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Personality Differences Between RTI-Oriented and Neuropsychological Assessment-Oriented School Psychologists

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PERSONALITY DIFFERENCES BETWEEN RTI-ORIENTED AND
NEUROPSYCHOLOGICAL ASSESSMENT-ORIENTED
SCHOOL PSYCHOLOGISTS

A Dissertation

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Requirements for the Degree

Doctor of Education

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In recent years, there has been an ongoing, polarizing debate within the field of school psychology over the use of Response-to-Intervention (RTI) methods versus cognitive processing/neuropsychological assessment methods for the identification of learning disabilities (LDs). Although this debate has been conceptualized in a number of ways, personality-which has been shown to yield an influence on school psychologists' preferred role and job satisfaction-has not yet been explored as a potential influence on orientation to LD identification method. The purpose of the present study was to examine the personality characteristics of school psychologists at opposite ends of this debate. A secondary purpose of the study was to explore which points of contention, with regard to LD identification, contribute to the differentiation of RTI and neuropsychological assessment-oriented school psychologists. Holland's (1985) Theory of Vocational Personality and Work Environments, a well-validated theory that has been applied to school psychologists in previous research, was used to conceptualize personality.

An extreme-groups sampling method was used to recruit participants likely to hold strong opinions regarding LD identification methods. Peer nomination by an expert in the RTI field and direct appeals were used to recruit RTI-oriented participants while school psychologists who received the American Board of School Neuropsychology

(ABSNP) diplomate were recruited as neuropsychological assessment-oriented participants. These participants received a Qualtrics survey comprised of a demographic data form, LD identification orientation questionnaire developed by the researcher, and the Self-Directed Search (SDS; Holland, 1994). The response rate was 37%. To answer research question one, 32 RTI-oriented participants were matched with 32 neuropsychological assessment-oriented participants on variables likely to influence orientation to LD identification method.

Results indicated no significant associations between orientation toward LD identification method and vocational personality in frequency of personality type or strength of personality. Examination of both modal first-letter codes and mean SDS scores suggested that both RTI and neuropsychological assessment-oriented participants exhibited a Social vocational personality. Both groups were also strongly oriented to the Investigative vocational personality.

The LD identification orientation questionnaire was highly reliable. Cronbach's alpha coefficients were above .90 for the RTI and neuropsychological assessment scales, which were comprised of items favorable to each respective orientation. High levels of agreement on either scale were associated with lower levels of agreement on the opposing scale. A logistic regression analysis using all LD identification orientation questionnaire items indicated that the best-fitting model was significant ($p < .0005$) and included two RTI-favorable and two neuropsychological assessment-favorable questions. Three of these items made significant contributions ($p < .05$) to the model's accuracy and together, reflected a considerable improvement over a constant-only model. The model correctly classified 92.6% of RTI-oriented participants and 99.2% of

neuropsychological assessment-oriented participants. Knowing the response to two items relating to assessment of LDs increased the chances of correctly classifying participant orientation by at least 13 times. The results supported Holland and Gottfredson's (1996) conceptualization of school psychology as a Social occupation, although less variability in vocational personality was seen in the current sample compared to previous research. The results also suggested that RTI and neuropsychological assessment-oriented school psychologists are more alike than different and, as Social types, are predisposed to value agreeability rather than divisiveness. Additional theoretical and applied implications are discussed and recommendations for future research are offered.

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I would like to dedicate this project to my family, whose support and encouragement were indispensable in its completion. To my parents, thank you for providing the inspiration to continue with my education and for both the emotional, and financial, support when I needed it. To my husband, Steve, who was an endless source of motivation, patience, and encouragement: words cannot express how lucky I am to have you by my side.

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CHAPTER 1

INTRODUCTION

Overview

Disagreement over professional practice is as apparent within the helping professions as it is in other professions. Professional psychology (e.g., Peterson & Levant, 2000) and social work (e.g., Eppler, 2007) are two examples of helping professions in which members have had tense or protracted conflicts over their roles, preferred practice, and direction of their field. In the case of the American Psychological Association (APA), interest-based factions with different foci and preferences for practice were an influential factor in the reorganization of APA and the creation of a number of divisions representing the specific needs of these interest-based groups (Peterson & Levant, 2000). In 1956, McEwen studied preferences for practice and professional orientations in psychiatrists and concluded that when discrepancies between orientations and administrative-guided practice arise among professionals within an organization, a protest movement begins to develop within that organization.

The field of school psychology has also had its share of conflicts. In the past, school psychologists have debated the virtues of a clinical versus an educational approach to services, psychoanalysis versus alternative forms of psychotherapy, the effectiveness of phonics versus whole language methods of teaching reading, or whether projective tests and analysis of intelligence test profiles should be a part of school psychological practice (Willis & Dumont, 2006; Woody, 2009). In recent years, there has been an ongoing, often polarizing, debate over the use of Response-to-Intervention (RTI) methods versus cognitive processing/neuropsychological assessment

methods for the identification of learning disabilities (LDs). Yet, this debate may be the most divisive to date and has the potential to create factions within the still united field of school psychology (Burns et al., 2006).

In this chapter, the current debate as it has played out within the literature and among practicing school psychologists will be outlined. The growing disagreement within the field and the growth of school neuropsychology as a specialty within school psychology will also be discussed. An overview of Holland's (1985) theory of vocational personality will then be introduced, as a means of examining the differing personalities that may distinguish between these professional factions. Finally, a rationale for the importance of the study will be offered.

The Debate

The debate over how best to serve struggling students-and in particular those suspected of having learning disabilities-has played out within the school psychology and special education literature. Subsequently, a number of studies canvassed school psychologist practitioners regarding the identification of learning disabilities and found less polarized opinions than those expressed within the professional literature.

Characterizations Within the Literature

Response-to-Intervention (RTI), which refers to a systematic set of procedures that matches student need to intensity of intervention, is frequently offered as a solution to the shortcomings of traditional assessment models for LD identification. Likewise, cognitive processing and neuropsychological assessment approaches to LD identification, which utilize tests based on cognitive neuroscience in a theory-driven manner overcome many of these shortcomings. However, those that believe cognitive

or neuropsychological assessments are necessary for the identification of LDs acknowledge the benefits of RTI as a prereferral strategy (e.g., Feifer, 2008; Kavale, Kaufman, Naglieri, & Hale, 2005; Reynolds & Shaywitz, 2009; Zach, 2005). It is difficult to locate special education or school psychological literature in which the authors completely oppose the application of RTI procedures in any form. Distinct differences emerge when RTI is proposed as the sole basis for diagnosing LDs (Batsche, Kavale, & Kovalski, 2006). Unfortunately, the debate becomes divisive, personal and political only when it turns to the sole use of RTI or cognitive processing assessment for this purpose.

The term *learning disabilities* refers to a group of disorders that impair a student's ability to acquire and use listening, speaking, reading, writing, reasoning or math abilities. These disorders are presumed to be the result of dysfunction in the central nervous system (Reynolds & Shaywitz, 2009) and are unexpected in light of the student's achievement in other areas (Mellard, Deshler, & Barth, 2004). Since the passage of the first federal special education law in 1975, the Education for All Handicapped Children Act (EAHCA; PL 94-142), the regulatory definition of what constitutes an LD has barely changed (Willis & Dumont, 2006). This definition maintains that an LD is the result of a disorder in the basic psychological processes that impair a student's ability to learn, think or use language effectively. To operationalize this unexpected underachievement, the United States Department of Education (1977) specified the use of a discrepancy formula that contrasted a student's intellectual abilities with his or her current level of academic achievement (Aptitude-Achievement Discrepancy; Holdnack & Weiss, 2006; Mellard et al., 2004).

Since that time, debates revolving around the LD construct and its operationalization have saturated the special education and school psychology literature due, in part, to the prevalence rates of LD in special education populations (Reschly & Ysseldyke, 2002). Identification of LDs have increased 200% over the last 10 years (VanDerHeyden, Witt, & Barnett, 2005) and LD students make up 50% of all special education students and about 5.2% of the school-age population (Reschly, 2008). At the turn of the century, the most frequent professional role for school psychologists involved comparing an IQ test to an achievement test in the search for a significant discrepancy that served as the marker for LD (Reschly & Ysseldyke, 2002). The current debate between those who advocate for a comprehensive evaluation of the cognitive processes implicated in learning disabilities and those who believe that learning difficulties are best ameliorated by providing immediate intervention and monitoring the student's response is due, in part, to dissatisfaction with this practice (Mather & Kaufman, 2006). Thus, RTI evolved as a remedy to this eligibility determination process (Shinn, 2007).

Traditional assessment approaches. Assessment of cognitive abilities and processes for the purposes of classification has been the traditional role for school psychologists (Burns & Coolong-Chaffin, 2006; Hosp, 2006; Sullivan & Long, 2010). The methods by which school psychologists conduct special education eligibility evaluations have been driven by the prevailing view of factors related to learning difficulties. Yet, professionals from several disciplines have struggled to agree not only on the definition of an LD, but on the appropriate way to assess and operationalize it (Mather & Gregg, 2006).

Proponents of assessment suggest that RTI cannot determine why a student has failed to learn (Mather & Kaufman, 2006). Therefore, evaluating the integrity of cognitive processes is necessary not only to rule out an intellectual disability but to identify limitations in the basic psychological processes that, according to the federal definition, are the essence of a learning disability (Wodrich, Spencer, & Daley, 2006). Thus, to ignore these processes is to fundamentally alter the basic concept of learning disabilities (Kavale et al., 2005; Mather & Gregg, 2006; Reynolds & Shaywitz, 2009). Other assessment proponents suggest that the misapplication of the discrepancy formula, which helps to differentiate low achievement from a learning disability, should be eliminated rather than the discrepancy model or the practice of cognitive processing assessment (Kavale et al., 2005; McKenzie, 2009; Willis & Dumont, 2006). Researchers have presented evidence that students with LDs demonstrate cognitive processing differences their typically-achieving peers do not (Fiorello, Hale, & Snyder, 2006; Johnson, Humphrey, Mellard, Woods, & Swanson, 2010). Yet, some proponents of the elimination of cognitive assessments for LD determination do not report this evidence (Hale, Naglieri, Kaufman, & Kavale, 2004; Miller, 2007) or refer to these cognitive processes as hypothetical (e.g., Reschly, 2008).

The response-to-intervention approach. Response-to-Intervention (RTI) is a systematic, data-based means of providing early intervention for academic and behavioral difficulties to all students, regardless of disability status (Fuchs & Fuchs, 2006). While various models have been implemented and studied, all RTI models have three general commonalities: universal screening of all students for academic or behavioral problems, progress monitoring of at-risk students, and the provision of

increasingly intensive interventions based on the student's response to a scientifically-validated intervention. Information on this response can be used to guide decisions concerning modifications to the intervention or special education eligibility (VanDerHeyden, Witt, & Gilbertson, 2007). RTI has also been hailed as an alternative to the use of the discrepancy model for identifying learning disabilities. With the passage of the 2004 amendments to the Individuals with Disabilities Education Improvement Act (IDEIA; PL 108-446), RTI advocates (e.g., Fletcher & Vaughn, 2009) contend that changes to the SLD category, which prohibit states from requiring use of the discrepancy model and allow use of models that focus on a child's response to an intervention, constitute explicit, regulatory support for RTI as an SLD identification method.

Ardent RTI supporters contend that cognitive or neuropsychological assessment is unnecessary and provides no useful information for treatment (Burns et al., 2006; Fletcher, Coulter, Reschly, & Vaughn, 2004; Gresham, Restori, & Cook, 2008). Rather, administering time-consuming and costly cognitive or neuropsychological testing delays the provision of interventions and has not been shown to identify a unique subset of students or lead to improved outcomes (Batsche et al., 2006; Fletcher & Reschly, 2005; Reschly, 2005; Tilly et al., 2005). Conversely, RTI minimizes the role of intelligence tests and higher-inference cognitive-processing assessments by providing support based on student need, regardless of label, before failure (Fletcher & Vaughn, 2009). Thus, unlike the traditional assessment model, RTI's primary focus is on the learning context and assumptions about the underlying causes of learning difficulties are not necessary (Speece, Case, & Molloy, 2003). RTI supporters contend that examination of

large-scale implementation of RTI models suggests that the use of an RTI approach to determine eligibility for special education leads to fewer special education placements overall and is less biased toward minority students (Burns & Ysseldyke, 2005; Speece et al., 2003).

The Extent of the Debate

In the literature, the debate over RTI versus cognitive or neuropsychological test-based approaches to LD identification has evolved into a schism, with each alternative presenting opposing views and criticisms of the others'. While there are a number of researchers who advocate for a more balanced approach to confronting academic difficulties (e.g., Kavale, Kauffman, Bachmeier, & LeFever, 2008; Reynolds & Shaywitz, 2009; Hale, Kaufman, Naglieri, & Kavale, 2006; Willis & Dumont, 2006; Wodrich et al., 2006; Witsken, Stoeckel, & D'Amato, 2008; Schmitt & Wodrich, 2008; Feifer, 2008; Fiorello et al., 2006), a number of researchers, many who are influential voices within the school psychology field, continue to promote school psychological practices that rely on one model at the expense of the other. Unfortunately, the debate has become polarized and divisive, breaking down into opposing camps of what Ikeda refers to as good guys and bad guys and fostering a "psychology of politics...of hatred" (Ikeda, 2005, para. 10). The literature supporting both sides of the argument feature articles with strongly-worded titles such as "self-congratulation" (Kavale et al., 2008), "competing views" (Batsche et al., 2006), "watch-them-fail" (Reynolds & Shaywitz, 2009), "perpetuating old ideas" (Fletcher & Reschly, 2005), and "poorly supported ideas" (Kavale et al., 2005). At times, language utilized in the literature advocating for either the RTI or cognitive assessment position has been so strong as to "demean the

contributions of the other approach” and has fostered “divisiveness and derision” (Hale et al., 2006, p. 754).

School Psychologists’ Opinions

While RTI has strong support of some national school psychology leaders, its support is not as strong among practicing school psychologists, who appear to be more measured in their enthusiasm for RTI and their approach to LD identification (Caterino, Sullivan, Long, & Bacal, 2008). Using surveys, researchers have demonstrated that practicing school psychologists acknowledge the merits and are willing to incorporate aspects of both RTI and cognitive assessment approaches in their practice (Machek & Nelson, 2010; Mike, 2010; Sullivan & Long, 2010). Only when the use of RTI is contrasted with use of the IQ-Achievement discrepancy approach do practitioners overwhelmingly prefer the use of RTI for LD identification (O’Donnell, 2007; Raso, 2009).

The majority of practicing school psychologists tend to avoid aligning themselves with one approach or another. Caterino et al. (2008) surveyed attendees at a state school psychology conference in a southwestern state and found that 98% of the practicing school psychologists in their sample did not believe that RTI should be the sole criterion for LD eligibility determinations. Likewise, Cangelosi (2009) demonstrated that 85% of school psychologists agreed that a combination of RTI and standardized, norm-referenced cognitive assessment approaches are the most defensible method of identifying learning disabilities.

Perceived origins of LDs, exposure to RTI, and training in RTI have been identified as factors that mediate school psychologists’ preferences for one approach

over another. Raso (2009) surveyed practicing school psychologists, administrators and teachers in New York state regarding RTI and discrepancy methods for LD identification and found that as attributions of LDs shifted toward biological or environmental influences, preference for the discrepancy approach increased. O'Donnell and Miller (2007) found that for practicing school psychologists, additional exposure to the RTI model increased acceptability for the use of RTI as a LD identification method. Likewise, acceptability for the discrepancy model decreased with increasing exposure to the RTI model. Similarly, Mike (2010) surveyed members of NASP (78% of whom were practicing in public schools) and found that 80% of respondents agreed with RTI as a pre-referral method but only 48% agreed with RTI as the sole method of LD identification. When RTI is contrasted with the IQ-Achievement discrepancy model, this number jumps to 59%. Seventy-six percent of respondents agreed with a need for cognitive testing for LD identification, yet increased RTI training opportunities led to higher favorability ratings for the RTI approach.

It appears as though the divisiveness that characterizes the RTI versus assessment debate predominates within the school psychology and special education literature. Surveys of school psychologists' opinions have failed to uncover large-scale polarization at the practitioner level. Indeed, a national study conducted by Macheek and Nelson (2007) regarding practicing school psychologists' preferred operationalization of reading disabilities suggests that practicing school psychologists are significantly less zealous in their endorsement of either approach than are journal editorial board members in the LD field. Yet, sampling method and participant pool appear to impact survey results substantially and no studies taking into account internal factors other than

perceived origins of LDs have been undertaken. In addition, Machek and Nelson note that, in previous studies, journal editorial board members overwhelmingly favored RTI compared to the discrepancy model, yet no clear consensus emerged on what constitutes a valid alternative means of identifying LDs. Some members of the school psychology and LD field believe school-based neuropsychological assessment provides such an alternative.

School Neuropsychology

With the technical and conceptual shortcomings of the traditional psychoeducational or intellectual assessment model for identifying LDs, RTI supporters maintain a strong stance in the debate by framing the traditional approach as hypothetical, outdated, and invalid. Yet, with the rapidly expanding field of neuroscience, the vast research base that links cognitive/neuropsychological processes to LDs (Hynd & Reynolds, 2005) and the number of psychometrically-sound neuropsychological instruments available to school psychologists (Hale et al., 2006), neuropsychological assessment has entered, and arguably altered, the current debate over LD identification (Zach, 2005). School neuropsychology, as a distinct mode of practice that integrates neuropsychology and education and applies it to the assessment and intervention process (Miller, 2007), has matured alongside these developments.

Maturation of School Neuropsychology

In 1981, Hynd and Obrzut first outlined the need for a specialty in school neuropsychology. Since then, brain research has increased exponentially and with it, a better understanding of the neurobiological bases of learning and behavior (Witsken et

al., 2008). Over the past 30 years, numerous tests have been published that are based on advanced neuropsychological theory, are psychometrically-sound and designed specifically for the neuropsychological assessment of children within the clinical and school setting. In the 1990s and 2000s, textbooks, professional organizations and certifying boards devoted to the practice of school neuropsychology emerged, as did graduate school psychology training programs that integrate clinical neuropsychology into their coursework (Miller, 2007; Witsken et al., 2008). These advances in school neuropsychology, along with the continuing conceptualization of LDs as neurologically-based (Learning Disabilities Roundtable, 2005; Lichtenstein, 2008) suggests that neuropsychological principles should be integrated into the practice of LD identification in order to meet regulatory standards as well as to identify those students who are likely to fail due to individual processing deficits that are identifiable only through a neuropsychological approach to assessment (Semrud-Clikeman, 2005; Wodrich et al., 2006).

Benefits of School Neuropsychological Assessment

Advocates of a school neuropsychological assessment approach to LD identification contend that these assessments provide information on the child's learning strengths and weaknesses that can help guide choice of intervention and reduce the blind, trial-and-error selection of interventions the RTI model infers (Holdnack & Weiss, 2006; Willis & Dumont, 2006). Using validated neuropsychological tests to identify the core deficit causing an academic problem is of the utmost importance, particularly because it opens the door to a substantial research base on processing impairments that are known to be related to academic functioning (Schmitt & Wodrich, 2008).

Studies from the neuroimaging and neuropsychological fields have demonstrated that complex cognitive and neuropsychological processes have been linked to academic achievement (Hale & Fiorello, 2004; Semrud-Clikeman, 2005). For example, we know that children with differing subtypes of reading disabilities exhibit different cognitive, memory, language, motor, attentional, and executive functioning profiles (Fiorello et al., 2006). Furthermore, some empirical evidence suggests that students with LD respond to brain-based teaching approaches that can be implemented once these neuropsychological deficits have been identified (Reynolds & Shaywitz, 2009; Semrud-Clikeman, 2005).

Rather than proposing school neuropsychology as a sole alternative to RTI, a great deal of the current school neuropsychological literature recommends integrating neuropsychological assessment into a multitier, problem-solving model similar to that used within an RTI approach (e.g., D'Amato, Crepeau-Hobson, Huang, & Geil, 2005; Feifer, 2008; Fiorello et al., 2006; Hale & Fiorello, 2004; Hale et al., 2006; Schmitt & Wodrich, 2008; Semrud-Clikeman, 2005; Willis & Dumont, 2006; Wodrich et al., 2006). Thus far, advocates of a school neuropsychological approach to identifying LDs have not maintained the extreme positions sometimes seen on the other side of the debate (e.g., Gresham et al., 2008; Reschly, 2008).

Changes Within School Psychology

Over the past 50 years, the school psychology literature has been filled with calls for a fundamental change in school psychology practice (Bradley-Johnson & Dean, 2000). Shortly after the passage of the EAHCA, which ushered in the school psychologist's role as gatekeeper for special education, calls for a shift in school

psychologists' roles from classification to prevention and intervention appeared within the school psychology literature. Although much of the school psychologist's role has remained unchanged, progress has been made in expanding the role to include prevention and systems-level responsibilities.

The emergence of RTI along with the legislative support afforded it represents the greatest and most formalized role change for school psychologists to date. NASP, through credentialing, training-program approval, and publications strongly supports RTI-focused activities for school psychologists and requires training programs to incorporate them into their curricula. The language in the No Child Left Behind Act (NCLB), which stresses scientifically-validated instruction and ongoing progress monitoring, and the Individuals with Disabilities Education Improvement Act (IDEIA) both directly and indirectly sanction RTI-based activities.

Both RTI and school neuropsychology have emerged as equally-formidable alternatives to the IQ-achievement discrepancy model. While RTI enjoys more explicit support within NASP and federal education law, school neuropsychology has become an established movement with its own empirical foundations, credentialing, training model, and standards for practice (Fletcher-Janzen, 2007). As noted above, surveys of practicing school psychologists have failed to uncover conflicting views to the extent seen in the literature. Nevertheless, dogmatic, attacking, and at times, ad hominem debates have played out among school psychologists with unyielding interests in one of these models, particularly on the NASP Listserv (Reynolds & Shaywitz, 2009; Willis & Dumont, 2006). Woody (2009), applying a social psychological perspective to organizational conflict, suggests that conflict will occur when resources are unequal

between subgroups within the same sphere. While there are influential and passionate voices supporting the growth of school neuropsychology, the fifth edition of *Best Practices in School Psychology* (NASP, 2008) dedicates a majority of its content to RTI and the problem-solving model upon which it is built.

While RTI and cognitive/neuropsychological assessment models can work together seamlessly within a comprehensive system of service delivery, their seemingly contradictory nature as a method of LD identification may portend at least some factionalization in the field of school psychology. Calls for a subspecialty within school psychology are already being made at multiple levels. Fletcher-Janzen (2007) notes that the interest and established activity within school neuropsychology has prompted some authors to call for a subspecialty within school psychology. Miller, Maricle, and Deornellas (2009) demonstrated that 52.7% of surveyed school psychologists believe the field of school psychology would benefit from recognizing subspecialties. As noted earlier, the reorganization of APA was partly a result of similar splintering among its members who held disparate opinions on the nature, purpose, and practice of professional psychology. It remains unclear whether the current debate over LD identification practices is rooted in a similar schism that reflects a field comprised of two distinct types of school psychologists.

Personality and Psychology

A significant amount of research has demonstrated the link between psychologists' personalities and their theoretical orientation (e.g., Chwast, 1978; Buckman & Barker, 2010; MacLennan, 2008). Using a random sample of NASP and APA clinical psychologists, Hollander (1995) demonstrated that personality, world view,

and theoretical orientation are correlated. For example, participants with cognitive-behavioral, eclectic, humanistic orientations exhibited significantly different personality profiles based on the Five Factor Model. Hollander's results also indicated that personality and world view predict theoretical orientation.

Zachar and Leong (1992) directly explored personality differences between psychology graduate students subscribing to either a *scientist* or *practitioner* perspective. Scientists were described as those that tend to value deeper scientific understanding of a problem, while practitioners were noted to be more comfortable with ambiguity. Using a research designed and validated instrument to identify participants' perspectives, participants with a scientist orientation obtained personality profiles that were judged to be the polar opposite of the practitioners' profiles. Between the scientist and practitioner groups, self-ratings revealed polar opposite theoretical orientations, leading the authors to conclude that these preferences have a strong personality component.

Holland's Theory of Vocational Personalities

The roles, practices and interests of school psychologists are influenced by a number of variables, both internal and external. Personality is one such intrinsic variable that can dictate in which role functions a school psychologist prefers to engage and how successful he or she will be in those roles (Itkin, 1966, as cited in Fagan & Wise, 2000; Roth, 2006). For example, socially-inclined, outgoing school psychologists will be more likely to enjoy and pursue cooperative, social roles such as consultation or staff development (Fagan & Wise, 2000). Indeed, Toomey (2001), relying on Holland's Theory of Vocational Personalities and Work Environments, found a correlation

between the vocational personality of school psychologists and desired time spent in particular roles. The small number of research studies that have been conducted on the personality of school psychologists have been conceptualized most often in relation to John Holland's Theory of Vocational Personalities and Work Environments.

Overview

Holland's Theory of Vocational Personalities and Work Environments is a very complete, frequently used and well-tested theory of career development (Toomey, 2001). Yet, despite its vocational appeal, the theory can also be applied to the description, understanding and prediction of behavior in a variety of settings (Gottfredson & Johnston, 2009). In this sense, the theory concerns competence and behavior as well as personality (Holland, 1985).

The central idea in Holland's theory is that people's personalities resemble a combination of six basic personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Each of these types is characterized by specific interests, preferred activities, beliefs, abilities, values, and characteristics (Nauta, 2010). Holland's theory further stipulates that one's chosen occupation is a manifestation of his or her personality. People, as well as occupational environments, can be categorized into combinations of the six major personality types and are indicated by a three-letter code representing the individual's most dominant types (Miller, 2002). For individuals, the first letter of the code reflects the personality type the person resembles most while the second and third represent the personality type the person next most resembles, in order (Toomey, Levinson, & Morrison, 2008). Similarly, occupations, or environments, can be characterized by their pattern of resemblance to six model environments that are

dominated by people with a specific personality type (Gottfredson & Johnstun, 2009). For example, a social environment is dominated by social personality types (Toomey, 2001). The proposed study will focus specifically on the vocational personality of individuals.

The personality code is determined via a number of self-report instruments, including the Self-Directed Search (SDS; Holland, 1994). The SDS is a self-administered instrument that assesses an individual's interests, competencies, opinions of a number of occupations, and estimates of his or her skills and abilities. Respondents rank themselves on each of six traits related to the six Holland types (R, I, A, S, E, and C), sum positive responses and arrive at a three-letter code representing degree of similarity to the six personality types. The SDS is a highly-reliable instrument with favorable validity and a strong research base attesting to its validity (Miller, 2002).

Holland's Theory Applied to School Psychologists

The *Dictionary of Holland Occupational Codes* (Gottfredson & Holland, 1996) lists school psychologists' code type as SEI. Thus, school psychologists have primarily Social, Enterprising, and Investigative personalities, in that order. Social types prefer activities that "entail the manipulation of others to inform, train, develop, cure, or enlighten" and have an aversion to "explicit, ordered, systematic activities involving materials, tools, or machines" (Holland, 1985, p. 21). These activities facilitate the Social person's development of interpersonal and education competencies. Primarily Social codetypes prefer engaging in social and ethical activities and problems, are motivated by understanding and helping others, and mainly employ social competencies to meet their goals (Holland, 1985).

School psychologists are also noted to be Enterprising and Investigative. Enterprising persons prefer activities that support the attainment of organizational goals or economic gain and tend to be averse to systematic activities. According to Holland, Enterprising types are motivated by political and economic achievement and, through their behavior, acquire strong leadership, persuasive and interpersonal competencies. While Holland's theory stipulates that Social and Enterprising types are similar to each other, the Investigative type is less similar to the Social type and considered to be the direct opposite of the Enterprising type. Investigative types pursue activities and occupations that allow them to utilize their scientific and mathematical competencies to investigate, understand and control physical, biological and cultural phenomena (Holland, 1985). Unlike Social and Enterprising types, the Investigative person is not especially persuasive but tends to be more reserved, intellectual, and scientifically-oriented. Thus, the vocational personality of school psychologists, as conceived by Gottfredson and Holland (1996) reflects the ever-expanding roles, functions, and competencies of practitioners (Fagan, 2008; Reschly, 2000).

In a study that represented the first empirical test of the vocational personality of school psychologists in the United States, Toomey, Levinson and Morrison (2008) demonstrated support for the three-letter SEI code. The modal code of participants, a random sample of NASP members, was SEI. However, mean scores for each of the six Holland personality types suggests that SIE also adequately reflects the vocational personality of school psychologists. While both codes demonstrate that Social personality types dominate school psychology, the opposing natures of the Investigative and Enterprising types suggests the field is comprised of a wide range of personalities

with differing interests, motivations, and competencies. Indeed, in an investigation of school psychologists' vocational personalities, job roles, and job satisfaction, Toomey (2001) found significant correlations between primarily Social code types and desired time spent in counseling and consultation. High scorers on the Enterprising scale desired greater involvement in administrative activities and less involvement in assessment. In addition, highly Investigative types desired increased time engaged in research. In general, then, a school psychologists' personality is manifested in the role one enjoys and in which he or she chooses to engage.

Roth (2006) explored the interaction between self-efficacy and Holland vocational personality type for school psychology graduate students and practitioners in Arizona. An examination of differences in personality type based on academic or professional development level and gender revealed that professional school psychologists reported greater interest in Realistic-type employment compared to graduate students. Put another way, graduate students Holland codes matched the conventional SEI designation significantly more than professional-level school psychologists, whose codes departed more often from the SEI code. In addition, female school psychologists had significantly higher scores on the Enterprising and Conventional scales. Similar to Toomey's (2001) findings, Roth found that psychologists with lower scores on the Investigative and Conventional (i.e., clerical employment interests) scales and higher Enterprising scale scores reported greater self-efficacy with regard to their interpersonal skills and lower self-efficacy with regard to research skills.

In summary, most school psychologists have been found to consistently exhibit the competencies, interests, and motivations that characterize the Social-Enterprising-

Investigative vocational personality. Studies indicate that practicing school psychologists are more satisfied and confident when engaging in activities that correspond with their vocational personality.

Statement of the Problem

RTI and school neuropsychology have emerged as formidable alternatives to the use of traditional, discrepancy-based approaches for the identification of LDs. Both of these approaches have the explicit, steadfast support of a specific group of leaders and researchers in the field of school psychology. Such resolute support is also evident among school psychologists who read and respond to comments in NASP's RTI Listserv, although practitioners are not nearly as fervent or divided in their opinions of these two approaches. Thus, the schism that has developed within school psychology is being perpetuated by a very specific, but still unidentified, group of people. The resulting polarization may portend the emergence of two distinct subspecialties within the field of school psychology. There is no doubt that the views of these two factions are supported by differing philosophical and theoretical foundations. However, it is unclear whether or not the schism is being sustained by two groups of school psychologists with differing personalities.

Within the literature, the RTI vs. assessment debate has been conceptualized in a number of different ways (e.g., medical model vs. legal model, cognitive psychology vs. behaviorist orientations). Yet, the underlying personality and vocational interests of those who comprise these two factions have not been explored. Fagan (2002a) called for research into the variables that most influence changes in school psychological practice rather than a consistent focus on training and policy development variables.

Although Fagan suggested that case studies and qualitative research could accomplish this, examination of personality and demographic variables may be equally important. In light of the potential for two distinct subspecialties to emerge in the field of school psychology, an exploration of these variables within the two groups seems warranted.

Despite the influence personality characteristics play in the school psychologists professional role (Itkin, 1966, as cited in Fagan & Wise, 2000), very little is known about the personalities of those who go into the profession of school psychology (Roth, 2006). A few studies have used Holland's Theory of Vocational Personality and Work Environments to conceptualize the personalities of school psychologists. According to Holland's theory, people in the same occupation have similar personalities and interests and will respond to similar situations comparably. This has not always been the case in school psychology. Aside from the current debate, school psychology as a field has countenanced widespread disagreement over identity, roles and practice. Because school psychology is a profession in which practitioners engage in a wide variety of roles and functions, each calling upon specific skills and personal attributes (Fagan & Wise, 2000), it can effectively support substantial variability in vocational personality.

Purpose of the Study

The current, and very possibly the most divisive schism to date, may suggest that the personalities of those school psychologists perpetuating this debate are more discrete than those of larger, random samples of school-based practitioners. These studies (e.g., Toomey, 2001) found support for Gottfredson & Holland's (1996) SEI code type for school psychologists. However, the personalities of those school psychologists who are most likely to maintain interests, motivations, and competencies less similar to

those of mainstream school-based practitioners have not been specifically studied.

Therefore, the current study sought to examine the personality characteristics of school psychologists at opposite ends of this spectrum: those who strongly believe in RTI and those who strongly believe in the use of standardized, norm-referenced cognitive processing or neuropsychological assessment for the identification of learning disabilities.

Research Questions and Hypotheses

The following research questions were explored through the personality differences among RTI and neuropsychological assessment-oriented school psychologists study:

1. Is there a difference between RTI-oriented and neuropsychological assessment-oriented school psychologists in terms of vocational personality?

Hypothesis: Vocational personality differences will emerge between RTI and neuropsychological assessment-oriented school psychologists. The RTI-oriented group will produce a vocational personality with “S” as the first letter. The neuropsychological assessment-oriented group will produce a code with “I” as the first letter.

2. Which points of contention with regard to LD identification contribute to the differentiation of RTI and neuropsychological assessment-oriented school psychologists?

Problem Significance

In 1999, Oakland and Cunningham (as cited in Fagan & Wise, 2000) suggested that sources of tension in the field must necessarily be resolved for the field of school

psychology to move forward. One tension identified by Oakland and Cunningham, traditional versus emerging assessment practices, has become a central focal point of the current schism. Assessment practices are integral to school psychology services and complement all other roles of the school psychologist (Fagan & Wise, 2000). Therefore, any large-scale changes to the time-honored assessment model in which most school psychologists are trained will likely cause friction within the field.

