1992) and Gnys. et al (1995) used simulated data and not real student data. In the Gnys et al. (1995) study, school psychologists were presented with student WISC-R and achievement data and the impact of WISC-R scatter and achievement level on decision accuracy and confidence were then examined. School psychologists reported overall high levels of confidence in identification decisions; however, confidence was not related to student achievement score level or WISC-R data scatter. Only Gnys et al. (1995) specifically examined LD

identification confidence whereas the other studies examined general special education identification (e.g., Aspel et al., 1998) or identification of Attention Deficit Hyperactivity Disorder (ADHD: de Mesquita, 1992). Furthermore, the Gnys et al. (1998) investigation was conducted prior to the 2004 reauthorization of IDEA and thus examined school psychologist confidence in LD identification only in relation to ability-achievement discrepancy. Thus, additional research concerning school psychologist confidence in LD identification decisions in relation to utilization of specific LD identification methodology and student evaluation data is warranted.

### **Purpose of the Studies**

Although there is considerable research examining LD identification as well as conceptual understanding of the disability, there is no current research examining consistency of LD identification across the three most commonly used identification approaches, ability-achievement discrepancy, RtI, and PSW nor is there empirical research examining the effect of inconclusive student data on the consistency of LD identification. Moreover, although limited research suggests that school psychologists report overall high levels of confidence in identification decisions, most research is descriptive in nature and rather dated. The purpose of the present studies, therefore, was to examine the differential consistency of LD identification across three identification methods and student data levels of conclusiveness and to examine differences in school psychologists' confidence across identification methods, student data levels of conclusiveness, and consistency of identification.

### **Research Questions**

The following research questions guided the studies:

1. What LD identification procedures do school psychologists most commonly use in practice; which LD identification procedures do school psychologists prefer to use; and which LD identification procedures are school psychologists taught in graduate school training?
2. To what extent do school psychologists adhere to state learning disability (LD) identification criteria?
3. To what extent does learning disability identification consistency differ across three identification methods?
4. To what extent does identification consistency differ by student LD evaluation report level of conclusiveness?
5. How confident are school psychologists in their evaluation decisions?
6. To what extent does school psychologist confidence differ across identification method?
7. To what extent does school psychologist confidence differ across level of conclusiveness? and
8. To what extent does school psychologist confidence differ across degree level and years of experience?
9. To what extent does school psychologist confidence difference across identification decision consistency?

## CHAPTER 3

### STUDY 1

Identification of learning disabilities (LD) has long been contentious. Differing views on appropriate LD identification have resulted in varying practices across states and school districts (Maki, Floyd, & Roberson, 2015). Consequently, students with learning difficulties are identified as LD at varying rates across states as well as over time (Data Accountability Center, DAC; [ideadata.org](http://ideadata.org)), which suggests potential underlying issues with identification methodology. Despite such variability, students with LD represent 40% of the student population receiving special education services (DAC; [ideadata.org](http://ideadata.org)). Thus, there is a large number of students with significant need for academic skill support, which underscores the importance of reliable and valid identification decisions to ensure appropriate service provision (Fletcher et al., 2007; Reschly, 2003). However, since the 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA) no research has systematically examined differences in LD identification across identification methodologies or other variables potentially impacting LD identification. Thus, this chapter will examine potential variables affecting LD identification including identification methodology and student evaluation data. Below, I will describe LD identification methodology, the research surrounding them and their potential impact on identification decisions. Then, I will discuss other factors affecting LD identification including clinical judgment and conclusiveness in student data and identification criteria.

## **Learning Disability Identification Methods**

One reason why states have such varying rates of students identified as LD is because they use different approaches to identify them (Maki et al., 2015). The three most common approaches are ability-achievement discrepancy, response to intervention (RtI) and pattern of strengths and weaknesses (PSW; Zumeta, Zirkel, & Danielson, 2014; Hale, Flanagan, & Naglieri, 2008). Below I will discuss these three identification methods, how they are used to identify LD, and criticisms regarding their use within a framework of research supporting or undermining their use in LD identification.

### **Ability-Achievement Discrepancy**

Ability-achievement discrepancy has served as the primary means of identifying students with LD since the original 1977 regulations of the Education for All Handicapped Children Act (EAHCA; P.L. 94-142; Kavale & Spaulding, 2008). This identification approach is grounded in the belief that students exhibiting underachievement discrepant from cognitive ability possess a unique set of characteristics indicative of LD (Gresham & Vellutino, 2010). However, research has consistently questioned ability-achievement discrepancy approach (Aaron, 1997; Epps, Ysseldyke, & McGue, 1984). However, many assert that a discrepancy between ability and achievement is not a valid marker of LD because children with and without discrepancies exhibit the same deficits (Hoskyn & Swanson, 2000; Stuebing et al., 2002; Vellutino, Scanlon, Zhang, & Schatschneider, 2008; Ysseldyke, Algozzine, Shinn, & McGue, 1982b). Moreover, difference scores used to determine discrepancy are not reliable, are not stable over time, and the similarity of student scores above and below the cut-score

minimizes the validity of decisions distinguishing LD versus not LD (Fletcher et al., 2005; Epps, Ysseldyke, & Algozzine, 1983; Ysseldyke et al., 1982b).

In addition to psychometric criticisms, there are practical concerns about the ability-achievement discrepancy model. Students typically must exhibit poor achievement for several years before achievement is significantly discrepant from cognitive ability, which has resulted in this method being termed a “wait-to-fail” approach (Batsche, Kavale, & Kovalski, 2006, p. 12). Moreover, assessment data gathered through ability-achievement discrepancy does not inform instruction or intervention (Bradley et al., 2005; Vaughn & Fuchs, 2003), responsiveness to intervention (Fletcher, Lyon, Barnes, Stuebing, Francis, Olson et al., 2002; Vellutino et al., 2003) or on long-term achievement outcomes (Fletcher et al., 2005; Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996). Finally, IDEA does not operationalize what constitutes a severe discrepancy, and leaves interpretation and operationalization to individual states, which results in variable practices within states (Haight, Patriarca, & Burns, 2002) and across states (Kavale, 2002; Maki et al., 2015).

### **Response to Intervention**

The issues undermining the consistency of ability-achievement discrepancy decisions served as the impetus for developing alternative identification methods, including RtI (Gresham, 2001). Although there are several methods for identifying LD within RtI, students are typically identified based on lack of responsiveness to increasingly intensive academic supports, including intervention and monitoring of progress (Vaughn & Fuchs, 2003). Commonly, the dual discrepancy approach is used, which compares a student’s achievement level and growth rate to peers or research-based

criteria (Kovaleski, VanDerHeyden, & Shaprio, 2013). Thus, if a student's achievement level and growth rate are both below established criteria, he or she may be identified with LD (Fuchs, 2003). Moreover, there is some support for dual discrepancy models in LD identification (McMaster, Fuchs, Fuchs, & Compton, 2005) and studies comparing identification decisions based on slope only, achievement level only, and dual discrepancy suggest dual discrepancy is superior in LD identification (Fuchs, 2003; Fuchs, Fuchs, McMaster, & Al Otaiba, 2003).

The use of RtI in LD identification is much less researched than ability-achievement discrepancy and many studies examined lack of responsiveness and not LD identification specifically. However, because RtI incorporates non-responsiveness as a key component of LD identification (Vaughn & Fuchs, 2003), these studies still provide valuable insight into the consistency of potential RtI identification decisions. Research demonstrates that there is low agreement among differing operationalizations of non-responsiveness suggesting that different identification decisions will result based on the responsiveness threshold (Barth, Stuebing, Anthony, Denton, Mathes, Fletcher, et al., 2008). Moreover, there is low agreement between RtI operationalizations and ability-achievement discrepancy and low stability of non-responsiveness identification decisions over time (Brown Waesche, Schatschneider, Maner, Ahmed, & Wagner, 2011). Simulated and real student data show low agreement in identification decisions among assessment measures used, although agreement levels may be moderated by reliability of the measures and sample size (Fletcher et al., 2014). However, when multiple achievement assessments are used in non-responsiveness decision-making, non-responsiveness identification decision agreement increases (Fletcher et al., 2014).

Moreover, in Burns and Senesac's (2005) comparison of student non-responsiveness identification, differences were evident in student reading scores between responders and non-responders thus supporting the validity of identification based on non-responsiveness.

### **Pattern of Strengths and Weaknesses**

Alternative research-based identification methods can also be used to identify LD (Pub. L. No. 108–446 § 300.307[a]), but further guidance on what constitutes an alternative research-based intervention is not provided within IDEA (Lichtenstein & Klotz, 2007). Examining a student's patterns of strengths and weaknesses (PSW) is the most commonly used alternative approach (Hale et al., 2008). LD identification methods based on PSW rely on identification of a core cognitive deficit, which theoretically aligns with exhibited achievement deficits (Hale et al., 2006). Because LD is defined as a psychological processing disorder, proponents of PSW models for LD identification assert that cognitive functioning must be measured when assessing for LD (Hale & Fiorello, 2004). Thus, under PSW models, accounting for such psychological processing deficits through cognitive and neuropsychological measures is essential for appropriate identification (Hale et al., 2006; Semrud-Clikeman, 2005).

PSW methods for LD identification are far newer and less researched than ability-achievement discrepancy or RtI. To date, there are no empirical studies supporting the reliability and validity of PSW identification decisions. However, there is a line of research suggesting that PSW methods do not result in reliable or valid LD identification decisions. Simulation studies show that although PSW methods have adequate specificity and negative predictive power (i.e., correctly identifying students as not having LD), they

have low base rates (1-2%) and low sensitivity and positive predictive power (i.e., correctly identifying students as having LD; Stuebing et al., 2012). Moreover, identification decisions are inconsistent across the three most commonly used PSW methods (i.e., Concordance/Discordance Model; Discrepancy/Consistency Model, Cross-Battery Assessment; Miciak et al., 2014a) and inconsistent depending upon the achievement test used (Miciak et al., 2014b). Such findings are particularly problematic as students with difficulties are consequently at-risk for not receiving needed academic support through special education services. Additionally, psychometric issues including compounding of Type 1 error rate and consequential misinterpretation of p-values and significance of results as well as lack of achievement differences between students identified LD and not-LD and lack of treatment validity potentially undermine this approach (Stuebing et al., 2012; Miciak et al., 2014). Although some assert that targeting intervention to cognitive deficits can result in improved student outcomes (Hale & Fiorello, 2004), findings regarding this assertion are at best inconsistent (Burns, Peterson-Brown, Haegele, Rodriguez, Schmitt, Braum et al., in press; Fletcher et al., 2012; Kearns & Fuchs, 2013). Moreover, research shows that training cognitive skills does not result in improved student achievement (Kavale & Forness, 2000; Kearns & Fuchs, 2013; Melby-Lervag & Hulme, 2013).

### **Other Factors Affecting LD Identification**

The identification methodology employed may impact LD identification decisions; however, there are other factors, which also affect LD identification. Although the empirical identification methods provide a semblance of objectivity, clinical judgment is nonetheless inherent within all LD identification decisions. Moreover, the

student data on which such identification decisions are based can also impact LD identification.

### **Clinical Judgment in Special Education Identification**

The use of categorical identification within special education law requires that students demonstrate unique characteristics that are indicative of a specific disability (Ysseldyke & Martson, 2000). Thus, school psychologists and others involved in making LD identification decisions should utilize clinical or professional judgment to appropriately determine not only if the student has a disability but to determine which specific disability each student displays (Pub. L. No. 108–446 § 300; Shinn, Good, & Parker, 2000). However, a significant body of research shows that individuals making such judgments demonstrate inconsistent professional decisions (Watkins, 2009).

Clinical judgment has been studied more extensively in other areas of psychology than within LD identification, despite the apparent inconsistencies in LD identification practices. Within the broader field of psychology, accuracy of diagnostic decisions has been shown to be inadequate (Hirschfield, Lewis, & Vornik, 2003; Marchand, Wirth, & Simon, 2006) and much like LD, the definition of the disorders being diagnosed affects diagnostic decisions (Jenkins, Youngstrom, Washburn, Youngstrom, 2011). Moreover, overlap of symptoms or characteristics with other disorders makes it difficult to distinguish specific psychological disorders from others (Kim & Miklowitz, 2002; Kowatch, Youngstrom, Danielyan, & Findling, 2005), and diagnostic assessment methodologies are often inadequate to make reliable and valid identification decisions (Jenkins et al., 2011).

Although professional judgment is important in analysis of various assessment results to determine identification, it also reduces the level of objectivity in identification decision-making. Subjectivity in special education identification is largely inevitable as such decisions rely on imperfect measurement of latent constructs (Fletcher et al., 2007). Moreover, some evidence shows that there is little relationship between evaluation data and identification decisions suggesting inordinate subjective judgment (Ysseldyke, Algozzine, Richey, & Graden, 1982). However, school psychologists' professional judgment should still result in reliable and valid identification decisions if data and professional knowledge are appropriately relied upon in decision-making (Mather & Gregg, 2006). Recognition of subjective professional and personal biases can help to minimize their influence on decision-making and maximize reliability and validity of decisions (Skiba, Simmons, Ritter, Gibb, Rausch, Cuadrado et al., 2008).

Multidisciplinary teams and school psychologists often search for confirming evidence for such hypotheses rather than potentially disconfirming evidence possibly resulting in over-identification (Barnett, 1988; Gnys et al., 1995). Reliance on confirmatory evidence may result from illusory beliefs regarding referral concerns and behaviors and their relationship to the presence of a disability and consequently identification (Fagley, 1988). Illusory beliefs are those that automatically presume a relationship between two variables such as a student behavior and disability status (Gnys, Willis, & Faust, 1995). Thus, such beliefs can result in diagnostic error when they underlie professional judgment (Fagley, 1988). Moreover, school psychologists may not accurately reflect upon the decision-making process thus being unaware of the objective and subjective influences on identification decisions (Aspel, Willis, & Faust, 1998).

Unawareness of decision influences is likely to result in erroneous decisions through unintentional reliance on subjective beliefs rather than objective data. Decision-makers are also likely to disproportionately focus on the belief that student data are reflective of a “true positive” (p. 215) or that the student data support that the student truly has a disability, which Watkins (2009) terms “pseudodiagnosticity” (p. 215). However, focusing on data that are believed to represent a true disability biases decisions as decision-makers do not appropriately consider other decision options (Nickerson, 2004).