Oakland and Cunningham also suggest that the tension between unity versus plurality also threatens the field of school psychology. Thus, like APA in the 1940s, the field of school psychology may be at a crossroads where differing opinions on roles and practices could fuel membership growth as well as factionalization within the organization (APA, 2012). Fagan (2002a) adds that “the plethora of positions reveal that the point has been exceeded where a school psychologist can be trained to perform all roles and functions with competence or to be all things to all people” (p. 7). Given Miller et al.’s (2009) finding that a majority of school psychologists believe the field would benefit from recognizing subspecialties, plurality, rather than unity, in the roles and identity of school psychologists seems likely.

Personality has been identified as a variable that can dictate in which role functions a school psychologist prefers to engage and how successful he or she will be in those roles (Itkin, 1966, as cited in Fagan & Wise, 2000; Roth, 2006). Yet, very little is known about the personalities of school psychologists (Roth, 2006). Therefore, more information on their personalities as well as the factors associated with school psychologists’ orientations toward one approach or another is warranted. Identifying any vast differences in vocational personalities may help leaders in the field assess the

risk for disaffection among particular school psychologists as well as the opportunity for like-minded people with similar personalities to collectively foster role expansion. In addition to helping NASP and school psychology leaders prepare for any upheaval that may accompany the emergence of subspecialties or organized factions within the field, recognizing the disparities in the personalities of those at opposite ends of the current schism can help training programs prepare school psychologists for role expansion and role change more readily, something that the field of school psychology has not been particularly effective at doing in the past (Fagan, 2002a).

Definitions

The following terms have been defined for use within the context of this study:

Cognitive Assessment – Unless otherwise noted, this term refers to an evaluation conducted by a trained school psychologist designed to identify cognitive, psychological processing, and academic strengths and weaknesses as well as illuminate barriers or facilitators of learning. This evaluation usually involves, but is not limited to, the use of standardized tests of cognitive processing, executive functioning, language capacity, memory and academic achievement. This evaluation may also include the use of intellectual assessment instruments such as the Wechsler scales or Stanford-Binet Intelligence Test. This term may be used interchangeably with the terms *psychoeducational assessment* and *cognitive/neuropsychological assessment*.

Current debate – The ongoing and intense debate between two groups of school psychologists: those who favor the sole use of response-to-intervention (RTI) procedures for LD identification and those who believe neuropsychological-based approaches to assessment are necessary for the LD identification.

Learning disability - a term referring to a group of disorders that impairs a student's ability to acquire and use listening, speaking, reading, writing, reasoning, or math abilities. These disorders are presumed to be the result of dysfunction in the central nervous system. The term does not apply to students whose learning difficulties are the result of sensory, motor, or emotional disturbances or mental retardation.

Response-to-Intervention (RTI) – A behaviorally-oriented model of service delivery that focuses on improved achievement for all students by matching student need with intensity of intervention. Using multiple-tiers, a student is provided with increasingly intense and individualized interventions depending on his or her response to prior interventions. Use of a problem-solving model, evidence-based interventions, consistent progress monitoring using curriculum-based measurement, and treatment integrity checks are core components of RTI.

School neuropsychological assessment – In the current study, this term will be used to refer to approaches to the assessment of learning difficulties that acknowledge the biological bases of behavior and are rooted in the principles of neuropsychology. The term also includes assessment approaches that examine cognitive processes and abilities, such as cross-battery assessment and process-oriented assessment.

School psychologist - A practitioner, trainer, or academician within the profession of school psychology who is employed in various settings including, but not limited to: public and private K-12 schools, preschools, residential institutions, mental health agencies, state departments of education, private practice, educational collaboratives, and colleges or universities. The term also includes specialist-level graduate students and doctoral candidates.

Vocational personality – Within Holland's (1985) theory, an individual's personality expressed as a drive toward social, conventional, realistic, investigative, artistic, or enterprising activities that is manifested in his or her chosen occupation. The vocational personality can be represented by a two-letter code generated by Holland's Self-Directed Search (SDS).

Assumptions

The rationale for the current study is based on two basic assumptions. The primary assumption is that those school psychologists with strong and resolute opinions on the utility and propriety of using and RTI versus a neuropsychological approach to identifying learning disabilities are essentially different types of people. Thus, if the current schism is viewed along a continuum, these two types of school psychologists are presumably situated at opposite ends of the spectrum. According to Holland's (1985) Theory, people in the same occupation have similar personalities and interests and will respond to similar situations comparably. However, this has not always been the case in the field of school psychology. Given the diversity in personality found by Toomey (2001) and Roth (2006), further exploration of the personalities of school psychologists, within the more focused context of the current debate over LD identification, is warranted.

Second, related to the primary assumption is the idea that these two types of school psychologists have differing motivations, interests and competencies that can be adequately conceptualized and reliably assessed according to a well-developed and validated theory of vocational personality.

Limitations

Due to the design of the study, there are limitations to the validity and generalizability of the results. Several threats to the internal validity of the study are related to instrumentation. The researcher developed an instrument that assesses orientation toward an RTI or neuropsychological/cognitive processing assessment approach to LD identification. While this instrument was piloted for assessment of its reliability and validity, study participants may have responded differently than pilot participants. Environmental conditions or time of year in which respondents may be more busy or engaged in specific practices may have impacted responses. Therefore, the instrument's reliability may have been somewhat limited.

Second, while the SDS has been shown to have adequate to good overall reliability and validity, the Investigative scale of the SDS has been noted to contain sex-biased items (Aronowitz, Bridge & Jones, 1985). While this study used an earlier version of the SDS and may not reflect the current version, the validity of the SDS may be somewhat limited for this reason.

The major threat to the external validity of the current study is the extent to which the results can be generalized to a target population. Results may generalize to those school psychologists who have strong opinions of RTI and assessment approaches to identifying LDs and are therefore likely to foster the organized development of subspecialties. Yet, the results cannot be generalized to the larger population of school psychologists who have shown themselves to be more measured in their opinions of the role of RTI and testing approaches to learning disability identification (Caterino et al., 2008). In addition, the population validity of the results may be threatened by individual

characteristics interacting with the chosen demographic and training variables. For example, the opinionated individuals in the study may be more likely to seek out RTI or neuropsychology training opportunities or credentials, thereby limiting the extent to which results can be generalized to opinionated but less assertive individuals. Finally, because participants will be volunteers, responses may be different from those who choose not to complete the study.

The second major threat to external validity concerns the extent to which the results can be generalized to another set of environmental conditions. First, the procedures used in the current study may have altered the responses of the participants. This may have occurred simply because they knew they were taking part in a research study and may have responded in ways considered more desirable. Second, the changing nature of the school psychologist's job, the knowledge base upon which practices are drawn, and the strengthening of the practitioner's skills and knowledge base suggests that the results of the current study will be valid only for a limited time period. Because additional training in RTI and years of experience impacts preferences for RTI (Mike, 2010), the results may not generalize beyond the time and conditions in which they were obtained.

Summary

In this chapter, an overview of the current debate over use of RTI vs. a neuropsychological assessment approach to LD identification was provided. Factors leading to the growth of RTI approaches and school neuropsychology were also discussed in light of the potential for growing discord within the field of school psychology. An overview of Holland's (1985) theory of vocational personality was

outlined as a basis for examining the differing personalities that comprise these opposing sides. Finally, a rationale for the importance of the study was offered.

CHAPTER 2

REVIEW OF THE LITERATURE

In the field of school psychology, the debate over the use of Response-to-Intervention (RTI) versus cognitive or neuropsychological test-based approaches to learning disabilities (LDs) identification has evolved into a schism. While this debate has played out within the literature and among national leaders in the field, practicing school psychologists are more moderate in their opinions. Advancements in the practices employed by those on both sides of the debate, such as school neuropsychological approaches and increasingly sophisticated RTI procedures, have not alleviated the polarization sparked by the debate. Thus, to understand the extent and possible outcomes of this schism, it will be helpful to understand the personalities of those perpetuating the debate. In the current study, Holland's theory of Vocational Personalities will provide a well-tested, practical method of understanding and contrasting these personalities.

Overview

This chapter will provide the historical context for the current study, including a comparison fractionalization within the American Psychological Association (APA), an overview of the special education reform movement, and a detailed review of the arguments in support of and opposed to both sides of the current debate. As a backdrop to these arguments, the issues and controversies surrounding the identification and treatment of LDs will also be discussed. Studies addressing the opinions of practicing school psychologists with regard to the identification of learning disabilities will be reviewed. As a defensible alternative to the use of RTI to identify

learning disabilities, the practice of school neuropsychology will be discussed in both a historical and present-day context. As it forms the basis for the study's rationale, the extent of the schism within the field of school psychology will be examined. Finally, a review of Holland's Theory of Vocational Personalities as well as its applications to school psychology will be offered, as it provides the framework by which the personalities involved in the current debate are contrasted.

Historical Perspective

In order to fully understand how the current debate evolved between those who favor psychoeducational, cognitive or neuropsychological assessment approaches for identifying LDs and those who favor RTI, an historical context is necessary. This section will provide a brief history of fractionalization within the APA as an analogy to the field of school psychology. In addition, background information on the reform movements in the special education and school psychology fields will offer additional historical context. Finally, a discussion of the factors leading to the emergence of RTI will facilitate understanding of how and why RTI was conceived and promoted as an alternative to the prevailing model of LD identification.

Fracture Within the APA

Four decades of research into organizational conflict suggests that conflict occurs at varying levels and sizes, such as within larger and smaller groups that comprise an organization, and that it can have positive or negative consequences. How that conflict is managed and assimilated has been found to determine the degree of functionality in the conflict's outcome (Speakman & Ryals, 2010). To provide both a context for and a window into one of the possible outcomes of the current schism within

the field of school psychology, a brief discussion of the events and consequences surrounding the fragmentation of the APA is warranted.

From its beginnings in 1892, the APA has countenanced debate over its true constituency and the type of psychology, whether applied or scientific-experimental, that it should represent (Benjamin, 1997; Bower, 1993; VandenBos, 1989). Since its formation, the central rift within the APA involved a view of psychology as primarily a scientific endeavor versus the view that psychology must apply scientific knowledge to “throw light upon the problems that confront humanity” (Witmer, 1897, as cited in Benjamin, 1997). In 1917, APA’s first special interest group (clinical psychology) was formed and by 1937 an offshoot of APA, the American Association for Applied Psychology, was formed to provide the professional identity, collegiality and assistance that APA did not offer its members with an orientation toward applied, rather than academic, psychology (Benjamin, 1997). In 1941, an APA subcommittee was formed to make recommendations for the use of psychology during World War II and to plan for the profession and science of psychology after the war. This subcommittee drafted plans to unify psychology and expand, as well as reorganize, the APA to more fully represent the subdivisions of psychology. In 1944, the 19 charter divisions, including both scientific and applied psychology, were adopted. These divisions were free to plan their own annual programs, generate revenue, elect officers, and recruit members (Benjamin, 1997).

For the next 40 years, the field of psychology became increasingly fragmented as psychologists became involved in an expanding range of activities (Bower, 1993). Yet, despite its efforts to meet the needs of its diverse membership, the pull between the

values, goals, and interests of research-academic members and practitioners continued. In 1988, after a period of intense conflict in which annual and organizational meetings were overflowing with intense debate and disagreement, a proposed reorganization plan was voted down (VandenBos, 1989). A cohort of members, dismayed at the APA's shift away from an academic/research orientation, formed the American Psychological Society (APS). The formation of the APS was viewed by many as a revolt against the APA power structure, which, over the previous 30 years, had become increasingly oriented toward private practice psychology (VandenBos, 1989). Rodgers (1990) notes that others considered it a logical consequence of the growing and changing nature of the field of psychology. More importantly, the APS maintained a clear conceptual basis and attracted members drawn more to their ideology than that of APA. Approximately 2/3 of APS members did not join the APA and, in its initial years, 1/3 of APS' membership resigned from the APA altogether.

Today, the APA remains a strong umbrella organization dedicated to meeting the needs of a wide variety of members through discussion and decision-making forums, a council of representatives and a complex governance structure. Yet, despite these mechanisms for conflict resolution, the wide range of interests and perspectives continues to provide fertile ground for recurrent conflict (VandenBos, 1989). Bower (1993) suggests that this process in psychology is essentially positive and should be labeled *specialization* rather than *fragmentation*. As a younger organization, the National Association of School Psychologists (NASP) may indeed experience these conflicts as a natural outcome of the maturation of a field with expanding applications and a growing membership. For example, NASP membership grew by 21% from 1999

to 2005 (Charvat, 2005). The pull within school psychology between the traditional, assessment-oriented and the reform-minded, RTI-oriented psychologists may be analogous to the tension between research-academic members and practitioners that has plagued APA since its inception. Organizational conflicts produce consequences, the impacts of which are dependent on the conflict's nature, the characteristics of the individuals involved, and the organizational membership's experience with previous conflict (Speakman & Ryals, 2010). As noted earlier, school psychology has managed to weather recurring conflicts over identity and practice. Yet, the current debate appears to be particularly more divisive than previous conflicts. It remains to be seen whether individual characteristics, such as personality, exert a moderating influence or precipitate further specialization.

Special Education Reform and the Paradigm Shift

The spirit of reform underlies not only the origins of school psychology, but the major turning points in practice and role function as well. Yet, perhaps no other factor has played a more direct, influential role in the field of school psychology than reform-leaning legislation.

School psychology's beginnings. From 1852 to 1918, the need for a more educated workforce and the desire to maintain the existing social structure and character prompted all 50 states to pass compulsory education laws, dramatically increasing enrollment (Field, 1976, as cited in Fagan & Wise, 2000). Among the students now attending school were those who were previously unsuccessful in school, those with medical conditions, physical defects or poor health and hygiene, poor children and immigrants, and those that had previously been referred to as

feeble-minded (Fagan & Wise, 2000). Medical examinations of large groups of children were undertaken, which in turn, prompted calls for methods of coping with children with mental or physical handicaps and planning for programmatic interventions. In order to do so, it was necessary to examine and select the students most appropriate for these oftentimes separate programs. The special education field, although in early form, was born and with it the *sorter* role for psychologists (Fagan & Wise, 2000, p. 108). Initially, school psychological services were clinical in nature and based on the work of Lightner Witmer, who founded the first psychological clinic at the University of Pennsylvania (Fagan & Wise, 2000). Often, these services involved administration of an intelligence scale, such as the Binet-Simon or later on, the Stanford-Binet Intelligence Scale for the purpose of classifying children for specific treatment programs. In the 1920s, the first training programs for school psychologists were opened and by the decade of the 1930s, the first doctoral program in school psychology at the University of Pennsylvania began. By the 1940s, the first state certifications, state associations and professionals devoted to school psychology emerged (Braden, DiMarino-Linnen & Good, 2001). As school psychology materialized as a profession with specific roles and standards for training, psychoeducational assessment became the primary function of school psychologists (Fagan & Wise, 2000; Fagan, 2002b).

The passage of the first special education law in 1975, the Education for All Handicapped Children Act (EAHCA; P.L. 94-142), dramatically increased the number of practicing school psychologists (Dwyer & Gorin, 1996). This law, which legislated the right to an appropriate education and protected student and parent rights, helped to formalize the *sorter* role. School psychologists quickly became gatekeepers for special

education (Reschly, 1988a). In addition, school psychologists also became *repairers* (Fagan & Wise, 2000, p. 108) who made recommendations for remediating academic problems and provided individual or group counseling to students with emotional or behavioral difficulties. Psychoeducational assessment and direct service to students and teachers, through consultation, took up the majority of the school psychologist's time (Fagan, 2002b). Yet, within a few years of the passage of the law, the special education field began slowly moving from a focus on within-child deficits and finding the correct diagnostic label that would ensure special education eligibility to examining the ecology of the child, building upon competencies and assessing outcomes (Reschly, 1988a, 1988b; Sheridan & Gutkin, 2000). The school psychology literature began to question the school psychologist's primary role of psychoeducational assessment, including its ability to provide information relevant to instruction, time and cost-effectiveness, narrow focus on the individual rather than the ecology in which he or she functions, the need to pathologize students rather than draw on competencies, lack of cultural sensitivity, and weak scientific foundation (Bradley-Johnson, Johnson & Jacob-Timm, 1995; Conoley & Gutkin, 1995; Dwyer & Gorin, 1996; Sheridan & Gutkin, 2000).

School psychology paradigm shift. From its earliest days, the medical model was the prevailing paradigm for school psychological practice (Canter, 2006; Sheridan & Gutkin, 2000). By the late 1980s to the early 1990s, the school psychology literature was characterized by newer, reform-minded calls for changes in how school psychologists conceptualized and delivered their services (e.g., Algozzine & Ysseldyke, 1983; Knoff & Batsche, 1991; Reschly, 1988a, 1988b; Wilson, 1991; Ysseldyke, Algozzine, & Epps, 1983). Within the literature, few other fields had seen so many calls

for role change over such a long period of time (Bradley-Johnson & Dean, 2000). School psychologists have always attempted to chart their own course and to do so by working within their ranks. Yet, changes outside the school psychology discipline, particularly in education and related legislation, have historically had a tremendous impact on the role and function of school psychologists (Ysseldyke & Schakel, 1983). Such changes would have tremendous implications for the practice of school psychology (Reschly, 1988a).

Only a few years after implementation of EACHA, position papers calling for reform (e.g., Reynolds & Wang, 1982) and empirical studies calling into question some of the foundations of special education practice, such as the concept of learning disabilities, (e.g., Ysseldyke, Algozzine, Shinn, & McGue, 1979) began to appear. In a review of factors leading up to the special education reform movement, Gersten and Woodward (1990) suggest that special education had become a *dumping ground* for low income and minority students, students who were difficult to teach but not necessarily disabled, and students receiving inappropriate instruction. The authors also cite the absence of exit criteria for special education, lack of a clear definition and conceptual basis for learning disabilities, inconsistency between the instructional methods and skills taught in special and regular education, and poor outcomes of special education as sources of dissatisfaction. In general, a shift in orientation from maintaining a focus on the root causes and cognitive deficits associated with learning difficulties to focusing on the instructional variables that facilitate learning was the driving philosophical force behind the special education reform movement. This ecological framework, which encourages attention to the multiple systemic influences

that impact a child's learning, stresses prevention and wellness rather than the search for pathology or individual differences (Sheridan & Gutkin, 2000).

The special education reform movement was typified by the Regular Education Initiative (REI). REI was an inclusion and accountability initiative that called for greater collaboration between regular education and special education with shared responsibility for the education and well-being of disabled students. REI appeared to have the greatest impact on students considered *mildly handicapped*, a category comprised primarily of students categorized as LD. At that time, school psychologists spent the majority of their time assessing and qualifying students with LD for special education. Thus, with REI, the role of the school psychologist was predicted to shift from the assessment of students for eligibility determination to an outcomes-oriented model with greater emphasis on the provision of remedial services within the regular education classroom through teacher consultation (Canter, 2006; Dwyer & Gorin, 1996).

In the early 1980s, two conferences on the future of school psychology (Olympia and Spring Hill) laid the groundwork for a role change for school psychologists. At these conferences, consensus built around the shortcomings of the traditional focus on eligibility determination using standardized tests (Reschly & Ysseldyke, 2002). The reform movement in both special education and school psychology gained momentum and in 1984, the document: *School Psychology: A Blueprint for Training and Practice* ("Blueprint I") was published by the National School Psychology Inservice Training Network. The original 16 domains of competence for training and practice were conceptualized as a move away from the school psychologist's heavily weighted role in assessment and eligibility determination. This paradigm shift reflected the vision of a

broader role for school psychologists. Conceptually, this role included more prevention, intervention and consultation-focused activities. While it has been suggested that the Blueprint I has driven the progress in school psychology training and practice (Ysseldyke et al., 2008), others suggest that Blueprint I may have simply mirrored existing trends in education, such as special education reform (Woody & Davenport, 1998).

At the national, state, and local level, the consistent call for educational reform was heard throughout the decade of the 1980s (Knoff & Batsche, 1991). During this time, reform-focused NASP position statements advocated for use of problem-solving methodology, intervening without labeling, and measuring the results of interventions (Dwyer & Gorin, 1996). By 1990, calls for educational accountability led to a focus on outcomes rather than on classification of disability (Canter, 2006). The EAHCA was reauthorized as the Individuals with Disabilities Education Act (IDEA) in 1991 and again reauthorized in 1997. By this time, the paradigm shift in school psychology practice was anchored in the school psychology and special education literature. Special education reform had taken hold and was reflected specifically in the emphasis on educating disabled students in the least restrictive environment and the adoption of a generic diagnostic label (i.e., developmental delay) for young children (Sheridan & Gutkin, 2000). In 1997, *School Psychology: A Blueprint for Training and Practice II* (Blueprint II) was published, providing the impetus for training school psychologists for a significantly broader role (Kaniuka, 2009). Blueprint II continued the move away from the traditional assessment and classification role and modified Blueprint I by updating domains of training and practice and emphasizing outcomes-oriented domains of practice

(Ysseldyke et al., 2008). One of these areas, data-based decision-making and accountability is perhaps the most important to the paradigm shift (Reschly & Ysseldyke, 2002).

At the turn of the century, the literature expanded to accommodate discussion concerning the future of school psychology and changes in the roles and functions of school psychologists as a result of special education reform and the accountability movement. At the time, the major national associations of school psychology (e.g., American Board of School Psychology, American Academy of School Psychology, Division 16 of the APA, NASP, Council of Directors of School Psychology Programs) agreed that school psychology was, again, at a crossroads (Cummings et al., 2004). Some school psychology leaders advocated for practicing school psychologists to use their interpersonal influence in a top-down manner through advocacy and legislative change to achieve role expansion (e.g., Sheridan & Gutkin, 2000). Others suggested change will be best accomplished proceeding from practitioners up to governing bodies by developing expertise in interpersonal influence, teacher training, and educational policy (see Pianta, 2000).

By the dawn of the new century, although evidence of change in the school psychologist's role could be seen among some practitioners and in a number of model programs (e.g., Heartland Problem-Solving Model, Pennsylvania's Instructional Support Teams), this change had not yet taken hold on a widespread basis (Bradley-Johnson & Dean, 2000; Kovalski, 2007; Reschly, 2000). School psychologists were spending 50-55% of their time completing psychoeducational assessments but significantly less time in prevention (23%) and intervention (20%) activities (Reschly, 2000). Despite a

literature base that reflected the philosophy and practices inherent in the reform movement and paradigm shift, school psychological practice remained largely devoted to the search for deficits instead of the identification and enhancement of strengths.

The LD construct and the paradigm shift. The vast majority of discussions on special education reform focus more attention on LD than any other category. The primary reason for this is the proportional dominance of LD in the special education population (Reschly & Ysseldyke, 2002). Shortly after the EACHA was adopted, the percentage of students identified as LD stood at less than 2 percent, but had increased immensely to 6 percent by 1999 (Fuchs & Fuchs, 2006). In 1983, Algozzine, Ysseldyke, and Christenson expressed grave concern over the rate of increase of LDs and the subsequent costs that would be borne by the education system. Based on surveys completed by a national sample of district special education directors, the authors estimated the rate of LD identification to increase 3% annually. They attributed this increase to the monetary incentives provided to districts by the federal government for increasing their numbers of disabled children as well as to the “fallacious” bases for LD identification practice and “woefully inadequate” LD definitions (p. 146). Identification of LD increased 200% in the 10 year period between 1995 and 2005, even as the special education reform movement and paradigm shift came to fruition (VanDerHeyden, Witt, & Barnett, 2005). At the turn of the century, the most frequent activity of school psychologists involved comparing one or more IQ tests to one or more achievement tests in the search for a significant discrepancy that served as the marker for LD (Reschly & Ysseldyke, 2002).

In the years leading up to the call for the paradigm shift in school psychology, dissatisfaction with the LD identification and treatment practices produced a vast literature base on the deficiencies in the ways special education services were delivered. This literature highlighted not only the financial burden of increasing numbers of students with LD but also the shortcomings in current practice with regard to the identification of LDs (e.g., Reschly, 1988a, 1988b; Ysseldyke et al., 1983), the construct of LD (e.g., Algozzine & Ysseldyke, 1983), and the utility of traditional assessment methods (e.g., Braden & Kratchowill, 1997; Deno, 1985). Subsequent sections of this literature review will provide a more thorough treatment of these issues.

The Emergence of RTI

In general, RTI is a systematic method of using data and resources to bring about changes in a student's learning and then using that information to evaluate performance. As a concept and practice, RTI evolved out of the special education reform movement and, in particular, dissatisfaction with the use of the IQ-achievement discrepancy model to identify LDs (Burns & VanDerHeyden, 2006; Fuchs, Mock, Morgan, & Young, 2003; VanDerHeyden et al., 2005). Since its inception, special education has relied on the deficit model and the search for normative differences in students as the foundation for providing individualized instruction. Yet, this orientation has been shown to be inconsistent with the desired role of school psychologists (Burns & Coolong-Chaffin, 2006). Despite calls for school psychologists to become the change agents (e.g., Bradley-Johnson et al., 1995; Conoley & Gutkin, 1995), RTI emerged from within the special education and school psychology literature. RTI evolved as a response to dissatisfaction with the prevailing special education paradigm in which the

search for deficits, lack of accountability, and use of special education as a dumping ground were central concerns. Yet, it was the legislated attention to data-based decision making that transformed the education culture and prepared it to embrace RTI as a conceptual foundation and distinct practice (Burns & Coolong-Chaffin, 2006).

Philosophical foundations. RTI reflects the school psychology paradigm shift and is rooted in the ecological perspective and the behaviorist orientation in school psychology (Fuchs et al., 2003; Gresham, 2004; Reschly, 2004), both of which gained prominence in the literature in response to concerns over special education practices. In contrast to the medical/deficit model which begins with the search for pathology, RTI focuses on the ecology by attending to the interaction between instruction and the student. From behaviorism, RTI borrows its attention to observable behavior rather than presumed cognitive dysfunction to solve problems of learning. Bloom's (1980) emphasis on *alterable variables*, or those variables that can be manipulated to bring about positive change in a student's learning or behavior, typifies this behaviorist orientation. In addition, RTI seeks empirical confirmation of an intervention's effectiveness through assessments that have a close relationship to observable performance within the curriculum (Deno, 1985; Reschly, 2004).

Reschly and Ysseldyke (2002) outlined the philosophical foundations of the traditional and alternative (i.e., RTI-based approaches) delivery systems for special education, referring to "Cronbach's two disciplines" (p. 3) of applied psychology: correlational and experimental. The authors suggest that the correlational discipline is more closely aligned with the traditional special education delivery model in which a disability is classified and treatment is then designed based on the naturally-occurring

characteristics of the disabled student. In contrast, the experimental discipline is closely aligned with paradigm-shift practices because of the attention to treatment control, measurement of baseline and outcomes, and functional, rather than deficit, assessment.

The special education reform movement and RTI, with its focus on accountability and outcomes, support practices rooted in the experimental tradition. Thus, they support the paradigm shift in school psychology practice. These practices are conceptualized to involve a shift from identifying and classifying deficits, focusing on process rather than product and matching characteristics and interventions to defining the problem, assessing functional academic behaviors, monitoring progress and evaluating outcomes. Central to this shift is a data-based, problem-solving method in which a problem is defined and evidence-based interventions are implemented, monitored and evaluated for their impact. Evidence-based interventions are interventions whose specific methods and practices have been identified and empirically-tested within a large-scale context. Thus, evidence-based interventions, in nature, are contrary to the traditional, deficit-oriented, correlational model of special education service delivery (Kratchowill & Shernoff, 2004).

RTI's beginnings. Although RTI primarily serves an accountability function designed to assess and ensure appropriate instruction and monitor educational outcomes, the RTI concept evolved from well-documented concerns about the identification of students with specific learning disabilities (Kavale, Kaufmann, Bachmeier, & LeFever, 2008). While RTI alleviates a number of concerns about special education practices, the bulk of this literature concerns use of the IQ-achievement

discrepancy as a means of identifying learning disabilities. Until the early part of the new millennium, there was little consensus as to what type of identification procedure should replace it (Hollenbeck, 2007).

The concept of using assessments tied directly to instruction to assess student response and determine eligibility is not new (Burns & VanDerHeyden, 2006). Yet, the term “Response to Intervention” and “RTI” did not enter the special education lexicon until 2001 when Gresham presented a “responsiveness to intervention” model at the Office of Special Education Programs’ (OSEP) Learning Disabilities Summit (Burns & VanDerHeyden, 2006). A decade earlier, Gresham (1991) had presented the idea of tracking a student’s resistance to behavioral interventions as a means of identifying him or her as behaviorally disordered. However, the idea of operationalizing this approach in order to identify learning disabilities was relatively novel. In his paper presented at the Learning Disabilities Summit, Gresham (2001) presented a model in which the discrepancy between IQ and achievement test scores was inconsequential. Instead, the discrepancy between pre- and post-intervention levels of performance would be used to classify students as learning disabled only if their academic performance did not change in response to a validated intervention. Soon thereafter, the President’s Council on Excellence in Special Education (PCESE) endorsed this RTI approach as an identification procedure for LD (Burns & Ysseldyke, 2005). By 2003, RTI as an LD identification procedure had been endorsed by OSEP, the Council for Exceptional Children, the International Dyslexia Association, The National Association of State Directors of Special Education, the National Center for Learning Disabilities, and the National Research Council (Fuchs et al., 2003).

With few changes in role and the continued dominance of the refer-test-place function of school psychologists (Curtis, Hunley, & Grier, 2002), leaders in the field of school psychology became concerned. These leaders organized and participated in the 2002 Conference on the Future of School Psychology (Futures Conference). The primary aim of the Futures Conference was to identify goals and critical issues for school psychology in the 21st century (Cummings et al., 2004). A consensus statement reflected participants' desire to move away from the gatekeeper role and toward the ecological perspective. Goals for school psychology's future were distilled from participants' responses to surveys, focus group questions, and solicited essays. Major goals included training practitioners in the use of a data-based problem-solving model to implement evidence-based interventions and implementing a public-health model of prevention and intervention. The term response-to-intervention cannot be found in any of the conference's goals or consensus statements. Yet, RTI's principles of prevention, reliance on a problem-solving model, use of data, progressively intensive interventions and use of evidence-based interventions had clearly permeated the consciousness of school psychology trainers, leaders and practitioners across the country. Soon thereafter, NASP endorsed RTI as the preferred method of identifying learning disabilities (Fuchs et al., 2003). At this time, however, even those researchers with a favorable disposition to RTI were careful to note that more must be understood about RTI before it can be confidently used as a valid means of identifying learning disabilities (Fuchs & Fuchs, 2006; Fuchs & Deshler, 2007).

RTI's ascendancy. While the dissatisfaction with special education practices, particularly for students with potential LDs, provided the impetus for the development of

RTI as an alternative identification and service delivery model, federal legislation created the climate conducive to the growth of RTI practices and provided the reason for abandoning current special education practice in many schools.

The No Child Left Behind Act (NCLB), a reauthorization of the Elementary and Secondary Education Act (ESEA), was signed into law in 2001 just as RTI was entering the national debate. NCLB resulted from numerous concerns over sluggish gains on national and international assessments as well as the stationary achievement gap between minority and disadvantaged students, including disabled students, and non-minority, economically-advantaged students (Fletcher, Coulter, Reschly, & Vaughn, 2004). NCLB can best be characterized as a standards-driven approach that established challenging standards for all students, even disabled students, and required that assessments are aligned with these standards. NCLB also brought school and district accountability to the forefront by establishing standards for school and district progress (Fuchs, Fuchs, & Stecker, 2010). Thus, NCLB's focus on accountability created a climate conducive to the growth of an outcomes-oriented approach such as RTI, given the strong interest in accountability in K-12 schools and an education culture steeped in the tenets of data-based decision making (Burns & Coolong-Chaffin, 2006).

The major piece of special education legislation in the United States, the Individuals with Disabilities Education Act (IDEA), was reauthorized in 2004 as the Individuals with Disabilities Education Improvement Act (IDEIA; PL 108-446). Since 1977, federal guidelines stipulated that students with LDs could be identified by meeting three criteria: failure to benefit from instruction, lack of sensory impairments, and a severe discrepancy between achievement and intellectual ability. The third criteria, the

IQ-achievement discrepancy, could be found in the federal definition and conceptualized an LD solely as a within-child deficit (Fletcher et al., 2004; Speece, Case & Molloy, 2003). IDEIA stipulates that districts cannot be required to use the discrepancy model and allows for use of a response to intervention method for LD identification. Even if RTI is not used for LD identification, IDEIA requires the team to consider progress monitoring data (a central component of RTI) in their eligibility determination (Zirkel & Krohn, 2008). In addition, IDEIA allows for up to 15% of special education funds to be allocated toward preventative instructional measures in the general education setting regardless of disability status (Burns & VanDerHeyden, 2006; Fuchs & Fuchs, 2006; National Joint Committee on Learning Disabilities, 2005). Thus, while IDEIA does not mandate a change in LD identification procedures, it suggests applications of RTI while still providing districts with the freedom to develop methods that best meet their needs (Hollenbeck, 2007).

In 2004, just prior to the IDEA reauthorization but after the emergence of RTI as a legitimate alternative, 48 states required school multidisciplinary teams to use an IQ-Achievement discrepancy formula to identify LDs (Reschly & Hosp, 2004). By 2008, two years after IDEIA regulations went into effect, ten states prohibited the use of an IQ-achievement discrepancy model. Six of these states required the use of RTI and the remaining four permitted the use of RTI. The remaining states had not made any determination of change or were permissive in their use of RTI, the discrepancy model or a proposed third alternative (Zirkel & Krohn, 2008). By 2010, 42 states had developed an RTI framework and 48 states integrated components of RTI into their state performance plan (National Center on Response to Intervention, 2010). Thus, RTI

was beginning to emerge as the leading remedy for decades of dissatisfaction with LD conceptualization, identification, and treatment practices.