### **Underlying Inconclusiveness**

Inconsistent identification across states and the consequential variation in students identified could also be due to the vague federal identification criteria and differing state identification criteria (Klinger et al., 2005; Maki et al., 2015; Reschly & Hosp, 2004). Moreover, there is considerable variability in the breadth and depth of information provided both within state special education regulations as well as state department of education guidelines (Maki et al., in press; Zirkel et al., 2010). Although state regulations and guidelines aim to provide additional information beyond the ambiguous federal criteria regarding LD identification, the extent to which LEAs adhere to such guidelines is largely unknown (Maki et al., in press). Thus, the ambiguous federal and sometimes state identification criteria impacts consistency of LD identification.

Although several reviews suggest that vague state identification criteria differ by state and may be related to varying prevalence rates across states (Maki et al., 2015; Mercer, Jordan, Allsopp, & Mercer, 1996; Reschly & Hosp, 2004), the role of inconclusiveness in student evaluation data and its potential impact on LD identification has not been experimentally examined. However, Huebner (1991) asserts that Algozzine

and Ysseldyke (1981) findings may have been influenced by the inconclusiveness of student data. Algozzine and Ysseldyke (1981) concluded that school psychologists' identification decisions were biased by referral concerns. However, Hueber (1991) argues that the student data with which participants were presented included inconclusive grade-equivalent scores thus influencing the identification decision consistency. It may be that school psychologists rely more on subjective professional experience and less on student assessment data when such data are inconclusive (Hueber, 1991). However, other research shows that when making identification decisions, school psychologists do rely heavily on student evaluation data in disability identification decisions (Burns, 1990; Huebner, 1987). Although it is possible that Algozzine and Ysseldyke's (1981) findings were confounded by inadvertent use of inconclusive student data, no studies have experimentally examined the impact of inconclusive student data on identification decisions and thus the extent to which inconclusive data impacts such decisions is unknown.

### **Purpose**

Although the federal definition of LD has remained stable over the last 50 years, IDEA identification criteria have seen significant changes in the last decade (Zumeta et al., 2014). Research reviews of state-level policy and guidance show shifting trends in the use of LD identification methodologies (Maki et al., 2015; Reschly & Hosp, 2004); however, identification method implementation at the district and school level is relatively unknown. Identification is a considerably high-stakes decision with special education services and resources dependent upon identification (Salvia, Ysseldyke, & Bolt, 2012). However, psychometric and conceptual issues with identification methods

threaten to undermine the consistency of identification decisions (Aaron, 1997; Miciak et al., 2014; Vaughn & Fuchs, 2003). Moreover, the inherent required professional judgment in decision-making (Mather & Gregg, 2006) and inconclusiveness in the data (Watkins, 2009) can impact the consistency of such decisions. Therefore, the purpose of the current paper was to examine consistency of LD identification decisions within and across three methods of identification (i.e., ability-achievement discrepancy, RtI, and PSW) and to investigate the impact of inconclusive student data on the consistency of identification decisions.

### **Research Questions**

The following research questions guided the study:

1. What LD identification procedures do school psychologists most commonly use in practice; which LD identification procedures do school psychologists prefer to use; and which LD identification procedures are school psychologists taught in graduate school training?
2. To what extent do school psychologists adhere to state learning disability (LD) identification criteria?
3. To what extent does learning disability identification consistency differ across three identification methods?
4. To what extent does identification consistency differ by student LD evaluation report level of conclusiveness?

In order to address the research questions, school psychologists examined student evaluation data, determined whether the student should be identified with LD, and answered several questions regarding their LD identification decision.

## Method

### Participants

The data from this study were drawn from a larger study examining school psychologists' identification of LD. Participants were sampled from state school psychology associations (SPAs), and included 376 school psychologists who completed the study. All participants were licensed or certified school psychologists practicing in public schools and all regularly participated in multidisciplinary teams making special education identification decisions. Eighty-three percent ( $n = 313$ ) of participants were female and 17% ( $n = 60$ ) were male. Ninety-one percent ( $n = 342$ ) of participants identified as Caucasian, 4% ( $n = 15$ ) Latino, 1.3% ( $n = 5$ ) African-American, .8% ( $n = 3$ ) Asian/Pacific Islander, .3% ( $n = 1$ ) Native American/Alaskan Native, 1.3% ( $n = 5$ ) two or more races, and 1.3% ( $n = 3$ ) did not report their ethnicity. The majority of participants held an Ed.S degree with 42% ( $n = 156$ ), 23% ( $n = 86$ ) held a Master of Arts degree, 12% ( $n = 45$ ) held a Ph.D., and an additional 23% ( $n = 87$ ) held other degrees (e.g., Psy.S, Psy.D, M.S., C.A.G.S.). The majority of participants had been practicing for less than 10 years with 35.6% ( $n = 134$ ) practicing less than 5 years and 20.5% ( $n = 77$ ) practicing between 6 and 10 years. Twenty-five percent ( $n = 93$ ) of participants had practiced between 11 and 20 years and 18.6% ( $n = 70$ ) practiced more than 20 years.

The 22 SPAs to whom the study was distributed represented all four NASP regions, Central, Northeast, Southeast, and West. Participants from the Central region comprised 32.23% ( $n = 121$ ) of the participants, 26.40% ( $n = 99$ ) of the participants were from the Northeast region, 17.60% ( $n = 66$ ) were from the Southeast, and 23.73% ( $n = 89$ ) of participants were from the West region. Participants from the Central region

comprised a slightly larger percentage of the participants than NASP members from the Central region (23.0%) whereas participants from the Northeast and Southeast slightly underrepresented NASP membership from these regions with 33.57% and 21.65%, respectively. Participants from the West region closely approximated the total percentage of NASP members from this region (21.82%).

## **Measures**

**Evaluation questionnaire.** An evaluation questionnaire was developed to answer the study research questions, which participants completed following examination of LD identification criteria and student evaluation data. Three types of identification criteria were used including ability-achievement discrepancy, RtI, and PSW. Within each type of identification criteria, there were three levels corresponding to the level of student evaluation data conclusiveness. The three conclusiveness levels were conclusive-LD, conclusive-not LD, and inconclusive data. Table 4 describes the study design.

Participants were asked to examine the criteria, the student data, and to answer several questions specific to the data with which they were provided. Participants also answered a series of questions regarding demographic background (e.g., race/ethnicity, gender, years practicing, type of school district, highest degree earned) and typical LD identification practices. Participants' demographic information was collected in an effort to ensure that participants were representative of practicing school psychologists across the United States. Information on participant LD identification practices was gathered in an effort to better understand how LD identification is being determined in schools. The evaluation questions were:

1. According to the LD identification criteria with which you were provided, does the student qualify as having a learning disability (LD)?
2. For how many years have you been a practicing school psychologist?
3. What is your highest degree earned?
4. In what type of school district do you currently practice?
5. With which gender do you identify?
6. With which ethnicity do you identify?
7. What system is your school district currently using to identify students as having learning disabilities?
8. What system do you prefer to use to identify students as having a learning disability?
9. During your graduate training, what system were you taught for identifying individuals with learning disabilities?

## **Materials**

**LD identification criteria for student data.** The first thing to appear on the survey was one of three LD identification criteria. Ability-achievement discrepancy, RtI, and PSW identification criteria were obtained from state special education regulations. Thirty-four (67%) states allow for the use of ability-achievement discrepancy in LD identification (Maki et al., 2015). States utilizing simple standard score or standard deviation differences were ruled out because use of regression equations in determining discrepancy has been shown to be more reliable than simple discrepancies (Proctor & Prevatt, 2003). Eleven states utilize regression formulas for determining discrepancies

and from those 11 states, one state's ability-achievement discrepancy identification criteria were randomly chosen.

State RtI identification criteria were then further analyzed for states requiring additional identification documentation (e.g., performance below a specific achievement level, growth below a specific level, minimum number of datapoints, minimum number of weeks in intervention) in order to provide participants with as objective criteria as possible. RtI identification criteria were then narrowed down to 7 states and one states' identification criteria were chosen at random.

Use of PSW methods in LD identification across states is far less clear due to the language utilized in federal and state regulations. Many states discuss the need for a child to exhibit a pattern of strengths and weaknesses in identification criteria. However, this language can refer to use of ability-achievement discrepancy or PSW approaches. Therefore, state identification criteria were further analyzed in order to differentiate criteria specifically allowing for PSW methods as evidenced by criteria allowing for alternative research-based methods. Twelve states explicitly specify that alternative research-based methods can be used in LD identification and one states' identification criteria were randomly chosen from those 12 criteria.

**Student data.** Each respondent examined one set of data that represented the LD identification method to which they were randomly assigned. To compile student identification data, 14 de-identified student evaluation reports were obtained from public school districts in the U.S. All students for whom data were obtained had gone through the special education identification process for suspected LD. Previous research shows that student demographics are correlated with identification decisions (Skiba et al., 2008).

Thus, demographics of the students for whom evaluation materials were used were held constant by selecting data from students who were Caucasian males in third through fifth grades. Of these evaluation reports, eight students were identified as LD by their school and six students were not identified as LD by their school.

Student test score data were then pulled from the student evaluation reports to develop the information with which participants were provided. Thus, student evaluation data only included student name (a pseudonym), race/ethnicity, birthdate, age, grade, testing dates, parent name (pseudonym), and student test scores. Student background information was kept constant across all student evaluation reports except for age and grade, although these were all grades 3 through 5 and ages 9 through 11. Student data for the ability-achievement discrepancy condition included cognitive general intellectual ability factor (GIA) and composite scores, and achievement composite scores. Student data for the RTI condition included curriculum-based measures (CBM) data including reading growth rate and seasonal benchmark scores for reading, math, and writing as well as Measures of Academic Progress (MAP; Northwest Evaluation Association, 2003) data. Student data for the PSW condition included cognitive GIA and composite scores as well as achievement composite scores. Confidence intervals were also provided for all test score data, including CBM reading growth rate. Participants were not provided with any additional student background information, observation data, or pre-referral intervention data.

Table 1

*Description of Student Evaluation Reports*

Condition	Evaluation Data Type	Conclusiveness Level	Identification criteria	Grade	Age
1	AAD	Conclusive-Not LD	AAD	5	10
2	AAD	Inconclusive	AAD	5	11
3	AAD	Conclusive-LD	AAD	3	9
4	RtI	Conclusive-Not LD	RtI	3	9
5	RtI	Inconclusive	RtI	3	9
6	RtI	Conclusive-LD	RtI	3	9
7	PSW	Conclusive-Not LD	PSW	3	9
8	PSW	Inconclusive	PSW	3	9
9	PSW	Conclusive-LD	PSW	3	9

*Note:* AAD=Ability-Achievement Discrepancy

**Conclusiveness of student data.** Finally, the level of conclusiveness of LD identification data from each set of student data were independently rated by the author and a fourth-year graduate student in school psychology. Each set of data was rated in comparison to the corresponding LD identification criteria that the school personnel used to evaluate the student (ability-achievement discrepancy, RtI, or PSW). Inconclusive data were operationally defined as student data that very closely surrounded the identification cut-point for the specific identification criteria (i.e., within 2 standard score points or .05 WRCM growth rate of expected growth rate). Thus, the inconclusive student data would not be eligible for LD if using only obtained student test scores, but would be eligible for

LD if confidence intervals were taken into account. Moreover, the inconclusive student data were not concordant with some of the data suggesting the student should be identified as LD and some of the data suggesting the student should not be identified as LD according to the identification criteria. A 5-point rating scale was used with 1 being the student did not have LD and the data were conclusive, 2 being the student likely did not have LD but the data were somewhat inconclusive, 3 being the data were inconclusive and identification was unknown, 4 being the student likely had LD but the data were somewhat inconclusive, and 5 being the student had LD and the data were conclusive.

Inter-rater agreement was calculated to ensure that the student evaluation data accurately reflected conclusiveness level. Inter-rater agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements. The two raters agreed on 93% of the ratings of student evaluation data based on exact rating agreements. When agreements were scored allowing for a 1-point difference in ratings, the raters agreed 100% of the time. Consensus was reached through discussion.

The original obtained 14 student cases were then further examined in order to select a final 9 student cases for use in the study (i.e., one student case for each study condition). The 9 student cases used for the study were chosen in order to have one student case in which the student did not have LD, one student case in which the student had LD, and one student case in which the data were inconclusive under each identification method (see Table 1). If there was more than one potential student case per condition, a student case was randomly selected for the condition.

## Procedures

Prior to disseminating the study to practicing school psychologists, the study was piloted with students in a graduate program in school psychology to ensure the survey was working properly. These practice participants completed the survey and provided feedback regarding any errors (e.g., spelling, grammar, punctuation) as well as any difficulties accessing or utilizing the online study. This feedback was used to make minor revisions (e.g., spelling, grammar, punctuation, data presentation). All graduate student practice responses were then deleted from the online server to ensure that these data were not analyzed with true participant data.

After piloting the questionnaire, all 51 school psychology state associations (SPAs) were contacted via email, telephone or both in September 2014 regarding conducting research with association members. Forty-five out of 51 (88%) SPAs were reached and of those 45 SPAs, 33 (73%) allowed for research to be conducted with association members. Research proposals were then submitted to SPAs to request dissemination of the study with SPA members. The study was approved by 25 (76%) of the 33 SPAs allowing research with members and subsequently disseminated to the members of 22 SPAs. Of the original 25 SPAs approving the study, three of did not distribute the study for unknown reasons despite multiple attempts by the researcher to contact the SPA and encourage dissemination.

Table 2

*Study Dissemination and Completion Rate*

	Rate	Number	Percentage
<b>Dissemination</b>			
SPAs Reached		45	88% of 51
SPAs Allowing Research		33	73% of 45
SPAs Approving Study		25	76% of 33
SPAs Disseminated Study		22	88% of 25
Disseminated via Email		17	77% of 22
Disseminated on SPA Webpage		4	18% of 22
Disseminated via Mail		1	5% of 22
<b>Completion</b>			
Agreed to Participate		555	91% of 610
Practicing, Licensed Psychologist		508	82% of 555
Participated in Multidisciplinary Teams		439	86% of 508
Completed Study		376	86% of 439

Upon SPA approval, the study link and participation research request was submitted to the SPA liaison. The SPA then distributed the study link and participation request to its members via the listserv or SPA website. Sixty-eight percent ( $n = 15$ ) of SPAs distributed the study by email, 27% ( $n = 6$ ) posted the study link on the SPA website, and 5% ( $n = 1$ ) distributed the study by mail. The survey was distributed at one point in time to each SPA and no reminders were sent regarding the study. Study links

were sent to SPA members in October and November 2014 and all data collection was completed by December 2014.