To summarize, school psychologists have traditionally functioned as assessment specialists and gatekeepers for special education. Yet, since special education's formal inception, many have questioned prevailing practices for identifying and treating LDs, the most commonly occurring disability. RTI emerged as a response to dissatisfaction with pathologizing labels, lack of accountability and outcomes criteria, and the IQ-Achievement discrepancy model. RTI later gained prominence with the reauthorization of IDEA in 2004, which did not require use of the discrepancy model and permitted use of RTI procedures to identify LDs.

The Debate

Since the emergence and elevation of RTI as the solution to the problems with LD practice identified since special education's formal beginning, it is difficult if not impossible to find literature in which the authors completely oppose RTI in any form. Distinct differences in positions emerge only when RTI is proposed as a basis for LD identification (Batsche, Kavale & Kovalski, 2006). A comprehensive review of the RTI and LD literature suggests that even stalwart supporters of more traditional assessment-based approaches and neuropsychological assessment approaches for LD identification advocate the use of RTI as a prereferral strategy (e.g., Feifer, 2008; Kavale, Kaufman, Naglieri, & Hale, 2005; Mather & Kaufman, 2006; Reynolds & Shaywitz, 2009; Semrud-Clikeman, 2005). Some of these proponents even suggest that use of RTI is necessary in order to allow the school psychologist to have the time to complete a thorough, systematic and scientifically-defensible evaluation for LDs should

the student fail to respond to a series of research-based interventions (e.g., Hale & Fiorello, 2004). Once the debate focuses on the sole use of RTI or traditional psychoeducational, cognitive or neuropsychological assessment approaches to identify learning disabilities, the debate becomes significantly more divisive. However, despite the stridency in opinions at the two extremes, the assumptions upon which the sole use of either method are based prove to be flawed and unsustainable when applied to actual school psychological practice (Wodrich, Spencer, & Daley, 2006).

As noted earlier, researchers have debated the definition, identification procedures, treatment utility and even the construct of LDs. Theory, research, and practice pertaining to LDs have provoked sharp and enduring disagreements which have not yet been settled (Dombrowski et al., 2006; Reschly & Ysseldyke, 2002). The controversy over the virtues of RTI versus assessment-based approaches to identifying LD served as an impetus for the LD requirements in IDEIA; in turn, these requirements have fueled the controversy even further (Willis & Dumont, 2006). Yet, dissatisfaction with the most frequently practiced and, at one time required, method of identifying learning disabilities led to an accumulation of research calling into question the validity of this method altogether (Speece et al., 2003). In this section, an overview of LDs and LD identification methods will be presented. Although a comprehensive review of the LD identification literature is not warranted for the purposes of this study, the opposing arguments with regard to LD identification approaches will be presented. In addition, scientifically-sound contemporary approaches to assessment, including the practice of school neuropsychology, will be discussed. Different conceptualizations of the RTI vs. assessment debate within the literature will be enumerated along with practicing school

psychologists' opinions regarding these approaches. Finally, the possible emergence of subspecialties within school psychology in tandem with the current debate will be touched upon.

Terminology

Within the professional literature, the terms *cognitive* and *neuropsychological* are used synonymously when discussing mental processes and comprehensive evaluations for learning disabilities. For example, Brieger and Majovski (2008) suggest that the term *cognitive assessment* when used in the school psychology literature “could be more broadly called neuropsychological assessment” (p. 155). Throughout their article on LD identification, Flanagan, Fiorello, & Ortiz (2010) group the terms *cognitive*, *cognitive processes*, and *neuropsychological* together when referring to the psychological processes that are hypothesized to be implicated in the manifestation of LDs. Furthermore, these authors encourage readers to seek out information on “the cognitive abilities and processes...described in the CHC and neuropsychology literature” (p. 755). Hale, Naglieri, Kaufman and Kavale (2004), referring to processes and tests, consistently use *cognitive* and *neuropsychological* interchangeably and suggest that “a convergence of cognitive and neuropsychological theories has begun” (p. 12). Hale et al. (2010) and Hale, Flanagan, and Naglieri (2008) use the terms *cognitive* and *neuropsychological* frequently when referring to psychological processes and assessment models supported by neuroscientific research. Feifer (2008) uses the term *cognitive neuropsychology* when referring to tests that are considered neuropsychological (e.g., RAVLT, RCFT) and cognitive (WJ-III Cog, WISC IV) interchangeably. Reynolds and Shaywitz (2009) suggest that cognitive processing

approaches are more analogous to neuropsychological models than cognitive ability or traditional intelligence assessments. Within the cognitive-neuropsychological assessment literature, these terms are generally understood to refer to mental processes, tests or evaluation techniques that are implicated in LDs, rooted in cognitive neuroscience, and have been shown to have robust relationships with academic performance. Therefore, consistent with this literature, the term *cognitive neuropsychological* will be used within the remainder of this chapter to amplify the more generic terms *assessment* and *processes*.

Learning Disabilities

Given the prevalence rates in the school-age population, the identification and treatment of students with specific learning disabilities is perhaps the topic of greatest concern to school psychologists. Although students with LD represent the largest group of special education students (41%), the number of students identified with LD has declined over the past 10 years (National Center for Learning Disabilities, 2013). Despite this decrease, the educational and vocational outcomes for students with LD are dismal. For example, nearly half of students with LD fall more than three grade levels below their peers in reading and math, while 20% drop out of high school, compared to 8% of the general population [NCLD], 2013). Very frequently, school psychologists are called upon to offer their expertise in the area of LD identification (Lichtenstein, 2008).

The term *learning disabilities* refers to a group of disorders that impair a student's ability to acquire and use listening, speaking, reading, writing, reasoning or math abilities. Due to the number of LD subtypes and the heterogeneity of the disorder, a

precise definition has eluded the field and has contributed to the haphazard, inconsistent approaches to LD classification (Dombrowski et al., 2006; Lichtenstein, 2008). Even during the process of signing the EAHCA into law, experts could not agree on the appropriate answer to the question “What constitutes a learning disability?” (LaVor, 1976). Yet, it is commonly accepted that these disorders result from central nervous system dysfunction and that underachievement is unexpected in light of the student’s abilities in other areas (Mastropieri & Scruggs, 2003; Mellard, Deshler, & Barth, 2004; Reynolds & Shaywitz, 2009). Thus, the measurement of internal psychological or cognitive processes and the quantification of degree of underachievement has been part of the identification procedure since special education’s formal inception. Dissatisfaction with these LD identification practices is viewed as, in many ways, responsible for the current debate (Mather & Kaufman, 2006).

IQ-achievement discrepancy model. The federal definition, which posits that an LD is the result of a disorder in one of the basic psychological processes, has barely changed since the passage of the EAHCA in 1975 (Willis & Dumont, 2006). In 1977, the U.S. Department of Education specified the use of a discrepancy formula to operationalize this unexpected underachievement. This formula, known as the aptitude-achievement discrepancy model or the IQ-achievement discrepancy model (hereinafter referred to as the discrepancy model), contrasted a student’s intellectual abilities (using the *Intelligence Quotient* or IQ) with his or her current level of academic achievement (Holdnack & Weiss, 2006; Mellard et al., 2004). As a result, the discrepancy model became the primary method of identifying and qualifying of students for special education services under the Specific Learning Disability (SLD) category. The SLD

category is the legal term for the construct of learning disabilities; however, the more global concept of learning disabilities has been explained and operationalized in numerous ways (Mather & Gregg, 2006). From 1979 to the present, researchers and practitioners alike have highlighted the shortcomings of the discrepancy model and have called into the question its utility, reliability, and validity. For decades, immense dissatisfaction with the discrepancy model was the driving force behind the ongoing debate, study, and discussion about the identification of students with LD (Berkeley, Bender, Peaster, & Saunders, 2009).

The literature specifically addressing the use of the discrepancy model for LD identification is both supportive and condemning. However, support for even the most defensible discrepancy models (e.g., regression-based models) has dwindled over the past five years. A review of the most recent literature indicates that there is significantly more literature calling for the abandonment of the discrepancy model than calling for its preservation. Since the early 1980s, the task forces, government agencies, advocacy groups, professional associations and researchers who have studied LD identification procedures have all concluded that there is little empirical support for the discrepancy model (Ysseldyke, 2005).

Limitations of the discrepancy model. While all critics point to the lack of empirical basis and the wait-to-fail nature of the discrepancy model, most detail more specific criticisms. The discrepancy model's power to differentiate between particular groups of students is a significant concern, including its power to differentiate between students with true LDs and generic low achievers (Fuchs & Deshler, 2007; Fuchs et al., 2003; Hoskyn & Swanson, 2000; Reschly & Ysseldyke, 2002; Ysseldyke et al., 1983),

between those students who have had poor instruction and those who are LD (Fuchs et al., 2003; Gresham et al., 2005), and between those students whose learning difficulties can be remediated and those whose can not (Gresham et al., 2005; Gresham, Restori, & Cook, 2008; Vellutino, Scanlon, & Lyon, 2000). In addition, researchers note that the model provides insufficient information and cannot conclusively identify the underlying etiology of a learning difficulty (Batsche et al., 2006; Gresham et al., 2008; Vellutino et al., 2000).

Issues of reliability and validity are also prominent among criticisms. For example, Gresham et al. (2005) firmly state that research has “established unequivocally the intractable validity and reliability problems with ability-achievement discrepancy as a key marker of SLD” (p. 27). Others echo similar concerns over the psychometric properties of the discrepancy model (Fletcher et al., 2004; Hoskyn & Swanson, 2000; Reschly & Ysseldyke, 2002; Stanovich, 1999, 2005) as well as its construct validity and lack of theoretical basis (Hoskyn & Swanson, 2000; Stanovich, 1999). Related to these concerns is the criticism that the discrepancy model is unreliable and invalid due to its failure to consider ecological factors such as ethnicity and socioeconomic status (Mellard et al., 2004), emotional and behavioral skills (Vellutino et al., 2000), or environmental influences such as parent involvement or the teacher’s feelings of responsibility for the student’s learning (Mellard et al., 2004).

In contrasting the discrepancy model with the use of curriculum based measurements (CBM) promoted in RTI models, many researchers present more pragmatic concerns, including the discrepancy model’s inability to provide information that leads to better instruction or outcomes (Fletcher et al., 2004; Gresham et al., 2005;

Gresham et al., 2008; Hoskyn & Swanson, 2000; Stanovich, 2005) and it's costly, time and resource-consuming nature (Fletcher et al., 2004; Fuchs et al., 2003).

Finally, Stanovich (1999, 2005) suggests that the discrepancy model is useless due to the fact that IQ is a myth with no relationship to a child's potential or academic skills. He adds that use of the discrepancy model lowers the LD field to a "pseudoscience" (2005, p. 103) and those who continue to employ it do so out of their sociopolitical agenda to redirect educational resources to particular groups of students.

Conversely, a body of literature, while criticizing the manner in which the discrepancy model is currently applied, supports the conceptual and statistical basis for the discrepancy model. Some point out that it is the misuse of the discrepancy model, not the model itself, that is fraught with problems (Willis & Dumont, 2006). Others note that the discrepancy model is the only sound statistical procedure for documenting the underachievement that is the central component of LD (Kavale, 2005). These counterarguments will be discussed in more detail in the next section.

The RTI Position

Although RTI primarily serves an accountability function designed to assess and ensure instructional adequacy, the RTI concept evolved from well-documented concerns about the identification of students with specific learning disabilities (Kavale et al., 2008). Thus, RTI is both a service delivery method and a source of data for special education eligibility determination decisions.

Overview. As a service delivery model, RTI allows for progressively more intensive interventions as students fail to respond to high-quality interventions for learning problems. These interventions take place within the general education setting,

regardless of disability status, and are therefore preventative in nature (Fletcher & Vaughn, 2009; Fuchs & Fuchs, 2006). RTI is not a single model but a set of processes that can be implemented with wide variation between schools or districts depending on need (Fuchs et al., 2003). RTI proponents suggest that without this systematic allocation of resources, the needs of all learners could not be met within the general education setting (Vaughn, Linan-Thompson, & Hickman, 2003). While various models have been implemented and studied, all RTI models implement a universal screening program, utilize focused progress monitoring for at-risk students, and provide variations in intervention intensity based on the students' responses to well-implemented interventions. The data collected throughout the RTI process can then be used to modify interventions or determine eligibility for special education (VanDerHeyden, Witt & Gilbertson, 2007). This process of matching students' needs to interventions, making instructional decisions, and evaluating outcomes is directed by a data-driven problem-solving framework.

The use of RTI for LD identification. In an RTI model of LD identification, cognitive processes are deemphasized and the student's response to a series of interventions becomes the focus. The dual discrepancy (DD) criterion proposed by Fuchs, Fuchs, & Speece (2002) as part of their treatment validity model has been promoted (e.g., Burns & Gibbons, 2008) as a defensible method of determining eligibility for special education under the SLD category. Under this approach, students are identified with an LD if they, after being provided with one or more high-quality interventions, exhibit a discrepancy between their peers and themselves in both level of achievement and rate of learning. In a three-year longitudinal study of reading, Speece,

Case, and Molloy (2003) verified the construct validity of the DD criterion and found that it differentiated between typically-achieving students and those who are able to close the achievement gap with their peers when provided with high quality instruction.

Once a DD has been identified using curriculum-based measures (CBM) and single-case design procedures, eligibility for special education services can be confirmed once the adverse impact on educational performance has been documented and exclusionary factors as outlined in IDEIA have been ruled out as alternative causes (Fletcher & Vaughn, 2009; Gresham et al., 2005; Vaughn et al., 2003). While some RTI proponents suggest that the data gathered during the RTI process is sufficient to determine eligibility for special education (e.g., Gresham et al., 2005), others suggest that ruling out alternative causes such as intellectual disabilities, once referred to as mental retardation, may require a brief intellectual assessment in accordance with state and district policies (e.g., Batsche et al., 2006) and only if screening data suggest that an intellectual disability is likely (e.g., Fletcher & Reschly, 2005). In general, however, most proponents of RTI disavow the use of cognitive processing assessments in the identification of LDs.

Arguments supporting the sole use of RTI to identify LDs. Ardent supporters of the use of RTI as an LD identification procedure argue both the merits of RTI as well as the shortcomings of cognitive neuropsychological assessment. RTI is touted as a prevention-focused alternative to the discrepancy model that, in focusing on student needs rather than eligibility, does not delay intervention until a student's failure is severe enough or that student is correctly labeled (Fuchs & Fuchs, 2006; National Joint Committee on Learning Disabilities [NJCLD], 2005; Reschly, 2005). As an alternative to

the discrepancy model, which has been viewed by critics as responsible for increasing numbers of students with LD and subsequent special education costs (Fuchs et al., 2003; Fuchs & Fuchs, 2006), a systematic RTI process can reduce both referral and identification rates of LDs (Burns & Gibbons, 2008; NJCLD, 2005). Comprehensive studies of RTI implementation have demonstrated that RTI can reduce the number of special education evaluations conducted, improve the true positive rate, and reduce costs (VanderHeyden et al., 2006); decrease disproportionate special education placement and more reliably identify LDs among males, students of lower SES, and English Language Learners (ELLs; VanderHeyden et al., 2006; Vaughn et al., 2003). Other researchers have cited the power of RTI to reallocate resources from higher IQ, middle class students to low socioeconomic status (SES) students and ELLs who previously fell through the cracks due to flawed testing and placement practices and the failure of special education to identify and attend to students conceptualized as low achievers (Fuchs & Fuchs, 2006; Reschly & Ysseldyke, 2002). This reduction in disproportionality among minority populations is touted as a major advantage of RTI (Burns & Ysseldyke, 2005; NJCLD, 2005; VanDerHeyden et al., 2005), perhaps due to a shift away from potentially-biased teacher-generated referrals to data-generated referrals for targeted interventions within an RTI model (Fletcher et al., 2004).

As part of a comprehensive assessment for the identification of LDs, RTI supporters highlight the shift in focus from tests tied to “hypothetical (usually unverifiable) inferences about brain structure or processes” (Gresham et al., 2005, p. 27) to more instructionally relevant tests that are directly linked to alterable variables

such as academic skills (Burns & Gibbons, 2008; Fletcher et al., 2004; Gresham et al., 2008; NJCLD, 2005; Tilly et al., 2005).

Data gathered during the RTI process can be used to assess a student's current skills and academic behaviors, the alterable variables within the instructional environment that may be manipulated to improve instruction (e.g., academic engaged time, pacing of instruction), and the response to particular interventions. Thus, RTI data can help maximize fit between the student and the instructional environment (VanDerHeyden et al., 2005). In keeping with the requirements of IDEIA, this information can be used to quantify the student's level of achievement compared to his or her age and grade level (i.e., dual discrepancy), ensure that the student has had adequate opportunity to learn, and document the student's need for special education (Fletcher et al., 2004; Gresham et al., 2005). In an alternate model focused on the treatment validity of special education, RTI data can be used to (1) examine and document student achievement using the DD criteria, (2) examine the impact of regular education adaptations on student learning, and, (3) through a diagnostic special education intervention within the RTI context, verify that special education will enhance learning prior to placement (Fuchs et al., 2002).

In support of an RTI process for LD identification, researchers often cite the lack of utility of cognitive neuropsychological assessments to identify LD and inform instruction. Frequently, these researchers (e.g., Gresham et al., 2008; Reschly, 2005) erroneously equate a cognitive neuropsychological assessment approach with the simplistic use of the discrepancy model (Feifer, 2008). Yet, some have outlined a

rationale for the exclusion of not only the discrepancy approach and intelligence tests, but of all cognitive neuropsychological measures within an LD identification model.

Primarily, RTI supporters contend that cognitive neuropsychological assessment is unnecessary as it (1) is not required under law (Fletcher & Reschly, 2005; Gresham et al., 2005; Reschly, 2005), (2) does not contribute useful or accurate information for LD identification (Fletcher et al., 2004; Canivez, 2013; Gresham et al., 2005), and (3) does not contribute to more effective interventions or predict the outcome of interventions (Batsche et al., 2006; Gresham et al., 2008; Fletcher & Reschly, 2005; Tilly et al., 2005). However, others cite more pragmatic concerns such as the cost in time and resources for evaluations that contribute little useful information and fail to differentiate between students with LD and those who are low achievers or students who are failing to achieve due to emotional difficulties (Fletcher & Reschly, 2005).

The reliability and validity of cognitive neuropsychological assessments has also been questioned by RTI-oriented researchers. While RTI uses multiple assessments of an observable skill over time, cognitive neuropsychological processing assessment utilizes measures purported to represent constructs that cannot be verified and are obtained at a single point in time (Fletcher et al., 2004; Gresham et al., 2005; Gresham et al., 2008). In the wake of literature calling into question the technical and predictive properties of the global IQ score (e.g., Vellutino et al., 2000), as well as the ethics of interpreting such a score (e.g., Stanovich, 1999), psychologists have placed more emphasis on score profiles across tests within assessments. Yet, Gresham et al. (2008) and Canivez (2013) note that intra-individual interpretation of scores is psychometrically indefensible due to their low specificity and reliability, poor predictive

validity for achievement, and tendency to produce errors in diagnosis and educational decision making.

RTI supporters often bolster the argument that traditional assessment approaches lack treatment validity by citing older studies that failed to find aptitude-treatment interactions (ATIs). The application of ATIs assumes that instructional interventions can be matched to aptitudes or modalities, such as auditory or visual processing, which then result in improved achievement. ATI research can be traced back to Cronbach's work (Gresham et al., 2008), which found no evidence to support the practice of matching educational interventions to a child's cognitive strength and weaknesses. To date, a consistent and clear relationship between a child's cognitive profile and its connection to instructional practice has not been established.

Reschly (2008), in summarizing the RTI position on cognitive assessment, notes these assessments are harmful to students because they "focus on formulating abstract inferences from limited samples of behavior about hypothetical internal attributes (e.g., intellectual functioning; hypothetical cognitive processes) that cannot be observed directly or, generally, modified significantly through known interventions" (p. 7).

The Assessment Position

In general, supporters of a cognitive neuropsychological assessment approach to LD identification (referred to as *assessment* within this section) cite as benefits the preservation of the LD concept as a neurologically-based disorder, the capacity for identifying the root causes of learning difficulties, and the increased likelihood of choosing an appropriate intervention given the additional information provided by a comprehensive evaluation. In addition, supporters of assessment approaches cite the

extensive research demonstrating that children with LDs process information differently from typical learners. Our knowledge base on the neurological correlates of LDs as well as the application of strong theory-driven assessment approaches (e.g., Cattell-Horn-Carroll) is still emerging, which suggests that, in the future, the current arguments used to deny to value of cognitive processing assessments (e.g., ATI research) may be irrelevant.

Assessment as an LD identification procedure. Insofar as various assessment approaches have been erroneously equated with the IQ-achievement discrepancy model (Willis & Dumont, 2006), many supporters of the assessment approach to LD identification similarly highlight the shortcomings of the discrepancy model, particularly when misused. However, in the literature, a number of researchers have delineated the benefits of the proper use of the discrepancy model. These researchers direct criticism at the assessor rather than the model and caution against using an oversimplified formula (Suhr, 2008) or violating statistical rules, ignoring regression to the mean or the Standard Error of Measurement (SEM), using irrelevant tests, denying support based on one or two standard score points, or using the discrepancy model as the sole method of identifying LDs (Willis & Dumont, 2006). Others suggest that use of a psychometrically defensible discrepancy formula, such as a regression-based formula, is the only way of operationalizing the underachievement that is at the heart of the LD construct (Kavale, 2005; Mastropieri & Scruggs, 2005; Ofiesh, 2006) and differentiating between students with LD and other struggling learners, such as students with emotional or intellectual disabilities (Holdnack & Weiss, 2006). Hale et al. (2010) reviewed relatively recent empirical data and concluded that

students with reading LDs can be reliably differentiated from typically-developing students on the basis of an ability-achievement discrepancy. In another example, Swanson (2008) notes that a variation of the traditional discrepancy model that uses the Verbal, rather than Global, IQ score can moderate outcomes in samples of struggling students.

In general, defenders of the intended use of the discrepancy model-to assist in identification rather than inform instruction (Kavale, 2005; McKenzie, 2009)-suggest that its proper and ethical use can help to not only differentiate LD from other academic difficulties, but to retain the LD construct of underachievement (Hale et al., 2004; Kavale, 2005; Mastropieri & Scruggs, 2005) and control LD prevalence rates (McKenzie, 2009), which ballooned after passage of the EAHCA in states not adhering to a discrepancy formula (Holdnack & Weiss, 2006).

Arguments supporting the use of assessment for LD identification.

Supporters of assessment approaches to the identification of LDs are often quick to point out the benefits of RTI as a prereferral strategy for both individual students and larger systems. Yet, these authors are reluctant to consider the sole use of RTI to identify learning disabilities due to a number of conceptual and technical concerns.

Primarily, supporters of assessment argue that the definition of an LD and the method used to identify it should be consistent. Thus, given the IDIEA definition of LD as a disorder in one or more basic psychological processes, RTI cannot meet the statutory and definition requirements because it fails to identify the deficient psychological processes (Hale et al., 2008; Hale et al. 2010; Kavale, 2005; Mather & Kaufman, 2006; Ofiesh, 2006; Schrank et al., 2005; Semrud-Clikeman, 2005; Willis &

Dumont, 2006; Wodrich et al., 2006). Although not expressly detailed in the federal definition, the commonly accepted conceptualization of LD as unexpected lower achievement manifested in a variety of areas and marked by intraindividual differences, or a pattern of strengths and weaknesses, is not preserved in an RTI system of LD identification (Mastropieri & Scruggs, 2005; Reynolds & Shaywitz, 2009). Holdnack and Weiss (2006) further suggest that the language in IDEIA specifically states that academic information cannot be the sole source of information in a comprehensive evaluation and that cognitive factors must be considered. Indeed, in the “Analysis of Comments and Changes” section of the final IDEIA regulations, the Department of Education (2006) states “an RTI process does not replace the need for a comprehensive evaluation. A public agency must use a variety of data gathering tools and strategies even if an RTI process is used” (p. 46648).

Mastropieri and Scruggs (2005) summarized another major concern of those skeptical of RTI for LD identification by stating, “If RTI cannot discriminate, how can it classify?” (p. 528). Many supporters of assessment note that RTI performs one task very well: identifying nonresponders. Yet, RTI cannot differentiate between students who have a true LD and those whose difficulties are due to comorbidities or other disabilities such as Attention-Deficit Hyperactivity Disorder (ADHD) or executive functioning disorders (Holdnack & Weiss, 2006; Mastropieri & Scruggs, 2005; Mather & Kaufman, 2006; Semrud-Clikeman, 2005). RTI cannot differentially diagnose students with LD from those who are slow learners or intellectually disabled (Mather & Gregg, 2006; Wodrich et al., 2006) nor can it rule out other causative factors such as low SES, poor parent involvement, or limited English proficiency (LEP; Flanagan et al., 2010;

Hale et al., 2004; Schrank et al., 2005; Willis & Dumont, 2006). As Mather and Kaufman (2006) suggest, RTI can tell us *what* and *how well* a student is learning, yet, it cannot determine *why* a student is not performing at grade level. Delineating the causes of underachievement is important to understand and document the unique needs of LD students and develop individualized interventions. Although cognitive neuropsychological assessments have been accused of failing to differentiate between students with true LD and those who can be considered generic low achievers, RTI does not fulfill this role more validly (Hale et al., 2004; Kavale, 2005; Mastropieri & Scruggs, 2005; Ofiesh, 2006). In an RTI identification context, all low achievers may be considered LD and the construct of LD may eventually hold little meaning (Hale et al., 2004; Kavale, 2005; Mather & Gregg, 2006). As a consequence, the prevalence rate of LD would swell such that all students identified as not meeting basic standards of proficiency under NCLB can be considered to be LD. Furthermore, identifying slow learners as LD would likely lead to disproportionality in special education due to the substantial prevalence of low achievers in minority populations (Hale et al., 2004).

In addition to the practical and conceptual shortcomings of RTI as an LD identification method, supporters of assessment cite numerous technical shortcomings of both the RTI model itself and of the data gathered during the RTI process. RTI relies on inferences about the presumed causes of LDs. Therefore, the reliability and validity of decisions within an RTI LD identification procedure is limited because all factors leading to achievement cannot be controlled, thereby increasing error (Hale et al., 2004; Hale et al., 2010; Kavale, 2005; Schrank et al., 2005). RTI focuses on only one factor, instruction, of which even the most controlled is still subject to differential teacher effects

(Gerber, 2005) and may account for only about 15% of the variance in outcomes (Swanson, 2008). Thus, RTI is simply a model of diagnosis-by-treatment failure, which has been shown to be a poor model for the medical field (Brieger & Majovski, 2008; Hale et al., 2010).

RTI has also been judged to be invalid as a comprehensive LD identification method due to its overwhelming focus on early reading. RTI focuses primarily on basic, early-developing skills and has not been adequately tested at later grades or for capacities beyond those basic skills, such as abstraction and applications (Brieger & Majovski, 2008; Kavale et al., 2005; Kavale, 2005; Hale et al., 2010; McKenzie, 2009; Semrud-Clikeman, 2005). The assessments of basic skills, CBMs, have been criticized for technical limitations including poor inter-rater reliability; limitations to content validity, particularly when CBM probes that stress basic speed are used for students engaged in a curriculum that stresses thoughtful analysis; insufficient technical adequacy for decision making, and the absence of published reliability and standard errors of measurement (Hale et al., 2010; Mather & Kaufman, 2006; McKenzie, 2009; Wodrich et al., 2006). Indeed, a number of recently published studies, many conducted by proponents of RTI and CBM, have cast doubt on not only the technical adequacy of CBM, but also the underlying assumptions that guide contemporary usage and interpretation of CBM data (Ball & Christ, 2012).

Supporters of an assessment approach to LD identification often highlight the power of a comprehensive evaluation to identify the processing deficiency upon which a diagnosis of LD rests. Indeed, the 14 organizations that comprised the 2004 Learning Disabilities Roundtable agreed that LDs are neurologically-based and are marked by a

pattern of strengths and weaknesses within achievement or cognitive processes (LD Roundtable, 2005). In 2011, the National Joint Committee on Learning Disabilities (cited in Mather, 2014) acknowledged that deficiencies in specific cognitive processes are predictive of LDs. In addition, NASP's (2011) "Position Statement on the Identification of Students with Specific Learning Disabilities" reiterates that LDs are characterized by "neurologically-based deficits in cognitive processes" that "impact particular cognitive processes that interfere with the acquisition of academic skills" (p. 1). Thus, a comprehensive assessment that attends to cognitive processing skills remains the only method by which the statutory definition of LD can be met. In general, while NASP (2011) strongly supports the implementation of problem-solving and RTI methods to identify and intervene for struggling students, it acknowledges that a comprehensive evaluation is an important component in determining eligibility under SLD.

While RTI can differentiate between treatment responders and nonresponders, it cannot differentiate between those students whose learning difficulties are due to an LD and those whose difficulties are due to other causes or comorbidities, such as ADHD (Holdnack & Weiss, 2006; Mather & Gregg, 2006; Semrud-Clikeman, 2005; Willis & Dumont, 2006; Wodrich et al., 2006). Hale et al. (2004) suggest that this differentiation is salient, otherwise all students who fall below the *basic* level according to the standards of the National Assessment of Educational Progress (NAEP) can be considered to be LD.

Differentiating between LD and other causes also leads to more individualized interventions that are tailored to the student's strengths and weaknesses. The

information provided by an assessment of a student's cognitive processing helps to illuminate what interventions might be most effective and can help to avoid overreliance on a trial-and-error approach in intervention selection (Flanagan et al., 2010; Hale & Fiorello, 2004). Research has demonstrated that cognitive processes can be directly linked to deficient achievement areas (Mather & Kaufman, 2006) and, across cognitive processes, students with LD exhibit significant deficits when compared to typical peers (Fiorello, Hale & Snyder, 2006; Johnson, Humphrey, Mellard, Woods, & Swanson, 2010). Thus, the information provided by a comprehensive assessment can increase the likelihood of choosing an appropriate intervention (Hale & Fiorello, 2004). Identifying the core problem behind a learning disability is of utmost importance, particularly because it opens the door to a substantial research base on processing impairments that are known to be related to academic functioning (Schmitt & Wodrich, 2008). This research clearly indicates that there are a number of cognitive processes that reading, mathematics, language and written expression. In a survey of 54 experts in the learning disabilities field, 96% of respondents agreed that there is empirical support for these cognitive processes and that cognitive neuropsychological assessment is critical for proper LD identification (Hale et al., 2010).

Contemporary School-Based Cognitive Assessment

To bolster their arguments, RTI supporters generally cite outdated and methodologically unsound research that impugns the validity of cognitive neuropsychological assessment. For example, the research suggesting that students who are low achievers cannot be differentiated from those who are LD (Kavale et al., 2005) and that IQ discrepant and non-IQ discrepant students also cannot be reliably

differentiated (Holdnack & Weiss, 2006) were flawed in their methodology, leading to erroneous conclusions. The ATI studies that many of these criticisms are based upon were plagued by numerous methodological and technical shortcomings, most notably the reduction of aptitudes into gross models of intelligence rather than specific cognitive processes (Fiorello et al., 2007; Naglieri, 2008) and research designs based on group models that ignore individual differences (Hale & Fiorello, 2004). In addition, these studies tended to minimize treatment integrity (Reynolds, 1988) and occurred before the cognitive constructs implicated in learning disabilities were understood and could be adequately measured (Hale & Fiorello, 2004). Yet, RTI supporters tend to ignore the vast and growing research base that documents the relationship between cognitive processes and achievement, recent advances in cognitive neuroscience and contemporary, multifactorial theories of cognitive functioning that provide an empirically-based view of intelligence (Kavale et al., 2005; Mather & Gregg, 2006).

Within the past decade, school psychologists have been allowed to “step into the light of a new era in cognitive assessment” (Flanagan, Ortiz, Alfonso & Dynda, 2008, p. 633). Whereas simple perceptual-motor or psycholinguistic theories and modality-matched treatments have failed to stand up to empirical scrutiny (e.g., Kavale & Forness, 1987), contemporary test batteries and interpretation of findings are rooted in empirically-based theories, such as Luria’s theory and Cattell-Horn-Carroll (CHC) Theory (Mather & Gregg, 2006). CHC theory, with the extensive research base supporting its validity and the relations between CHC cognitive processes and academic outcomes, has become the leading prototype for modern cognitive test development (Flanagan et al., 2008; Flanagan et al., 2010). Five of the seven major

cognitive test batteries now incorporate CHC Theory constructs into their test batteries- a fitting achievement in consideration of the evidence suggesting that CHC Broad and Narrow abilities can explain a significant portion of variance in specific academic abilities aside from what can be accounted for by general intelligence (Flanagan et al., 2008). For example, numerous empirical studies have found significant to medium effects on specific skill areas within the reading, written expression and math domains across the school years (Fiorello, Thurman, Zavertrnik, Sher, & Coleman, 2009).