Table 3

*Study Completion Rate by State*

State	Dissemination Process	SPA Members	Number Completed	Percentage Completed
Alaska	Email	75	11	14.7
Arizona	Email	500	3	.6
Arkansas	Email	125	12	9.6
California	Email	2894	47	1.6
Colorado	Email	192	10	5.2
Connecticut	Email	180	2	1.1
Delaware	Email	64	9	14.1
Idaho	Webpage	50	4	8
Illinois	Webpage	765	1	.1
Kentucky	Email	281	9	3.2
Louisiana	Webpage	285	2	.7
Michigan	Webpage	569	2	.4
Minnesota	Webpage	225	3	.13
Montana	Webpage	62	2	3.2
Nebraska	Email	100	17	17.0
New Jersey	Email	500	38	7.6
New York	Email	1263	46	3.6

North Carolina	Email	400	38	9.5
North Dakota	Email	54	7	13.0
Ohio	Email	789	49	6.2
Utah	Mail	124	13	10.5
Wisconsin	Email	389	37	9.5
Miscellaneous	N/A	N/A	14	N/A

The study link and a brief explanation of the study were distributed to the SPA members. Participants utilized the study link to access the study via a secure online server and were then provided with additional information regarding the study including the study purpose, potential risks and benefits of participating in the study, notification of the voluntary nature of the study, and notification of participant confidentiality and anonymity. Potential participants were then asked whether or not they agreed to participate in the study. If the individual did not agree to participate, the study ended and the individual was thanked for his or her time. If the individual agreed to participate, he or she was presented with two additional questions to determine participation eligibility:

1. Are you a practicing licensed or certified school psychologist in the United States?
2. Do you participate in multidisciplinary teams making special education eligibility decisions?

If the individual responded no to either of these questions, the study completed and he or she was thanked. If potential participants responded yes to both questions, they were then randomly assigned to one of the nine study conditions. Participants were informed that

they could return to a previous page of the study at any time. Ninety-one percent (555) of individuals who originally accessed the link agreed to participate. Of those 555 individuals, 508 (82%) indicated that he or she was a practicing, licensed school psychologist and of those 508 individuals, 439 (86%) school psychologists responded that they participate in multidisciplinary teams, which make special education identification decisions. Eighty-six percent (376) of the 439 school psychologists completed the survey. For unknown reasons, 14% of potential participants who indicated they participate in multidisciplinary teams and were thus eligible to participate started the survey but did not complete the study.

The online server then directed the participant to the appropriate identification criteria based on the condition to which he or she was randomly assigned (ability-achievement discrepancy, RtI, or PSW). The participant was asked to review the criteria carefully and to then use the criteria to determine student identification after reviewing the student evaluation data. The server then directed the participant to the student evaluation data corresponding to the condition to which he or she was randomly assigned. The participant was asked to view the student data carefully and to use the identification criteria to determine if the student was eligible under LD. Participants were also told to assume that all exclusionary criteria (e.g., visual, motor, hearing, emotional disturbance, economic disadvantage, inadequate instruction) could be ruled out as interfering variables. After reviewing the student evaluation data, the nine evaluation questions were presented followed by the demographic and LD identification practices questions. After answering the study questions, participants were thanked for their time. Participants were informed that they could be entered to win one of ten \$20 Amazon gift cards by emailing

the author and submitting his or her name. This method of gift card entry was utilized to ensure that participant names could not be linked to participant study responses. See the Appendix for the complete survey.

### **Research Design and Analyses**

Table 4

#### *Description of Study Design*

Data	<u>Identification criteria</u>		
	Ability-Achievement	Response to	Pattern of Strengths
Conclusiveness	Discrepancy	Intervention	and Weaknesses
Conclusive-Not LD	Condition 1	Condition 2	Condition 3
Inconclusive	Condition 4	Condition 5	Condition 6
Conclusive-LD	Condition 7	Condition 8	Condition 9

An experimental 3 x 3 factorial design was used to investigate the research questions resulting in nine unique study conditions. Three types of identification criteria were used including ability-achievement discrepancy, RtI, and PSW. Within each type of identification criteria, there were three levels corresponding to the level of student evaluation data conclusiveness. The three levels of conclusiveness were conclusive-LD, conclusive-not LD, and inconclusive data. Participants were randomly assigned to one of these nine conditions. Table 4 describes the study design.

The extent to which various LD identification methods are used in practice, are preferred, and are taught in graduate school training was examined through descriptive statistics by calculating the percentage of school psychologists identifying each method.

School psychologist adherence to LD identification criteria was analyzed by first calculating the percentage of consistent decisions (i.e., agreements) between participant and study identification decisions. A kappa statistic was also computed as a measure of agreement. The Kappa statistic provides an indication of the proportion of agreement (i.e., identification consistency here) above chance levels (Cicchetti, 2011). Although various researchers (e.g., Cicchetti, 1994; Fleiss, Levin, & Paik, 2003; Landis & Koch, 1977) have provided guidelines regarding interpretation of kappa statistics, kappa statistics of .60 are typically good indicators of agreement whereas kappa estimates greater than .75 are excellent (Cicchetti, 1994; Fleiss et al., 2001).

The third research question was examined by analyzing identification consistency and identification method with a chi-square test. Chi-square analyses provide an indication of how well the frequency of categorical variables fall as expected. Differences in identification consistency across conclusiveness level were also examined with a chi-square test to evaluate the relationship between these two variables.

## **Results**

### **Use of LD Identification Methods**

The first question examined school psychologists' use of LD identification methods in practice as well as school psychologists' preferred identification methods and graduate school LD identification training. Participants were able to select multiple responses and there is thus overlap in the percentage of participants identifying particular identification methods. Findings are reported below in Table 5. Although a majority of participants were trained in ability-achievement discrepancy (i.e., 78.7%), only 40.7% reported using ability-achievement discrepancy for LD identification in their district and

only 14.9% reported preferring use of this method for LD identification. Far fewer participants reported being trained in RtI for LD identification (i.e., 38.8%), but 46.0% preferred this method and 48.7% of participants reported currently using RtI in practice. However, 43.1% of participants also reported preferring a combination of RtI and ability-achievement discrepancy whereas 34.3% reported currently using these methods in combination and only 22.6% reported receiving graduate training in a combination of these methods. Although 42.8% and 46.0% of participants reported using PSW in practice and as a preferred method, respectively, only 30.6% reported being trained in this method during graduate school. Thus, although most school psychologists primarily received training in ability-achievement discrepancy, participants reported using and preferring a variety of identification methods.

Table 5

*School Psychologists' Use of Identification Methods in Practice, Preferred Methods, and Graduate Training Methods*

Identification Method	District Practice		Preferred		Trained	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Ability-Achievement	153	40.7	56	14.9	296	78.7
Discrepancy						
Response to Intervention	183	48.7	172	46.0	146	38.8
Pattern of Strengths and Weaknesses	161	42.8	173	46.0	115	30.6
RtI & Ability-Achievement Discrepancy	129	34.3	162	43.1	85	22.6
Other	19	5.1	32	8.5	14	3.7

*Note.* Participants selected all appropriate responses

**Adherence to LD Identification Criteria**

Research question 2 inquired about school psychologists' overall adherence to LD identification criteria. Adherence to identification criteria was operationally defined by a consistent identification (i.e., LD or not LD) between the participant identification decision and the study-based identification. Study-based identification relied on strict adherence to the identification criteria when reviewing the student evaluation data to make an identification decision in order to provide a true indication of whether the student was LD under state educational law (see method for additional description). School psychologists' adherence to LD identification criteria was therefore examined by

calculating the percentage of identification consistency between the study-based identification and participant identification.

School psychologist participants demonstrated an overall identification decision consistency of 73.7% indicating that school psychologists adhered to the LD identification criteria less than 75% of the time. This identification consistency percentage resulted in a kappa estimate of .45 ( $p < .05$ ), which was somewhat low and suggested inconsistency in identification decisions. Therefore, there appeared to be inconsistent adherence to identification criteria despite reviewing the same student evaluation data and identification criteria within study conditions.

### **LD Identification Consistency**

The extent to which LD identification consistency differed across LD identification methods (i.e., ability-achievement discrepancy, RtI, and PSW) was examined by first calculating the percentage of consistent identification (i.e., LD or not LD) within each identification method. A chi-square statistic was then calculated to examine differences in identification consistency across identification methods. Although the percentage of consistent identification differed across identification methods (i.e., 68.3% for ability-achievement discrepancy, 79.1% for RtI, and 74.8% for PSW), these differences in consistent identification were not statistically significant,  $\chi^2 (2, N = 376) = 3.78, p = .151$ . Thus, these data do not demonstrate a significant relationship between LD identification method and LD identification decision consistency and therefore do not suggest differences in identification consistency across LD identification methods.

Table 6

*Identification Decision Consistency Across Identification Methods*

Consistency with Expert Judgment	AAD		RtI		PSW		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
No	44	31.7	23	20.9	32	25.2	99	26.3
Yes	95	68.3	87	79.1	95	74.8	277	73.7

$$X^2 (2, N = 376) = 3.78, p = .151$$

*Note.* AAD = ability-achievement discrepancy, RtI = response to intervention, PSW = patterns of strength and weaknesses.

The extent to which identification consistency differed across student evaluation data conclusiveness level was examined by first calculating the percentage of consistent identification decisions within each student data conclusiveness level (i.e., conclusive-not LD, inconclusive, conclusive-LD). A chi-square statistic was then computed to examine differences in identification decision consistency across conclusiveness level. Findings are presented in Table 7 and show that when participants were presented with inconclusive student evaluation data, they were much less consistent in their identification decision (i.e., 51.2% consistency for inconclusive student data versus 88.1% for conclusive-not LD data and 81.0% for conclusive-LD data). These differences resulted in a significant effect  $X^2 (2, N = 376) = 50.40, p < .05$ . Thus, when student evaluation data were inconclusive, school psychologists were less likely to make consistent identification decisions.

Table 7

*Identification Decision Consistency Across Conclusiveness Level*

Consistency with Expert Judgment	Conclusive-Not LD		Inconclusive		Conclusive-LD		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
No	16	11.9	61	48.8	22	19.0	99	26.3
Yes	119	88.1	64	51.2	94	81.0	277	73.3
Total	135	100.0	125	100.0	116	100.0	376	100.0

$\chi^2 (2, N = 376) = 50.40, p < .05^*$

### Discussion

The purpose of this study was to examine school psychologists' use of LD identification methods as well as the consistency of their LD identification decisions. LD identification has been and likely will continue to be a hot topic within the special education and school psychology fields (Kavale et al., 2009). Although the field as a whole is widely studied, LD identification practices and decision consistency are not well supported or understood (Hallahan et al., 2013). Moreover, while much research has focused on conceptual understanding of the construct and reliability and validity of identification methodologies (e.g., Batsche et al., 2006; Francis et al., 2005; Stuebing et al., 2012), little research has explicitly focused on school psychologist identification decisions, especially since the IDEA 2004 reauthorization. Thus, examination of school psychologists' identification practices and decision-making is necessary to understand how such decisions may impact student identification and consequential instruction and services.

### **Use of LD Identification Methods**

Several reviews over the last 30 years (e.g., Maki et al., 2015; Mercer et al., 1996; Reschly & Hosp, 2004) have discussed the variability in LD identification practices across states. However, such reviews have focused on practices at the state level and have not addressed LD identification at the local school district level. Thus, although such reviews provide an indication of legally mandated practices and practices supported by the state department of education, the extent to which individual districts and school psychologists are adhering to and utilizing such practices was largely unknown.

Much like at the state level, school psychologists' use of identification methods at the district level was variable as were the methods school psychologists preferred and those in which school psychologists were trained. Moreover, although 78.7% of school psychologists reported being trained in using ability-achievement discrepancy, only 40.7% reported currently using this method in their district and only 14.9% preferred this identification method. Thus, it appears that actual and preferred use of ability-achievement discrepancy at the district level is decreasing because ability-achievement discrepancy was previously the only method used in LD identification. Such changes in LD identification at the district level appear to coincide with changing federal and state identification requirements in the years since the 2004 IDEA reauthorization (Maki et al., 2015). For many years, researchers have questioned the appropriateness of ability-achievement discrepancy (e.g., Aaron, 1997; Epps et al., 1984; Vaughn & Fuchs, 2003). Despite lack of research regarding school psychologists' individual use and preferred methodology, it seems reasonable to conclude that school psychologists' attitudes toward this identification method is reflective of arguments against this approach within the

literature (e.g., unreliability of difference scores, lack of treatment validity; Vaughn & Fuchs, 2006). Moreover, it may be that the low percentage of school psychologists who preferred this method compared to districts utilizing this method underscores school psychologists' role as consumers of research but also the difficulty of translating such research into practice (Keith, 2008).

The changing LD identification landscape is also evident in reported use of RtI. Although RtI has only been allowed in LD identification since 2004, 38.8% of participants reported being trained in this method in graduate school, while 48.7% reported currently using this method in their district, and 46.0% prefer to use this method to identify LD. Although no previous studies have reported use of RtI in LD identification at the district level, it is likely that school psychologists' actual and preferred use are reflective of larger changes within the field (i.e., required allowance at the federal level, mandated use within some states, and research questioning the reliability and validity of ability-achievement discrepancy; Zumeta et al., 2014). Moreover, because federal law now requires that states allow for use of RtI in LD identification (Pub. L. No. 108–446 § 300.307[a]), it seems reasonable that more school psychologists will be trained in this method in graduate school, which may also impact its use in practice. Many schools are implementing multi-tiered systems of support (MTSS) or RtI frameworks as a means to appropriately service all students (Spectrum K12 School Solutions, 2010), which has been associated with many positive outcomes (e.g., improved student achievement, fewer special education referrals and placements; Burns, Appleton, & Stehouwer, 2005; Kovalski et al., 2013). Positive outcomes associated with an LD

identification method may also impact school psychologists' attitudes toward use of RtI in LD identification.