Referring to LD assessment practices in school psychology, Zach (2005) notes that there is a “growing trend toward identifying the neurological underpinnings of a learning problem” (p. 153). Indeed, the past 25 years have seen a substantial increase in the number and empirical quality of neuroscientific research studies documenting the relationship between cognitive neuropsychological processes and LDs (Hale, Kaufman, Naglieri, & Kavale, 2006; Hynd & Reynolds, 2005). These studies appear to be just the beginning for an area of study referred to by experts in the LD and neuroscience fields as “burgeoning” (Kaufman, 2008, p.9), “nascent” (Schmitt & Wodrich, 2008, p. 834), and “evolving at a rapid pace” (Hale et al., 2006, p. 758). Hynd and Reynolds (2005) note that there has been an “explosion of research that has provided compelling evidence” of the link between neuropsychological processes and LDs (p. 5). Fueled by this research, school psychologists can now access a number of technically-sound instruments that can help to identify LDs and inform intervention more precisely (Hale et al., 2006; Schmitt & Wodrich, 2008). Armed with the knowledge of which specific cognitive neuropsychological processes are likely to be affected in particular learning difficulties, school psychologists apply logic to their diagnostic approach and test

selection and interpretation is efficient and empirically-based (Berninger & Holdnack, 2008). Whereas, a decade ago, LDs were once only presumed to have a distinct neurobiological basis, they are no longer so given the strong evidence of the link between cognitive neuropsychological processes and academic achievement (Kaufman, 2008).

As this evidence has only just begun to emerge, these instruments are growing in complexity. Elliot (2008) suggests that, as in the medical field, as our LD diagnostic procedures become more refined, subsequent interventions will become more precise. This refinement can be seen in a number of empirically-based, technically-sound alternatives to the RTI or discrepancy models for identifying LDs (i.e., *third methods*) that have been proposed relatively recently. Approaches such as those considered *actuarial*, in which all relevant variables (e.g., scores on relevant cognitive neuropsychological tests, academic engaged time, CBM data, etc.) related to a student are weighted and then used within a formula to identify an LD, hold promise but are still in need of empirical support before they can be applied in schools (Benson & Newman, 2010).

Other more established models provide a psychometrically-defensible response to two of the primary criticisms leveled at both the RTI and cognitive neuropsychological assessment approaches in that they (1) fulfill the tenets of the LD definition and, (2) inform instruction (Hale et al., 2008). Three of these alternatives are reviewed by Hale et al. (2008). The Operational Definition of LD model proposed by Flanagan, Ortiz, Alfonso, and Mascolo (2006) integrates the RTI model with specific criteria and data collection procedures (e.g., achievement data, exclusionary factors, cognitive processes

and CHC abilities, and degree of underachievement) at each tier of instruction. Hale and Fiorello's (2004) Concordance-Discordance model requires the application of neuropsychological and neuroscientific literature to make plausible connections between deficient and spared achievement areas and their respective cognitive processes. Finally, Naglieri's (1999, cited in Hale et al., 2008) discrepancy/consistency model identifies an LD if a cognitive profile shows significant variability and if the child's relative cognitive weaknesses are consistent with his or her academic weaknesses. Hale et al. (2008) note that all of these models are empirically-supported and have been shown to provide information relevant to instruction. Given the advances in both neuroscientific research related to LD and more precise LD identification methods that apply this research, the potential exists for cognitive neuropsychological approaches to LD diagnosis and treatment to experience a resurgence in both utility and popularity. In light of evidence on the neuropsychological correlates of LD's, the practice of school neuropsychology is emerging as a formidable alternative to RTI for the identification and treatment of LDs.

School neuropsychology. Many proponents of assessment disapprove of the discrepancy model and recommend using neuropsychological tests to provide a more sophisticated, research-based approach to identifying and treating learning disabilities (e.g., Feifer, 2008; Semrud-Clikeman, 2005). Within the LD field, traditional evaluation practices involving the simple search for an aptitude-achievement discrepancy are falling out of favor and are being replaced by more dynamic, multitier, and scientifically-supported practices (Schmitt & Wodrich, 2008). It is therefore, not surprising, that school neuropsychology as a distinct mode of practice has grown alongside RTI as a

viable alternative to the discrepancy model. Witsken, Stoeckel, and D'Amato (2008) suggest that, within the professional literature, school neuropsychology is defined as “the practice of individuals who have been trained in school psychology and clinical neuropsychology and who apply training from both fields to practice in the schools” (p. 782). Miller (2007) expands this definition to outline specific roles for school neuropsychologists including assessment, intervention, family involvement and behavior management as well as consultation focused on curriculum development and instructional design using brain-based research principles.

Early development. With the passage of the first special education law, the Education for All Handicapped Children Act (EAHCA; PL 94-142) in 1975, researchers began to investigate the neurobiological origins of learning and behavioral disorders and a growing interest in applying the principles of clinical neuropsychology in the schools emerged (Miller, 2007; Obrzut, 1981). In the 1980s, neuropsychological approaches to assessment and intervention with children were based on adult rehabilitation models that were rooted in identifying organic, rather than environmental, brain impairments (Witsken et al., 2008). Initially, the practice of integrating neuropsychological assessment into school psychology was fraught with problems. Critics noted that such assessment ignored environmental influences, oversimplified the complexity of learning and behavior, focused primarily on weaknesses, failed to inform treatment in schools, and, since neuropsychological assessment models were based on adults, were invalid for children (Sandoval & Haapmanen, 1981; Witsken et al., 2008). Reynolds (1981) noted that contemporary neuropsychological approaches were ineffective because they

attempted to remediate deficits, whereas a strengths-based neuropsychological model could identify the cognitive abilities that could compensate for a student's weaknesses.

Early attempts to integrate deficit-based neuropsychological principles into school psychological practice (e.g., perceptual-motor training; psycholinguistic assessment; teaching to learning modalities) were not particularly effective at intervening on behalf of students with LDs. These shortcomings provided an argument for the use of behaviorist-oriented techniques such as curriculum-based measurement (Miller, 2007). Pioneers in the neuropsychological approach to school psychology attempted to reconcile some of these difficulties by calling for school psychology training in the student-environment-neurobiological interaction (e.g., Dean, 1984) and additional research that connects how the brain processes information to educational interventions (D'Amato, 1990).

Interest in applying neuropsychological principles in schools continued to grow and surveys completed during the 1980s suggested that practicing school psychologists desired additional training in neuropsychology (D'Amato, 1990). By the late 1980s, school neuropsychology had garnered enough support among school psychologists that a special interest group was formed within NASP (Miller, 2007). In 1990, President Bush proclaimed the 1990s as a decade to promote neuroscientific research and the *decade of the brain* began. By the end of that decade, "no aspect of the neurosciences went untouched by profound and fundamental developments in knowledge" (Joseph, 2001, p. 113). Yet, in 1999, Walker, Boling, and Cobb found that only 23% of 86 surveyed school psychology training programs required a complete course in neuropsychology and very few offered a child neuropsychology course. Furthermore,

86% of the programs surveyed acknowledged that they had no future plans to add neuropsychology training to their programs. The authors concluded that the surveyed programs exhibited little interest in neuropsychological training for their students and likely lacked the information and means necessary for incorporating this training into their programs. Nevertheless, in 1999, the American Board of School Neuropsychology (ABSNP) was founded to set standards for practice and credentialing. These standards dictated that applicants for the ABSNP diplomate must first have a strong professional identity as a school psychologist and, in addition, have documented knowledge and competencies in a number of areas of clinical neuropsychology. While the doctoral level is preferred, specialist-level school psychologists are eligible for the ABSNP diplomate providing they demonstrate the necessary competencies. By 2006, there were 197 school psychologists holding the ABSNP credential (Miller, 2007). Currently, there are 529 ABSNP diplomates in the United States (American Board of School Neuropsychologists, 2014).

Current status. More than ten years after the conclusion of the decade of the brain, the neuroscientific literature continues to grow at a tremendous rate. Hundreds of articles and books on the relationship between brain functions and behavior, such as educational achievement, are written each year (Hale & Fiorello, 2004). Because it overcomes many of the criticisms of RTI supporters, the argument for a neuropsychological approach to school psychology is strong (e.g., Hale & Fiorello, 2004; Miller, 2007; Witsken et al., 2008) and is slowly gaining more acceptance (Cleary & Scott, 2011; Fletcher-Janzen, 2007). Still, legislation, literature and task force reports appear to simultaneously support and weaken the argument for a neuropsychological

approach to the identification of LDs. For example, IDEIA and NCLB appear to emphasize behaviorally-based techniques, such as CBM, at the expense of cognitive processing or neuropsychological assessment. However, IDEIA deemphasized the discrepancy model, which, in turn, paves the way for inclusion of a process-oriented approach to LD assessment (Miller, 2007). Likewise, the LD Roundtable report (2004) underscored the validity of the LD concept and its neurological basis and recommended that a comprehensive evaluation be part of the identification criteria. Yet, member organizations, which included NASP, declined to specify whether cognitive neuropsychological assessments should be included in this evaluation. So far, the issue of how best to identify LDs has not been settled and the role of the school neuropsychological evaluation in the process is unclear.

Leaders in the field of school neuropsychology have presented empirically-based models in an attempt to reconcile criticisms of the neuropsychological approach to LD identification (e.g., D'Amato, Crepeau-Hobson, Huang, & Geil, 2005; Hale & Fiorello, 2004; Hale et al., 2006; Feifer, 2008, Schmitt & Wodrich, 2008). Still, driven by a supportive political climate and ideological preferences, RTI has become the predominant model of school psychological practice. Since 1995, the number of articles in the school psychology literature involving neuropsychology as a topic has declined (Decker, 2008). Simultaneously, however, influential textbooks on school neuropsychology were published, psychology journals increased their attention to school neuropsychology as a topic area (including a special issue of *Psychology in the Schools*), and the first annual conference for school neuropsychologists was held in Dallas, TX (Hynd & Reynolds, 2005; Miller, 2007). In a 2009 survey, a majority of

practicing school psychologists report an understanding of neuropsychological assessment's importance and their desire for more training in that area (Slonaker, 2009).

Currently, RTI appears to be consistent with the reform-minded political and ideological climate in school psychology and education while cognitive neuropsychological approaches are framed as incompatible with progress (Decker, 2008; Feifer, 2008; Holdnack & Weiss, 2006; Kavale et al., 2008). In spite of RTI's ascendancy, the explosion of neuroscientific research, innovations in neuropsychological theory and assessment techniques for children, and advances in understanding the neuropsychological components of a variety of childhood disorders will maintain the already strong interest in school neuropsychology (Miller, 2007). Today, the neuropsychology interest group is one of the largest groups in NASP (Hynd & Reynolds, 2005). Although school neuropsychology is not recognized as a specialty by the APA, NASP, the National Association for Neuropsychology (NAN) or the International Neuropsychological Society (Witsken et al., 2008), it is considered an emerging specialization that is positioned to contribute a great deal to the practice of school psychology and to the identification and treatment of learning disabilities.

Conceptualizations of the Debate

Within the school psychology and special education literature, the RTI versus cognitive neuropsychological assessment debate has been conceptualized in a number of different ways. Most often, these conceptualizations pit one type of person or philosophy against another to highlight the dual nature of the debate. Fuchs, Fuchs, and Stecker (2010) suggest that those with a stake in the RTI-assessment debate break

down into two camps: the IDEA group and the NCLB group. Both groups support RTI as a preventative model involving instruction of increasing intensity. However, the IDEA group's focus concerns the application of RTI as a process designed to serve struggling students and low achievers as well as identifying students with disabilities. The NCLB group's focus is to utilize RTI as a means of meeting NCLB mandates; in other words, ensuring that all children learn. The authors contend that members of the NCLB group believe that the difference between disabled and non-disabled students is simply a matter of degree of underachievement. Conversely, those in the IDEA group believe that disabled and nondisabled students do indeed differ in their skills and abilities.

Kavale, Kauffman, Bachmeier, and LeFever (2008) conceive of the debate as a mismatch of visions rather than as a simple methodological disagreement. The authors frame the debate in terms of what Sowell (1995) referred to as opposing visions of the *anointed*, or the ideological, intellectual elites who presume to take the moral high ground, and the *benighted*, or, those who dare oppose the prevailing view. According to Sowell, the anointed tend to consider themselves more humanistic, caring and compassionate while those who disagree with their assertions are considered mean-spirited naysayers who require enlightenment. Legislation and governmental policies are then utilized as a means of entrenching the positions of the anointed, however empirically unfounded. Reynolds and Shaywitz (2009) echo this assertion, noting that RTI is "characterized as moral imperative and political activism rather than science" (p. 134) and that questioning RTI is often seen as heretical. Similarly, Holdnack and Weiss (2006) provide an example of this unsupported political activism, noting that Bob Pasternak, former Assistant Secretary of Special Education, attempted to vilify

intelligence tests by selecting speakers at congressional hearings that represented a biased view of the causes and treatment of learning disabilities.

Kavale et al. (2008) suggest that, currently, RTI is the prevailing vision and RTI proponents represent the anointed who discredit or marginalize those who offer evidence in disagreement (i.e., the benighted). Applying Sowell's theory to special education, the authors suggest that educators favor the vision of the anointed because it telegraphs humanism, caring, and compassion, traits highly valued by educational professionals. In addition to RTI, movements such as REI and the least restrictive environment (LRE) mandate exemplify the vision of the anointed.

Kauffman (2007) suggests that the current debate places the medical model in opposition to a legal model, with traditional assessment approaches and special education service delivery seen as an outflow of the medical model. Kauffman notes that the medical model attempts to reduce false negatives. In other words, it seeks to identify disorders and provide treatment quickly, even if no disorder exists. In contrast, the legal model is associated with a slower more careful response, seeks to minimize false positives, focuses on group contingencies, and as a result, makes broad conclusions about individuals. In a legal model of service delivery for students with LD, false identification of a disability is to be avoided at all costs and within this model, strong general education instruction is viewed as sufficient for all but the most profoundly disabled students.

Burns et al. (2006), highlighting the differing perspectives of those on each side of the debate, suggest that those who favor a standardized cognitive assessment approach are resistant to change and, because they experience cognitive dissonance

when faced with information that challenges previously held beliefs, view new ideas with more skepticism than those who favor an RTI approach. The authors also note that many in the field of school psychology argue that the debate pits behavioral psychologists against cognitive psychologists. Those cautious of RTI emphasize the psychological processing component of the LD definition, anchor their positions in the cognitive psychological school of thought, and rely on cognitive neuropsychological research. RTI supporters are rooted in the behaviorist tradition and emphasize observable behaviors, rely on behavioral analysis and CBM research, and attempt to link assessment and intervention.

In summary, the current debate has been conceptualized as a struggle between opposing factions rooted in different schools of thought and with differing motivations, visions and conceptualizations of the nature of learning disabilities, and the most appropriate treatment methods. Yet, the underlying personalities of those who comprise these two factions have not been explored and the current debate has not yet been settled. Given Fagan's (2002a) call for research into the variables that most influence changes in school psychological practice, examination of personality and demographic variables can illuminate another dimension of those involved in this debate.

Severity

Despite calls for reconciliation and combining the best aspects of both models, the RTI versus assessment debate has, unfortunately, become polarized and divisive, breaking down into opposing camps of "good guys" and "bad guys" and fostering a "psychology of politics...of hatred" (Ikeda, 2005, "5.", para 1). Reynolds and Shaywitz (2009) refer to the RTI movement as a "frenzy" (p. 134) similar to the whole-language

movement, pointing to the personal attacks that are routinely leveled at supporters of both methods on NASP listservs. Within the professional literature, the debate has also been referred to as “contentious” and “heated” (Mather & Kaufman, 2006, p. 747), sustained by “polarizing camps” (Zach, 2005, p. 152), and characterized by “divisiveness and derision” (Hale et al., 2006, p. 754). Woody (2009) notes that the RTI versus assessment debate tends to provoke “either defensive or attacking communications” (p. 126) and suggests that some embroiled in this debate “wish to fire a salvo over the bow of another ship” (p. 127). Burns et al. (2006) add that “it is difficult to imagine a time in the history of school psychology in which the field was so passionately divided” (para. 2) and implore both sides to allow data to triumph over dogma. The literature supporting both sides of the arguments features articles with strongly-worded titles such as “self-congratulation” (Kavale et al., 2008), “competing views” (Batsche et al., 2006), “watch-them-fail” (Reynolds & Shaywitz, 2009), “perpetuating old ideas” (Fletcher & Reschly, 2005), and “poorly supported ideas” (Kavale et al., 2005).

The September 2005 edition of the NASP Communiqué featured a commentary by Naglieri and Crockett which questioned the scientific research base of RTI and helped to propel the controversy into unnecessarily personal territory. Responses to the commentary were printed in subsequent issues, one of which questioned NASP’s judgment in printing the commentary and accused Naglieri and Crockett of misrepresentation, lack of truthfulness and focusing the debate on themselves, as suggested in the title of the commentary, “It’s Not About us: It’s About the Kids” (Tilly et al., 2005). Ikeda (2005) took these accusations one step further, intimating that Naglieri

and Crockett criticized RTI to “further their own agendas” and questioned whether the purpose of these agendas is to “get the next big NIMH grant? To be on Oprah? To pad a vita that nobody, not even their own kids, cares about long after they’re gone?” (“5.”, para 1). The Communiqué’s editor noted at the conclusion of the article that Naglieri and Crockett’s commentary was printed in order to refrain from suppressing member opinion. However, the Naglieri and Crockett commentary is no longer accessible on NASP’s website, despite their extensive electronic archives of most Communiqué articles from past issues, including those from the same volume in which the Naglieri and Crockett commentary appeared.

Seemingly-dueling authors published articles in the Winter 2004 and 2005 issues of *The School Psychologist*, highlighting the professional discord that is playing out within the literature. Initially, Hale et al. (2004), in their article titled, “Specific Learning Disability Classification in the New Individuals with Disabilities Education Act: The Danger of Good Ideas,” outlined the value of including cognitive assessments in the identification of LDs. At the same time, these authors extolled the value of the RTI model when used preventatively. Hale et al. raised thoughtful questions concerning the appropriateness of RTI as an LD identification model and included in their article a reprint of a letter sent to Senators Gregg and Kennedy containing recommendations for language to be included in the new IDEA reauthorization. In a follow-up critique of the Hale et al. article titled, “Changing Procedures for Identifying Learning Disabilities: The Danger of Perpetuating Old Ideas,” Fletcher and Reschly (2005) suggest that Hale et al. misstated evidence and refer to the information presented in the letter to the senators as “the opinion of four people with vested interests in current practices who formed what

they described as an ad hoc committee that met over a weekend” (p. 14). A further response to that critique by Kavale et al. (2005) titled, “Changing Procedures for Identifying Learning Disabilities: The Danger of Poorly Supported Ideas,” again underlines the authors’ support for RTI as a method of ensuring high quality instruction to all students and as a preventative, prereferral method. The authors then rebuke Fletcher and Reschly for maintaining a “firmly entrenched position” (p. 22) and for being “driven by ideological goals” (p. 20). Rather than valuing both RTI and cognitive assessment approaches and their ability to enhance the other, Kavale et al. suggest that Fletcher and Reschly “pit one against the other as if they were natural adversaries” (p. 22). These fundamental differences regarding the essence of LD may constitute more than just a simple disagreement. In a dialogue between influential voices in the debate, Batsche et al. (2006) suggest that “the paradigmatic differences between the positions illustrated in this article are perhaps unresolvable” (p. 17).

School Psychologists’ Opinions

NASP’s (2011) position statement on LD identification recommends a comprehensive evaluation consisting of “relevant functional, developmental and academic information” (p. 3) within the context of a problem-solving process and multitier instructional model. According to NASP, such comprehensive assessments may include CBM probes as well as cognitive processing assessments, with the assessments’ relevance to intervention employed as a guiding factor. In other words, while NASP strongly supports RTI practices (Feifer, 2008) and denounces use of the discrepancy model, LD identification recommendations allow for the administration of cognitive processing assessments. In general, school psychologists opinions on LD

identification practices are similarly balanced and do not reflect the polarization seen in the professional literature.

Relevant studies. Several recent surveys have been completed to canvass school psychologists' opinions on RTI as it relates to LD identification practices.

Caterino, Sullivan, Long, and Bacal (2008) surveyed 115 school psychologists working in a southwestern state. The survey respondents were primarily school-based practitioners (88.7%) whose male-to-female ratio was similar to that of larger samples of school psychologists obtained for national surveys. Overall, 72% of these respondents indicated that a comprehensive psychological evaluation (including cognitive and academic assessment) should be completed before an LD can be identified. Only 1.7% agreed that RTI should be the only criteria for LD identification. It should be noted that respondents were attendees at a state school psychology conference and therefore may be more likely to access literature that provides an alternative view of the empirical research base for RTI.

O'Donnell and Miller (2011) surveyed a random sample of 496 school-based NASP members (representing 48 states) regarding their acceptance of RTI and the discrepancy model for LD identification. The sample was judged to be representative of NASP members for the demographics of sex, highest degree, and years of experience. Overall, respondents rated the RTI model as significantly more acceptable than the discrepancy model for LD identification. In addition, acceptability of RTI increased with exposure to the RTI model while at the same time acceptability for the discrepancy model decreased. Thus, exposure to RTI mediates practitioners' opinions on RTI as an LD identification method; however, this variable accounts for only 3% of the variance in

RTI acceptability. In addition, another 3% of the variance is accounted for by school setting, with middle and high school practitioners rating the RTI model as significantly less acceptable than elementary or multiple-setting practitioners. Sex, highest degree, years of experience, school locale, and exposure to the discrepancy model did not mediate preference for RTI versus the discrepancy model. In this study, training was cited most frequently as a barrier to RTI implementation. However, Sullivan and Long (2010) surveyed NASP members nationwide and found that 92% had reported receiving some RTI training and 53% practiced at RTI-implementing sites. At these sites, almost 99% reported involvement in RTI implementation and intervention efforts while 79% reported using RTI in combination with a comprehensive evaluation to determine special education eligibility. Thus, variations in training and exposure to RTI may help to explain the significantly higher acceptance of RTI.

Cangelosi (2009) surveyed 168 practicing school psychologists recruited via mailing list and electronic listserv representing all four US regions and 36 states. Demographic characteristics of participants appear to be similar to those reported in other national surveys (e.g., Lewis, Truscott, & Volker, 2008). Unlike the more polarized positions found in the literature, 90 percent of these respondents indicated that a failure to respond to intervention typifies LDs and 80% indicated that a pattern of cognitive strengths and weaknesses is also characteristic of LDs. Overall, 85% of the respondents indicated that a combination of RTI and cognitive assessment is the most defensible means of identifying LDs, with this combination method chosen at a statistically significantly higher rate than either RTI or cognitive assessment methods alone. Furthermore, Cangelosi found more support for the ability-achievement

discrepancy than against it. This is a surprising finding considering a significant number of participants were recruited via National Association of School Psychologists (NASP) Listserv, which has been noted to harbor “intense, and at times ad hominem, debate” concerning RTI and cognitive neuropsychological assessment (Reynolds & Shaywitz, 2009, p. 131). Interestingly, Cangelosi found that respondents’ professional beliefs on LD identification were highly inconsistent with their practices. The author suggested this disparity may be related to state laws and regulations, the influence of team chairpersons, school psychologists falling back on methods they learned in graduate school, or the recognition that RTI is still in its developing stages.

Raso (2009) surveyed 84 teachers, administrators, and school psychologists from the capital region of New York regarding their acceptability of the discrepancy model and RTI for LD identification. This study also examined the relationship between respondents’ perceived origin(s) of LDs and their preference for an RTI or discrepancy based approach to identification. School psychologists rated RTI as significantly more acceptable than the discrepancy model, yet these ratings were lower than those of school administrators. All three groups attributed greater weight to environmental and instructional, rather than biological, variables as causative factors in LDs and those that attributed the origins of LDs to instructional factors favored RTI as an LD identification approach significantly more. School psychologists attributed more weight to environmental factors than instructional or biological factors and positively endorsed the use of curriculum-based measures in LD evaluations. The author concluded that the school psychologists in his sample exhibited a departure away from psychometric approaches to LD identification. Raso also noted that school psychologists who

exhibited more confidence in their ability to use specific instructional, assessment and consultative techniques required in an RTI model were more likely to rate this approach to LD identification as favorable. While this may be a function of training or exposure to RTI, given O'Donnell and Miller's (2011) findings, it may also indicate that, to a degree, personal feelings may influence school psychologists' attitudes towards RTI.

Mike (2010) surveyed 41 NASP members nationwide, most of whom (79%) were practicing in public schools, regarding their preferences for RTI as a prereferral process or LD identification method, perceived benefits of RTI and the school psychologist's role in RTI implementation. Respondents agreed with RTI as a prereferral method significantly more than they agreed with RTI as an LD identification method. Three-fourths of respondents agreed that cognitive processing assessment should be used to identify an LD and slightly less than half noted that they hesitated to use RTI as a sole criterion for LD identification because it does not provide information about cognitive neuropsychological processing difficulties. Similar to O'Donnell & Miller's (2011) findings, Mike found that increased training opportunities (more or less than nine days) mediated preference for RTI vs. the discrepancy model, with additional training leading to an increased preference for RTI. School psychologists with less than five years of experience and those working in a school where RTI is not being implemented agreed with significantly more RTI benefit statements. Thus, it is possible that training and exposure to RTI convinces practitioners of the benefits of RTI, but practical, real world experience with RTI makes them skeptical.

Unruh and McKellar (2013) explored differences in LD identification practices for school psychologists employed at schools with an existing RTI model in place and for

those employed at non-RTI schools. Participants were asked to indicate the method they use for identifying an LD (discrepancy model, RTI only, pattern of processing strengths and weaknesses, other, or a combination of the above) as well as whether RTI is being implemented in their schools. The survey of 382 state school psychology association members from 27 states representing all NASP regions suggests that the method used to identify an LD is significantly related to the school's model (RTI or non-RTI) for the discrepancy and RTI models, but not for the pattern of processing deficits model. Among all respondents, the discrepancy model still prevailed as the most common method in use (60%) while RTI is used only slightly less (56%). Processing strengths and weaknesses, which implies use of cognitive neuropsychological measures, was the least employed method (49%), although large numbers of practitioners reported using these methods in combination. In addition, half of the total sample employed in RTI and non-RTI schools reported using the pattern of processing deficits method at approximately similar rates. Therefore, while employment at RTI or non-RTI schools mediates use of either the RTI or discrepancy model, respectively, the pattern of processing deficits model (or "third method") is not dependent on whether or not RTI is being implemented in a school and is used approximately equally across both settings.

Machek and Nelson (2007) surveyed 549 NASP members regarding their perceptions of the operational definitions and exclusionary criteria relevant to the identification of reading disabilities (RD), the most frequently occurring LD. The authors compared the results of their survey to those of a previous survey of journal editorial board members regarding the operationalization of RD (Speece & Sheitka, 2002, cited

in Machek & Nelson, 2007). While school psychologists (81%) endorsed RTI as an important criterion for RD at a significantly higher rate than journal editorial board members, they also endorsed cognitive processing difficulties (78%) at a significantly higher rate. Machek and Nelson suggest that the endorsement of a balanced approach captures the sentiment of many practicing school psychologists. They attributed respondents' high level of acceptability for RTI to its considerable representation in the literature and among professional development offerings, RTI and the problem-solving models' prominence in NASP publications and required readings for graduate students, and school psychologists' desire for role expansion. The authors also noted that school psychologists may be reluctant to endorse an RD identification model that excludes cognitive assessment due to job security fears and their established skill set in cognitive testing.

The emergence of RTI has created the potential for substantial shifts in role functions for school psychologists. Accompanying these shifts may be fears of job loss, devaluation of practice, and a minimization of specialized skills and subsequent loss of credibility (Allison & Upah, 2006). Indeed, Decker, Hale, and Flanagan (2013) note that the federal government's cost-benefit analysis for IDEIA highlights the potential costs savings of the IDEIA regulations resulting from the need to employ fewer school psychologists. In a follow up study utilizing the 2007 sample of respondents, Machek & Nelson (2010) explored school psychologists' opinions of their ability to engage in RTI roles and the desirability of doing so, the advantages and challenges of the RTI approach to RD identification, and job security concerns. The proportion of respondents who disagreed that decreases in intelligence test usage constituted a threat to job

security was significantly lower than the proportion that agreed. Still, one third of respondents felt their job security would be threatened. There was no correlation between years of experience and perception of job security. Respondents' desire and perceived ability to take on RTI-based roles were generally equivalent. Only slightly more than half (58%) perceived this role expansion to be desirable.

Similar to O'Donnell & Miller (2011) who found greater acceptability for the RTI model at elementary schools, Machek and Nelson (2010) found that respondents working in elementary schools expressed significantly more desire to take on RTI-related roles than those in middle or high school. A moderate (but not significant) positive correlation was found between years of experience and perceptions of abilities to organize RTI. Yet, a negative correlation was found between this variable and the desirability of various RTI roles, including organization, consulting on CBM and engaging in CBM. This coincides with Mike's (2010) finding that less experienced practitioners acknowledged more RTI benefits than more experienced practitioners and suggests that those with more experience may be reluctant to discard traditional assessment practices in favor of RTI, which requires different skills. Compared to the discrepancy model, the majority of respondents perceived RTI implementation to result in improvements for students with RD on instruction, early identification, connecting assessment to intervention, and monitoring progress. It should be noted that a number of challenges to RTI were noted by participants, yet these concerns were shared to a lesser degree by those already working within an RTI framework. This contrasts with what Mike's (2010) finding that school psychologists not working within an RTI

framework agreed with significantly more RTI benefit statements than those working within an RTI framework.

In summary, most studies have found that practicing school psychologists take a balanced view of LD identification and agree that an LD identification approach that combines RTI and cognitive assessment methods is preferable to the sole use of either approach. Actual use of RTI data to identify an LD is related to whether or not RTI is being implemented in a practitioner's school, yet the use of cognitive neuropsychological assessments to establish a pattern of processing deficits is not related to employment in an RTI or non-RTI school. Years of experience as a school psychologist, exposure to RTI and training opportunities, and employment in an elementary vs. middle/high school setting has been shown in a number of studies to mediate acceptability for an RTI approach. However, in one study, the combination of employment setting and exposure to RTI accounted for only 6% of the variance in preferences for RTI.

Surveyed school psychologists' opinions on RTI were found to be inconsistent with their LD identification practice (Cangelosi, 2009). While this may be a result of state or district assessment requirements that are misaligned with their preferences, Wilczenski & Bontrager (1996) found very little relationship between the types of assessment procedures employed by a random sample of school psychologists and their theoretical orientation. Though RTI, with its strong philosophical and historical foundations, had not yet materialized at the time this study was conducted, it suggests that professional beliefs, such as theoretical orientation, may be less influential than other factors in determining the types of practices in which school psychologists

engage. In addition, these authors concluded that a significant number of school psychologists do not subscribe to a particular orientation and instead, do “what comes naturally” (p. 9). Yet, factors that lead to school psychologists doing what comes naturally to them were not identified. As such, with only 6% of the variance accounted for in practitioners’ assessment preferences and the unestablished role of theoretical orientation in driving assessment practices, exploration of other variables is warranted. Indeed, Curtis et al. (2002) suggest “the discrepancies between preferred and actual roles and practices suggest the need for investigation into factors that are associated with engagement in various professional practices” (p. 31).

The emergence of subspecialties. The emergence of RTI along with the support afforded it within legislation, policies and the professional literature, represents the greatest and most formalized role change for school psychologists to date. Additional movement toward RTI requires the development of new and different skills and will bring role expansion and increased collaboration with other stakeholders (Lichtenstein, 2008; Machek & Nelson, 2007). RTI may appeal to some school psychologists because of the opportunity for expansion into prevention and consultation functions (Machek & Nelson, 2007; Hosp, 2006). RTI may also allow for increased specialization of skills and can facilitate the movement of school psychologists into administrative and management positions (Allison & Upah, 2006). NASP, through credentialing, training-program approval, and publications *Best Practices in School Psychology V* (NASP, 2008), and the *Model for Comprehensive and Integrated School Psychological Services* (NASP, 2010) strongly supports RTI practices and RTI-based roles for school psychologists. As a prerequisite to receiving NASP approval, training

programs must demonstrate that they provide training in problem solving, intervention, consultation, and progress monitoring. All of these competencies are integral to delivering school psychological services within an RTI framework (Decker, Bolt, & Triezenberg, 2006). However, the widespread adoption of RTI may shift the role of the school psychologist to that of a behaviorally-oriented curriculum specialist who provides support to general education. This shift may occur at the expense of psychological assessment and diagnostic practices. Thus, RTI may function as a barrier to the inclusion of a cognitive neuropsychological approach to service delivery (Decker, 2008).

Contemporary school psychologists are trained to fulfill so many roles that many may be unable to do so competently (Fagan, 2002a). Indeed, many school psychologists desire increased specialization. In a survey of randomly-selected NASP members, Miller, Maricle, and Deornellas (2009) found that 53% of those surveyed believed the field of school psychology would benefit from recognizing subspecialties and 81% agreed that NASP should recognize subspecialties. School neuropsychology was identified among others as an area of possible subspecialization. As a result of individual interest and specialized skills obtained, many graduate students gravitate toward an area of subspecialization soon after graduation (Miller, Deornellas, & Maricle, 2008). In concert with Fagan (2002a), Miller et al. (2008) suggest that the growing and diverse body of knowledge that school psychologists are required to master may impede their ability to perform all role functions with competence. Thus, parent organizations of professionals, such as NASP, have a duty to set standards that define specialization in an area. The authors also note that specialization within a profession is a sign of maturity. Comparing the field of school psychology to that of professional

psychology represented by the APA, Miller et al. suggest that recognizing subspecialties, in much the same way APA recognizes its divisions, may be a way to respect the diversity of knowledge within the school psychology field. Miller et al. add that failing to do so may lead to fracture: “when a subgroup within an organization does not feel like their professional and educational needs are being addressed, the parent organization runs the risk of losing that cohort of members” (p. 41). Referring to various schisms within the field of school psychology, including the RTI versus cognitive assessment debate, Woody (2009) notes “conflict will occur when resources are unequal between subgroups within the same sphere” (p. 127). Given the preference for RTI evident within the law and literature, it is not surprising that a number of researchers and scholars have called for recognition of subspecialties, namely school neuropsychology (e.g., Fletcher-Janzen, 2007; Hynd & Reynolds, 2005; Miller et al., 2008).