Similar to findings regarding RtI, only 30.6% of school psychologists reported being trained in PSW methods whereas 42.8% reported using this method in practice and 46.0% reported preferring this method for LD identification. The language in the federal regulations regarding PSW is vague (Lichtenstein & Klotz, 2007) which may be reflected in participants' reporting of its use in the current study. Although PSW refers to analysis of individual cognitive processing strengths and weaknesses (Hale et al., 2008), ability-achievement discrepancy has also historically served as an operationalization of such language within federal law (Reschly & Hosp, 2004). It is therefore plausible that some participants may have interpreted "pattern of strengths and weaknesses" within this study as referring to ability-achievement discrepancy rather than analysis of processing strengths and weaknesses. Thus, findings regarding actual and preferred use of PSW should be interpreted with caution, as they may not accurately reflect true use of this methodology.

### **Adherence to LD Identification Criteria**

The extent to which school psychologists adhered to LD identification criteria was examined by analyzing the consistency of LD identification decisions. School psychologists demonstrated 73.7% (kappa statistic of .45) identification consistency while strict adherence to the LD identification criteria should have resulted in 100% identification consistency. Thus, it appears that school psychologists did not make identification decisions following strict adherence to these criteria. Previous research has shown that school psychologists only make consistent identification decisions

approximately 50% of the time (Epps et al., 1984) and that different operationalizations of identification criteria result in different identification decisions (Epps et al., 1983). Although the results from the current study are somewhat better than these previous findings, 73.7% identification decision consistency is still rather low and could result in differential support for students. However, the Epps and colleagues' (1983; 1984) studies only utilized ability-achievement discrepancy and participants in the present study using ability-achievement discrepancy demonstrated lower consistency (68.3% compared to 73.7%) than consistency across all identification methods.

No studies have directly examined school psychologists' decision-making using RtI and PSW although there is research examining identification decisions based on different cut-points within identification methods. Burns and Senesac (2005) showed that different cut-points for nonresponse were likely to identify different groups of students within an RtI model and studies examining identification using PSW show inconsistent identification decisions across three PSW approaches and low reliability and validity of the decisions (Miciak et al., 2014a, Stuebing et al., 2012). The findings from this study coincide with previous findings as evidenced by the inconsistency of identification.

Empirical criteria provided within state regulations are intended to objectify such identification decisions (Garda, 2004). However, these data suggest that school psychologists may also be relying on other information or knowledge (e.g., professional judgment) when making such decisions, which is consistent with previous research (Aspel et al., 1998; Watkins, 2009). Although professional judgment is explicitly allowed within many state special education regulations (Pub. L. No. 108-446 § 300), allowance of subjective decision-making becomes problematic when it results in varying

identification decisions and consequently varying service provision. Inconsistent decisions may have been influenced by confirmation bias, pseudodiagnosticity, or illusory correlation (Watkins, 2009). Thus, participants may have incorrectly judged the student data to be reflective of prior beliefs regarding LD data.

### **LD Identification Consistency**

In addition to examining overall adherence to LD identification criteria, LD identification consistency was also examined across identification methods and student evaluation data conclusiveness level. Although identification consistency across identification methods did vary somewhat, there were not statistically significant differences across identification methods. Thus, school psychologists did not demonstrate better or worse identification consistency using a particular identification method and therefore one method does not appear to result in more “accurate” identification than another. However, as discussed above, overall identification consistency was low which could minimize the ability to find significant differences between the methods and is likely indicative of overall inconclusiveness surrounding the construct (Reschly & Hosp, 2004). Although previous research demonstrates unreliable decision-making within identification methods (e.g., Francis et al., 2005; Miciak et al., 2014), no research has empirically examined such decision-making across identification methods. Thus, further research is needed regarding identification consistency across these methods because many states allow for use of all methods, which could impact student identification.

Although significant differences across identification methods were not found, significant differences across student evaluation data conclusiveness level were evident. When school psychologists were reviewing inconclusive student data, they were far less

consistent (51.2%) in their identification decision than when the student data were conclusive (88.1% for not-LD data and 81.0% for LD data). Thus, when student scores were not significantly different from cut-points, identification decisions were far less consistent than when student scores were significantly different from cut-points. This finding is particularly problematic because student test scores tend to bounce around cut-points with repeated testing (Francis et al., 2005) and extreme scores (i.e., those well below the cut-point) are likely lower than the student's true score due to regression to the mean (Schatschneider, Wagner, & Crawford, 2008). Thus, additional testing may result in different identification decisions and a test score at a single point in time may not accurately capture student ability or skill level, which consequently may result in inappropriate identification (Francis et al., 2005).

Although previous research has not examined the issue of inconclusive student data in LD identification, Huebner (1991) suggested that Algozzine and Ysseldyke's (1981) assertion that evaluation referral concerns influence school psychologists' identification decisions are misleading. He argued that Algozzine and Ysseldyke (1981) used inconclusive grade-equivalent scores, which may have influenced identification decisions. Although it is possible that inconclusive scores may have influenced such decisions in the Algozzine and Ysseldyke (1981) study, this hypothesis was not explicitly or experimentally examined in that study or any subsequent studies and the impact is therefore unknown. Results from the present study, however, suggest that when student scores closely surround the identification cut-point, identification consistency decreases. These findings are particularly concerning because more student scores will surround the cut-point rather than the extreme scores above and below the cut-point based on the

normal distribution of cognitive ability and achievement (Schatschneider et al., 2008). Moreover, school psychologists should consider confidence intervals when making identification decisions due to the inherent measurement error within observed test scores (Fletcher et al., 2007). Doing so can help minimize some of the underlying psychometric issues with dichotomous disability identification particularly with reference to cut-points because potential error is accounted for in decision-making (Fletcher et al., 2007).

### **Implications for Practice and Training**

Findings from the present study have several implications for school psychology and special education practice and training. The overall low level of identification consistency is concerning because the provision of special education services is dependent upon identification (Ysseldyke, et al., 2010). Thus, although the particular methodology did not appear to impact identification consistency in this study, overall consistency was low which will impact which students are identified as having or not having LD. Although professional experience and judgment likely play an important role in such identification decisions based on the nature of LD as a latent construct, lack of adherence to empirical identification criteria is noteworthy. Such empirical criteria are intended to minimize subjectivity in identification decisions and therefore to maximize identification consistency (Dombrowski, Kamphaus, & Reynolds, 2004). However, lack of identification consistency suggests that perhaps school psychologists do not appropriately or consistently utilize identification criteria. Thus, further information regarding school psychologists' beliefs surrounding LD identification criteria and identification is needed.

Inconclusive student data are particularly problematic because these data resulted

in less consistent identification decisions. Underlying psychometric issues regarding student test score data (e.g., regression to the mean, test score bounce around cut-points) will impact identification decisions (Francis et al., 2005; Schatschneider et al., 2008). It is imperative that school psychologists consider the effect of such statistical phenomena when making identification decisions in order to minimize error in such decisions.

Special education law and school psychological ethical codes require school psychologists and other decision-makers to consider the reliability and validity of data obtained from assessment procedures when making special education identification decisions (APA, 2002; NASP-PPE, IV, C, #2; also Pub. L. No 108– 466 § 614 [b][3][A][iii]). Thus, school psychologists need to take the underlying psychometric issues of identification methodology into account when making LD identification decisions. Consideration of the impact of standard error of measurement on student test scores must be taken into account when making identification decisions and is particularly relevant when making identification decisions based on student data from a single point in time as with ability-achievement discrepancy and PSW methods (Fletcher et al., 2007). School psychologists and multidisciplinary teams must consider such influences when making identification decisions to ensure student needs are appropriately met.

In this study, a large percentage of participants reported being trained in ability-achievement discrepancy (78.7%), but far fewer reported being trained in RtI (38.8%) or PSW (30.6%). However, a recent review study suggested that allowance of ability-achievement discrepancy at the state level is decreasing while more states are allowing for RtI in LD identification (Maki et al., 2015). Thus, it is important that school

psychologists are being trained in the identification methods allowed at the state level. Moreover, participants reported differential use of identification methods in their district compared to the methods in which they were trained and therefore school psychologists may be using identification methods in practice in which they did not have graduate training. Sullivan and Long (2010) found that participants reported the majority of their training in RtI in workshops and conference presentations compared to graduate and practical training. Thus, it is possible that participants in this study received additional training in RtI and other identification methods outside of their graduate school experience that they did not report in this study. However, it is important that school psychologists receive comprehensive training in LD identification methods to ensure appropriate implementation when evaluating students for LD.

### **Implications for Research**

Further research regarding LD identification is needed specifically with regards to differences across identification methods and student data conclusiveness. Although significant differences regarding identification consistency between identification methods were not found in this study, future research should further examine such potential differences. This was the first study to experimentally examine school psychologists' decision-making across these three identification methods and therefore replication is needed. Because allowance of these methods differs across states and implementation differs both across and within states, it is possible that utilization of different methods results in different identification decisions. Thus, additional research regarding these methods is needed.

Future research concerning student evaluation data is also needed. Because this study was the first to explicitly address and experimentally examine identification consistency differences across conclusiveness level of student data, additional research regarding this question is also needed. Future studies on this topic should seek to replicate the findings from this study to provide support regarding identification differences among levels of student data conclusiveness. Moreover, future research could examine how inconclusive student data can impact student educational trajectories based on identification decisions. In the current study, race and gender were kept constant across conditions but future research could examine differences in identification consistency across race and gender as well as such differences in consistency across identification methods.

### **Limitations**

Although results from the current study are of interest to practitioners and researchers, the findings should be interpreted within the context of the study limitations. First, school psychologists were recruited from state school psychological associations and participants therefore may not be representative of all school psychologists. Although significant efforts were made to ensure adequate representation, it is possible that members of state associations as well as NASP differ from individuals who choose not to be members of such associations. Second, although participants were randomly assigned to groups, participants may have been assigned to utilize identification criteria with which he or she was not familiar which may have impacted the consistency of his or her identification decision.

Third, although the number of members in each state SPA is known, I have no way of knowing how many potential respondents actually received the survey and have no way to compute an accurate response rate. The percentage returned for each state reported in Table 3 likely underestimates the response rate because it is likely that SPA members did not receive or view the email or webpage containing the study information in order to be able to participate. Thus, the number of potential participants is likely less than the total number of participants in the SPA. Despite the low response rate, the participants in the current study were demographically representative of practicing school psychologists across the United States. The most recent survey of school psychologists reported that 78.1% of practicing school psychologists were female and 90.7% were Caucasian, 3.4% Latino, 3% African-American, 1.3% Asian/Pacific Islander, .6% Native American/Alaskan Native, and 1% other. (Curtis, Castillo, & Gelley, 2010). Moreover, 53.9% reported holding an Ed.S degree, 29.4% a master's degree, and 16.7% a doctoral degree. Although the Curtis et al. (2010) review did not survey years of experience, they did survey age and found a mean age of 47.4 years (Curtis et al., 2010) suggesting that participants in the current study may be younger and have fewer years experience practicing than the participants in the Curtis et al. (2010) study.

Fourth, the student evaluation reports with which participants were presented were from third and fifth grade students. Because some participants viewed third grade student data and some participants viewed fifth grade student data, the results could be affected by differences in student grade level. Fifth, the participants could have been presented with state regulations with which they were not familiar which could have impacted their use of these identification criteria in their identification decision.

Finally, school psychologists were asked to make decisions based mostly on student test scores in an effort to focus on the empirical identification methods and student data conclusiveness level. Although participants were informed that all exclusionary criteria (e.g., vision, hearing, motor difficulties, cultural/language influences) could be ruled out as potential interfering variables and that the student demonstrated on-task and appropriate classroom behavior, it is possible that participants rely heavily on observation, interview, and other anecdotal information when making identification decisions in practice. Thus, although this study provides information on the consistency of LD identification with specific respect to LD identification methodology and student evaluation data, it does not provide information on overall LD identification consistency because participants did not have extensive information from data sources other than cognitive, achievement, and monitoring progress test scores. The internal and external validity of this study are therefore limited due to the purposeful focus on identification methodology and test scores because comprehensive data were not included.

### **Conclusion**

Findings from this study suggest that school psychologists do not make consistent identification decisions and that identification decisions may be affected by student evaluation data. However, further research is needed to support such findings. LD identification has been a stronghold in the research literature despite over 50 years of debate and confusion. Unclear conceptualization and understanding of the construct prevents accurate measurement and therefore interferes with reliable and valid identification decision-making. Underlying conceptual and psychometric issues with the

construct itself as well as how it is measured impact identification consistency. Student instruction, intervention, and special education servicing and support are dependent upon unreliable measurement of a poorly understood construct. Therefore, it is imperative that continued research focus on consistent identification so that students who are experiencing difficulty in school receive much needed support.

## CHAPTER 4

### STUDY 2

Special education identification decisions are dependent upon the decision-making of school psychologists and other education professionals in order for students who are struggling to receive intensive support (Ysseldyke et al., 2010). However, identification decisions are often difficult in the face of vague special education regulations and identification criteria thus requiring professional judgment on the part of decision-makers (Watkins, 2009). Professional judgment of the decision-maker is potentially problematic in special education identification decisions if it impacts the consistency of identification decisions.

#### **Special Education Identification Decision Confidence**

Learning disability (LD) special education identification decisions can be particularly difficult due to challenges in precise and reliable measurement of the construct (Fletcher et al., 2007), and require careful consideration of identification criteria and multiple sources of student data (Fletcher & Reschly, 2005). IDEA identification criteria provide minimum regulation of the methods used in LD identification (e.g., Pub. L. No. 108–446 § 300.307). Although state regulations often further define and operationalize identification methods, LD identification decisions still necessitate professional judgment and require some level of subjective decision-making (Mather & Gregg, 2006). The vague federal criteria and consequential necessary professional judgment may impact school psychologists' confidence in their identification decisions. Although research shows that actuarial or statistical prediction methods of identification result in more accurate identification than decisions made using professional judgment

(Dawes, Faust, & Meehl, 1989; Grove & Meehl, 1996), special education identification decisions continue to rely on professional judgment in such decisions which could be dependent upon school psychologist characteristics including decision confidence.

Despite difficulties and research demonstrating inconsistent decision-making in LD identification (Epps et al., 1984; Francis et al., 2005), little research has examined school psychologists' and multidisciplinary teams' confidence in identification decisions. Research within the medical field, however, suggests that there may be an inverse relationship between diagnostic error and confidence level of the decision-maker (Norman & Eva, 2010). Thus, more diagnostic errors may be made with increased decision-maker confidence. Such diagnostic errors may result from confirmation bias on the part of the decision-maker (Mamede, Schmidt, & Rikers, 2007). Initial perceptions regarding the presence of a disorder, therefore, may influence the diagnostic decision thus resulting in errors when decision-makers' overconfidence inappropriately influences his or her decision (Berner & Graber, 2008). Research within the broader field of psychology has also shown that decision-maker confidence increases with the number of diagnostic decisions made (Arkes, Hackett, Boehm, 1989; Dunning, Heath, & Suls, 2004). Thus, as psychologists gain more practice over time and years of experience, they are likely to report higher levels of confidence in their diagnostic decisions. However, research on this topic, particularly within school psychology and special education is lacking.