Summary

This section examined the current debate in terms of the arguments presented by both sides, different conceptualizations of the debate within the literature, and school psychologists’ opinions on LD identification methods. Supporters of an RTI approach to LD identification cite dissatisfaction with the discrepancy model, with its poor differentiation capacity and wait-to-fail nature, as a driving force behind the emergence of RTI. These supporters tout RTI as an ecologically-valid model designed to ensure accountability and instructional adequacy. RTI is promoted as an efficient and systematic method of allocating resources where they are needed. As an LD identification method, RTI is viewed as a treatment-valid approach that reduces LD

identification rates and reduces disproportionate placements among males and minorities. Supporters of RTI as an LD identification procedure cite traditional assessment's failure to contribute useful or accurate information for treatment or predict response to treatment as well as its time consuming nature and lack of scientific validation.

Supporters of assessment note that the definition of LD as neurologically-based and the method of identification must be consistent. Cognitive neuropsychological assessment is rooted in the latest neuroscientific research demonstrating that LD students process information differently than typically-developing peers. Therefore, unlike RTI, only a cognitive neuropsychologically-oriented assessment can identify the root cause of an LD and point to the right intervention. RTI can identify nonresponders, but, unlike assessment-based approaches, cannot differentiate truly LD students from students who are low achievers, low SES, or who have comorbidities or other disabilities that impair learning. Given the explosion in neuroscientific research, contemporary, empirically-based and scientifically-validated cognitive neuropsychological assessment approaches have the capacity to respond to the shortcomings of the RTI model. School neuropsychology, as an approach, provides a more sophisticated, research-based approach and is in its nascent stages as an area of specialization in school psychology.

The current debate has become highly divisive and, within the literature, has been conceptualized in a number of ways. Yet, practicing school psychologists are more balanced in their preferences for either RTI or assessment approaches in LD identification. Only when RTI is contrasted with the discrepancy model are substantial

differences in opinions seen. A large majority of practicing school psychologists agree that a comprehensive assessment of cognitive processing is essential for LD identification. Yet, the movement toward RTI seen in the literature, legislation, training, and NASP recommendations may frustrate assessment-oriented practitioners. Because school psychologists are trained to fulfill so many roles, they may be unable to do so competently. Thus, a movement toward recognizing subspecialties may be underway.

The Influence of Personality on School Psychologists' Practice

A number of variables, both internal and external, influence the professional practice of school psychologists (Fagan & Wise, 2000). Role function, legal requirements, the needs of stakeholders, and district or organizational goals most certainly determine many of the daily activities in which school psychologists engage. However, personal variables, such as age, race, socioeconomic status, gender, personal history, and marital status also play an influential role in school psychological practice (Fagan & Wise, 2000). School psychologists are unique individuals who will bring important aspects of themselves and their histories to their practice. These variables will likely influence not only their career choices, but also the manner in which they fulfill their professional roles (Roth, 2009). Unfortunately, the personalities of school psychologists have not been widely studied. Most recently, Toomey (2001) and Roth (2009) applied Holland's Theory of Vocational Personalities and Work Environments to the study of school psychologists' personalities. Toomey concluded that, with regard to school psychologists, "personality variables need further exploration" (p. 211). In particular, she stressed the extent to which personality variables relate to

other unexplored variables, for example school setting, as a means of explaining additional variance in job satisfaction for school psychologists.

Personality and Theoretical Orientation of Psychologists

A significant amount of research has demonstrated the link between psychologists' personalities and their theoretical orientation. Most of this research concerns the extent to which clinical psychologists' personalities influence their choice of therapy or preferred treatment orientation (e.g., behavioral, psychodynamic). For example, Chwast (1978) interviewed five clinical psychologists, all of whom stated that (1) their personality influenced their preferred mode of practice and, (2) their personality needs (e.g., need for consistency, explanatory power, or omnipotence) were highly significant in their choice of therapeutic practice. More recent studies comparing clinical psychologists from different theoretical orientations found significant differences between groups on measures of personality (Buckman & Barker, 2010; MacLennan, 2008). Using a random sample of NASP and APA clinical psychologists, Hollander (1995) demonstrated that personality, world view, and theoretical orientation are correlated. For example, participants with cognitive-behavioral, eclectic, humanistic orientations exhibited significantly different personality profiles based on the Five Factor Model. Hollander's results also indicated that personality and world view predict theoretical orientation.

Zachar and Leong (1992) directly explored vocational personality differences between psychology graduate students subscribing to either a scientist or practitioner perspective. Like Toomey (2001) and Roth (2009), these authors applied Holland's Theory of Vocational Personality and Work Environments to their study of personality.

Briefly summarized, Holland's (1985) theory stipulates that most people resemble primarily one of six basic personality types: Realistic (ordered, systematic, mechanical), Investigative (analytical, curious, intellectual), Artistic (creative, expressive, imaginative), Social (friendly, outgoing, helpful), Enterprising (acquisitive, adventurous, ambitious), Conventional (conforming, careful, methodical) and that an individual's personality leads him or her to seek out a career that supports or rewards those personality characteristics (Holland, 1985). Using the VPI (Holland, 1985) to assess personality, those whose self-ratings on a validated inventory revealed a *scientist* perspective scored significantly higher on the Investigative scale and lower on the Social scale than *practitioners*, whose scores were significantly higher in the opposite direction (lower Investigative scores but higher Social scores). Between the scientist and practitioner groups, self-ratings revealed polar opposite theoretical orientations, leading the authors to conclude that these preferences have a strong personality component. The authors note that those with a strong proclivity toward scientific thinking tend to question ambiguity and value deeper scientific understanding, while practitioners tolerate ambiguity more readily and have less interest in increasing their scientific understanding of a problem. Applying this dichotomy to the current debate with regard to LD identification, it may be that those who favor RTI can be characterized as practitioners. RTI proponents minimize the role of diagnosis and proper identification while stressing the need to intervene on behalf of a struggling student. Likewise, proponents of assessment approaches, with their search for proper diagnosis and greater predictive accuracy, can best be characterized as scientists. Thus, practitioners likely ask *what* and *how well* while scientists likely ask *why*.

Personality and School Psychologists' Orientations With Regard to LD

Identification

Research suggests that school psychologists are a diverse group of people with a wide variety of vocational personalities (Toomey, Levinson, & Morrison, 2008).

Bardon (1983) compares the field of school psychology to a wedding cake, with numerous layers, representing school psychologists, of differing sizes, textures and flavors. Yet, at opposite ends of the field are *pragmatists* and *purists*. Pragmatists are aligned with education, are focused on responding to the immediate need for pupil services, focus on their utility within the education establishment, and do not identify with the field of psychology to a great extent. On the other hand, purists see themselves as psychologists first, are highly invested in the science of psychology, and are uninterested in working within a pupil services model. Between these two opposite ends, where most practitioners lie, are the *compromisers* who want to improve the field of school psychology but are unwilling to take firm positions, will give in to the demands of others, and hope that with time, issues in the field will resolve themselves. Thus, any change in the field of school psychology is likely to result from the efforts of the purists or pragmatists rather than the compromisers.

Those at opposite ends of the RTI vs. assessment debate for LD identification may be classified as psychologists or educators, scientists or practitioners, or pragmatists or purists. Yet the attitudes, values, drives, interests and motivations that lead to these fundamental differences may be simply a difference of personality. If personality is a factor in determining the theoretical orientations and preferred practice

models of professional psychologists, might it not be a factor for school psychologists as well?

Those who use assessment methods for LD identification seek to understand behavior, detect impairments in functioning, align assessment methods with neuroscience, access research on the identification and treatment of learning disabilities, and root their practice firmly in psychology (Schmitt & Wodrich, 2008). These school psychologists seek an understanding of why a problem is occurring (Mather & Kaufman, 2006). According to Holland's (1985) theory of vocational personality, these school psychologists may be more oriented toward the Investigative type of personality. The Investigative type prefers the systematic and "creative investigation of physical, biological and cultural phenomena in order to understand and control such phenomena" (p. 19-20). Investigative types also develop scientific and mathematical competencies and, therefore, value scientific understanding. They tend to be averse to persuasive, social and repetitive activities. Indeed, Toomey (2001) found that school psychologists who scored higher on the Investigative scale were more likely than other types to prefer assessment and research activities. This is not surprising considering the use of a cognitive processing approach for LD identification requires complex data analysis; professional judgment regarding LDs and their causes, comorbidities and treatments; and knowledge of the technical properties of the assessments used to diagnose them (Lichtenstein, 2008).

Conversely, RTI-oriented school psychologists take an advocacy stance and focus on changing policies and leading reform rather than engaging in the scientifically-specific treatment of LDs. While RTI supporters value diagnostic precision and

scientific understanding of LDs less than assessment-oriented school psychologists, their efforts at reform of LD identification procedures represents a “humanistic concern” aimed at obtaining the appropriate support for struggling students (Kavale et al., 2005). These school psychologists may have a Social personality, which, according to Holland (1985), leads to a preference for activities that “entail the manipulation of others to inform, train, develop, cure, or enlighten” (p. 21) and an aversion to systematic and ordered activities. The Social type acquires interpersonal and educational competencies rather than manual and technical competencies. The RTI approach to LD identification requires the interpersonal skills that support consultation, team-building, and the problem-solving process as well as educationally-oriented knowledge of curriculum and instruction (Lichtenstein, 2008). In addition, facilitating collaboration between home, school, and community agencies is a critical role for school psychologists in RTI (Burns & Coolong-Chaffin, 2006).

In a discussion of possible future roles for school psychologists, Reschly (2000) notes that attitudes and beliefs are likely influences on roles, but that the nature and strength of their influence is unclear. Attitudes, values, interests, and beliefs, in Holland’s (1985) view, form a significant part of an individual’s personality. The expression of this vocational personality influences the extent to which a person is drawn to a particular type of work. Thus, vocational personality is likely to influence the roles in which school psychologists seek out and prefer to engage.

Holland’s Theory of Vocational Personalities

As noted earlier, variables such as age, gender, race, and socioeconomic status influence school psychological practice. Yet, personality traits are also likely to

influence the roles in which school psychologists engage (Fagan & Wise, 2000).

Personality traits refer to the psychologically-determined reasons for a person's behavior that reflect his or her thoughts, emotions and actions. While there are various explanations for the meaning and development of personality, theorists tend to agree that people's actions are influenced by their personality, which tends to remain stable over time (Mount, Barrick, Scullen, Rounds, & Sackett, 2005). Thus, while some determinants (e.g., legislation, new research, district initiatives) of school psychologists' roles change, basic personality can be expected to exert a more stable influence on their actual and desired role functions. Vocational psychology and various career development theories are rooted in trait and factor theory, which assumes that an individual possesses specific traits that can be matched to an appropriate, and therefore, satisfying job (Wille, Beyers, & De Fruyt, 2012). One of these theories, John L. Holland's (1985) Theory of Vocational Personality and Work Environments, helps to explain how personal and environmental factors interact to explain vocational behavior.

Overview

Holland's Theory of Vocational Personality and Work Environments is a very complete, frequently used and well-tested theory of career development (Toomey, 2001). The theory helps to explain the personal and environmental characteristics that lead to career decisions and accomplishments as well as stability and change (Holland, 1985). Holland further posits that one's chosen occupation is a manifestation of his or her personality. Therefore, as a personality theory, Holland's ideas can also be applied to the description, understanding and prediction of behavior in a variety of settings (Gottfredson & Johnstun, 2009).

The central tenet of Holland's theory is that people's personalities resemble one or more of six basic personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Each of these types is characterized by specific interests, preferred activities, beliefs, abilities, values, and characteristics (Nauta, 2010). While individuals' personalities resemble a combination of the six basic types, referred to as the vocational personality, close correspondence to one of the basic types increases the likelihood of exhibiting the personal traits and behaviors associated with that type. Thus, a type is a model against which the real person is measured (Holland, 1985). Each vocational personality type results from an interaction between cultural and personal forces, such as peers, biology and heredity, social class, family, and physical environment. As a consequence of these interactions, people learn to prefer particular activities, which later become interests that promote specific competencies. Eventually, a disposition evolves that leads a person to think and behave in a manner that resembles one or more of the six basic types. This disposition influences choice of occupation, thus, career choice is a manifestation of personality (Holland, 1985).

Occupations, as well as people, can be categorized into combinations of the six major types and are also indicated by a three-letter code representing their resemblance to six model environments (Miller, 2002). The first letter of the code reflects the vocational personality type or environmental model an individual or occupation resembles most. The second and third letters represent the type the individual or environment resembles next (Toomey et al., 2008). Each occupation is dominated by a given vocational personality type, thereby creating a work environment that reflects these traits (Toomey, 2001). Occupational environments tend to encourage

and reward specific values and traits corresponding to the environment it typifies (Gottfredson & Johnstun, 2009; Holland, 1985). For example, social types blossom in an environment in which extraversion and sociability are necessary and valued traits. The interaction of an individual's vocational personality and the characteristics that dominate and are valued by an environment results in degrees of fit between the person and the work environment (Gottfredson & Johnstun, 2009; Holland, 1985).

Holland's six types (both persons and environments) are not entirely distinct entities. Instead, they resemble each other in different ways, with each type resembling some more than others. Holland (1985) uses a hexagonal plane to delineate the relationships among types, with resemblances among types represented by the distance between the types on the hexagon. The shorter the distance between any two types, the greater their similarity. For example, from a vocational personality standpoint, the Realistic and Investigative types are similar in some ways and are therefore situated adjacent to each other on the hexagon. However, the Realistic type is most dissimilar to the Social type and is therefore situated directly across from it, and furthest away, on the hexagon. Holland's hexagonal model is shown in Figure 1. below:

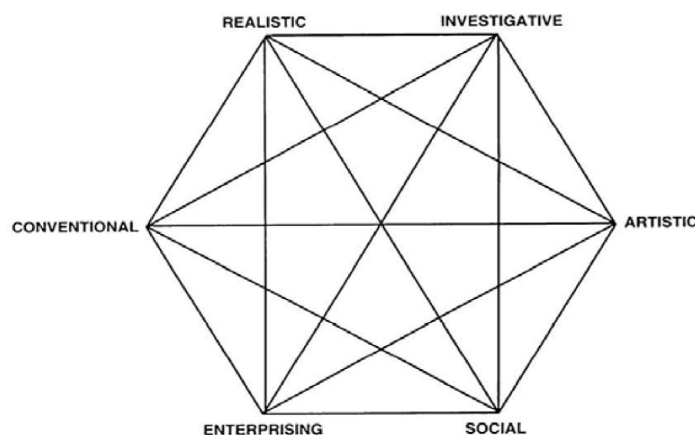


Figure 1. Hexagonal model depicting the relationship among RIASEC types as indicated by relative distances between types (Holland, 1985).

According to Holland (1985), the hexagon helps to define the degree of consistency in a person's pattern and provides a model by which his main ideas can be linked and applied to the solution of practical problems.

Holland (1985) has outlined four working assumptions that support the theory's capacity to explain the nature of persons and environments as well as how they interact to create differing vocational, educational, and social phenomena. These assumptions include: (1) most persons can be categorized as one of the six types, (2) there are six model environments dominated by a given vocational personality, (3) people search for the environment corresponding to their vocational personality type, and (4) behavior is determined by an interaction between vocational personality and environment. A dissimilarity between one's vocational personality and occupation (*incongruence*) and how clearly defined one's vocational personality profile (*differentiation*) can be used to predict job performance, preferred job roles, stability and job satisfaction (Toomey, Levinson & Palmer, 2009; Nauta, 2010).

Holland types can be assessed quantitatively using two main instruments. The Vocational Preference Inventory (VPI; Holland 1977) identifies a respondent's type by asking him or her to choose appealing and unappealing occupations from a list, thereby yielding a vocational personality pattern. The second instrument, the Self-Directed Search (SDS; Holland, 1979), samples a broader range of content than the VPI. Respondents who complete the SDS rate themselves with regard to preferred activities, competencies, occupational preferences, and other aspects, which are tallied by the respondent to arrive at the three-letter Holland type code. The code can be used to choose occupations or environments that are suited to the individual's vocational

personality. The SDS is self-administered, self-scored and self-interpreted instrument that has received widespread acceptance by vocational and guidance counselors, psychologists and professionals in other related fields and has been completed by millions of people (McKee & Levinson, 1990).

Gottfredson and Holland (1996) suggest that the Theory of Vocational Personalities and Work Environments is “the most widely used organizing principle for vocational interest assessment” (p. 703) for a number of reasons. The theory is easily grasped due to its clear definitions and internally consistent structure, is empirically sound due to its broad base of research support, and is straightforward enough to apply to a number of practical problems that people face. While the authors note some of the weaknesses of the theory, which are consistent with those offered by Holland (1985), they do not suggest that the three-letter code, as a reflection of vocational personality, is inadequate, unsound or empirically unsupported.

Evidence for the Vocational Personality Construct

Holland’s (1959) Theory of Vocational Choice emerged as a more comprehensive theory of vocational behavior than those prevailing at the time, yet “sufficiently close to observables to stimulate further research” (p. 35). Holland’s revisions in 1966, 1973, 1985 and 1997 were driven primarily by evidence. The hexagonal relationship among types was introduced in 1969 and incorporated into the formal theory in his 1973 revision. In his final formulation, Holland emphasized the idea that each of the six vocational personality types has unique beliefs about the self and the consequences of behavior (Nauta, 2010). As the current study focuses on Holland

types as indicators of an individual's overall personality, literature addressing the validity of the vocational personality and the RIASEC structural typology will be reviewed.

Early support for Holland's theory. Between 1959 and 1970, Holland developed, tested and revised his original theory, which he then applied to the construction of the initial version of the Self-Directed Search (SDS; Gottfredson & Johnston, 2009). The various revisions Holland made to his theory were driven primarily by evidence (Nauta, 2010) accumulated across a variety of experimental and correlational studies and researchers, including Holland himself (Holland, 1985).

Research supporting the vocational personality. Holland (1985) reviewed over 400 studies testing aspects of his theory and summarized evidence from the most methodologically-sound large-scale investigations. In his review, Holland presents substantial evidence that supports the utility of his vocational personality and environmental types as well as the interaction between them. In 1962, Holland tested his theory on a sample of National Merit finalists and found that a variety of characteristics, including academic aptitude, self-ratings, extra-curricular activities, academic interests, nonacademic achievements, and a number of general personality variables were associated with each of the six Holland types. Holland and others replicated these findings with different samples, including honor students, other national merit finalists, and several samples of college freshmen in both shorter-term and longitudinal studies. These studies took his initial findings a step further by demonstrating differences across subtypes rather than just across the six main RIASEC types. In one of these studies, Williams (1972) assessed male graduate students using Holland's VPI, the 16PF, Allport-Vernon-Lindzey Study of Values and the Miller

Occupational Values Indicator. Results indicated that the students' personalities and life and work values were significantly related to occupational choice. Holland (1985) suggests Williams' findings provide evidence for the relationship between career values and the characteristics of various Holland types. Finally, in his summary, Holland also reports evidence from studies demonstrating meaningful relationships between the SDS and a wide range of personality inventories, such as the 16PF, the Meyers-Briggs Type Indicator (MBTI), and the Neuroticism-Extraversion-Openness Personality Inventory (NEO-PI), as well as ability indicators, such as self-ratings of competencies and the Armed Services Vocational Aptitude Battery (ASVAB).

Research on the RIASEC structure. Holland (1985) reported that the initial hexagonal arrangement of the six types was supported by statistical analysis which located the types on a best-fitting plane. In a study that attempted to duplicate findings from two earlier investigations in which configurational analyses approximated the hexagonal model for both males and females, Edwards and Whitney (1972) factor analyzed data from four different domains. Clear patterns of convergent and discriminant validity reinforced the hexagonal model as well as the placement of each type and their proximal relationships to the other types. Using a sample of 1206 professional accountants, a factor analysis conducted by Rachman, Amernic, and Aranya (1981) supported Holland's six factors and confirmed the Hexagonal arrangement. The authors, as well as Holland (1985) suggest that the extreme homogeneity of the sample lends additional validity to the results and reaffirms the soundness of the theoretical structure. In general, since Holland first proposed his

hexagonal model, a number of factor analyses have shown that the SDS measures six factors corresponding to the types and that the hexagonal arrangement is valid.

After a comprehensive review of the empirical studies that tested his theory, Holland concluded that each type chooses occupations, moves among occupations and behaves according to theoretical expectations. In addition, his typology is supported by a broad base of research with a variety of males and females of different cultures, including children, adolescents, college students, and adults as old as 88. Yet, Holland also acknowledged some of the weaknesses of his theory, particularly with regard to its validity and utility as a theory of personality as well as his proposed typology. Empirically, Holland (1985) cited only moderate support for the theory's enumerations on personal development and change. In addition, the influence of variables such as education, sex, social class, intelligence, and special aptitudes or disadvantages are outside the scope of the theory. Holland specifically cites social status as an influential variable that must be controlled in empirical studies testing his theory. However, more recent research has provided some answers to these shortcomings.

Contemporary research. Nauta (2010) summarizes the contemporary research supporting the RIASEC types as expressions of personality and their hexagonal arrangement to each other.

Research supporting the vocational personality. A substantial amount of research supports the existence of RIASEC types among a wide variety of individuals. However, sex, race or ethnicity, and social class exert an influence. For example, Fouad (2002) found that men tend to score higher on the Realistic scale while women tend to score higher on the Social scale. In addition, although the effect size was small,

differences in vocational interests among ethnic groups were also found. A number of studies have demonstrated that the Holland type three-letter code, whether assessed using the VPI or SDS, is stable over time and therefore reflects general personality traits. While Nauta reviews studies of short-term test-retest stability, additional studies have demonstrated the code's stability over the longer term. Miller (2002) investigated degree of change in a single client's code over a 10 year period. Using the SDS, Miller's client three-letter code at age 16 was identical to his code at age 26. In addition, his profile became more differentiated (i.e., distinctive) over time, further supporting Holland's theory.

Barrick, Mount, and Gupta (2003) provide support for Holland RIASEC types as expressions of personality. In a meta-analysis of literature examining the relationship between the five-factor model (FFM) of personality (openness, agreeableness, conscientiousness, extraversion, and neuroticism) and Holland's RIASEC types, the authors concluded that there are meaningful relations between some FFM dimensions and RIASEC types. While the Realistic type was related more to ability dimensions (e.g., math reasoning, background knowledge) than to personality, moderate correlations were found between the Social, Conventional and Investigative types and FFM personality dimensions. The Enterprising and Social vocational types were related to Extraversion, the Social type was related to Agreeableness, the Artistic and Investigative types were related to FFM Openness to Experience, the Conventional type was related to FFM Conscientiousness, and the Investigative type was related to FFM Conscientiousness and Emotional Stability. These findings were similar to a 1993 study by Gottfredson, Jones, and Holland which found that the Investigative and Artistic types

were related to FFM Openness, the Social and Enterprising types were related to FFM Extraversion and FFM Ambition/Sociability, and the Conventional type was related to FFM Control.

Research on the RIASEC structure. A number of recent studies support Holland's hexagonal model and the ordering of types. Yet, there is less support for a model that maintains equal distances between each type, as research suggests that some types are more and less similar to each other. Therefore, many researchers have suggested that the Holland hexagon should be referred to as a circumplex (Nauta, 2010). Indeed, Holland (1985) himself acknowledged that the empirical data are more consistent with a "misshapen polygon" than a hexagon (p. 96). Figure 2 depicts this hypothesized polygon.

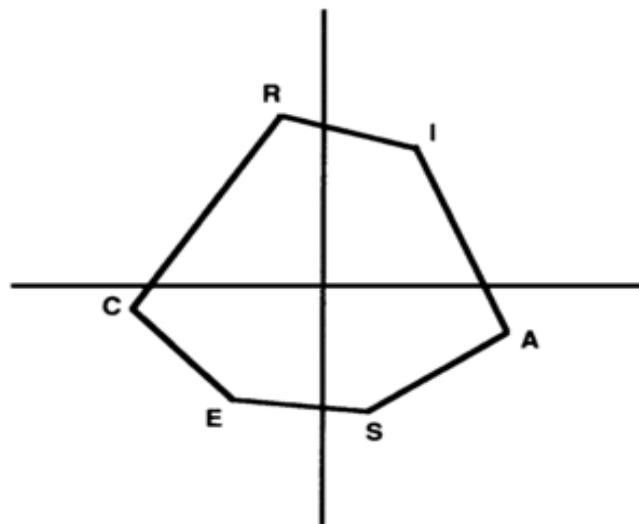


Figure 2. Misshapen polygon that more accurately depicts the relationship among RIASEC types as indicated by the relative distances between types (Rounds & Tracey, 1993).

Nauta (2010) reviews contemporary research and concludes that the Holland RIASEC structure holds across gender, race or ethnicity, and socioeconomic status. Similarly, Gottfredson and Johnston (2009), in a review of the specific theoretical

aspects underlying the SDS, concluded that Holland's hexagonal configuration has broad applicability across gender and cultural differences. However, the research is more inconsistent regarding its fit among different nationalities. Rounds and Tracey (1996) conducted a structural meta-analysis to evaluate the fit of Holland's hexagonal typology across ethnic groups both within and outside the U.S. While past cross-culture studies supported the hexagonal typology with U.S. and international ethnic samples, Rounds and Tracey's comparison of RIASEC correlation matrices from 19 countries with a U.S. benchmark matrix suggested that the cross-cultural structural equivalence of Holland's model was not supported.

Holland's Theory Applied to School Psychologists

Although not much is known about the personalities of school psychologists (Roth, 2006; Davis & Sandoval, 1992), the dual nature of school psychology, grounded in the theory and practices of both psychology and education, suggests that it is comprised of people who are likely to thrive in an environment that rewards the competencies upon which these two professions draw.

Holland codes within education and psychology. The educational environment is primarily a Social environment (Gottfredson & Holland, 1996), therefore a majority of the people populating schools would be expected to have "S" as the first letter of their Holland code. Schuttenberg, O'Dell, and Kaczala (1990) tested the vocational personality of teachers, educational administrators and school counselors and found that, as expected from Holland's predictions, the Social vocational orientation dominated. Fifty-one percent of teachers, 76% of counselors and 43% of administrators had an "S" as the first letter in their Holland code.

The Holland code for school psychologists is listed as SEI in the Dictionary of Holland Occupational Codes (DHOC; Gottfredson & Holland, 1996). However, as a profession, school psychology is grounded in the theory and science of psychology and would also be expected to attract and retain Investigative types, as suggested by the DHOC designation of psychology as a Investigative profession. Yet, school psychology differs from other applied psychologies in that it focuses on the application of psychological knowledge to solve problems of learning and improve educational outcomes within an educational institution (Tharinger, Pryzwansky, & Miller, 2008). Thus, although these educational institutions are primarily social environments, the wide variety of role functions performed by school psychologists likely attracts both highly differentiated Social and Investigative types. The dual nature of the school psychology field is captured by comparisons with other educational and psychological professionals. School principals, special and regular education teachers, education consultants, and social workers are categorized as primarily Social types. However, a number of subspecialties in psychology, which share theoretical, philosophical, role function and training similarities with school psychology, are primarily Investigative occupations. For example, counseling psychologists are categorized as Social types, yet, developmental, educational, social and psychometric psychologists are classified as primarily Investigative types (Gottfredson & Holland, 1996).

Vocational personality research. Although research on the vocational personality of school psychologists is not voluminous, the few studies undertaken have revealed some interesting findings regarding the nature and diversity of the school psychology field.

Toomey (2001) surveyed a random sample of 241 NASP members practicing full-time in U.S. public schools. The sample was judged to be representative of NASP members in general and Toomey achieved a 70% response rate. Participants completed a data form, the SDS-Revised, and the Minnesota Satisfaction Questionnaire-Short Form (MSQ-Short) adapted for use with school psychologists. As expected based on the DHOC, the modal code of school psychologists was SEI. While no correlations between job satisfaction and occupational congruence were found, significant correlations between job satisfaction and actual or desired role function arose. Higher Social scores were correlated with a desired increase in time spent in counseling and consultation. Likewise, greater job satisfaction was positively correlated with actual time spent in these role functions but negatively correlated with time spent in assessment activities. Enterprising types desired less time in assessment but more time engaging in administrative activities. Participants with higher Investigative scores desired increased time in research activities. In addition, those with I as the second letter in their Holland Code rather than E, C, or A reported increased job satisfaction as the time spent in assessment activities increased. Thus, results suggest that Social-Enterprising/Artistic/Conventional types are not oriented toward assessment activities while Social-Investigative types are more comfortable and satisfied engaging in increased assessment time.

In a follow up article, Toomey, Levinson, and Morrison (2008) elaborated further on the diversity within the field of school psychology using the same data obtained by Toomey (2001). While S was found most frequently in the first position of participants' codes, E and I were separated by only two participants as the modal letter in the second

position. Thus, while Toomey originally concluded that SEI was the most appropriate code, SIE was also noted to be an equally applicable code, especially when mean- rather than modal-scores are used. While the authors' data reveals that 73% of respondents rated themselves as Social types, 10% rated themselves as Investigative types.

Care should be taken, however, not to generalize these findings to non-NASP members. Among practicing school psychologists, estimates of the number of NASP members ranges from approximately 54% (Lewis et al., 2008) to 70% (Fagan & Wise, 2000). Thus, roughly 30% to 42% of practicing school psychologists are non-NASP members and may not be adequately represented as primarily Social types. Indeed, some role functions differ between members and non-members. For example, NASP members are significantly more likely to use CBMs (Lewis et al., 2008), a staple of assessment practice within any RTI model. In addition, many non-NASP members may be represented by APA's Division 16 (School Psychology), which views school psychology as a doctoral-level practice specialty within professional psychology and maintains the focus on psychology, rather than education, at its core (Tharinger et al., 2008). Doctoral and non-doctoral school psychologist practitioners who are NASP members differ very little on specific demographic variables (age, gender, years of experience, job satisfaction, intent to remain in the profession) and job activities (Brown, Swigart, Bolen, Hall, & Webster, 1998). However, it is unclear whether these groups, doctoral versus nondoctoral or NASP members versus non-NASP members, would evidence differing vocational personalities.

Roth (2006) surveyed graduate (master's, specialist and doctoral) students enrolled in three Arizona universities as well as professional school psychologists practicing in Arizona. Although Roth's dissertation concerned the relationship between self-efficacy and vocational personality, very few correlations were found between these two variables. Therefore, only her findings on vocational personality will be discussed here.

As part of the study, 135 participants volunteered to complete the VPI (Holland, 1985). As noted earlier, the VPI was originally designed to assess vocational personality in a less-comprehensive manner than the SDS. Results indicate that only 32% of the participants' ratings resulted in an SEI code. This contrasts with Toomey's (2001) finding that SEI was the most frequently occurring Holland code in her sample. In addition, Roth found differences in vocational personality as a function of sex and graduate student or professional status, with females earning higher scores on the Enterprising and Conventional scales than males and professional school psychologists earning higher Realistic scores than graduate students. Furthermore, graduate students' profiles were more consistent with the SEI code than professional school psychologists, which Roth attributed to the broadening perspective of a professional school psychologist. Thus, although Roth's participants were not drawn from a random, national sample and are not likely representative of school psychologists as a whole, her results do suggest that the field of school psychology is comprised of a variety of individuals with substantial differences in vocational personalities.

To summarize, Holland's theory of personality is a well-tested, empirically supported model that can be used to understand and predict behavior. Individuals'

vocational personalities are summarized by three-letter codes indicating their resemblance to one or more of six basic vocational personality types that result from the interaction of background and cultural variables. This code type has been shown to be stable over time, meaningfully related to other measures of personality, and supported across gender, race, ethnicity and socioeconomic status. Applying Holland's theory to school psychology, research has supported the primarily Social (SEI) designation of school psychology. However, additional research highlights the diversity of the field with regard to Holland personality type. Many specialties of professional psychology that share training, theoretical and role function similarities with school psychology are classified as primarily Investigative occupations. While primarily Social school psychologists are more likely to desire increased time in counseling and consultation, Investigative types desire increased time in research-oriented activities. Social-Investigative, as opposed to Social-Enterprising or Social-Conventional, types enjoyed increased job satisfaction as time spent in assessment increased.

Summary

This chapter provided the historical context for the current study, including the influential role of the special education reform movement and reform-minded legislation on the development of the current debate as well as RTI. The current debate between those that favor RTI and those that favor cognitive and neuropsychological assessment-based approaches was explored, with a focus on the issues and controversies surrounding the identification and treatment of LDs. Studies examining what were found to be very balanced opinions of practicing school psychologists regarding LD

identification were reviewed. The practices employed within school neuropsychology were presented as defensible alternatives to the use of RTI to identify LDs.

The concepts presented within the literature reviewed in this chapter suggests that there is a wide variety of theoretical orientations, desired role functions, values and interests among school psychologists. School psychologists with opposite approaches to their jobs have been conceptualized as psychologists or educators, scientists or practitioners, pragmatists or purists or advocates or investigators. Given the influence of personality on theoretical orientation of psychologists and the effect of attitudes and beliefs on role function, the Holland personality of these opposite types, in the context of the current debate, should be explored. Holland's theory of vocational personalities was chosen as the framework for contrasting the personalities in the current study due to its clarity, simplicity, strong empirical basis, validity as a personality theory, and use with school psychologists in previous studies.