Limited research in special education has suggested that higher levels of confidence in special education identification decisions results in lower accuracy due to possible confirmation biases (Barnett, 1988). However, Barnett (1988) did not examine decision-maker confidence experimentally and he did not specifically address LD

identification, which has been shown to be particularly problematic (Francis et al., 2005; Miciak et al., 2014a). Moreover, Barnett's (1988) work is somewhat dated especially considering the changes in IDEA in the last decade.

Few studies have systematically examined school psychologists' confidence in special education identification decisions. Although some research found that school psychologists tend to exhibit medium (de Mesquita, 1992) to high levels of confidence (Aspel et al., 1998; Gnys et al., 1995) in their identification decisions, the Aspel et al. (1998) and de Mesquita (1992) studies did not examine decision-making confidence experimentally and de Mesquita (1992) used simulated and not real student data. Gnys and colleagues (1995) presented school psychologists with student cognitive (WISC-R) and achievement data and examined the impact of WISC-R score scatter and achievement level on decision accuracy and confidence. Although participants demonstrated relatively high levels of decision confidence (mean of 5.5 on a 7-point Likert type scale), decision confidence was not related to student score level or scatter. Only the Gnys et al. (1995) specifically studied the influence of school psychologist' confidence in LD identification whereas the other studies examined general identification (e.g., Aspel et al., 1998) or identification of Attention Deficit Hyperactivity Disorder (de Mesquita, 1992). Moreover, these studies were conducted prior to the 2004 reauthorization of the Individuals with Disabilities Education Improvement Act (IDEA) and therefore did not include Response to Intervention (RtI) or Pattern of Strengths and Weaknesses (PSW) methods in identification, both of which were allowed in the most recent version of IDEA. Thus, the extent to which student data inconclusiveness and LD identification method relate to school psychologist confidence in LD identification is largely unknown.

## **Learning Disability Identification**

Although professional judgment is inherent within LD identification, specific identification methods are used to provide an empirical basis for LD identification.

Original LD identification methodology was ushered into law through the push to codify the 1975 Education for All Handicapped children Act (EAHCA; PL 94-142; Kavale & Spaulding, 2008). Subsequent reauthorizations of EAHCA (i.e. IDEA) allowed for use of RtI and alternative research-based methods. Below I will discuss the three approaches to LD identification allowed in IDEA.

### **Ability-Achievement Discrepancy**

Ability-achievement discrepancy is predicated on the belief that underachievement discrepant from cognitive ability is suggestive of a unique set of characteristics representative of LD (Gresham & Vellutino, 2010). The underlying characteristics of LD manifest in such a discrepancy, which then must be measured for identification (Mastropieri & Scruggs, 2005). Despite such assertions, ability-achievement discrepancies do not appear to be valid markers of LD as evidenced by similar deficits in children with and without discrepancies (Vellutino, Scanlon, Zhang, & Schatschneider, 2008). Despite its wide use, there is little empirical support regarding ability-achievement discrepancy and special education stakeholders have increasingly criticized the approach (e.g., D. Fuchs, L. S. Fuchs, & Compton, 2004; Gresham & Vellutino, 2010). Critics often refer to ability-achievement discrepancy as a “wait-to-fail” approach because students must generally demonstrate underachievement for several years before it is significantly discrepant from cognitive ability (D. Fuchs et al., 2004). Ability-achievement discrepancy also relies on difference scores, which do not

demonstrate adequate reliability for decision-making (Vaughn & Fuchs, 2006). Moreover, students exhibiting discrepancies do not differ significantly in achievement or cognitive scores from students not exhibiting discrepancies (Hoskyn & Swanson, 2000; Stuebing et al., 2002; Ysseldyke et al., 1982b) and ability-achievement discrepancy assessment data lack treatment validity because they do not inform appropriate intervention and instruction (Bradley et al., 2005; Vaughn & Fuchs, 2003).

### **Response to Intervention**

Although there is not a universal RtI approach to LD identification, student lack of responsiveness to increasingly intensive intervention and monitoring of progress is typically used in identification (Vaughn & Fuchs, 2003). The dual discrepancy approach to interpreting RtI data compares student achievement level and growth rate to either research-based criteria or peer performance (Fuchs, 2003), and is the most commonly used LD identification method within RtI (Kovaleski et al., 2013). Thus, when a student demonstrates below a criterion performance and growth rate over a specified period of time, he or she may be identified with LD (Kovaleski et al., 2013). Proponents of RtI suggest that it allows for early support for students who are struggling (Reschly, 2008). Despite considerable research supporting RtI as an effective means of providing tiered supports to students (Gresham et al., 2005), RtI LD identification decisions have not been validated (Burns, Jacob, & Wagner, 2008). Moreover, RtI approaches do not align with the historical theoretical underpinnings of the LD construct (i.e., cognitive and psychological processing deficits; Kavale & Spaulding, 2008; Mastropieri & Scruggs, 2005).

Because RtI is a relatively new approach to LD identification, it is much less researched than ability-achievement discrepancy. Moreover, many studies examined lack of responsiveness to intervention rather than LD identification specifically. However, because non-responsiveness represents a key component of LD identification (Vaughn & Fuchs, 2003), such studies still inform the research base regarding consistency of potential LD identification decisions using RtI. Much like ability-achievement discrepancy, identification decisions will vary depending upon the operationalization of non-responsiveness (Barth, et al., 2008) and there is low agreement among non-responsiveness thresholds and ability-achievement discrepancy criteria (Brown Waesche, Schatschneider, Maner, Ahmed, & Wagner, 2011). Moreover, RtI identification decisions do not demonstrate adequate stability over time (Brown Waesche et al., 2011). Both real and simulated student data demonstrate that identification decisions differ depending upon the assessment measure used although reliability of the assessment measures may moderate agreement levels, but use of multiple achievement assessments increases identification decision agreement (Fletcher et al., 2014). The validity and reliability of RtI LD identification decisions is undermined by such inconsistent identification decisions across operationalizations.

### **Pattern of Strengths and Weaknesses**

IDEA also allows for alternative research-based methods to be used in LD identification (Pub. L. No. 108–446 § 300.307[a]), but does not provide further guidance on implementation of such methods (Lichtenstein & Klotz, 2007). Despite the vague language within the law, PSW models are the most commonly used alternative method (Hale et al., 2008). The core underlying features of this approach require demonstration

of a core cognitive deficit in theoretical alignment with achievement deficits (Hale et al., 2006). Proponents assert that PSW approaches align with the theoretical underpinnings of the LD construct through assessment of cognitive processes (Hale & Fiorello, 2004) and that use of cognitive and neuropsychological measures are necessary to account for psychological processing deficits and therefore appropriate identification (Hale et al., 2006; Semrud-Clikeman, 2005).

Significant psychometric issues underlie PSW approaches despite proponents' assertions that this approach appropriately measures LD. PSW approaches do not correct for type 1 error rate despite analyses across multiple subtests. Thus, p-values and consequently significance of results are misinterpreted (Stuebing et al., 2012). There is also no evidence of achievement differences between students identified as LD and not-LD. Moreover, PSW approaches lack treatment validity providing no information regarding appropriate instruction or intervention (Miciak et al., 2014). Proponents assert that intervention can be targeted to student cognitive deficits (Hale & Fiorello, 2004), but meta-analytic research has consistently challenged the effectiveness of doing so (Burns et al., in press; Fletcher et al., 2012; Kearns & Fuchs, 2013) and cognitive skills training does not improve student achievement (Kavale & Forness, 2000; Kearns & Fuchs, 2013; Melby-Lervag & Hulme, 2013).

There are currently no empirical studies supporting reliability and validity of LD identification decisions using PSW approaches. There is, however, a line of research showing that PSW approaches do not result in reliable or valid decisions regarding LD identification (e.g., Miciak et al., 2014a; Miciak et al., 2014b; Stuebing et al., 2012). Simulation studies show that although PSW models demonstrate adequate specificity and

negative predictive power (i.e., correctly identifying students as not having LD), they also have low sensitivity and positive predictive power (i.e., correctly identifying students as having LD) and low base rates (Stuebing et al., 2012). Identification decisions across PSW models (i.e., Concordance/Discordance Model; Discrepancy/Consistency Model, Cross-Battery Assessment) and achievement are also inconsistent (Miciak et al., 2014a; Miciak et al., 2014b). Thus, reliance on PSW models for LD identification could place struggling students at-risk for not receiving needed academic support through special education services.

### **The Effects of Inconclusiveness in LD Identification**

Vague LD identification criteria have been shown to result in variable identification practices and rates across states (Maki et al., 2015; Reschly & Hosp, 2004). Federal and state identification criteria are intended to increase the objectivity in identification decision-making, but because such criteria can still be interpreted somewhat subjectively and allow for (and require) professional judgment, identification decisions and decision-maker confidence may be impacted by the ambiguity in the special education regulations. The extent to which differences in student data affect identification decisions and decision-maker confidence has not been experimentally examined.

One underlying difficulty in the consistency of LD identification is evident in the complexity of student data and the relative overlap of student data and identification cut-points (Fletcher et al., 2005; Watkins, 2009). The underlying properties of LD as a continuous latent construct are in conflict with the dichotomous decision-making framework used to identify LD (Fletcher et al., 2007). Student test score data far above or

far below cut-points are arguably more conclusive but student test scores closely surrounding cut-points are less conclusive because inconsistency of identification is likely to increase (Francis et al., 2005).

Although inconclusive student data have not been directly examined in special education identification, Huebner (1991) argued that inconclusive data may have influenced Algozzine and Ysseldyke's (1981) findings that referral concerns biased school psychologists' identification decisions. Huebner (1991) asserted that inconclusive student grade-equivalent scores influenced school psychologists' inconsistent identification decisions rather than referral concern biases and that school psychologists rely on professional experience to a greater extent and less on student test scores when student data are inconclusive. However, Huebner's (1991) argument is purely conjecture and was not experimentally tested. Thus, the extent to which the student data in the Algozzine and Ysseldyke (1981) study were inconclusive and influence identification consistency is not known. Moreover, these studies were concerned with the consistency of identification and not the relationship between inconclusive data and decision-maker confidence. Gnys and colleagues (1995) examined the relationship between WISC-R scatter and school psychologists' identification decision confidence and found no relationship between the two. However, these data were not conceptualized nor rationalized as inconclusive or conclusive. Thus, the relationship between school psychologist confidence and inconclusive student data is unknown.

### **Purpose**

Although considerable research has examined LD identification from both conceptual and empirical viewpoints, there is no known research investigating school

psychologists' confidence in LD identification decisions across identification methods. These methods have been studied extensively in isolation (although there is no empirical research supporting the reliability of the PSW method), but confidence in identification decisions using these methods have not been directly compared. Moreover, school psychologists tend to exhibit relatively high levels of confidence in identification decisions (Aspel et al., 1998), but the relationship between confidence and identification decision is largely unknown. The purpose of the present study, therefore, was to examine school psychologists' overall confidence in LD identification decisions as well as differences in confidence across method of identification, conclusiveness of student data, degree level, years of experience, and the consistency of such decisions.

### **Research Questions**

The following research questions guided the study:

1. How confident are school psychologists in their evaluation decisions?
2. To what extent does school psychologist confidence differ across identification method?
3. To what extent does school psychologist confidence differ across level of conclusiveness?
4. To what extent does school psychologist confidence differ across degree level and years of experience?
5. To what extent does school psychologist confidence difference across identification decision consistency?

## Method

### Participants

The data from this study were drawn from a larger study examining LD identification. Study participants were drawn from the same sample as study 1 and included 376 licensed or certified school psychologists practicing in U.S. public schools. All participants regularly took part in multidisciplinary teams determining special education identification. Participants were 83% ( $n = 313$ ) female and 17% ( $n = 60$ ) male with 91% ( $n = 342$ ) self-identifying as Caucasian, 4% ( $n = 15$ ) Latino, 1.3% ( $n = 5$ ) African-American, 0.8% ( $n = 3$ ) Asian/Pacific Islander, 0.3% ( $n = 1$ ) Native American/Alaskan Native, and 1.3% ( $n = 5$ ) two or more races. Just over 1% ( $n = 3$ ) of participants did not report their ethnicity. Most participants held an Ed.S degree (42%;  $n = 156$ ), 23% ( $n = 86$ ) of participants held an M.A., and 12% ( $n = 45$ ) held a Ph.D. An additional 23% ( $n = 87$ ) of participants reported holding other degrees including Psy.S, Psy.D, M.S., and C.A.G.S. Most participants were newer to the field with 35.6% ( $n = 134$ ) of participants practicing less than five years and 20.5% ( $n = 77$ ) practicing between 6 and 10 years. An additional 20.5% ( $n = 93$ ) of participants had practiced between 11 and 20 years and the remaining 18.6% ( $n = 70$ ) had practiced more than 20 years.

Participants were recruited from state school psychology associations (SPAs). In September 2014, I contacted all 51 state SPAs by email, telephone, or both inquiring into the SPA research request process. I reached 45 (88%) SPAs and 33 (73% of those reached) allowed for research with association members. To request study dissemination to SPA members, research proposals were submitted to SPA boards and proposals were

approved by 76% (25) of the SPAs allowing for research. Study dissemination and completion rate are presented in Table 9.

Table 10 presents study completion by SPA. The 22 SPAs that distributed the study represented the four regions comprising the National Association of School Psychologists (NASP). Study participants from the Central region somewhat overrepresented the total percentage of NASP comprising 32.23% ( $n = 121$ ) of study participants compared to 23.00% of NASP members. Conversely, members from the Northeast and Southeast regions slightly underrepresented NASP regional membership composition with 26.40% ( $n = 66$ ) compared to 33.57% and 17.60% ( $n = 66$ ) compared to 21.65%, respectively. Participant composition from the West region closely approximated the percentage of NASP West region members with 23.00% ( $n = 89$ ) and 21.82%, respectively.

## **Materials**

**Identification Criteria.** State special education regulations were reviewed to obtain study ability-achievement discrepancy, RtI, and PSW identification criteria. Of the 51 states (including Washington, D.C.), 34 (67%) allow for ability-achievement discrepancy to be used in LD identification. Because use of regression equations in determining discrepancy is more reliable than simple discrepancies (Proctor & Prevatt, 2003), identification criteria utilizing standard score and standard deviation differences were ruled out. From 11 states using regression formulas in discrepancy determination, one state's ability-achievement discrepancy identification criteria were chosen randomly.

Because all states must allow for use of RtI in LD identification (Pub. L. No. 108–446 § 300.307[a][2]), all states' RtI identification criteria were reviewed for additional

identification documentation requirements (e.g., performance below a specific achievement level, growth below a specific level, minimum number of datapoints, minimum number of weeks in intervention) in order to incorporate objective data to the greatest extent possible. One state's identification criteria were randomly chosen from 7 states requiring additional documentation for identification.

The extent to which states use PSW methods in LD identification is rather vague because the terminology "pattern of strengths and weaknesses" can refer to both ability-achievement discrepancy and PSW methods. All state identification criteria were therefore further examined to differentiate criteria specifically allowing for "alternative research-based methods" thus suggesting use of PSW methods. Of the 12 states allowing for use of alternative research-based methods, one state's identification criteria were randomly chosen.

**Student Evaluation Data.** Fourteen de-identified evaluation reports of students evaluated for suspected LD were obtained from public school districts in the United States. Because student demographics are shown to correlate with special education identification decisions (Skiba et al., 2008), all students for whom evaluation reports were obtained were Caucasian males in 3<sup>rd</sup> or 5<sup>th</sup> grade in order to hold demographic data constant across study conditions. Of the 14 obtained evaluation reports, eight students' schools identified them with LD and six students' schools identified them as not LD.

All student evaluation reports were examined and information irrelevant to the study was removed. Student evaluation data for the purposes of this study included student name (a pseudonym), race/ethnicity, birthdate, age, grade, testing dates, parent name (pseudonym), and student test scores. Student background information (e.g., name,

race/ethnicity, parent name) was constant across all student evaluation reports with a constant range for age (9 to 11) and grade (3<sup>rd</sup> or 5<sup>th</sup>). Cognitive general ability factor (GIA), cognitive composite scores, and achievement composite scores comprised ability-achievement discrepancy student data. Curriculum-based measures (CBM) seasonal benchmark scores for reading, math, and writing, CBM reading growth rate, and Measures of Academic Progress (MAP; Northwest Evaluation Association, 2003) data comprised the RtI student data. Cognitive GIA, cognitive composite scores, and achievement composite scores comprised PSW student data. All test score data and CBM reading growth rate included confidence intervals. Additional student background information, specific observation data, or pre-referral intervention data were not provided.

Matching student data type (i.e., ability-achievement discrepancy, RtI, PSW) to identification criteria type (i.e., ability-achievement discrepancy, RtI, PSW), the author and a fourth-year school psychology graduate student independently examined and rated the 14 student evaluations following strict adherence to the identification criteria to determine if the student should be identified with LD. For example, if the student's school used ability-achievement discrepancy for LD identification, then ability-achievement discrepancy identification criteria were used for study purposes as well. A 5-point rating scale was used to determine the extent to which the student could be identified with LD. 1 was used if the student data did not indicate LD and the data were conclusive, 2 was used if the student data did not indicate LD but the data were somewhat inconclusive, 3 was used if the data were inconclusive and identification was unknown, 4 was used if the student data indicated LD but the data were somewhat

inconclusive, and 5 was used if the student data indicated LD and the data were conclusive. Inconclusive data were operationally defined as student data that closely surrounded the identification cut-point (above or below) for the specific identification criteria (i.e., within 2 standard score points or .05 WRCM growth rate of expected growth rate). Thus, the inconclusive student data would not be identified LD if using only obtained student test scores, but would be identified LD if confidence intervals were taken into account. Moreover, the inconclusive student data were not concordant with some of the data suggesting the student should be identified as LD and some of the data suggesting the student should not be identified as LD according to the identification criteria.

To ensure student data accurately reflected the level of conclusiveness and LD identification, inter-rater agreement was calculated by dividing the number of agreements by the number of disagreements plus agreements resulting in 93% agreement based on exact rating agreements. When agreements were calculated allowing for a 1-point rating difference, there was 100% agreement. The raters reached consensus on any disagreements through discussion.

To ensure equal representation of student cases across the three identification methods and conclusiveness levels, the final 9 student cases were included in the study to ensure one student case per combination of identification method (i.e., ability-achievement discrepancy, RtI, PSW) and conclusiveness level (conclusive-LD, conclusive-not LD, inconclusive). If more than one student case was available for a study condition, a student case was selected randomly. Participants were not presented with the remaining 5 student cases. See Table 8 below for additional description of student cases.

Table 8

*Student Evaluation Data Description*

Condition	Evaluation Data Type	Conclusiveness Level	Eligibility Criteria	Grade	Age
1	AAD	Conclusive-Not LD	AAD	5	10
2	AAD	Inconclusive	AAD	5	11
3	AAD	Conclusive-LD	AAD	3	9
4	RtI	Conclusive-Not LD	RtI	3	9
5	RtI	Inconclusive	RtI	3	9
6	RtI	Conclusive-LD	RtI	3	9
7	PSW	Conclusive-Not LD	PSW	3	9
8	PSW	Inconclusive	PSW	3	9
9	PSW	Conclusive-LD	PSW	3	9

*Note.* AAD = Ability-Achievement Discrepancy

**Measures**

**Evaluation Questionnaire.** The author developed an evaluation questionnaire to examine participants' LD identification decision-making. Participants were presented with two questions regarding LD identification after reviewing the LD identification criteria and student evaluation data. Following the evaluation questions, participants were also presented with questions regarding their demographic background in an effort to ensure that participants were representative of practicing school psychologists. The evaluation and demographic questions were:

1. According to the LD identification criteria with which you were provided, is the student eligible as having a learning disability (LD)?
2. How confident are you in your decision?
3. For how many years have you been a practicing school psychologist?
4. What is your highest degree earned?
5. In what type of school district do you currently practice?
6. With which gender do you identify?
7. With which ethnicity do you identify?

### **Procedures**

The author disseminated the study to students in a graduate school psychology program prior to distribution to potential participants through state SPAs to ensure the study was functioning properly through the online server. After completing the survey, practice participants provided feedback regarding difficulties accessing or maneuvering through the study as well as errors (e.g., spelling, grammar, punctuation). Minor revisions were made based on such feedback including spelling, grammar, and presentation of data. Prior to dissemination to state SPAs, all practice responses were deleted to ensure that these data did not confound true participant data.

Upon SPA board approval for study dissemination, a brief participation request letter and the study link were submitted to the SPA liaison. Through the SPA listserv or website, the SPA liaison then distributed the participation request and study link to SPA members. The study was disseminated at one time point in October or November and there were no reminders sent to potential participants prompting completion of the study. Data collection was completed by December 2014. Across all SPAs, the study was

distributed to 9952 SPA members and 376 practicing school psychologists (3.8%) completed the study.

Table 9

*Dissemination and Completion of Study*

	Number	Percentage
<b>Dissemination</b>		
SPAs Reached	45	88% of 51
SPAs Allowing Research	33	73% of 45
SPAs Approving Study	25	76% of 33
SPAs Disseminated Study	22	88% of 25
Disseminated via Email	17	77% of 22
Disseminated on SPA Webpage	4	18% of 22
Disseminated via Mail	1	5% of 22
<b>Completion</b>		
Agreed to Participate	555	91% of 610
Practicing, Licensed Psychologist	508	82% of 555
Participated in Multidisciplinary Teams	439	86% of 508
Completed Study	376	86% of 439

Twenty-two (88% of SPAs approving the study) SPAs disseminated the study to potential participants by email or a posting on the SPA website, which included a brief explanation of the study and the study link. Participants accessed the study through a secure online server at which time they were provided with additional study information

including purpose of the study, potential benefits and risks of participation, notification of the voluntary nature of the study, and notification of participation anonymity and confidentiality. Potential participants were then asked to indicate whether they agreed or did not agree to participate in the study. If the potential participants indicated that they did not wish to participate, the study completed and the individual was thanked for his or her time. If the potential participant agreed to participate, two additional questions were presented to determine participation eligibility:

1. Are you a practicing licensed or certified school psychologist in the United States?
2. Do you participate in multidisciplinary teams making special education eligibility decisions?

A no response to either of these questions triggered study completion and the individual was thanked for his or her time. Individuals were eligible for participation if they responded yes to both of these questions and he or she was then randomly assigned to one of the nine study conditions. Participants were informed that they could return to a previous page at any time while completing the study. Of the 555 individuals to initially access the study link, 91% agreed to participate in the study. Eighty-two percent (508) of these individuals indicated they were a licensed, practicing school psychologist. Of these 508 school psychologists, 439 (86%) indicated that they regularly participate in multidisciplinary teams making special education identification decisions. Thus, those 439 individuals were eligible to participate and 376 (86%) completed the study.

Table 10

*Rate of Study Completion by State*

State	Dissemination Process	SPA Members	Number Completed	Percentage Completed
Alaska	Email	75	11	14.7
Arizona	Email	500	3	.6
Arkansas	Email	125	12	9.6
California	Email	2894	47	1.6
Colorado	Email	192	10	5.2
Connecticut	Email	180	2	1.1
Delaware	Email	64	9	14.1
Idaho	Webpage	50	4	8
Illinois	Webpage	765	1	.1
Kentucky	Email	281	9	3.2
Louisiana	Webpage	285	2	.7
Michigan	Webpage	569	2	.4
Minnesota	Webpage	225	3	.13
Montana	Webpage	62	2	3.2
Nebraska	Email	100	17	17.0
New Jersey	Email	500	38	7.6
New York	Email	1263	46	3.6
North Carolina	Email	400	38	9.5
North Dakota	Email	54	7	13.0

Ohio	Email	789	49	6.2
Utah	Mail	124	13	10.5
Wisconsin	Email	389	37	9.5
Miscellaneous	N/A	N/A	14	N/A

The online server then presented the participant with one of three identification criteria (ability-achievement discrepancy, RtI, or PSW) based on the condition to which he or she was randomly assigned. The participant was directed to carefully review the identification criteria and to then use these criteria to determine whether or not the student should be identified with LD upon reviewing the forthcoming student evaluation data. Student evaluation data corresponding to the individual's randomly assigned condition were then presented to the participant and he or she was directed to carefully review the student data and then determine LD identification based on the student data and identification criteria. Participants were also informed that all exclusionary criteria (e.g., visual, motor, hearing, emotional disturbance, economic disadvantage) could be ruled out as potentially confounding variables. The evaluation, demographic, and LD identification practices questions were then presented to the participants. Upon completing all study questions, participants were thanked for their time and informed that they could enter to win a \$20 Amazon gift card by submitting their name and email address to the author. This gift card entry process ensured that participant responses could not be linked to identifying information.

## Research Design

Table 11

### *Study Design Description*

Data Conclusiveness	<u>Eligibility Criteria</u>		
	Ability-Achievement Discrepancy	Response to Intervention	Pattern of Strengths and Weaknesses
Conclusive-Not LD	Condition 1	Condition 2	Condition 3
Inconclusive	Condition 4	Condition 5	Condition 6
Conclusive-LD	Condition 7	Condition 8	Condition 9

The research questions were examined using an experimental 3 x 3 research design with nine unique study conditions. Three levels of identification methods/eligibility criteria were used and included ability-achievement discrepancy, RtI, and PSW. Three levels of conclusive data were also used and included conclusive-LD, conclusive-not LD, and inconclusive data. The study design and conditions are described in Table 11. Each condition was determined based on one of three identification criteria and the level of student data conclusiveness. Participants were randomly assigned to one of the nine study conditions.

### **Analyses**

School psychologists' overall confidence in LD identification decisions was analyzed by calculating the percentage of participants reporting each confidence level rating. Differences in school psychologist confidence across identification method was examined by first calculating the percentage of each confidence rating within the three

identification methods (ability-achievement discrepancy, RtI, and PSW). A chi-square test was then used to examine whether confidence rating was significantly different across identification methods.

Similarly, the extent to which school psychologist confidence differed across student evaluation data conclusiveness level was evaluated by calculating the percentage of confidence ratings within each conclusiveness level and then a chi-square statistic was used to determine the if confidence rating was significantly different across student data conclusiveness level. Differences in school psychologist confidence across degree level and years of experience were analyzed by calculating the percentage of confidence ratings within each degree level and experience level. A chi-square statistic was then calculated to determine if there were significant differences in school psychologist across degree level and years of experience. The relationship between school psychologist identification confidence and identification decision consistency was also analyzed by calculating the percentage of consistent identification decisions in each confidence level rating followed by a chi-square test.

## **Results**

### **School Psychologist Confidence**

The first research question inquired about the overall confidence of school psychologists in their LD identification decisions. Table 12 shows that school psychologists reported overall high levels of confidence with a majority of participants indicating that they were either “very confident” (44.4%) or “somewhat confident” (46.3%) in their identification decision. Far fewer participants reported being “somewhat

not confident” (6.6%) or “not very confident” (2.7%). School psychologists therefore felt overwhelmingly confident in their LD identification decisions.

Table 12

*Descriptive Statistics of School Psychologists’ Confidence in Identification Decisions*

Confidence Level	<i>N</i>	Percentage of Participants
Very Confident	167	44.4
Somewhat Confident	174	46.3
Somewhat Not Confident	25	6.6
Not Very Confident	10	2.7

**Differences in Confidence across Method and Data Conclusiveness**

The second research question inquired about the extent to which school psychologists’ confidence in his or her identification decision differed across the three identification methods (i.e., ability-achievement discrepancy, RtI, and PSW). First, the percentage of confidence ratings (i.e., very confident, somewhat confident, somewhat not confident, not very confident) within each identification method was calculated. Across all three identification methods, participants reported more “very confident” and “somewhat confident” ratings than “somewhat not confident” and “not very confident” ratings. However, school psychologists applying ability-achievement discrepancy in LD identification reported a higher percentage of “very confident” ratings while school psychologists applying RtI reported the lowest percentage of “very confident” ratings as well as the highest percentage of “somewhat confident,” “somewhat not confident,” and “not very confident” ratings. A chi-square statistic was also calculated to determine the

relationship between school psychologists' confidence in his or her identification decision and LD identification method,  $X^2(6, N = 376) = 28.97, p < .05$ . Thus, school psychologist identification decision confidence significantly differed across identification methods. The LD identification method used in making the identification decision was therefore related to the confidence that school psychologists reported in their identification decision.