CHAPTER 3

METHODS AND PROCEDURES

This chapter provides a discussion of the methodology used in the study. After the research design is identified, information on sample selection, instrumentation and data collection procedures will be provided. Finally, the statistical procedures that were used in the analysis of the collected data will be discussed.

Research Design

The study used a prospective causal-comparative research design to explore differences in vocational personality between a group of participants that favors an RTI approach to LD identification and a group that favors a cognitive processing or neuropsychological assessment approach to LD identification. Causal-comparative research is nonexperimental and involves comparing groups, for whom the independent variable is either present or absent, on a dependent variable (Gall, Gall, & Borg, 2007). In the current study, an RTI-oriented group and an assessment-oriented group were compared on a measure of vocational personality. Specific sampling methods and administration of a survey that assesses preferences for LD identification guided the assignment of participants to groups.

Population

The population of interest in this study is school psychologists who strongly prefer either an RTI or assessment-based approach for LD identification. In the study, the term *school psychologist* refers to a public or private practitioner, researcher, trainer, consultant, or academician, or graduate student who maintains an identity as a school psychologist. A number of research studies (e.g., Caterino, Sullivan, Long, & Bacal,

2008; Machek & Nelson, 2010; Mike, 2010) have demonstrated that practicing school psychologists' opinions on this topic are quite moderate and most favor a combination of RTI and assessment-based approaches for LD identification. Yet, the simultaneous movement toward RTI (i.e., in literature, legislation, training, and NASP recommendations) and emergence of school neuropsychology suggests that two distinct ideological subspecialties have materialized. In addition, the bitter and defensive communications observed in professional and scholarly discourse (Reynolds & Shaywitz, 2009) suggests that school psychologists who are inclined toward one approach or another are sustaining the current debate. The study explored the personalities of these school psychologists.

Sample

The population of interest in this study was school psychologists whose preferences for LD identification lie at opposite ends of a continuum. Therefore, in order for the sample to more closely approximate the population of interest, all attempts were made to draw participants from these two extremes rather than from the more moderate positions that characterize the majority of school psychologists.

Sample Size

The minimum sample size needed to increase the likelihood of rejecting a false null hypothesis was estimated using a combination of power analysis and commonly accepted conventional guidelines. This sample size determination was based on the statistical analyses outlined at the end of this chapter.

Power analysis. When planning research, it is useful to determine the sample size needed to provide a specified level of power using two pre-determined

components: significance criterion and effect size (Cohen, 1992). The power of a statistical test of significance refers to the probability that it will lead to rejection of the null hypothesis. According to Cohen (1992), a power level of .80 is appropriate for general research use.

The significance criterion, or alpha level, refers to the risk of committing a Type I error. In practice, researchers usually set the alpha level at .05 (Gall et al., 2007). In other words, there is a 5% risk of rejecting the null hypothesis when it is true. In this study, alpha was set at .05.

The second component, effect size in the population, refers to the “estimate of the magnitude of the difference, relationship or effect in the population being studied” (Gall et al., 2007, p. 143). Thus, if the population being studied is likely to show a large effect size, it will be easier to reject the null hypothesis, provided the sample size is appropriate. While the effect size in the target population of the current study was unknown, the presumed effect size was increased by using the extreme groups sampling technique (Van Voorhis & Morgan, 2007), a method in which participants are drawn from the extremes of a target population.

To answer research question one and test the stated hypothesis, chi-square analyses were anticipated. Although there are six possible Holland types (R,I,A,S,E and C), the likelihood of obtaining a substantial number of cases in which E and C represent the first letters in a code is minimal, based on data from Toomey (2001). Therefore, all attempts were made to meet the minimum expected frequency for a 2x4 chi-square analysis. Using a power level of .80, setting the alpha level at .05 and estimating a medium to large effect size in the target population, a sample size between

51 and 143 was judged to be desirable (Cohen, 1992) for the greatest possible number of analyses (i.e., $df = 5$). However, because larger effect sizes allow for increased power, as few as eight cases per group would not necessitate an increase in alpha level (Van Voorhis & Morgan, 2007).

Portions of research question one and question two were examined using *t*-tests. Given a medium to large effect size and based on a power of .80, a minimum of 30 participants was required (Van Voorhis & Morgan, 2001).

Conventional guidelines. In addition to power analysis, conventionally-accepted guidelines, or rules of thumb, were considered in sample size determination. Conventional guidelines that apply to chi-square analysis and logistic regression were consulted.

A conservative rule of thumb for conducting chi-square analyses is that no expected frequency should drop below five cases. In other words, a minimum of five cases per cell should be used (VanVoorhis & Morgan, 2007). However, some researchers believe that no expected frequency should drop below ten cases (Gall et al., 2007). Using a 2x4 design, a minimum of 40 participants was sought using this rule of thumb. However, all attempts were made to obtain at least 120 participants in order to: (1) meet the 10 cases per expected frequency and to (2) maintain the range of participants specified via power analysis (i.e., 51 to 143).

A logistic regression analysis was conducted in order to answer research question two. A general rule of thumb for logistic regression stipulates that a minimum of 10 outcomes per predictor variable is desirable (Peduzzi, Concato, Kemper, Holford & Feinstein, 1996). Therefore, a minimum of 20 participants per analysis would be

necessary using this guideline. However, after conducting a number of logistic regression simulations using a variety of sample sizes, Vittinghoff and McCulloch (2007) concluded that discounting the results from any model that used 5–9 outcomes per predictor variable is not justified and that many of the issues that occur with less than 10 outcomes per predictor can also occur with 5-9 outcomes per predictor. Given 25 predictor variables, a sample of at least 200 participants was necessary in order to meet the 5-10 outcomes per variable guideline.

In conclusion, after applying conventional guidelines both liberally and conservatively, a sample size between 60 and 250 was sought. This sample size also meets the minimum sample size specified via power analysis.

Sample Selection

Participants were selected for inclusion in the study in two steps. Initially, participants were recruited from pre-defined groups that are likely to count as members those school psychologists with strong preferences for either RTI or assessment approaches to LD identification. School psychologists with an orientation toward neuropsychological and cognitive assessment approaches were recruited from a mailing list of American Board of School Neuropsychology (ABSNP) diplomates.

RTI-oriented school psychologists were recruited using several approaches. Primarily, a number of RTI-oriented school psychologists were identified personally via peer nomination by an expert in the RTI field. These participants received personalized e-mails that utilized the RTI expert's name and appealed to them as a peer in order to encourage participation. In addition, these prospective participants were asked to forward the survey link to colleagues or students they considered to be strongly oriented

toward RTI approaches to LD identification. Participants were also recruited via direct appeals to professional publications, organizations, and educational settings. These participants represented several authors of *The Handbook of Response-to-Intervention in Early Childhood*, students in the Lehigh University RTI Specialist certification program, and practicing school psychologists working at two internship sites identified as model sites for RTI-focused internships: the LaGrange Area Department of Special Education and the Minneapolis Public School District (Decker, Bolt, & Triezenberg, 2006).

All prospective participants were contacted directly via e-mail and asked to participate in the study. An e-mail introduction provided a brief description of the study and informed recipients of how they were chosen as a prospective participant. All voluntary participants were asked to complete a modified, electronic version of the Self-Directed Search (SDS), a brief demographic data form, and a 26-item questionnaire that assessed opinions concerning LD identification that was developed and piloted by the researcher. Upon request, paper and pencil versions of these forms were made available to participants. The SDS provided information on each respondent's vocational personality while the survey assessed orientation toward an RTI or cognitive neuropsychological-assessment approach to identifying LDs.

In the second phase of sample selection, participants were placed into groups based on their response to question 26 of the LD questionnaire described below. This question asked each participant to identify their preferred method of identifying LDs. In order to control for those participants who may prefer a combination approach, the question prompted participants to assume that a tiered-approach to intervention that

incorporated high-quality instruction, fidelity checks, and frequent progress monitoring was implemented prior to a referral for a comprehensive evaluation for LD identification. Given their response to this question, participants were placed into groups and matched on the variables of sex, highest degree earned, and years of experience. Data analyses conducted to answer research question one included responses from these participants only. Data from the total sample of participants was used to answer research question two.

Instruments

School psychologists selected to participate in the study were asked to complete a brief demographic data form, a survey designed to assess their opinions and preference for either approach to LD identification, and a portion of the SDS. Variables included for analysis in the study were derived from the data collected through these instruments.

Demographic Data Form

The data form was used to obtain demographic information on the participants in order to provide descriptive information on the sample. Participants were asked to indicate their primary role, age, sex, highest degree earned, organizational memberships, professional credentials, years of experience, and employment setting. A copy of the demographic data form is available in Appendix A.

LD Identification Orientation Questionnaire

An instrument designed to identify participants who are strongly oriented toward either an RTI or cognitive neuropsychological assessment approach to LD identification was developed for use in this study. This LD identification orientation questionnaire was

used to assign participants to groups and to answer research question two.

Development of the instrument followed guidelines provided by Patten (2001) and Gall et al. (2007).

Preliminary item generation. A preliminary list of items was developed by the researcher for review by the researcher's dissertation committee. Questions were formulated based on a comprehensive review of the LD identification literature. Authoritative sources addressing the benefits, underlying theories, and value of using either approach were consulted for specific, clear, and unambiguous statements that could be reworded as questions. A review of the RTI and cognitive neuropsychological assessment literature indicates that statements on the value of each approach fall into four possible categories with regard to LDs: (1) assessment and evaluation, (2) intervention, (3) causes, and (4) validity. Attempts were made to include questions from each category in the same proportion as the number of sources reviewed. Since the majority of articles and book chapters reviewed pertained to assessment, intervention, and validity, more questions were included from these categories. In order to ensure adequate content-validity, the questions were designed to canvass the most salient aspects of the RTI versus assessment debate in the most comprehensive manner possible. A list of sources upon which the items in the preliminary and final questionnaires are directly based is available in Appendix B.

The majority of preliminary items were written to measure only one construct within the domains of RTI and cognitive neuropsychological assessment. These items were phrased so that each item can be interpreted in only one way: as indicative of either a favorable or unfavorable attitude toward an RTI or cognitive neuropsychological

assessment approach to LD identification. These items were counter-balanced using both positive and negative statements to increase the likelihood of detecting an invalid response set. One final, forced-choice item asked participants to identify their preferred method of LD identification given the prior implementation of procedures that ensured high-quality instruction was provided prior to the referral for special education services.

Final questionnaire development. Thirty-nine preliminary items were reduced to 25 items using procedures, outlined by Patten (2001), that are likely to improve validity. These procedures include: (1) item review, (2) item analysis, and (3) item elimination.

Item review. Four practicing school psychologists familiar to the researcher were asked to review the 39 item survey and provide feedback on the items. These individuals were asked to provide as much commentary as possible and to identify any items that were unclear, vague, confusing, or redundant. Based on this feedback, items that could be reworded- while still maintaining fidelity to the literature from which they were drawn- remained in the preliminary survey. Those that could not be reworded were eliminated.

Item analysis and elimination. In phase two of the item analysis portion, six additional school psychologists were asked to respond to the remaining items in the preliminary survey. This convenience sample included a combination of public or private school practitioners, consultants, and doctoral students. Two of these school psychologists held positions in state school psychologist associations. One school psychologist is the current president of a state school psychologist association while another is the research chair of a state school psychologist association.

Responses to individual items were tallied and each item choice, from *Strongly Agree* to *Strongly Disagree*, was given a number representing the percentage of respondents who made that choice for each item. When all choices were assigned a percentage for each questionnaire item, the responses were reviewed and items that produced the least polarizing patterns were eliminated. For example, an item with a pattern of 25% for *Strongly Agree*, 25% for *Agree*, 25% for *Disagree*, and 25% for *Strongly Disagree* would be considered less polarizing than a pattern in which *Strongly Agree* earned 50% of responses and *Strongly Disagree* earned 50% of responses. Pilot participant comments, category of question (e.g., assessment, intervention, validity, or causes), and length and clarity of the question were considered when attempting to eliminate items with similar patterns of response percentages. The 25 questions that produced the most polarization in response pattern were retained for use in the study. In other words, items to which more than a combined 50% of participants responded with the less-polarized Likert responses of *agree* or *disagree* were eliminated. A copy of the final version of the LD identification orientation questionnaire is available for review in Appendix C.

Self-Directed Search

The Self-Directed Search, 4th Edition (SDS; Holland, 1994) is a self-administered, self-scored vocational interest inventory used primarily for career counseling. Holland, Powell, and Fritzsche (1997) note that the SDS is based directly on John Holland's Theory of Vocational Personality and provides a description of the respondent's resemblance to one of six personality types. Form E, which uses simpler language than the more common Form R, contains 98 items that require respondents to rate their

competencies and preferences for both activities and occupations. Respondents then score their protocol, resulting in a two-letter code that describes their vocational personality. The SDS Form E also asks respondents to identify occupations about which he or she has thought. However, this section was not utilized in this study since it did not contribute to the calculation of the two-letter code. While the SDS is used primarily for career counseling and exploration, the SDS also reflects Holland's conception of RIASEC types as essentially personality types. SDS items assess not only occupational preferences, but also beliefs about the self, preferences for various activities, and self-rated competencies (Nauta, 2010).

Technical properties. The SDS, 4th Edition, is a revision of earlier versions of the SDS. The norm group for Form E consisted of 719 racially diverse individuals aged 17 to 65 from 25 states including the District of Columbia. In revising the SDS, the authors attempted to increase its overall reliability and validity by adding new items or revising older items, deleting weak or outdated items, and omitting items endorsed by an overwhelming number of either males or females (Holland et al., 1997). Holland et al. (1997) noted that an examination of the internal consistency coefficients from all three editions of the SDS (1977, 1985, and 1994) suggests that the reliability of the SDS has increased steadily over time. In addition, Lumsden, Sampson, Reardon, Lenz, and Peterson (2004) compared scores from the paper-and-pencil, computerized, and internet versions of the SDS for equivalency. No significant differences were found among subscale scores produced by the three versions and the range of correlations between pairwise comparisons of the versions was .85 to .97. The authors concluded

that the mode of administration does not alter the scores obtained and the three versions of the SDS are equivalent in the high point codes obtained.

Reliability. Internal consistency coefficients range from .81 to .92 for the scales assessing preferences for activities, self-assessments of competencies, and occupational interests. Coefficients for the summary scales range from .94 to .96. Test-retest reliability ranged from .76 to .89 over four to 12 weeks. However, the sample size in this calculation was very small (Brown, 2012). Holland et al. (1997) noted that, overall, all scales and subscales of the 1994 edition have internal consistency coefficients of .70 or above.

Validity. The construct validity of the SDS was established through an analysis of scale convergence and independence, using scale correlates and concurrent and predictive validity estimates. Data used to create the 1985 edition of the SDS show a convergent-discriminant set of correlations, with only one of the 1,260 pairs failing to correlate according to theoretical expectations (Holland et al., 1997). Correlations between the 1985 and the 1994 editions of the SDS were also examined. Section scale correlations were all greater than .80 and summary scale correlations were greater than .94. In addition, half of the individuals in the norm groups produced occupational codes that were exactly the same for both forms. Two-thirds of the individuals in the norm groups had the same first two letters in their codes (Brown, 2012). Intercorrelations from the total adult, high school, and college samples approximated the hexagonal model (Toomey, 2001).

The relationship of the SDS to a number of personality, values, aptitudes, competencies, and perceptual variables has been widely explored and summarized in

the SDS Technical Manual (Holland, Fritzsche, & Powell, 1997). As a measure of personality, the SDS has been shown to correlate strongly with the NEO Personality Inventory (particularly the Investigative, Artistic, Social and Enterprising scales). The Vocational Preference Inventory, which assesses vocational personality in a manner analogous to the SDS, is related to a number of scales of the 16 Personality Factor Questionnaire (16PF) and to self-ratings of personality, goals, and competencies when examined using diverse samples of respondents.

Holland et al. (1997) noted that the SDS possesses “average to high concurrent and predictive efficiency depending on the sample, criterion, and time interval” (p. 27). Hit rates increase as age and level of education increases. Concurrent validity estimates were obtained by comparing high-point codes and the first letter of respondents’ vocational aspiration codes (Miller, 2002). Holland (1985) reported percentages of agreement ranging from 14% to 58%. Overall, 54.7% of the norm group’s high-point code matched their one-letter vocational aspiration code (Brown, 2012), placing it at the upper end in comparison to other interest inventories. In his review of the SDS, Brown (2012) identified the major drawback of the SDS as its failure to provide evidence of predictive validity with regard to occupational choice over the long term. No weaknesses with regard to the SDS’s validity as a personality assessment were noted.

Dumenci (1995) used a hierarchically-nested structural model to test the multitrait-multimethod matrix structure of the SDS. The completed model examining all six traits attained an acceptable fit and, overall, the data indicated that the SDS

possesses both convergent and discriminant validity. In addition, a moderate level of covariance was found between males and females.

Aronowitz, Bridge, and Jones (1985) examined the items on the SDS Investigative subscale for sex-bias using a sample of 252 male and 353 female psychologists identified as both researchers and practitioners. Comparatively higher scores were found on the Investigative subscale for researchers than for practitioners, supporting the construct validity of the subscale. However, higher scores were also found for males than females, leading the authors to conclude that sex bias exists in the Investigative subscale. Holland et al. (1997) noted that the major findings in studies comparing special groups, such as males and females or African-Americans and whites, are characterized more by similarities than dissimilarities. Therefore, the issue of sex bias in the Investigative scale was not addressed by the authors during the 1994 revision.

Modified Self-Directed Search. In order to decrease participation time, the version of the SDS used in this study eliminated completion of the *Daydreams* section of the SDS. This section does not contribute to the calculation of the two-letter Holland Code; therefore, its elimination does not constitute a threat to the reliability or validity of the vocational personality code. Unless specifically requesting a paper and pencil version of the SDS, all participants received a version of the SDS modified for inclusion in a Qualtrics survey accessed via e-mail link. The content, wording, or presentation order of the SDS test items was not modified in any way. However, the overall appearance shifted from an eight-page, green and white colored, sectioned questionnaire to a survey-style questionnaire presented in electronic form. A copy of

the electronic version of the modified SDS Form E embedded within the research study questionnaire is available for review in Appendix D. Permission was granted to modify the SDS in this manner by Psychological Assessment Resources, Inc. A copy of the licensing agreement granting permission to modify and use the SDS is available for review in Appendix E.

Group Formation

Comparison groups were selected using an extreme-groups technique, which involves selecting the two extremes of a distribution of scores on one variable (Gall et al., 2007). Group assignment was achieved in two steps. Initially, respondents were categorized according to their response to the final question on the LD questionnaire, which required them to indicate their preference for either an assessment or RTI approach to LD identification.

Next, participants were matched on the variables of sex, highest degree earned, and years of experience. These variables were chosen due to their individual influences on attitudes toward RTI and vocational personality as demonstrated, albeit inconsistently, in previous research. For example, Machek and Nelson (2010) and Mike (2010) found that years of experience exerted an influence on level of comfort with RTI, preference for RTI, and willingness to engage in RTI-related roles. Holland acknowledged that sex is one of a number of variables that influences vocational personality and Fouad (2002) found that men tend to score higher on the Realistic scale while women tend to score higher on the Social scale. Roth (2006) found differences in vocational personality as a function of sex and graduate student or professional status,

with females earning higher scores on the Enterprising and Conventional scales than males and professional school psychologists earning higher Realistic scores than graduate students. It is unclear whether the difference between graduate students and professionals was a function of the high proportion of males in the graduate student group compared to the practitioner group, years of experience, or highest degree earned. Furthermore, a high number of ABSNP members in the sample were expected to hold doctoral degrees, despite the fact that most practicing school psychologists hold specialist level degrees (Lewis, Truscott, & Volker, 2008). Therefore, a decision was made to match participants on the variable of highest degree earned as well. Each group contained the same number of participants who were included in the data analysis for research question one.

Procedures

The data collection process began after receiving approval from the Institutional Review Board (IRB) and completion of the LD identification orientation questionnaire pilot study. Data collection involved a multi-step process of recruitment and follow-up which is described in the following section.

Data Collection

In this section, data collection procedures will be discussed, including adherence to principles of informed consent. Data collection procedures consisted of three major steps: (1) initial survey distribution, (2) first e-mail reminder, and (3) one follow-up reminder.

Informed consent. Ethically-conducted research must adhere to the principles of informed consent. The process of informed consent includes informing prospective

participants of what their participation will entail and obtaining their written consent to participate (Cone & Foster, 2006). To adhere to informed consent procedures, the researcher provided information to prospective participants as part of the initial mailing in compliance with the APA Ethical Principles of Psychologists and Code of Conduct (2002). This information was contained in the introductory letter and included (1) a description of the study and its purpose; (2) a description of the research procedures, including what participants would be asked to do and how long it would take; (3) a statement outlining their right to decline to participate or withdraw at any time without penalty; (4) a description of potential risks and benefits to participants; (5) a statement of assurance that all information will be kept confidential and data will be de-identified; (6) a description of incentives offered for participation; and (7) contact information should participants have questions or concerns.

Initial survey distribution. Participants recruited via peer nomination and the ABSNP mailing list were contacted via e-mail and received an introductory letter as well as digital links that accessed a secure Qualtrics online survey with the embedded demographic data form, LD orientation questionnaire, and modified SDS. The introductory e-mail was personalized and provided brief information on the study, how and why participants were recruited, an assurance of confidentiality, a request to forward the survey link to others who might be appropriate for the study, and notification that participants may qualify to win a \$75.00 gift card from Amazon.com[®]. A copy of these introductory e-mails is available for review in Appendix F. Once prospective participants followed the e-mail link, they were routed to an introductory cover letter that described the study in more depth, provided a brief summary of the debate between RTI

and cognitive neuropsychological assessment proponents, assured participants of confidentiality, and informed participants that, with their consent, completed questionnaires will qualify them to win a \$75.00 Amazon.com[®] gift card. A copy of this letter is available for review in Appendix G.

First reminder. Follow-up reminders were generated using the Qualtrics e-mail distribution function, which generates follow-up e-mails for participants who have not responded without revealing identifying information. The first reminder was sent to participants via e-mail one week after the original questionnaire distribution. This brief reminder served two purposes: to thank participants who already completed the study questionnaire and to encourage those who had not yet responded. This reminder also provided an additional link if participants did not retain the original link and reminded participants that they could qualify for a \$75.00 Amazon.com[®] gift card by completing the survey. A copy of the first reminder for each recruitment group is available for review in Appendix H.

Follow-up reminder. One additional follow up reminder was e-mailed to non-respondents four weeks after the initial materials distribution. This follow-up reminder contained a link to the survey and reiterated confidentiality, the purpose of the study, and the importance of participation. A copy of this follow-up cover letter for each recruitment group is available in Appendix H.

Additional participant recruitment and data collection procedures. A response rate of 36% was achieved following the distribution of the four-week follow-up reminders for both RTI peer nomination and ABSNP members. However, the sample was highly imbalanced in favor of ABSNP members. Therefore, an additional group of

prospective participants were nominated by an expert in the RTI field. Selected authors of chapters in the *Handbook of Response to Intervention in Early Childhood* were also contacted. These authors were chosen due to their experience as practitioners of school psychology and to their positions as trainers of school psychologists. In addition, several students in the RTI Specialist program at Lehigh University were contacted along with school psychologists practicing in the Minneapolis Public Schools (MPS) and within the LaGrange (Illinois) Area Department of Special Education (LADSE), two sites noted for their strong orientation toward RTI. Follow-up reminders for the second peer-nominated RTI group adhered to the timeline described above. However, because direct personal contact was made with the RTI handbook authors, Lehigh University students, LADSE school psychologists and MPS school psychologists following the initial mailing, additional reminders for these participants were judged to be redundant and unnecessary. A copy of the introductory e-mail and follow-up reminder for these additional recruitment groups is available for review in Appendix I.

Gift Card Drawing Procedures

Participants who opted into the \$75.00 Amazon.com[®] gift card drawing were asked to provide a name and physical or e-mail address for contact purposes should their name be chosen. After data collection was complete, a list of these participants was downloaded and printed. Printed names were cut up and placed into a container. A person not affiliated with the study but known to the examiner picked a name at random and that participant was contacted using the information provided. The winning participant opted for an e-mail gift card, which was sent directly by the researcher within 30 minutes.

Data Analysis

As participant responses were received, surveys were automatically de-identified by Qualtrics. Data were downloaded directly into the Statistical Package for the Social Sciences (SPSS) program for statistical analysis to minimize error associated with human handling. Data were screened and checked for errors using visual inspection. Variable values, labels, and missing data were coded for ease and organization. LD identification orientation questionnaire scale scores and two-letter Holland Codes were not immediately calculated in order to avoid any potential bias in the matching process. After accounting for missing responses, data from 32 RTI-oriented participants and 143 neuropsychological assessment-oriented participants were obtained. Thirty-two participants from the neuropsychological assessment group were matched with 32 participants who were RTI-oriented on the variables of sex, highest degree earned, and years of experience. Matching was conducted by the researcher's dissertation chairperson. Through SPSS variable coding procedures, these groups were separated from the remaining participants in order to answer research question one.

Scoring

The following scoring procedures were used in order to obtain the necessary data to answer research questions. These scores were then downloaded into the SPSS data set as new variables.

Demographic data form. The information obtained via the demographic data form was not included in any of the primary statistical analyses. Instead, this information was used to provide descriptive information about the sample. Group

comparisons relied on frequency counts and, for the continuous variables of age and years of experience, total number of years.

Self-Directed Search. From each respondent's SDS protocol, a two-letter Holland code was determined by adding the raw scores from each section according to directions in the SDS manual. In the case of a tie between first or second letters, both letters were entered into the data set and separate analyses were conducted using both letters as the presumed first letter. To minimize human handling and potential sources of error, data from the SDS portion of the survey were downloaded directly into a Microsoft Excel spreadsheet developed by the researcher. Data were coded in the Qualtrics survey prior to distribution. In accordance with SDS Form E scoring instructions (Holland et al., 1997), responses of "yes" were assigned a value of 1 while values of "no" were assigned a value of 2 for the Activities, Skills, and Jobs sections. Responses were assigned a score between one and seven for the Abilities section. After survey distribution, the spreadsheet totaled the number of "yes" responses in each area (Activities, Skills, and Jobs) and the numerical score for the Abilities area to arrive at a numerical raw score for each personality type, Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C). A two-letter Holland code was then assigned for each participant based on the highest and second-highest raw scores for each RIASEC type. For example, a participant with raw scores of R=24, I=12, A=21, S=32, E=19, C=8 would receive a code of SR, as S and R yielded the first and second-highest numerical values.

LD identification orientation questionnaire. The LD identification orientation questionnaire contains 25 Likert-type items appropriate for scoring numerically. The

choices were weighted as follows: *Strongly Agree*, assigned an ordinal weight of 4; *Agree*, assigned an ordinal weight of 3; *Disagree*, assigned an ordinal weight of 2; and *Strongly Disagree*, assigned an ordinal weight of 1. Neither total scores, derived from summing the values for all questions, nor total mean scores, derived by calculating the mean score for all item responses, were expected to discriminate between the RTI and neuropsychological assessment-oriented groups. This was assumed because both groups were expected to respond in an opposite manner to each type of question (i.e., RTI-favorable and neuropsychological assessment-favorable), thereby yielding similar total scores. Therefore, two scale scores were calculated for each participant based on each respective question set, or scale, within the LD questionnaire: the RTI scale, comprised of RTI-favorable questions, and the Neuropsychological Assessment scale, comprised of neuropsychological assessment-favorable questions. These scores reflected the mean of all weighted responses to RTI-favorable or neuropsychological assessment-favorable questions. Higher mean scores on each respective scale reflected a greater degree of agreement with its content.

Statistical Analysis

Following calculation of total scores and data inspection and coding, univariate and multivariate data screening was conducted to determine that the data were error free and that the underlying assumptions for the statistical analyses were met.

Descriptive statistics were used to examine means, standard deviations, and range of responses. To examine distribution normality, histograms for each variable were visually inspected and values for skewness and kurtosis were examined.

Multicollinearity was assessed by examining correlation matrices as well as SPSS

tolerance values obtained via linear regression procedures. Outliers and influential cases were assessed through examination of standardized residuals and Cook's distances. The following statistical procedures were used to answer the research questions presented in Chapter 1 and reiterated below:

1. Is there a difference between RTI-oriented and neuropsychological assessment-oriented school psychologists in terms of vocational personality?

Participants' raw scores within each SDS personality type (i.e., R, I, A, S, E, C) were calculated, yielding a set of numerical values that represents the Holland code type. Although previous research into the vocational personality of school psychologists treated the Holland code primarily as a categorical variable (Roth, 2006; Toomey, 2001), Toomey (2001) and Toomey, Levinson, and Morrison (2008) calculated mean as well as modal codes and concluded that the resulting Holland code was equally applicable. Therefore, a decision was made to treat the Holland code as both a categorical and continuous variable and perform two separate analyses in order to answer this research question. This decision was made for three reasons: (1) the calculation of the Holland code relies on the relative scores of each participant (e.g., two participants with S scores of 21 and 10 can produce a code with S as the first letter, providing it is each person's relative high-point code), in which case numerical values may be misleading, (2) low values within the R, A, E, and C codes violated the minimum expected cell frequency assumption of the chi square test of independence, (3) using mean scores for analyzing the dispersion of letters in the codes between groups accounts for missing values, the relative values issue noted above, and allowed for analysis of all six letters. To test the hypothesis that the RTI-oriented group will produce

a vocational personality with “S” as the first letter and the neuropsychological assessment-oriented group will produce a code with “I” as the first letter, a chi-square test of independence was conducted. In addition, using mean scores for each letter in the code, independent samples *t*-tests were conducted to determine if significant differences between groups exist within any of the Holland code types.

2. Which points of contention with regard to LD identification contribute to the differentiation of RTI and neuropsychological assessment-oriented school psychologists?

The reliability of the total LD identification orientation questionnaire, the RTI and neuropsychological assessment scales, and the individual items was examined. To obtain an estimate of internal consistency reliability, Cronbach’s alpha coefficient was computed for the total test and for both scales. Cronbach’s alpha is a widely used method for computing test score reliability and is particularly appropriate for instruments in which items are not scored dichotomously (Gall et al., 2007).

To determine which points of contention contribute to the differentiation of RTI-oriented and neuropsychological assessment-oriented school psychologists, a logistic regression analysis was conducted using items of the LD identification orientation questionnaire. The resulting model’s capacity to differentiate between the two orientations was assessed as well as the individual contributions of the LD questionnaire items.

Summary

In this chapter, the proposed study’s research design, target population, and sampling procedures, along with group assignment, were described. The study uses a

causal-comparative research design with an extreme-groups sampling technique. Prospective participants were chosen purposively from populations that would be expected to maintain strong orientations toward either RTI or cognitive neuropsychological assessment approaches to LD identification. Participants were assigned to groups using a researcher-designed questionnaire which asked them to self-identify as RTI or neuropsychological assessment oriented. In addition to the LD identification orientation questionnaire, the demographic data form and Self-Directed Search (SDS) were described along with technical properties and a review of data speaking to the validity of the SDS as a measure of personality.

Data collection procedures were described in detail, including adherence to the principles of informed consent. Prospective participants were contacted directly using a personalized e-mail introduction containing a link to the survey. This e-mail introduction provided information on the study as well as how and why they were chosen as a participant. Two follow-up reminders were sent to encourage participation. Finally, the data analysis methods used and statistical techniques proposed to answer each research question were outlined.

CHAPTER 4

RESULTS

Overview

The purpose of the study was to examine the vocational personalities of school psychologists at opposite ends of the RTI vs. cognitive neuropsychological assessment debate. A secondary intention was to determine which points of contention contribute to the differentiation of RTI-oriented and neuropsychological assessment-oriented school psychologists. This chapter presents results of the data analyses described in chapter three and has been divided into three main sections. The first section describes the characteristics of the sample and includes demographic information. The second section presents results pertaining to research question one, or the comparison between the two groups on vocational personality. Finally, the third section addresses the reliability of the LD identification orientation questionnaire as well as the results pertaining to research question two. To answer the second research question, a logistic regression analysis was conducted to determine the contribution of individual items to a model that predicts orientation toward either an RTI or neuropsychological-assessment approach to LD identification. Each of these sections will begin with a brief discussion of data screening and preparatory data analysis procedures that were undertaken prior to performing the statistical analyses.

Characteristics of the Sample

Across the data collection period, a total of 555 surveys were distributed via e-mail using Qualtrics, a web-based survey building and distribution platform. A total of 470 of these surveys were sent directly to school psychologists holding the American

Board of School Neuropsychologists (ABSNP) diplomate while 85 were sent to prospective participants who were RTI-oriented along with an appeal from the researcher or from an expert in the RTI field who provided the peer nominations. While 208 surveys were returned, reflecting a response rate of 37%, a number of these surveys were incomplete. Taking into account only surveys in which participants progressed to the end of the survey, 181 surveys were completed for a response rate of 33%. However, this figure may be misleading, as participants were encouraged to forward the survey to students or colleagues presumed to maintain a strong orientation toward either RTI or neuropsychological-assessment methods for LD identification (i.e., snowballing technique). As the number of surveys forwarded from an original participant is unknown and data from participants who completed surveys were de-identified, the total number of prospective participants who received the survey is unknown.

Matching Procedures

All cases were kept within the data set and Holland Codes were not calculated until the matching process was complete to avoid introducing bias into the matching process. Participants who failed to complete LD questionnaire item 25, which asked them to identify their preferred method of LD identification and was critical for group assignment, were excluded from the matching process. Participants who failed to complete demographic questions focusing on years of experience, sex, and highest degree earned were also excluded. Matching was completed by the researcher's dissertation chair. A total of 32 participants who self-identified as RTI-oriented were matched with 32 participants who self-identified as neuropsychological assessment-

oriented on the variables of sex, years of experience, and highest degree obtained for inclusion in the data analysis portion of the study.

Data Screening for Demographic Comparisons

Data screening began by coding missing values for ease and organization. The data were inspected to ensure they were error free and that the underlying assumptions for the statistical analyses were met. Descriptive statistics were used to examine means, standard deviations, and range of responses. Distribution normality and values for skewness and kurtosis were examined for the continuous variables of age and years of experience. Skewness refers to the degree to which the distribution is symmetrical, such that the mean and median values will be the same (Gall et al., 2007). Kurtosis refers to the peakedness of a distribution, independent of the variance, as well as the flatness seen in its tails (DeCarlo, 1997). Absolute values for skewness and kurtosis for age (skew: .32; kurtosis: .33) and years of experience (skew: .66; kurtosis: .00) were less than 1.0 for the RTI group, representing slight non-normality (Blanca, Arnau, López-Montiel, Bono, & Bendayan, 2013). Within the neuropsychological assessment group, slight skewness (-.12) and moderate kurtosis (-1.34; absolute values between 1.0 and 2.3; Blanca et al., 2013) were seen in the distribution of the age variable. Slight skewness (.71) and kurtosis (-.25) were seen in the years of experience variable. Because the impact of non-normality on inferences made using *t*-tests is minimal given the robustness of the test (Hopkins & Weeks, 1990), these variables were judged to be acceptable for analysis.

Demographic Characteristics of Matched Groups

Participants were asked to self-identify as RTI-oriented or neuropsychological assessment-oriented with regard to LD identification and were grouped according to their responses to this question. A comparison between the matched RTI and neuropsychological assessment-oriented groups on three matching variables as well as on additional variables of interest is presented in Tables 1 and 2.

Table 1

Comparison Between RTI-Oriented and Neuropsychological Assessment-Oriented Groups on Age and Years of Experience

Variable	RTI Group			Neuro. Assessment Group			<i>df</i>	<i>t</i>	<i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>			
Age	32	41.66	10.01	31	46.29	10.91	61	-1.76	.084
Years of Experience	32	13.53	9.61	32	14.84	10.07	62	-0.53	.596

Note. Neuro. Assessment Group = neuropsychological assessment group. RTI = Response-to-Intervention group.

Table 2

Comparison Between RTI-Oriented and Neuropsychological Assessment-Oriented Groups on Demographic and Professional Variables

Variable	RTI Group		Neuro. Group		χ^2	<i>p</i>
	<i>n</i>	%	<i>n</i>	%		
Sex					0.06 ^a	.801
Male	13	40.6	15	46.9		
Female	19	59.4	17	53.1		
Degree					0.08 ^{a,b}	.775
Masters	4	12.5	4	12.5		
Specialist	10	31.3	8	25.0		
Doctoral	18	56.3	20	62.5		
Role						
School-based Practitioner	17	53.1	21	65.6	1.59 ^a	.208
Consultant	2	6.3	2	6.3	‡	‡
Administrator	2	6.3	0	0.0	‡	‡
Trainer	5	15.6	3	9.4	‡	‡
Student	3	9.4	0	0.0	‡	‡
Other	2 ^c	6.3	6 ^d	18.8	‡	‡
Organizational Membership						
NASP	29	90.6	25	78.1		.054 ^e
APA	9	28.1	10	31.3	0.00 ^a	1.000
ABSNP	3	1.5	27	84.4		.000 ^e
ABPP	0	0.0	1	3.1	‡	‡
State Association	21	65.6	16	50.0	2.57	.109
Other	10 ^f	31.3	5 ^f	15.6	‡	‡
Professional Credentials						
NCSP	16	50.0	16	50.0	‡	‡
ABSNP	3	9.4	27	84.4	‡	‡
ABPP	0	0.0	2	6.3	‡	‡
Other	6 ^g	8.8	2 ^g	6.3	‡	‡
Employment Setting						
Preschool	1	3.1	0	0.0	‡	‡
Elementary	11	34.4	8	25.0	‡	‡
Middle	1	3.1	1	3.1	‡	‡
High School	1	3.1	5	15.6	‡	‡
Multiple Levels	8	25.0	9	28.1	‡	‡

Note. $df=1$ for all analyses. Neuro. = neuropsychological assessment. RTI = Response-to-Intervention. Percentages based on group. Column totals are not consistent due to missing data. Cells marked (‡) denote chi-squares not calculated due to a violation of the minimum expected cell frequency, missing values, or equal counts across groups.

^a Yates' continuity correction applied

^b Computed between Specialist and Doctoral level degrees only

^c RTI Coordinator or Administrator

^d Private practice, hospital practitioner, retired, school-based neuropsychologist

^e Fisher's Exact Test

^f Local or district-based school psychologists association; National/international behavior analysts association; Child advocacy, policy or research organization

^g State/Canadian licensed school psychologist; counseling or assessment organization

^h Values provided for school-based practitioners only

As shown in Table 1, an independent samples *t*-test was used to compare the groups on age, $t(61)=-1.76$, $p=.08$, and years of experience, $t(62)=-0.53$, $p=.60$ and no significant differences were found.

Table 2 shows demographic data and comparisons between matched groups on the variables of sex, highest degree obtained, and school-based practitioner status. As both matched groups contained the same number of participants holding masters degrees, comparisons were made using participants holding specialist and doctoral degrees only. Chi-square tests for independence and with Yates continuity correction indicated no significant association between group and sex, $X^2(1, n=64)=.06$, $p=.801$, group and highest degree obtained, $X^2(1, n=64)=.08$, $p=.8775$, or group and practitioner status, $X^2(1, n=63)=1.59$, $p=.208$. Due to a violation of the minimum expected cell count, Fisher's exact test was conducted for the NASP Membership Status variable. This test indicated no significant association between group and NASP Membership status, $p=.054$.

With regard to professional credentials, group distributions were equal for participants holding the Nationally Certified School Psychologist (NCSP) credential. However, this comparison may not be suitable given the substantial number of skipped items in the RTI group, $n=11$, compared to the neuropsychological assessment group, $n=2$. As expected, the neuropsychological assessment group was comprised mostly of participants holding the ABSNP diplomate. While it was expected that all ABSNP diplomates would subscribe to a neuropsychological assessment approach, the three participants who were RTI-oriented holding the ABSNP diplomate were likely

participants recruited from the ABSNP diplomate mailing list, yet this is unclear due to the de-identification of data.

To summarize, the RTI-oriented and neuropsychological assessment-oriented matched comparison groups were not significantly different from each other in terms of variables that could yield an influence on their vocational personality or opinions concerning LD identification. These variables included sex, age and years of experience, highest degree obtained, NASP and APA membership, role as a school-based practitioner, and whether the NCSP credential is held.

Data Analysis

Research Question One: Is there a difference between RTI-oriented and neuropsychological assessment-oriented school psychologists in terms of vocational personality?

Based on previous research and theory, RTI-oriented psychologists were hypothesized to exhibit a primarily Social (S) personality type (e.g. Burns & Coolong-Chaffin, 2006; Holland, 1985; Kavale, Kaufman, Naglieri, & Hale, 2005; Lichtenstein, 2008; Raso, 2009) while neuropsychological assessment-oriented school psychologists were hypothesized to exhibit primarily an Investigative (I) personality type (e.g. Holland, 1985; Lichtenstein, 2008; Mather & Kaufman, 2006; Schmitt & Wodrich, 2008; Toomey, 2001; Toomey, Levinson, & Morrison, 2008).

Holland code calculation and data screening. After groups were matched and formed, Holland codes were calculated for each participant using data downloaded directly into a Microsoft Excel spreadsheet developed by the researcher. Total raw scores for each personality type were also calculated for each participant.

There were 13 cases in which Holland codes were initially not calculated due to one missing questionnaire item and one case in which three items were missing. When Holland codes were calculated with scores of 0 substituted for the missing value and then recalculated with scores of 1 substituted for the missing value, the first letter of the Holland code did not change. Therefore, these cases were included in the non-parametric statistical analyses using letter codes but were excluded from the parametric analyses that used mean raw scores, since substituting a value would change the raw score for that participant. In one case, the second letter in the Holland code changed, therefore, this case was excluded from both parametric and non-parametric analyses involving second letters of codes. As Holland Codes changed when value substitutions (i.e., inserting a 1 for the missing item) were made, cases in which there were five or more missing items were judged to result in invalid Holland codes and were excluded from the analysis of vocational personality.

Similar to previous research (e.g. Toomey, 2001; Toomey et al., 2008), Holland codes were analyzed in terms of the frequency of personality code types in the groups, assessed by examining modal codes, and the strength of personality types within the groups, indicated by the raw numerical scores. Expected cell frequencies were examined in preparation for a chi-square analysis to analyze the distribution of personality code types. In order to test the hypothesis concerning the Holland code between groups and to meet the minimum expected cell frequency assumption, participants whose high-point codes resulted in an S or I as their first letter were isolated from participants whose first letter resulted in an R, A, E, or C. A chi-square analysis was conducted using only these cases.

To examine the strength of personality types within the groups, total raw scores within each personality type were used. After calculating, the raw scores were screened for normality, skewness, and kurtosis. Visual inspection of histograms as well as examination of values for skewness and kurtosis indicate that the distributions of the R, I, A, S, and E personality types were symmetrical for the total sample. The distribution of the Conventional personality type was moderately skewed across the total sample as well as both groups and exhibited borderline moderate-severe kurtosis values within the neuropsychological assessment group (i.e., absolute value above 2.3; Blanca et al., 2013). To adjust for this, a square root transformation was applied to the Conventional data, as suggested in Tabachnick and Fidell (2007), allowing them to reach adequate normality. A logarithm transformation was not required, as values for the transformed C variable fell between -1 and 1, reflecting only slight skewness and kurtosis (Blanca et al., 2013; Morgan, Griego, & Gloeckner, 2000). All other assumptions for parametric statistical procedures were met. Table 3 presents descriptive statistics for the R, I, A, S, E, and C raw scores by group.

Table 3

Descriptive Statistics for Personality Types

Holland Code	RTI-Oriented				Neuropsychological Assessment-Oriented			
	<i>M</i>	<i>SD</i>	Skew	Kurt.	<i>M</i>	<i>SD</i>	Skew	Kurt.
R	12.71	8.70	.26	-1.35	12.93	7.23	.88	.13
I	24.56	6.91	-.31	-.74	23.13	10.08	-.28	-.70
A	17.15	8.14	-.28	-.34	19.90	7.30	.83	.81
S	28.62	7.62	-.67	-.12	27.43	6.64	.07	-1.08
E	17.00	5.94	.72	.46	15.86	9.49	.14	-.99
C	14.68	8.22	1.18	1.05	14.30	7.52	1.12	2.31
C Trans.	3.70	1.01	.66	-.11	3.65	1.01	-.05	1.32 ^a

Note. C Trans.= C variable with square root transformation. Kurt. = kurtosis.
^a Kurtosis value reduced to .50 for total sample after square root transformation

Vocational personality of groups. Fifty-eight of the 64 participants in the total sample produced calculable first letter Holland codes. From these 58 cases, the modal code for the total sample and for each of the matched groups was determined.

Distribution of personality types. Figure 3 presents the distribution of Holland codes in first and second positions across the total sample and matched comparison groups.

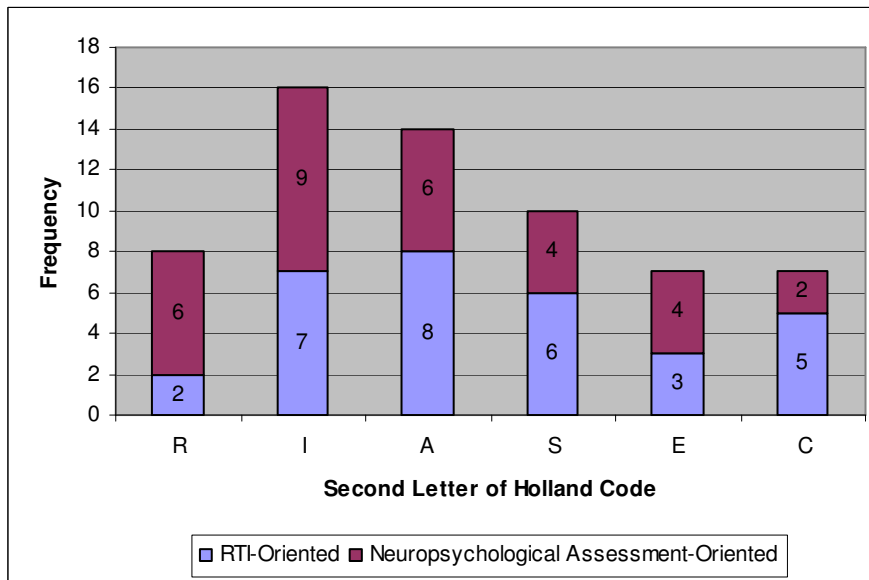
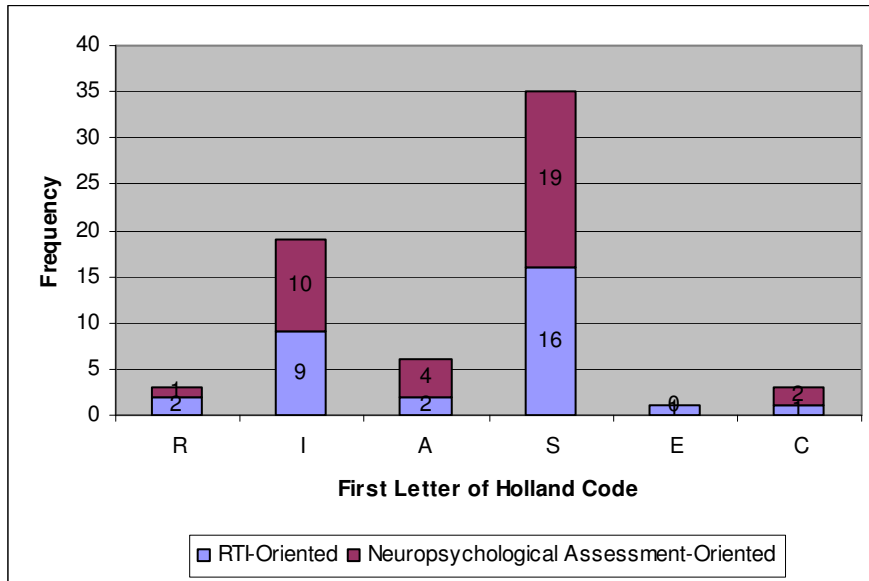


Figure 3. Distribution of Holland codes by letter position. In the case of tie codes, both letters were counted. Holland personality types are coded as follows: R=Realistic; I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional.

As depicted in Figure 3, the Social vocational personality dominates and S was found to be the modal code for the total matched sample as well as for both the RTI and neuropsychological assessment groups. The Investigative (I) vocational personality was the second most-frequent code in the first position across groups and total sample.

There were five tie codes in the first letter position in the neuropsychological assessment group and three in the RTI group. Tie codes occur when the raw scores for two or more Holland types are equal. In the neuropsychological assessment group, four of these ties involved I and S. When ties were redistributed in favor of I, S remained the modal code for both groups, but became much less prominent in the neuropsychological assessment group in which S and I were separated by only one case. When tie codes were redistributed in favor of S, 76.7% of the neuropsychological assessment group and 64.3% of the RTI group exhibited Social vocational personalities, indicated by S as the first letter in the personality code.

In terms of frequency, the RTI and neuropsychological assessment-oriented groups shared the same first letter in their vocational personality codes. Yet, these groups differed in terms of their second letter. The RTI group's modal second letter was A (Artistic), however, the neuropsychological assessment group's modal second letter was I. Within the RTI group, however, the A code occurred more frequently than the I code by only one case. When tie codes were redistributed, the modal second-letter codes of both groups did not change.

Separate statistical analyses for modal codes, Social and Investigative, were conducted using both tie codes. Chi-square tests for independence and with Yates continuity correction indicated no significant association between orientation toward an RTI or neuropsychological assessment approach to LD identification and modal vocational personality, $\chi^2(1, n=49)=0.00, p=1.00$. When tie codes were substituted, results also indicated no significant association between orientation with regard to LD identification and vocational personality, $\chi^2(1, n=49)=0.51, p=.475$.

Comparison of raw scores. Toomey (2001) and Toomey et al. (2008)

calculated participants' total raw scores for each personality type in addition to modal codes. By comparing total raw scores rather than frequencies, the degree to which the matched groups and the sample resemble each personality type can be examined. In other words, raw scores reflect how strongly an individual resembles each personality type.

Figure 4 presents boxplots comparing the raw scores of the RTI and neuropsychological assessment groups for each of the six Holland vocational personality types. Similar to the examination of modal codes, the Social and Investigative personality types prevailed, with the Social type showing the highest median raw scores overall. An examination of the interquartile ranges suggests more variability within the neuropsychological assessment group in the Investigative and Enterprising types. This is also evident through examination of the standard deviations presented in Table 3. In addition, more variability was seen within the RTI group for the Realistic type. A number of outliers can be seen within the neuropsychological assessment group in the Artistic personality type. These cases most likely represent the four participants within this group that produced Holland codes with A as the first letter. Thus, 12.4% ($n=31$) of the neuropsychological assessment group is primarily and strongly oriented toward the Artistic personality.

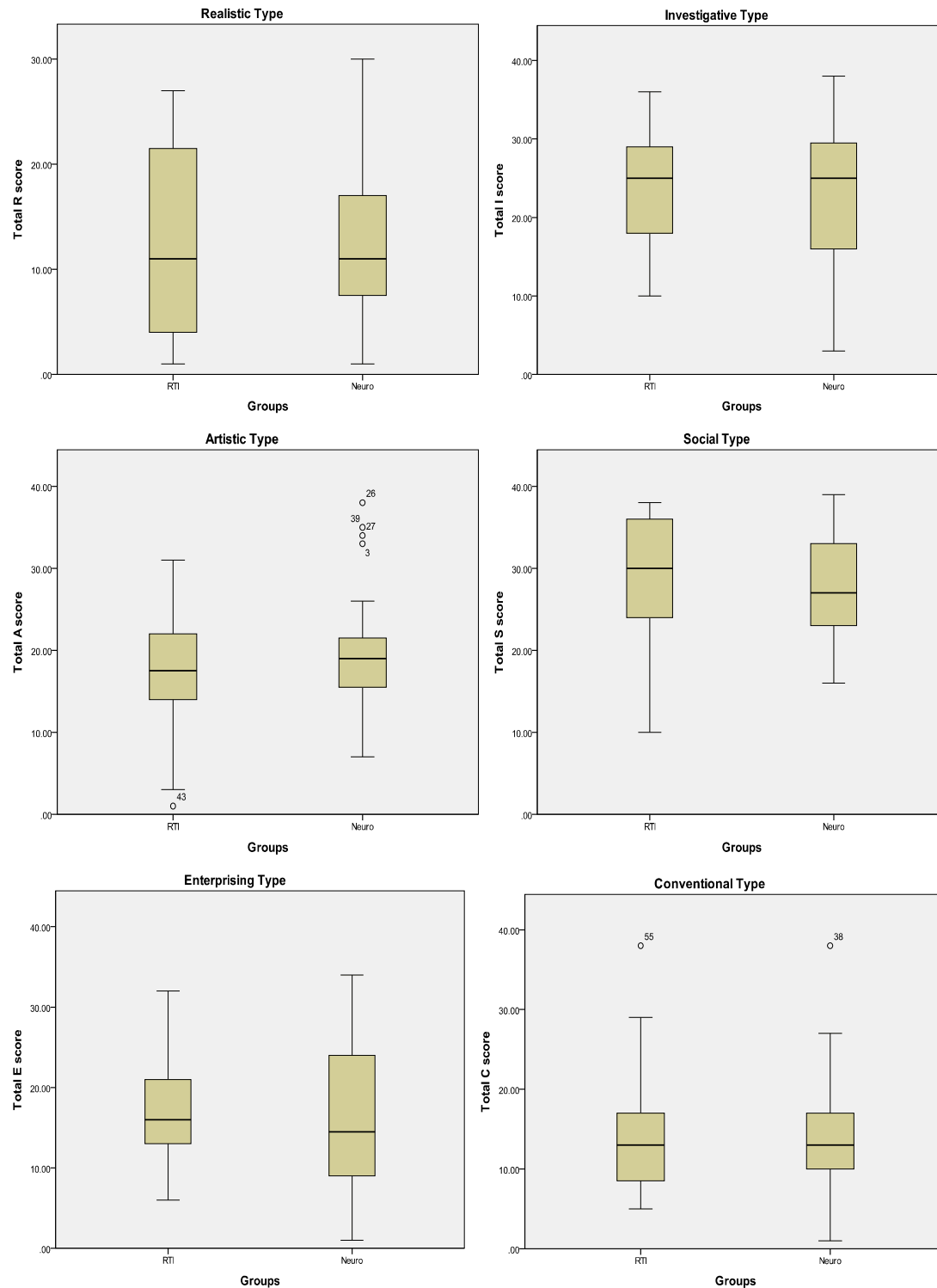


Figure 4. Boxplots comparing the distribution of raw scores between groups for the six personality types. The length of the shaded box is the interquartile range and contains 50% of cases. The horizontal line within the shaded box represents median value. Protruding whiskers extend to smallest and largest values. Outliers are indicated by points outside of the end of the whisker. Holland personality types are coded as follows: R=Realistic; I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional.

Examining mean values, both groups followed the same pattern of highest to lowest mean raw scores (S, I, A, E, C, R). While modal code comparisons indicated separate personality types for the RTI group (SA) and the neuropsychological assessment group (SI), mean raw score comparisons suggested an SI personality type for both groups. Thus, the strength of each group's resemblance to the Social and Investigative personalities was similar. In frequency, the R and C types were equally represented in the total sample. Yet, a comparison of raw scores suggested a relatively stronger, and unexpected, resemblance to the Conventional personality in both groups. A review of participant responses indicates that this can be attributed to the acquisition of conventional-type skills (*Skills* domain score = 374) rather than an interest in conventional activities (*Activities* domain score = 181) or jobs (*Jobs* domain score = 71).

A series of *t*-tests were used to compare the mean R, I, A, S, E, and C raw scores presented in Table 3 between the RTI and neuropsychological assessment groups. Table 4 displays the results of these analyses.

Table 4

Comparison of t-values between RTI and Neuropsychological Assessment Groups for RIASEC Domain Total Scores

Vocational Personality Type	Group <i>n</i>		<i>t</i>	<i>df</i>	<i>p</i>
	RTI	Neuro. Assmt.			
Realistic	28	28	-0.10	54	.921
Investigative	25	31	0.60	54	.548
Artistic	26	31	-1.34	55	.185
Social	29	30	0.64	57	.526
Enterprising	28	28	0.54	54	.592 ^a
Conventional ^b	28	30	0.19	56	.851

Note. Neuro. Assmt. = Neuropsychological assessment. RTI = Response-to-Intervention. Bonferroni correction applied for multiple comparisons. Adjusted $p < .008$.

^a Equal variances not assumed

^b Square root transformation applied to data prior to analysis

While the variance between groups on the R, I, A, S, and C values were approximately equal, Levene's test for homogeneity of variances reached significance for the E personality type data. Therefore, equal variances between groups were not assumed for the Enterprising vocational personality. As indicated in Table 4, there were no significant differences in raw scores between the RTI and neuropsychological assessment groups for any of the vocational personality types. Thus, in frequency of personality code types as well as in the strength of each group's inclination toward these personalities, no significant differences were seen. However, other patterns were noted which will be elaborated upon in the discussion section of this study.

Research Question Two: Which points of contention with regard to LD identification contribute to the differentiation of RTI and neuropsychological assessment-oriented school psychologists?

The LD identification orientation questionnaire was developed by the researcher to produce a score reflecting the strength of each participant's orientation toward an RTI or neuropsychological assessment approach to LD identification. The LD identification orientation questionnaire yielded three main scores: a total mean score for all questions, an RTI scale score reflecting the mean of all RTI-favorable questions, and a neuropsychological scale score reflecting the mean of all neuropsychological assessment-favorable questions. These scores were used to assess the overall reliability of the questionnaire. In addition, mean scores for each individual item were used to determine the points of contention that contribute to the likelihood of being RTI or neuropsychological assessment-oriented. These items were scored on a four-point Likert scale from *Strongly Disagree* to *Strongly Agree*, with higher mean scores

reflecting a relatively greater degree of agreement with the content. Table 5 presents descriptive statistics for both groups and the total matched sample on the LD identification orientation questionnaire.

Table 5

Descriptive Statistics for Groups on LD Identification Orientation Questionnaire

Group/Scale	<i>n</i>	<i>M</i>	<i>SD</i>	95% CI	
				Lower	Upper
Neuropsychological Assessment-Oriented Group					
Neuro. Assessment Scale	31	3.33	0.35	3.20	3.46
RTI Scale	31	1.76	0.35	1.63	1.89
Total LD Questionnaire	31	2.58	0.17	2.51	2.64
RTI-Oriented Group					
Neuro. Assessment Scale	31	1.89	0.47	1.71	2.06
RTI Scale	28	2.82	0.45	2.65	3.00
Total LD Questionnaire	27	2.37	0.20	2.29	2.44
Total Matched Sample					
Neuro. Assessment Scale	62	2.61	.84	2.40	2.82
RTI Scale	59	2.26	.67	2.09	2.44
Total LD Questionnaire	58	2.48	.21	2.42	2.53

Note. Neuro. Assessment Scale = neuropsychological assessment scale; RTI = Response-to-Intervention. CI = confidence interval

Reliability analysis. The reliability of the total LD identification orientation questionnaire, the RTI and neuropsychological assessment scales, and the individual items was examined. Cronbach's alpha coefficient, which is based on the extent to which participants responded to similar items in similar ways (Gall et al., 2007), was calculated in order to determine the extent to which the test items consistently measured the same construct (Cronk, 2008). Item-total correlations were examined to assess the relationship between individual items and the total test or scale. For the total test, inter-item correlations were examined to assess the relationship among items on

the RTI scale and items on the neuropsychological assessment scale. Within each scale, squared multiple correlations were reviewed to determine the contributions of each item to the scale's internal consistency. Cases in which data were missing were excluded from the analysis resulting in a total sample of 120 participants.

Total questionnaire reliability. For the total LD identification orientation questionnaire, Cronbach's alpha coefficient was .14, indicating that the total LD questionnaire measured very different dimensions. This is likely a function of (1) the test wording, which was designed to provoke strong opinions on two methods of LD identification, and (2) sampling, in which participants were comprised of two groups of people chosen for their diametrical opinions of LD identification. These groups are likely to respond in the opposite manner to the same question, thereby producing relatively higher and lower scores for the item given the scoring procedures in which higher scores reflect a greater degree of agreement with that item's content. As the Cronbach's alpha coefficient of .14 fell well below the commonly accepted range of .70 for adequate reliability, the reliability of the RTI and neuropsychological assessment scales were examined separately.

Reliability of scales. The relationship between the neuropsychological assessment scale score and the RTI scale score was examined using a correlational analysis. Preliminary data exploration indicated that the data for these variables departed mildly from normality, therefore, Spearman's rho correlation coefficient was used instead of Pearson's r . In addition, Spearman's rho is more appropriate for Likert scale ratings than Pearson's r (Pallant, 2013). There was a strong, negative correlation between the neuropsychological scale score and the RTI scale score, $r_s = -.88$, $n = 62$,

$p < .005$, indicating an inverse relationship between the two scales that comprise the LD identification orientation questionnaire.

Tables 6 and 7 present correlation matrices between all neuropsychological assessment scale items and between all RTI scale items, respectively. As shown, all items on the neuropsychological scale were positively correlated with each other and all items on the RTI scale were positively correlated with each other. The neuropsychological assessment scale was relatively more unitary than the RTI scale. A total of 99% of the correlations on the neuropsychological assessment scale fell within the moderate to high range ($\geq .35$), with only one correlation falling within the low range ($r_s = .34$) according to guidelines provided in Gay & Airasian (2003). Ten percent of the total correlations were considered high. All correlations were significant at the $p < .01$ level. Conversely, 66% of the RTI scale correlations fell within the moderate to high range, with 6% of those correlations considered high. Of the total number of RTI scale correlations, 44% fell within the low range ($< .35$). Yet, 94% of the RTI scale correlations were significant at the $p < .01$ level.

Table 6

Correlation Matrix of Neuropsychological Assessment Scale Items

Item	2	3	4	5	7	12	14	15	19	20	22	23
2	-											
3	.61	-										
4	.36	.60	-									
5	.64	.60	.68	-								
7	.53	.55	.59	.62	-							
12	.63	.68	.64	.61	.64	-						
14	.65	.65	.60	.69	.59	.67	-					
15	.56	.51	.49	.49	.45	.54	.58	-				
19	.46	.43	.37	.37	.39	.40	.40	.50	-			
20	.39	.47	.46	.43	.52	.45	.50	.40	.36	-		
22	.43	.34	.42	.46	.43	.47	.42	.51	.37	.46	-	
23	.64	.63	.58	.60	.60	.64	.69	.55	.38	.54	.52	-
25	.61	.56	.58	.58	.58	.62	.67	.62	.43	.55	.56	.76

Note: Spearman's rho coefficients reported. All correlations significant at $p < .01$. $n=120$

Table 7

Correlation Matrix of RTI Scale Items

Item	1	6	8	9	10	11	13	16	17	18	21
1	-										
6	.66**	-									
8	.71**	.73**	-								
9	.34**	.44**	.39**	-							
10	.53**	.58**	.61**	.41**	-						
11	.31**	.39**	.45**	.21**	.37**	-					
13	.55**	.60**	.60**	.34**	.52**	.35**	-				
16	.53**	.60**	.66**	.33**	.48**	.40**	.54**	-			
17	.30**	.26**	.29**	.04	.18*	.28**	.22**	.24**	-		
18	.47**	.50**	.52**	.26**	.32**	.32**	.40**	.48**	.33**	-	
21	.40**	.42**	.46**	.19*	.48**	.40**	.40**	.44**	.25**	.30**	-
24	.38**	.37**	.29**	.21**	.25**	.27**	.34**	.25**	.08	.27**	.22**

Note: Spearman's rho coefficients reported. $n=120$

* $p < .05$

** $p < .01$

Table 8

Correlations Between Items on the Neuropsychological Assessment and RTI Scales

	Item	Neuropsychological Assessment Scale												
		2	3	4	5	7	12	14	15	19	20	22	23	25
R T I S c a l e	1	-.56**	-.48**	-.48**	-.52**	-.48**	-.53**	-.57**	-.52**	-.39**	-.40**	-.40**	-.56**	-.61**
	6	-.57**	-.47**	-.49**	-.50**	-.51**	-.57**	-.56**	-.61**	-.48**	-.48**	-.52**	-.62**	-.63**
	8	-.58**	-.53**	-.49**	-.52**	-.56**	-.60**	-.59**	-.58**	-.46**	-.51**	-.52**	-.64**	-.67**
	9	-.41**	-.39**	-.38**	-.37**	-.36**	-.37**	-.40**	-.37**	-.35**	-.44**	-.26**	-.44**	-.44**
	10	-.55**	-.56**	-.49**	-.47**	-.41**	-.55**	-.60**	-.51**	-.40**	-.43**	-.36**	-.56**	-.54**
	11	-.45**	-.40**	-.35**	-.40**	-.31**	-.39**	-.41**	-.32**	-.27**	-.36**	-.29**	-.47**	-.40**
	13	-.56**	-.50**	-.45**	-.44**	-.42**	-.54**	-.57**	-.53**	-.35**	-.31**	-.36**	-.51**	-.57**
	16	-.54**	-.48**	-.46**	-.44**	-.43**	-.50**	-.50**	-.58**	-.52**	-.38**	-.47**	-.59**	-.57**
	17	-.26**	-.21**	-.22**	-.21**	-.14	-.28**	-.21**	-.16*	-.10	-.06	-.16*	-.27**	-.23**
	18	-.35**	-.33**	-.24**	-.27**	-.29**	-.34**	-.37**	-.43**	-.28**	-.22**	-.35**	-.40**	-.42**
	21	-.49**	-.44**	-.42**	-.36**	-.41**	-.52**	-.41**	-.41**	-.36**	-.22**	-.38**	-.34**	-.42**
	24	-.40**	-.25**	-.29**	-.39**	-.30**	-.27**	-.39**	-.30**	-.15*	-.30**	-.27**	-.39**	-.40**

Note. Spearman's rho coefficients reported. n=120

* $p < .05$ ** $p < .01$

Table 8 shows correlations between all items on the LD identification orientation questionnaire. As expected, all items on the RTI scale were negatively correlated with items on the neuropsychological assessment scale. Of the total number of correlations, 21% fell within the low range while the remainder, except for one, fell within the moderate range. One correlation fell within the high range.

The reliabilities of the RTI and neuropsychological assessment scales were examined separately. For the RTI scale, Cronbach's alpha coefficient was .90, indicating very high reliability. A review of corrected item-total correlations indicates that two items had moderate correlations with the total RTI scale: item 9, $r=.37$, and item 24, $r=.41$, according to guidelines provided by Gay & Airasian (2003). Item 17, $r=.34$, had a low correlation with the total RTI scale. Deletion of these items would result in an increase in Cronbach's alpha of .003 and .002 for items 9 and 24 and an increase of .004 for item 17. The squared multiple correlations for these items, $R^2 = .19$, .22, and .18, respectively indicate that they contribute minimally to the internal consistency of the scale. Three additional items had moderate corrected item-total correlations ranging from .53 to .58. However, deletion of these items would not result in an increase in Cronbach's alpha coefficient. The remaining items had high correlations with the total RTI scale, ranging from .67 to .85.