Table 13

*Differences in School Psychologist Identification Decision Confidence Across Identification Methods*

Confidence Level	Identification Method							
	AAD		Rtl		PSW		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Very Confident	78	56.1	28	25.5	61	48.0	167	44.4
Somewhat Confident	47	33.8	67	60.9	60	47.2	174	46.3
Somewhat Not Confident	10	7.2	10	9.1	5	3.9	25	6.6
Not Very Confident	4	2.9	5	4.5	1	.8	10	2.7

$X^2(6, N = 376) = 28.97, p < .05$

*Note.* AAD = Ability achievement discrepancy

The third research question examined differences in school psychologist identification decision confidence across student evaluation data conclusiveness level. The percentage of each confidence rating (i.e., very confident, somewhat confident, somewhat not confident, not very confident) within each level of student evaluation data conclusiveness (i.e., conclusive-not LD, inconclusive, conclusive-LD) was first calculated. Although overall confidence was rather high, a larger percentage of

participants reported feeling “very confident” in their identification decision if he or she reviewed conclusive (both not LD and LD) data as opposed to inconclusive data. Conversely, participants who reviewed inconclusive data reported more ratings of “somewhat confident” than both the conclusive-not LD and conclusive-LD conditions. Moreover, participants reviewing inconclusive data were more likely to provide “somewhat not confident” and “not very confident” ratings, although the total number of individuals reporting these ratings was rather small. A chi-square statistic was calculated to further examine the relationship between identification decision confidence and student evaluation data conclusiveness level, which resulted in a significant effect,  $\chi^2(6, N = 376) = 18.92, p < .05$ . Differences in school psychologist confidence are therefore evident across conclusiveness level of student evaluation data. Thus, when school psychologists were presented with inconclusive data, they reported lower confidence in their LD identification decisions.

Table 14

*Differences in School Psychologist Identification Decision Confidence Across Conclusiveness Level*

Confidence Level	Student Evaluation Data Conclusiveness Level							
	Conclusive-				Conclusive-			
	Not LD		Inconclusive		LD		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Very Confident	76	56.3	38	30.4	53	45.7	167	44.4
Somewhat Confident	50	37.0	71	56.8	53	45.7	174	46.3
Somewhat Not Confident	7	5.2	12	9.6	6	5.2	25	6.6
Not Very Confident	2	1.5	4	3.2	4	3.4	10	2.7

$$X^2(6, N = 376) = 18.92, p < .05^*$$

### **Confidence Differences across Degree and Years of Experience**

The fourth research question examined differences in school psychologist confidence across degree level and years of experience. The confidence rating within each degree level and years of experience category (i.e., 0 to 5 years, 6 to 10 years, 11 to 20 years, more than 20 years) were first calculated. Chi-square tests revealed that there were not significant differences in school psychologist confidence in identification decisions across degree level,  $X^2(12, N = 375) = 7.63, p = .81$  or years of experience,  $X^2(12, N = 375) = 18.20, p = .11$ , respectively. Thus, school psychologists reported similar levels of confidence regardless of his or her degree level and the number of years he or she had been practicing.

Table 15

*Differences in School Psychologist Identification Decision Confidence Across Degree Level*

Confidence Level	<u>School Psychologist Degree Level</u>							
	M.A.		Ed.S		Ph.D		Other	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Very Confident	47	54.7	69	44.2	16	35.6	34	39.1
Somewhat Confident	32	37.2	72	46.2	24	53.3	46	52.9
Somewhat Not Confident	6	7.0	12	7.7	1	2.2	6	6.9
Not Very Confident	1	1.2	3	1.9	4	8.9	1	1.1

$\chi^2 (12, N = 375) = 7.63, p = .81$

Table 16

*Differences in School Psychologist Identification Decision Confidence Across Years of Experience*

Level of Confidence	<u>School Psychologist Years of Experience</u>							
	0 to 5		6 to 10		11 to 20		More than 20	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Very Confident	53	39.6	33	42.9	44	47.3	36	51.4
Somewhat Confident	67	50.0	36	46.8	42	45.2	29	41.4
Somewhat Not Confident	11	8.2	6	7.8	6	6.5	2	2.9
Not Very Confident	3	2.2	2	2.6	1	1.1	3	4.3

$\chi^2 (12, N = 375) = 18.20, p = .11$

### **Differences in Confidence across Identification Consistency**

The fifth research question examined the relationship between school psychologist identification decision confidence and the consistency of LD identification decisions. The percentage of consistent identification within each confidence level rating was first calculated. Identification consistency was fairly equal across three of the four confidence levels including, “very confident,” “somewhat confident,” and “somewhat not confident.” However, a higher percentage of inconsistent identification is evident within the “not very confident” rating as evidenced in Table 17. A chi-square statistic was calculated to further examine the relationship between identification consistency and school psychologist identification decision confidence resulting in a non-significant effect,  $\chi^2(3, N = 376) = 6.37, p = .10$ . Thus, although school psychologists were more likely to report lower confidence when they made an inconsistent decision, a significant relationship between identification confidence and identification consistency was not evident and therefore the data do not suggest a relationship between school psychologist confidence and identification decision.

Table 17

*Relationship between School Psychologist Identification Decision Confidence and Consistent Identification*

Confidence Level	<u>Identification Consistency</u>					
	No		Yes		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Very Confident	40	40.4	127	45.8	167	44.4
Somewhat Confident	46	46.5	128	46.2	174	46.3
Somewhat Not Confident	7	7.1	18	6.5	25	6.6
Not Very Confident	6	6.1	4	1.4	10	2.7

$X^2 (3, N = 376) = 6.37, p = .10$

### Discussion

The purpose of this study was to examine school psychologists' confidence in LD identification decision-making. Although there is some research regarding confidence of individuals making diagnostic decisions within the broader psychological and medical fields (Kassin & Gudjonsson, 2004; Mamede et al., 2007; Norman & Eva, 2010), school psychologists' confidence in making special education identification decisions has not been well studied. However, examining the potential relationship between school psychologist identification decision confidence is important because there is some research in other fields to suggest that decision-maker confidence may actually impact diagnostic decisions (Berner & Graber, 2008; Norman & Eva, 2010).

The current sample was representative of school psychologists in the United States. Curtis et al.'s (2010) survey of school psychologist demographic characteristics reported 78.1% female and 90.7% Caucasian, 3.4% Latino, 3% African-American, 1.3%

Asian/Pacific Islander, .6% Native American/Alaskan Native, and 1% other ethnicity. Additionally, the majority of participants reported holding an Ed.S degree (53.9%), 29.4% held a master's degree (e.g., M.A., M.S., M.Ed), and 16.7% held a doctoral degree. The Curtis et al. (2010) study reported mean school psychologist age of 47.4 years suggesting that the participants in the current study may be somewhat younger and have been practicing for slightly fewer years than the findings reported by Curtis et al. (2010).

### **Overall School Psychologist Confidence**

Findings from the current study showed that school psychologists demonstrated overall high levels of confidence with 44.4% of participants reporting being “very confident” and 46.3% reporting being “somewhat confident.” Such findings are consistent with previous studies examining school psychologists’ confidence (e.g., Aspel et al., 1998; de Mesquita, 1992; Gnys et al., 1995). Although it is largely unknown why school psychologists report high levels of confidence in both this study and previous studies, school psychologists are often viewed as holding an expert role in evaluation and assessment on the multidisciplinary team (NASP, 2010). Special education identification decisions are team-based decisions; however, school psychologists possess unique evaluation and assessment skills and knowledge that other team members are less likely to have (e.g., test score meaning including inherent error, disability category meanings; Becker, Paternite, & Evans, 2014; Gilliam, 1979; Knoff, 1983a; Mehan, 1991; Yoshida, Fenton, Maxwell, & Kaufman, 1978). Thus, school psychologists may be influenced by the desire to be correct and thus confident in their identification decisions due to their

unique contributions to the multidisciplinary team.

### **Differences in Confidence across Identification Methods**

Although school psychologists reported overall high levels of confidence in their identification decisions, significant differences in confidence were found across the three identification methods (i.e., ability-achievement discrepancy, RtI, and PSW). School psychologists using ability-achievement discrepancy reported the most “very confident” ratings, while those using RtI reported the least “very confident ratings.” Across all three identification methods, fewer school psychologists reported being “somewhat not confident” or “not very confident.” However, participants using RtI reported more ratings of “somewhat not confident” and “not very confident” than did participants using ability-achievement discrepancy or PSW. Interestingly, school psychologists using PSW reported the least amount of “somewhat not confident” and “not very confident” ratings even though identification criteria for this method are particularly vague (Lichtenstein & Klotz, 2007).

The data from the current study do not describe why such differences in confidence exist across identification methods, only that study participants reported such differences in confidence. It could be that school psychologists using RtI reported being less confident because it is a relatively new approach to LD identification compared to ability-achievement discrepancy (Kovaleski et al., 2013). Moreover, results from study 1 showed that far fewer school psychologists reported being trained in RtI (38.8%) approaches to LD identification than those receiving training in ability-achievement discrepancy (78.7%). Thus, perhaps school psychologists are less confident using RtI in LD identification due to less training in that approach. Ability-achievement discrepancy

has been used in LD identification since students with LD began being served under EAHCA in 1975 (Kavale & Spaulding, 2008), which could relate to school psychologists' greater confidence in using this approach. However, such reasoning does not explain why so few participants using PSW reported feeling "somewhat not confident" and "not very confident" because this approach to LD identification is also new LD identification methodology. PSW methods, though, stem from the same theoretical orientation regarding the underlying process involved in LD and the need to assess cognitive processes in order to identify LD (Hale et al., 2008; Mastropieri & Scruggs, 2005). Moreover, the greatest number of school psychologists (78.7%) in study 1 reported being trained in ability-achievement discrepancy compared to 38.8% and 30.6% for RtI and PSW, respectively. Thus, perhaps school psychologist training impacts school psychologists' confidence when implementing a particular approach. However, further research is needed to examine these hypotheses regarding school psychologist confidence in identification decisions.

### **Confidence Differences across Student Data Conclusiveness Levels**

As with differences across identification methods, significant differences in school psychologist confidence were found across levels of student data conclusiveness. School psychologists examining conclusive data, both LD and not-LD, reported higher levels of confidence than school psychologists who examined inconclusive data. Participants examining inconclusive data reported more "somewhat not confident" ratings than those examining conclusive data. Interestingly, school psychologists examining conclusive, not-LD data reported as many "not very confident" ratings as

school psychologists examining inconclusive data. However, very few participants reported “not very confident” ratings overall.

It is not particularly surprising that school psychologists felt less confident when making identification decisions based on inconclusive data. All inconclusive data test scores with which participants were presented were closer to the identification cut-points than were test scores within the conclusive conditions (both not-LD and LD data). Measurement error is inherent within all test scores and thus a student’s obtained score is likely not equal to his or her true score (Schatschneider, Wagner, & Crawford, 2008). Upon repeated testing, therefore, student test scores will bounce around the cut-point and could result in different identification decisions (Francis et al., 2005). Thus, school psychologists’ knowledge regarding statistical phenomena and the impact of such phenomena on measured test scores may impact decision confidence when student test scores are closer to decision cut-points.

### **Differences in Confidence across Degree Level and Years of Experience**

School psychologist confidence in this study did not differ across degree level or years of experience. Overall, school psychologists reported high levels of confidence in their identification decisions as discussed above but school psychologists who had been practicing longer or had a higher degree did not report higher levels of confidence. These results do not coincide with previous findings regarding decision-maker confidence, which suggested that individuals’ confidence increases with the number of diagnostic decisions he or she has made (Arkes, et al. 1989; Dunning, et al., 2004). However, findings from these studies were not specific to school psychologists’ special education identification decisions but were broader psychological diagnostic decisions. Although

the results from this study suggest that confidence does not increase or vary with years of experience or degree level, lack of significant findings may be due to the fact that most school psychologists reported high levels of confidence. Because very few school psychologists reported low levels of confidence (i.e., somewhat not confident, not very confident) it may have been difficult to detect differences in confidence across experience and degree. Additional research is needed regarding school psychologist confidence to further examine the potential impact of experience on confidence.

### **Differences in Confidence across Identification Consistency**

Although school psychologists demonstrated high levels of confidence in identification decisions, such confidence is not necessarily beneficial to identification accuracy. A significant relationship between identification consistency and identification decision confidence was not found. School psychologists therefore reported equivalent levels of confidence whether they made a consistent or inconsistent identification decision. Such findings are potentially problematic because if school psychologists feel confident in their interpretation of the data, they may be less likely to consider alternative hypotheses (Watkins, 2009). Thus, students who are not eligible under the identification criteria may be inappropriately identified.

Previous studies examining school psychologist confidence in identification decisions also found high levels of identification decision confidence (e.g., Aspel et al., 1998; de Mesquita, 1992; Gnys et al., 1995). However, Aspel et al. (1998) and de Mesquita (1992) did not examine confidence experimentally. Consistent with the findings from the present study, Gnys et al. (1995) found that school psychologist confidence was not related to the WISC-R score scatter or student achievement level. Thus, despite

differences in student data, school psychologists report high levels of confidence in identification decisions. However, there is some research suggesting that decision-maker confidence may be inversely related to diagnostic accuracy (Norman & Eva, 2010) and that confirmation bias may influence decisions resulting in inconsistent decisions (Mamede et al., 2007). Such findings are particularly concerning because when school psychologists demonstrate high confidence they may be less likely to self-evaluate their decision (Watkins, 2009) which could result in inappropriate identification decisions.

### **Implications for Practice**

The findings from this study have potentially important implications for practicing school psychologists and multidisciplinary teams involved in special education identification decisions. School psychologists reported overall high levels of confidence but such confidence was not related to identification consistency. Thus, school psychologists still reported high levels of confidence even when they did not make consistent identification decisions. In practice, therefore, school psychologists must be particularly careful to self-evaluate their identification decisions to ensure that confirmation bias does not impact identification (Mamede et al., 2007). Such high confidence could lead to disproportionate security in the accuracy of identification decisions (Watkins, 2009). If school psychologists are overconfident in their decisions, they may be less likely to self-monitor their identification decision-making which could result in erroneous decision-making (Kruger & Dunning, 1999). Moreover, without self-monitoring of decision-making, confirmation bias may impact identification (Mamede et al., 2007). Because referral concerns and amount of student data have been shown to relate to identification consistency (Algozzine & Ysseldyke, 1981), school psychologists

should ensure that identification decisions are based on student data and identification criteria rather than confirming a priori beliefs.

In school psychology as well as other fields, decision-makers demonstrate a tendency to anchor outcome decisions in initial perceptions (Della Tofallo & Pedersen, 2005; de Mesquita, 1992). School psychologists may exhibit high levels of confidence due to cognitive biases such as fundamental attribution error or the tendency to view others' difficulties as within person traits (Watkins, 2009). Thus, school psychologists should be careful to make identification decisions based on consideration of the child and his or her environment as a whole rather than relying on confidence in within child disabilities. Identification decisions are particularly prone to hindsight bias in which one believes that his or her decision is post hoc reflective of an accurate decision thus increasing decision-making confidence (Wedding & Faust, 1989). School psychologists should therefore be cognizant of the potential effects of hindsight bias and confirmation bias so they do not impact identification decisions. Moreover, school psychologists need to be careful to continue to self-monitor identification decision-making as they advance in their careers so that experience does not unduly influence identification confidence and consequently result in inconsistent identification (Garb & Boyle, 2003). Confidence in identification decisions is useful when it is based on thoughtful examination of student data and identification criteria. School psychologists should therefore be deliberate in special education evaluations and identification to develop professional competence and expertise (Watkins, 2009).

### **Implications For Research**

School psychologists' identification decision confidence has not been extensively researched. Findings from this study coincide with previous studies suggesting that school psychologists exhibit high levels of confidence in identification decisions (e.g., Aspel et al., 1998; de Mesquita, 1992; Gnys et al., 1995). Although results within the medical field suggest that overconfidence may lead to more diagnostic errors (Norman & Eva, 2010), similar research has been limited within the field of school psychology. The current study did not find a significant relationship between confidence and identification consistency. However, these findings only suggest a lack of relationship between confidence and identification consistency and do not suggest that confidence leads to inconsistent decisions. Thus, future research should further examine the relationship between identification confidence and identification consistency to better understand the potential impact of confidence on identification decision.

Future Research should also focus on potential reasons why school psychologists may exhibit high levels of confidence in identification decisions. Although researchers have theorized potential causes of overconfidence such as fundamental attribution error (Watkins, 2009), hindsight bias (Wedding & Faust, 1989), confirmation bias (Mamede et al., 2007), and experience (Watkins, 2009), additional research is needed to confirm such theories. Such research could lead to better understanding of underlying causes of overconfidence, which could help school psychologists become more cognizant of and thus reduce such influences in identification. Additional research should also examine the relationship between identification confidence and identification method as well as the relationship between identification confidence and student data conclusiveness level. The

current study found significant relationships between confidence and these two variables; however, such findings should be replicated.

### **Limitations**

This study provides insight into school psychologist confidence when making LD identification decisions. However, the results should be interpreted within the context of the study limitations. First, although extensive efforts were taken to ensure that study participants represented a national sample of school psychologists, it is possible that participants differed from school psychologists who choose not to be members of state school psychological associations. Second, there is no way to know how many potential participants received the study information in order to participate even though the number of members in each SPA is known. Thus, it is not possible to compute an accurate response rate and the response rate percentages reported in Table 10 likely underestimate the response rate of potential participants who actually received the study information. Third, participants may have been assigned to make an identification decision using unfamiliar identification criteria, which could impact his or her confidence in his or her identification decision. However, because participants were randomly assigned, this limitation should not have impacted differences across groups. Fourth, participants were told that LD exclusionary criteria were ruled out and thus should not be considered interfering variables and that classroom observations determined that the student demonstrated on-task and appropriate behavior. However, in order to focus on the research questions examining identification methods and student data conclusiveness level, participants made identification decisions primarily based on student test scores. Thus, because practicing school psychologists may be accustomed to collecting

additional information through observations, interviews, and anecdotal information, and the role of such information in LD identification is not represented in this study's findings. The findings from this study are therefore limited in their generalizability to LD identification best practices.

Fourth, participants were presented with student evaluation data from third and fifth grade students, which may have resulted in differences in identification depending on the grade level of the student evaluation report the participant viewed. Fifth, participants were presented with state LD identification criteria, which were chosen randomly from state special education regulations. Thus, it is possible that participants were not familiar with the LD identification criteria with which they were presented which could have impacted their identification decision

## **Conclusion**

Although school psychologists demonstrated overall high levels of confidence in LD identification decisions, differences in confidence were found among identification methods as well as student data conclusiveness level. Such findings, however, should be replicated to support such confidence differences because studies of school psychologists' LD identification decision confidence are limited despite concerns regarding identification accuracy (e.g., Francis et al., 2005; Miciak et al., 2014; Stuebing et al., 2012). School psychologist identification decision confidence could potentially impact identification consistency (Norman & Eva, 2010) thus it is imperative that school psychologists monitor their decision-making behavior to ensure that overconfidence does not unduly influence identification consistency (Watkins, 2009). School psychologists should be aware of possible underlying correlates of overconfidence in identification

decisions so that appropriate measures can be taken to address such effects and minimize the impact on identification consistency. Further research regarding school psychologist identification confidence is needed to ensure LD identification consistency.

## **CHAPTER 5**

### **INTEGRATED DISCUSSION**

Although differentiated and individualized instruction for students with disabilities has greatly improved over the last 50 years, disability identification, particularly with regard to learning disabilities (LD), continues to be debated within both research and practice (Fletcher et al., 2007). Significant changes in LD identification are evident in recent years and were implemented in response to concerns regarding initial identification methods (i.e., ability-achievement discrepancy; Gresham, 2001; Kovaleski et al., 2013). LD identification is still dependent upon methodology for which there is little empirical support at best and disconfirming evidence at worst (Aaron, 1997; Miciak et al., 2014; Reschly, 2003). However, empirical research has not previously examined LD identification decision-making across ability-achievement discrepancy, response to intervention (RtI), and patterns of strengths and weaknesses (PSW) nor has it examined identification decision-making across differences in student data. The studies conducted within this project, therefore, examined the consistency of such LD identification decisions as well as school psychologists' confidence when making LD identification decisions.

#### **Study 1**

The purpose of study 1 was to examine the consistency of LD identification decisions across three identification methods (i.e., ability-achievement discrepancy, RtI, and PSW) and across three levels of student data (conclusive –not LD, inconclusive, and conclusive- LD). School psychologists demonstrated moderately low consistency (Fleiss et al., 2001) in identification decisions (73.7%) and although significant differences in

identification consistency were not found across identification methods, significant differences were found across level of conclusiveness for student evaluation data. Thus, when participants were presented with student data closer to the identification cut-point, they were far less consistent in their identification decisions than when student data were further from the identification cut-point.

Inconsistency in LD identification is particularly concerning because a greater amount of student data will surround identification cut-points than the amount of student data at the extremes (i.e., far above or far below the cut-point; Schatschneider et al., 2008). Because student evaluation data are subject to measurement error (Fletcher et al., 2007; Francis et al., 2005), the observed student score could result in a different identification decision than the student's true score would. Moreover, statistical phenomena such as regression to the mean indicate that the student's score will be closer to the population mean upon repeated testing which also could result in different identification decisions (Schatschneider et al., 2008). In this study, participants were evenly presented with data that were inconclusive (close to the cut-point), conclusive-not LD (far above the cut-point), and conclusive-LD (far below the cut-point). However, due to the normal distribution of student ability and achievement (Schatschneider et al., 2008), it is reasonable to believe that school psychologists and multidisciplinary teams examine more student data surrounding the cut-point than student data far above or far below the cut-point. Thus, consistency of identification within school-based settings may be even lower than the findings in this study suggest.

## Study 2

Although LD as a construct and LD identification methods have been widely discussed in the LD and special education literature, school psychologists' confidence in LD identification decisions has not been well researched. The purpose of study 2, therefore, was to examine school psychologists' confidence and any differences in confidence across identification method and student evaluation data conclusiveness level. Overall, school psychologists reported high levels of confidence in their LD identification decisions. However, significant differences were found across identification methods with school psychologists using the ability-achievement discrepancy reporting the most "very confident" ratings and participants using RtI reporting the least "very confident" ratings. Moreover, when student evaluation data were inconclusive, school psychologists reported lower levels of confidence than when data were conclusive. However, a significant relationship between school psychologist confidence and consistency of identification was not found.

Although the data from this study did not demonstrate a relationship between school psychologist confidence and LD identification consistency, considerations regarding confidence are still important when making identification decisions. When school psychologists and other education professionals feel particularly confident in their identification decision, they may seek to confirm initial hypotheses, be less likely to consider alternative hypotheses, and unduly rely on experience which can all result in less accurate diagnostic decisions (Mamede et al., 2007; Watkins, 2009). Such influences are particularly concerning when combined with identification methods lacking strong empirical support.

## **Policy Implications**

The use of LD identification methods within local education agencies (LEAs) is based upon policy decisions at the federal and state levels (IDEA, 2004; Pub. L. No. 108–446 § 300.307). Thus, the inconsistency of LD identification decisions, particularly with regards to inconclusive data, should be considered when making decisions regarding allowance of LD identification methods from the local to the federal level. Concerns regarding ability-achievement discrepancy spurred the allowance of RtI and alternative research-based methods; however, IDEA still allows for use of ability achievement discrepancy (Pub. L. No. 108–446 § 300.307), which is still being widely used to identify students with LD as evidenced by school psychologist reporting in study 1. Despite years of research demonstrating underlying psychometric problems, ability-achievement discrepancy grasps onto the historical ideology that LD is reflective of unexplained underachievement (Gresham, 2001; Kavale & Spaulding, 2008; Lyon et al., 2001). The need to make identification methodology fit such ideology is not supported empirically and it is not benefiting students who are experiencing difficulty in school (Vaughn & Fuchs, 2006). In the face of concerning evidence regarding the psychometric issues underlying this approach (Aaron, 1997; Francis, 2005; Vaughn & Fuchs, 2003) and the inconsistency of identification decisions evidenced in this project, it seems inappropriate to base special education servicing on such unreliable methodology.

PSW models also lack empirical support for use in high-stakes decisions such as LD identification. Although such models align with the theoretical underpinnings of LD (Hale et al., 2008), there is not currently research to support their use in LD identification. Study 1 showed that participants demonstrated approximately 74%

identification consistency using the PSW approach to LD identification. Given that study 1 exclusively focused on the use of cognitive and achievement data in LD identification, consistency of identification was dependent upon the identification method used and not other potential variables (e.g., student background, behavior, parent interview). Use of PSW in this study did not result in consistent LD identification. It is particularly concerning that PSW approaches are being used in such high-stakes decisions without empirical support (Miciak et al., 2014a). The underlying concept of PSW models is somewhat appealing when considered within the context of how LD is currently defined (i.e., psychological processing disorder) and there are a considerable number of non-empirical publications arguing for this approach. However, without empirical support regarding LD identification, it seems premature to allow for use of such approaches in high-stakes special education identification decisions.

When used in LD identification, RtI models also demonstrate some inconsistency as evidenced in this project and additional validation studies are therefore needed (Burns et al., 2008). Participants demonstrated 79% LD identification consistency in study 1, which suggests that using RtI may not result in consistent LD identification decisions. However, only RtI models utilize intervention to lead to improved student outcomes, which is a fundamental component of classification frameworks (Cromwell, Blashfield, & Strauss, 1975). RtI models are designed to provide quality core instruction to all students and tiered intervention supports for struggling students (Reschly, 2008; Marston, 2005). Although differences across identification methodologies were not found, the studies discussed in this paper suggested that participants made overall inconsistent identification decisions. However, at least within RtI models, struggling students are

provided appropriate support services in the meantime. Students should receive instruction and intervention support matched to student need (Batsche et al., 2005; Burns et al., 2006). Such services are likely to result in positive student outcomes (Burns, 2002) including increased student learning (Burns et al., 2005; Kovaleski et al., 2013) and reductions in the number of students identified for special education (Kovaleski et al., 2013; Marston et al., 2003; Sornson et al., 2004; Tilly, 2003). Implementing other practices at this time not only lacks an evidence base, but also is arguably inappropriate as students in need may not receive necessary support services.

### **Implications for Research**

Additional research is needed on LD identification decisions. Validation of current LD identification decisions is necessary to ensure that students are appropriately identified and serviced (Fletcher, Lyon, Fuchs, & Barnes, 2007). Validity refers to the interpretation of test scores, rather than the test scores or the tests themselves (Kane, 1992). Thus, LD identification methodology should lead to valid interpretation regarding the presence or absence of LD. However, research shows that the use of IQ tests in ability achievement discrepancy and PSW in LD identification does not result in valid decisions concerning LD identification (Algozzine & Ysseldyke, 1982; Miciak, 2014a; Vaughn & Fuchs, 2003) and previous studies as well as the current study show that decision-makers do not consistently identify students as LD or non-LD (Epps, Ysseldyke, & McGue, 1984; Gresham, 2002). Thus, additional research on LD identification methodology is necessary to ensure consistent identification and ultimately, valid identification decisions.

## Conclusion

Special education identification decisions are arguably one of the most high stakes decisions that occur in schools. Reliability of data used for high stakes decisions should exceed .90 for any one subgroup (Salvia, Ysseldyke, & Bolt, 2012) and therefore the inconsistency evidenced in this project is particularly concerning. Although there are arguments regarding special education services' ineffectiveness (Fuchs et al., 2010; Kavale & Forness, 2000), when research-based instructional and intervention approaches are implemented with students with disabilities, improved student outcomes are evident (Fuchs et al., 2013; Graham et al., 2013; Lovett et al., 2013). Therefore, evidence suggesting a lack of effectiveness of special education services may be more reflective of a research to practice gap rather than true ineffectiveness of special education (Burns & Ysseldyke, 2009). Thus, it is still necessary to consistently identify students to ensure that student needs are appropriately met as research-based practices are being implemented in schools at a growing rate in response to federal legislation (i.e., NCLB, 2001). Additional research is needed to examine the reliability, validity, and utility of decisions made using LD identification methods particularly RtI and PSW. In the meantime, making LD identification decisions based on unreliable methods could have serious consequences for students with learning difficulties who may not have their unique learning needs met as a result of such decisions. Providing additional academic support within the decision-making process and outside of special education services is arguably the most defensible practice in light of current evidence regarding LD identification.

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