The neuropsychological assessment scale was highly reliable, as indicated by a Cronbach's alpha coefficient of .95. A review of corrected item-total correlations indicates that all items had at least moderate correlations with the total scale. No improvement in Cronbach's alpha would result from deletion of these items. A review of squared multiple correlations indicates that item 20, $R^2=.31$, contributed minimally to the

internal consistency of the scale. Ten of 13 items had high correlations, ranging from .68 to .85, with squared multiple correlations that indicated substantial contributions to the internal consistency of the scale, $R^2 > .52$.

Logistic regression analysis. Binary logistic regression was performed to determine the likelihood of accurately classifying participants as RTI or neuropsychological assessment-oriented using items on the LD identification orientation questionnaire. In addition, item contributions to the predictive ability of the model were examined in order to determine which points of contention best differentiate between the two orientations. Logistic regression models follow the principles used in linear regression models except that the outcome variable in logistic regression is dichotomous (Hosmer & Lemeshow, 2000). The goal of logistic regression is to find “the best fitting and most parsimonious, yet biologically reasonable model to describe the relationship between an outcome variable and a set of independent variables” (p. 1). In order to identify the most significant contributors to the model among the LD identification orientation questionnaire items and to reduce the pool of predictor variables, a series of *t*-tests were conducted prior to the logistic regression analysis.

Data screening. Data were screened to ensure that the assumptions that apply to both *t*-tests and logistic regression analyses were met. Generally, logistic regression is free of restrictions (Tabachnick & Fidell, 2007). However, data screening procedures that apply to logistic regression were conducted prior to the analysis and by examining SPSS output prior to interpretation.

Sample size. Given a medium to large effect size and an alpha level of .05, a minimum sample size of 26-64 participants was required to conduct independent

samples *t*-tests. Data from the total sample of participants were used for this analysis, which exceeded the minimum sample size required. For the logistic regression analysis, Hosmer and Lemeshow (2000) suggested that the rule articulated by Peduzzi, Concato, Kemper, Holford, and Feinstein (1996) of ten cases per predictor variable is appropriate. After accounting for 52 cases in which data were missing, a sample of 155 participants was available for the logistic regression analysis. This sample size conforms to the later guideline articulated by Vittinghoff and McCulloch (2007) which stated that 5-9 cases per variable is acceptable.

Assumptions. In preparation for *t*-tests, data were screened in order to check the assumptions of normality and homogeneity of variances. Table 9 presents descriptive statistics, including values for skewness and kurtosis, for the 25 items in the LD identification orientation questionnaire. As shown, severe skewness and kurtosis (absolute values above 2.3; Blanca et al., 2013) were seen in four items within the neuropsychological assessment group. However, a decision was made not to transform or exclude these variables for three reasons: (1) the questionnaire items were designed to provoke strong reactions in participants and therefore the greatest points of contention are likely to produce nonnormal distributions, (2) the *t*-tests conducted were used only to determine which questionnaire items should be entered into a logistic regression, therefore no conclusions were drawn based on these tests, and (3) the *t*-test is robust to violations of normality, particularly with larger sample sizes (Hopkins & Weeks, 1990).

Table 9

Descriptive Statistics for LD Identification Orientation Questionnaire Items by Group

Scale/Item	RTI Group				Neuro. Assessment Group			
	<i>M</i>	<i>SD</i>	Skew	Kurt.	<i>M</i>	<i>SD</i>	Skew	Kurt.
RTI Scale								
1	3.13	.92	-.82	-.13	1.47	.70	1.42	1.50
6	2.66	.79	-.13	-.22	1.25	.58	2.44*	5.69*
8	3.41	.87	-1.24	.41	1.42	.58	1.00	.02
9	2.19	.65	.55	1.06	1.54	.71	1.32	1.59
10	3.16	.78	-.75	.50	1.55	.72	1.41	2.17
11	2.69	.69	.51	-.74	1.74	.56	.01	-.41
13	2.78	.83	.09	-.86	1.48	.58	.98	1.21
16	3.13	.71	-.18	-.89	1.97	.71	.29	-.25
17	3.19	.78	-1.22	2.24	2.66	.63	-.47	.28
18	2.65	.84	.41	-.83	1.85	.77	.56	-.26
21	2.91	.64	.08	-.39	1.88	.59	.03	-.19
24	2.09	1.09	.60	-.90	1.43	.65	1.73	3.68*
Neuro. Scale								
2	1.91	.73	.15	-1.06	3.70	.52	-1.86	4.57*
3	1.88	.75	.21	-1.14	3.39	.59	-.59	.60
4	2.13	.71	-.18	-.89	3.55	.53	-.49	-1.12
5	1.72	.81	.96	.45	3.51	.58	-.70	.49
7	2.31	.93	.08	-.83	3.50	.53	-.30	-1.28
12	1.63	.61	.40	-.58	3.22	.55	.07	-.21
14	1.63	.66	.58	-.57	3.40	.61	-.47	-.63
15	1.87	.62	.08	-.24	3.19	.75	-.53	-.35
19	1.97	.66	.78	2.28	2.84	.79	-.24	-.40
20	2.50	.76	-.70	-.18	3.31	.69	-.76	.48
22	1.84	.68	.86	2.23	2.96	.75	-.37	-.10
23	1.75	.84	.86	.00	3.32	.55	-.02	-.64
25	1.66	.79	1.14	1.08	3.43	.64	-1.03	1.55

Note. n=32 for the RTI Group; n=140 for the neuropsychological assessment group. Neuro. Scale = neuropsychological assessment scale. RTI = Response-to-Intervention.

*Severe skewness or kurtosis (Blanca, Arnau, López-Montiel, Bono, & Bendayan, 2013)

Levene's test for Equality of Variances was examined to determine whether variances between variables were homogeneous. Ten of 25 LD questionnaire items did not produce homogeneous variances; therefore alternative *t*-values that account for these differences were interpreted for these items.

Collinearity. Unlike linear regression, logistic regression does not make assumptions regarding normality of distribution, homogeneity of variances, or linearity between the predictor variables. Yet, logistic regression is highly sensitive to the presence of collinearity among predictor variables (Tabachnick & Fidell, 2007). Collinearity concerns the extent to which binary predictor variables are correlated, which may decrease the influence of one or more of these variables in the final model (Agresti, 2002). Examination of a correlation matrix can be useful in detecting collinearity. However, Midi, Sarkar, and Rana (2010) suggested that examination of this matrix is not sufficient and better detection can be achieved by using the diagnostics from a linear regression model. Hosmer and Lemeshow (2000) suggested that diagnostic checks, such as a tolerance test employed in linear regression, are appropriate for detecting collinearities prior to logistic regression. Yet, they cautioned that although variables may pass tolerance tests, output can be distorted due to larger than normal standard error values. Therefore, they recommended examining results of both tolerance tests and estimated standard errors in the model fit statistics. Prior to performing the logistic regression analysis, collinearity was assessed by examining a correlation matrix as well as SPSS tolerance values obtained via linear regression procedures. Standard errors for the model were examined after conducting the logistic regression analysis.

In examining a correlation matrix for collinearity, Tabachnick & Fidell (2007) suggested that values above .90 indicate variables are highly correlated, with singularity, and therefore redundant. They further suggest that these predictors should

be deleted from the analysis because error rates increase with redundant predictors. Correlations between predictors did not exceed .90.

Pallant (2013) suggested that tolerance values below .10 indicate high correlations between variables. Results of tolerance tests indicated that collinearity was not a significant concern and none of the variables produced tolerance values below .10. However, an examination of standard errors in the final model suggest that output may be somewhat influenced by collinearity. Hosmer and Lemeshow (2000) suggested that problems in model fit are indicated by unexpected and “aberrantly large” estimated standard errors. An example of such large standard errors provided by Hosmer and Lemeshow suggested that standard errors that are more than twice the value of the coefficient can be considered problematic. In the final model, the values of all standard errors were less than the coefficients, suggesting that collinearity did not distort the models.

Outliers and influential cases. Outliers and influential cases can distort the validity of interpretations that are based on output generated from a logistic regression analysis (Sarkar, Midi, & Rana, 2011). Prior to performing the logistic regression analysis, the presence of outliers was assessed through examination of the standardized residual plot. For small samples, Tabachnick and Fidell (2007) suggested that outliers are denoted by standardized residual values above 3.3 or below -3.3. The highest absolute value of any standardized residual value was 2.42 and none exceeded an absolute value of 3.3.

Hosmer and Lemeshow (2000) suggested that the use of the influence diagnostic, Cook’s distance, is appropriate for detecting cases that could have an

influence on the solution. The authors indicated that a Cook's distance greater than 1.0 signifies a pattern of influence that could affect the estimated coefficients. None of the variables entered into the logistic regression analysis produced a Cook's distance greater than 1.0, indicating that no particular cases exerted a distorting influence on the results of the analysis.

Results. In order to identify LD identification orientation questionnaire items for inclusion in the logistic regression analysis, *t*-tests were conducted to compare scores on all LD identification orientation questionnaire items for participants who are RTI and neuropsychological assessment-oriented. Significant differences between these groups were seen for all 25 LD questionnaire items; therefore, all items were included in the logistic regression analysis. Table 10 presents the results of these *t*-tests for all LD identification orientation questionnaire items.

Table 10

Results of t-tests Comparing RTI- and Neuropsychological Assessment-Oriented Participants on All LD Identification Orientation Questionnaire Items

Item No.- Scale	<i>n</i>		<i>t</i>	<i>df</i>	<i>p</i>
	<i>RTI</i>	<i>Neuro.</i>			
1 - RTI	31	140	11.18	169	<.001
2 - Neuropsychological Assmt.	32	140	-13.15 ^a	38	<.001
3 - Neuropsychological Assmt.	32	140	-12.31	170	<.001
4 - Neuropsychological Assmt.	32	139	-12.83	169	<.001
5 - Neuropsychological Assmt.	32	140	-11.78 ^a	39	<.001
6 - RTI	32	140	9.54	170	<.001
7 - Neuropsychological Assmt.	32	140	-6.96 ^a	36	<.001
8 - RTI	32	140	12.24 ^a	37	<.001
9 - RTI	31	140	4.71	169	<.001
10 - RTI	31	137	11.14	166	<.001
11 - RTI	32	138	7.22 ^a	41	<.001
12 - Neuropsychological Assmt.	32	140	-14.51	170	<.001
13 - RTI	32	140	8.40 ^a	38	<.001
14 - Neuropsychological Assmt.	32	139	-14.59	169	<.001
15 - Neuropsychological Assmt.	31	139	-9.12	168	<.001
16 - RTI	32	139	8.28	169	<.001
17 - RTI	32	140	4.05	170	<.001
18 - RTI	31	139	5.12	168	<.001
19 - Neuropsychological Assmt.	31	139	-6.43 ^a	51	<.001
20 - Neuropsychological Assmt.	32	139	-5.87	169	<.001
21 - RTI	32	138	8.66	168	<.001
22 - Neuropsychological Assmt.	32	139	-7.79	169	<.001
23 - Neuropsychological Assmt.	32	139	-10.04 ^a	37	<.001
24 - RTI	32	138	3.33 ^a	36	.002
25 - Neuropsychological Assmt.	32	138	-13.56	168	<.001

Note. Neuro. = Neuropsychological assessment. RTI = Response-to-Intervention. Assmt. = Assessment

^a Equal variances not assumed

Forward stepwise (likelihood ratio) logistic regression procedures were used to assess the relationship between LD questionnaire items and orientation toward an RTI

or neuropsychological-assessment approach to LD identification as well as the individual contributions of the LD questionnaire items to the model's predictive ability. This method either includes or removes predictors from the equation based solely on statistical criteria (Tabachnick & Fidell, 2007) and is appropriate for a large number of predictor variables (Hosmer & Lemeshow, 2000). In forward stepwise logistic regression, the relative importance of variables is based on the statistical significance of the coefficient and these variables are statistically screened for inclusion based on a fixed decision rule that specifies a probability level at which variables are included or excluded. Although Hosmer and Lemeshow suggested that this probability level should be set at .15 or .20 when research involves a preliminary screening of a large number of variables, the level used for the purposes of the current study was kept at the more common .05 level of significance due to its exploratory nature.

Classification of Orientation. A constant-only model that did not include predictor variables was statistically significant ($p < .0005$) and correctly classified the orientations of 82.6% of participants. The best-fitting model included four LD questionnaire items, shown in Table 11.

Table 11

LD Identification Orientation Questionnaire Items Included in Best Fitting Logistic Regression Model

Item No.	LD Questionnaire Item Text
2	It is important to identify how children with LDs process information differently from typical children.
8	RTI is a more promising approach for identifying LDs than neuropsychological/cognitive processing assessment.
13	RTI alone provides the information necessary to develop appropriate interventions for struggling students.
25	Administration of standardized, norm-referenced assessments of neuropsychological functioning/cognitive processing is essential for accurate identification of LDs.

This full model was significant, $X^2(4, n=155)=126.10, p<.0005$, indicating that the model was able to distinguish between participants who are RTI-oriented and those who are neuropsychological assessment-oriented. The Hosmer and Lemeshow Goodness-of-Fit Test for the model yielded a nonsignificant value, $X^2(6, n=155)=1.11, p=.981$, indicating support for the model. This regression equation reflected a considerable improvement from the constant-only model and correctly classified 92.6% of participants who were RTI-oriented and 99.2% of participants who were neuropsychological assessment-oriented. For this model, odds ratios for correctly classifying orientation suggest that estimates increase by a factor of 20 if one knows the response to LD questionnaire item 2 and by a factor of 13 if one knows the response to LD questionnaire item 25. The confidence intervals associated with the odds ratio of items 2 and 25 are exceptionally large, however, making it difficult to ascertain an acceptable range for the true odds ratios. These are likely due to the smaller sample size, which frequently results in very wide confidence intervals around estimated odds ratios (Pallant, 2013).

An examination of the individual contributions of the items in the omnibus model suggests that only item 8 failed to demonstrate a significant relationship ($p=.144$) with orientation. In other words, when all items were included in the final model, item 8 was no longer significant. Table 12 shows regression coefficients, standard errors, and odds ratios for the predictor items included in the model.

Table 12

Logistic Regression Predicting Orientation on the Basis of LD Identification Orientation Questionnaire Items

Item	<i>B</i>	<i>SE</i>	<i>p</i>	Odds Ratio	95% CI for Odds Ratio	
					Lower	Upper
2	3.00	1.25	.017	20.03	1.72	233.76
8	-1.37	.93	.144	.26	.04	1.60
13	-3.72	1.63	.023	.02	.00	.60
25	2.59	1.19	.029	13.35	1.30	137.27

Note. CI = confidence interval
 $n=155$

Response pattern analysis. Patterns of item responses within and between groups were examined. Compared to the neuropsychological assessment-oriented group, the RTI group's response patterns were more variable. Much of this variability was related to patterns of agreement within the scale aligned with each group's orientation. Participants who were RTI-oriented tended to disagree with RTI favorable content and "cross over" to agree with neuropsychological assessment scale content more often than the participants who were neuropsychological assessment-oriented agreed with RTI scale content or disagreed with content favorable to their own orientation. In the RTI group, 35% of participants disagreed with RTI-favorable content while 21% agreed with neuropsychological assessment-favorable content. In

comparison, 10% of participants who were neuropsychological assessment-oriented disagreed with neuropsychological assessment favorable content and 14% agreed with RTI-favorable content.

In general, an inverse relationship was found between level of agreement with RTI-favorable content and level of agreement with neuropsychological assessment-favorable content. Figure 5 shows a scatterplot reflecting the relationship between the number of RTI-favorable items to which participants agreed (i.e., by selecting either *Strongly Agree* or *Agree*) and number of neuropsychological assessment-favorable items to which participants agreed. This relationship was investigated through a correlational analysis. Preliminary data exploration indicated that the data for these variables were not normally distributed, therefore, Spearman's rho correlation coefficient was used instead of Pearson's r . There was a strong, negative correlation between the two variables, $r_s = -.85$, $n = 58$, $p < .005$, indicating that high levels of agreement with content on either of the scales is associated with lower levels of agreement with content on the opposing scale.

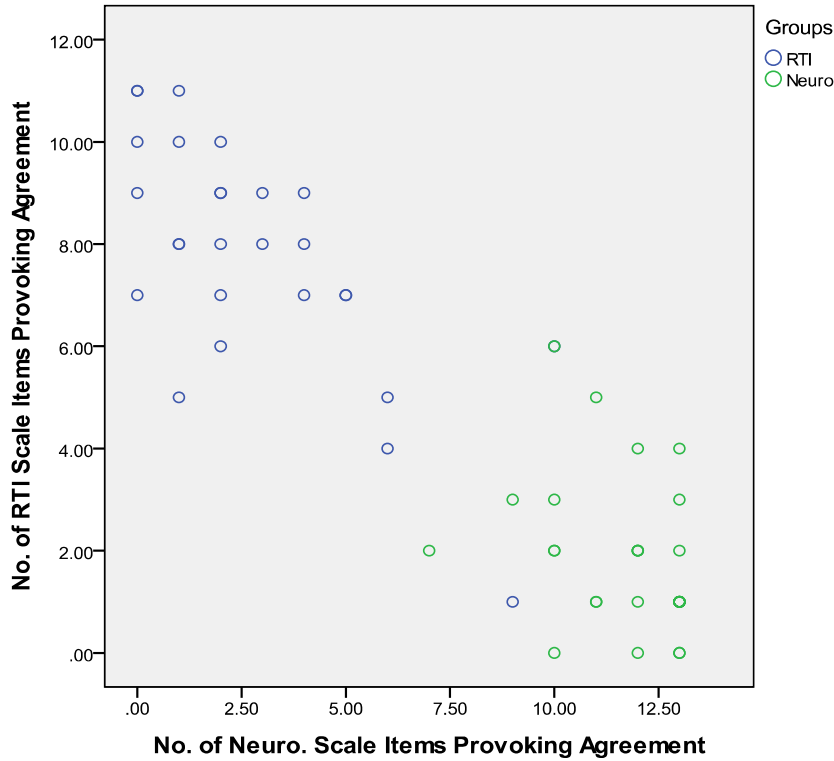


Figure 5. Relationship between RTI scale content agreement and neuropsychological assessment scale content agreement.

There were a number of individual questionnaire items that provoked unexpected response patterns or frequencies across groups. Table 13 shows points of agreement as well as items that produced unexpected response patterns. On the RTI scale, one item produced a response pattern that was the opposite of what was expected in both RTI and neuropsychological-assessment groups. There were two items that produced consensus, such that a majority of participants in both groups disagreed with the item's content. None of the items on the neuropsychological assessment scale produced consensus or unexpected reactions in both groups. However, there were three items that produced high levels of agreement in the RTI group.

Table 13

*Response Patterns and Frequencies for Selected LD Identification Orientation
Questionnaire Items*

Item	Neuropsychological Assessment Group		RTI Group	
	% Agree	% Disagree	% Agree	% Disagree
RTI Scale				
Legislation should be passed that requires all states to adopt RTI as the only acceptable method of identifying LDs	9.4	90.6	59.4	40.6
Cognitive functioning is not directly related to learning to read [♦]	12.6	87.5	25.8	74.2
Those who oppose the RTI model are likely poorly informed [†]	18.7	81.3	46.9	51.6
High-incidence disabilities (such as LDs and intellectual disabilities) should be grouped into one disability category [♦]	3.1	96.9	31.2	68.8
Neuropsychological Assessment Scale				
The RTI model fails to meet modern scientific standards of evidence for acceptance as a method for identifying LDs	62.5	37.5	12.5	87.1
Children with LDs can be differentiated from each other based on differences in their cognitive, memory, language, motor, and executive functioning profiles	100.0	0.0	43.8	56.3
There is no doubt that brain functioning is impaired in students with true LDs	84.4	12.5	59.4	40.6

[♦] Substantial consensus achieved across groups

[†] Unexpected pattern observed within groups

Summary

In this chapter, the results of data analysis procedures outlined in Chapter 3 were described. The overall response rate was 37%, although taking into account only largely completed surveys, 33% is a more accurate reflection of the actual response rate. Participants were asked to forward surveys to colleagues, therefore, it is unclear how many initial surveys were distributed given the de-identification of data. A total of 32 participants who were RTI-oriented were matched with 32 participants who were neuropsychological assessment-oriented on the variables of sex, years of experience, and highest degree obtained.

Comparisons between groups on influential variables were also conducted. RTI-oriented and neuropsychological assessment-oriented matched comparison groups were not significantly different from each other in terms of sex, age and years of experience, highest degree obtained, NASP and APA membership, role as a school-based practitioner, and whether the NCSP credential is held.

A comparison of SDS results indicated that the Social personality type was the modal code for the total sample as well as for each group. Modal code comparisons indicated separate personality types for the RTI group (SA) and the neuropsychological assessment group (SI). Yet, mean raw score comparisons suggested an SI personality code for both groups. Comparisons based on frequency of personality type and mean raw scores indicate no significant association between orientation toward an RTI or neuropsychological assessment approach to LD identification and vocational personality. An examination of raw scores for RIASEC domains indicates a strong inclination toward Social and Investigative competencies and interests in both groups.

There was relatively more variability in Investigative skills, activities, and abilities within the neuropsychological assessment group compared to the RTI group.

The LD identification orientation questionnaire items were written to provoke strong opinions in favor of one of the two approaches to LD identification. As expected, all items on the RTI scale were negatively correlated with items on the neuropsychological assessment scale. Most of these correlations fell within the moderate range. Cronbach's alpha coefficients were .90 for the RTI scale and .95 for the neuropsychological assessment scale, indicating high reliability.

Logistic regression analyses were conducted to determine the likelihood of accurately classifying participants' orientations using items on the LD identification orientation questionnaire as well as to assess which points of contention, reflected in LD questionnaire items, best differentiate between the two orientations. This full model, which included four LD questionnaire items, was significant and able to distinguish between participants who are RTI-oriented and those who are neuropsychological assessment-oriented. The regression equation reflected a considerable improvement from the constant-only model and correctly classified 98.1% of participants into their respective orientations.

An examination of response patterns suggests the RTI group's response patterns were more variable. Participants who were RTI-oriented tended to disagree with RTI favorable content and agree with neuropsychological assessment scale content more often than the participants who were neuropsychological assessment-oriented agreed with RTI scale content or disagreed with content favorable to their own orientation. In general, an inverse relationship was found between level of agreement with RTI-

favorable content and level of agreement with neuropsychological assessment-
favorable content.

CHAPTER 5

DISCUSSION

Overview

The primary purpose of the study was to determine whether differences in vocational personality exist between school psychologists who are oriented to the use of Response-to-Intervention (RTI) for LD identification and those who are oriented toward the use of cognitive neuropsychological assessment methods. Orientation refers to the participants' professional practices but also to the theoretical and ideological beliefs that underlie these practices. As part of the present study, a sample of school psychologists selected based upon their likelihood of maintaining a particular orientation completed a questionnaire developed by the researcher to assess the direction and strength of their orientation toward these approaches. Thus, assessing which points of contention, reflected in the questionnaire items, best differentiate between participants with opposing orientations was a secondary purpose of the study. In addition, participants completed a demographic questionnaire and the Self-Directed Search (SDS; Holland, 1994) to obtain an assessment of their personality in the context of Holland's (1985) Theory of Vocational Personalities and Work Environments. Participants were matched on the basis of sex, highest degree obtained, and years of experience prior to data analysis.

This chapter presents a discussion of the results that were detailed in chapter four and is divided into four sections. Section one interprets the results in the context of the research questions outlined in chapter one. Section two offers conclusions related to the results of the study, including connections to previous research and implications

for the field of school psychology. Section three outlines limitations to the study and the final section offers directions for future research.

Discussion of the Findings

This section provides a review of the discussion of the results presented in the previous chapter and is organized in relation to research questions. Where applicable, findings are interpreted in the context of the hypothesis outlined in chapter one as well as previous research.

Research Question One: Is there a difference between RTI-oriented and neuropsychological assessment-oriented school psychologists in terms of vocational personality?

Given previous research (e.g. Roth, 2006; Toomey, 2001; Toomey, Levinson, & Morrison, 2008) and Holland's (1985) type descriptions that suggested school psychologists who are neuropsychological assessment-oriented are drawn to the scientific, cognitive aspect of school psychology rather than the behaviorist-educational aspects, it was hypothesized that vocational personality differences would emerge between school psychologists who were RTI-oriented and those who were neuropsychological assessment-oriented. Using modal codes, the RTI-oriented group was predicted to exhibit a primarily Social vocational personality while the neuropsychological assessment-oriented group was predicted to exhibit an Investigative vocational personality, as indicated by the first letter in their code. Results did not support this hypothesis and both RTI and neuropsychological assessment-oriented groups produced modal codes with S as the first letter. This is consistent with Toomey's (2001) findings, in which the modal first-letter of her participants' vocational

personalities was S. However, when tie codes were redistributed, the Social personality became less prominent in the neuropsychological assessment group and was separated from the Investigative type by only one case. In general, no significant association between orientation to particular LD identification method and primary vocational personality was found based on frequency of first letters of Holland codes.

One possible explanation for the lack of association between orientation and vocational personality is the higher proportion of school-based practitioners in the neuropsychological assessment group (65.6%) compared to the RTI Group (53.1%). Toomey (2001) found that, for school-based practitioners, engaging in research-type activities is positively correlated with the Investigative personality. Yet, Roth (2006) found lower self-efficacy scores with regard to research pursuits in school-based practitioners. Thus, school-based practitioners may have rated themselves more harshly on the research-oriented skills and abilities associated with the Investigative personality type, leading to lower Investigative scores than hypothesized. Similarly, while they may not be inherently Social types, school-based practitioners may develop skills related to the Social vocational personality, such as developing a “preference for activities that entail the manipulation of others to inform, train, develop, cure or enlighten” that leads to “interpersonal and educational competencies” (Holland, 1985, p. 21). Employment within a school, which is categorized as primarily social environment, can influence the degree to which the social personality is developed and manifested. Indeed, the unexpectedly high Conventional scores seen in the sample were related to the development of Conventional abilities, rather than interests. Toomey (2001) found similar pattern and suggested that the skills and competencies acquired by school

psychologists, rather than Conventional-type interests, accounted for this relatively higher C score. Thus, participants viewed themselves as possessing many Conventional skills (e.g., orderly, clerical, methodical)-skills they have likely acquired on the job-but did not indicate a similar degree of interest in Conventional-type vocations or activities. Similarly, the interpersonal, people-oriented, and persuasive skills of school-based practitioners may have developed in response to the Social environment of the school, leading to higher scores in the Social domain. Thus, it may be that, in Holland's (1985) words, "jobs change people, and people change jobs" (p. 11). Obtaining a larger sample of non-school-based practitioners or matching the comparison groups on practitioner status would be one way to test this hypothesis.

Another possible explanation concerns the assumption that the sample consisted of truly extreme groups who represent the most ardent RTI and neuropsychological assessment supporters in the field. Although this assumption was based on knowledge of the field and seemed likely given the training, credentials, and work of the participants, it may have been inaccurate. One way to be certain extreme groups were sampled would be to administer the LD identification orientation questionnaire to a large, random sample of school psychologists and to study the extreme 10% of high-scorers from both orientations.

A review of demographic and professional characteristics indicates that the comparison groups were more alike than different on demographic and professional variables. Thus, the possibility exists that an unidentified variable, other than vocational personality, accounts for their disparate views on LD identification in the context of vocational personality similarities. Indeed, Rounds and Tracey (1993) noted that

several researchers have referred to a “general factor” that underlies the expression of RIASEC patterns and may account for as much as half the variance in vocational personality. They also noted that this general factor has been viewed by most researchers as a response-bias factor in which acquiescence or social desirability influences respondents’ interest scores. While response bias may never be adequately mitigated, controlling for variables that have been shown to yield an influence on preference for RTI or cognitive assessment methods might clarify these questions. These variables include training and exposure (Mike, 2010; Sullivan & Long, 2010; O’Donnell & Miller, 2011), school setting (O’Donnell & Miller, 2011), perceived origins of LDs (Raso, 2009), confidence in implementing RTI methods (Raso, 2009; Machek & Nelson, 2010), and employment at an RTI site (Unruh and McKellar, 2013). Alternatively, participants could be matched on vocational personality and then compared on a number of these influential variables in order to determine the extent of their association with LD identification orientation.

Raw scores were also calculated in accordance with previous research into the vocational personality of school psychologists (e.g., Roth, 2006; Toomey, 2001; Toomey et al., 2008). Consistent with Toomey (2001) and Toomey et al., (2008), the highest mean raw scores were seen in the Social domain while the second-highest scores were seen in the Investigative domain. While this may appear to suggest the groups resembled the Social personality more than the Investigative personality, the mean raw score difference between the Social and Investigative types in both groups was less than five. Holland, Powell, and Fritzsche (1997) cautioned that scale score differences less than eight are within the measurement error and should be assumed

not to constitute a true difference. Taking only Social and Investigative types into account, 24 of the participants in the total matched sample produced codes that differed by less than eight points which, if redistributed, would alter the modal codes considerably. Therefore, while there were more Social types overall, both RTI and neuropsychological assessment groups appeared to exhibit similar degrees of both the Social and Investigative personalities. This minor variability is not unusual within a profession and Holland et al. (1997) noted that approximately 75% of individuals have high-point codes drawn from one of the three letters in their field's occupational code (Holland Code for School Psychologists = SEI). In both groups, the similar degree of resemblance to both the Social and Investigative personality types may be related to the high proportion of doctoral-level practitioners. Doctoral-level practitioners are likely to have strong research skills along with an interest in research and investigative type activities. Indeed, a review of responses indicates that the number of Investigative types who held doctoral degrees outnumbered the number of Investigative types who held masters or specialist degrees by more than two to one.

Examining raw scores, the current sample's orientation is less Social than those found in previous research (Roth, 2006; Toomey, 2001) and more Investigative in orientation than a large, random sample of practitioners (Toomey, 2001; Toomey et al., 2008). It should be noted that Roth (2006) used the Vocational Preference Inventory (VPI) in her study, which, despite being highly correlated with the SDS, assesses only preferences for occupations rather than interests, skills, and abilities. Thus, participants who view themselves as lacking Investigative type competencies (such as analytical skills or math and science abilities) but who nevertheless maintain Investigative

interests may score lower on the Investigative subscale of the SDS than the VPI. Within the current sample, mean raw scores across codes more solidly resembled S, I, and to a lesser extent, A. Applying the 8-point rule, Toomey noted that the choice of SEI and SIE as the two potential vocational personality codes for her sample was arbitrary, since the second and third place codes could have been I, E, A, or C in any order. Similarly, Roth's sample generated four potential high-point codes: I, S, A, and R while E and C tied for second place. Thus, contrary to Toomey's and Roth's sample of practitioners, less overall variability was seen in the current sample.

Given the SEI Holland Code for school psychologists (Gottfredson & Holland, 1996), the representation of the Artistic personality type within the sample in strength and frequency was unexpected. About 12% of participants in the neuropsychological assessment group were Artistic personality types. Applying the 8-point rule, the neuropsychological assessment group's code could be SA while, using modal codes, the RTI group exhibited an SA personality. Holland's Hexagonal model stipulates that the Social and Artistic personality types are closer in proximity to each other, and therefore resemble each other more, than the Social and Investigative types. Rounds and Tracey's (1993) misshapen polygon places the Social and Artistic types in even greater proximity and in a different quadrant than the Investigative type. Thus, although they may potentially be classified as Social, Investigative, or Artistic, the RTI and neuropsychological assessment groups exhibit consistent personalities in that they maintain common characteristics (Holland, 1985).

Research Question Two: Which points of contention with regard to LD identification contribute to the differentiation of RTI and neuropsychological assessment-oriented school psychologists?

The LD identification orientation questionnaire was developed after a comprehensive review of the LD identification literature. Items were rated on a Likert scale from *Strongly Disagree* to *Strongly Agree* and scored so that higher scores reflect a greater degree of agreement with the item. An initial questionnaire was piloted and items that were redundant or did not discriminate between orientations were removed. The 25 items on the final questionnaire were grouped into four primary categories that addressed the two methods of LD identification: validity of each method, causes of LDs, intervention, and assessment. These items provided the data for the logistic regression analysis conducted to answer research question two. Cronbach's alpha coefficients for both the RTI scale, comprised of the mean of RTI-favorable items, and the neuropsychological assessment scale, comprised of the mean of neuropsychological assessment-favorable items, were above .90, indicating very high reliability.

Within each of the groups, a strong, negative correlation between the number of RTI-favorable items to which participants agreed and the number of neuropsychological assessment-favorable items to which participants agreed indicated that high levels of agreement with content on either of the scales was associated with lower levels of agreement with content on the opposing scale. In addition, all RTI items were negatively correlated with neuropsychological assessment items, suggesting that, in general, participants who agreed with RTI favorable items tended to disagree with

neuropsychological assessment favorable items. Finally, an examination of mean score patterns within groups and across LD questionnaire scales indicates that agreement with content favorable to one's orientation on the LD questionnaire was stronger than disagreement with opposing content.

A four-item logistic regression model was able to distinguish, to a significant degree, between participants who are RTI-oriented and participants who are neuropsychological assessment-oriented. Based on statistical methods, these items yielded the strongest influence on the likelihood of accurately classifying participants as RTI-oriented or neuropsychological assessment-oriented. The full model was able to correctly classify the orientations of 98% of participants, significantly better than chance. The relationship of three of these items with orientation was statistically significant.

Two items in the model were RTI-favorable while two were neuropsychological assessment-favorable. Three of the four items included in the model were related to assessment of learning disabilities while one was related to intervention. This item, although categorized as pertaining to intervention, concerned the extent to which RTI procedures provide the information necessary to develop appropriate interventions. Inasmuch as the purpose of assessment is to provide information that can assist in intervention development, this item can be considered to relate to both assessment and intervention.

The items yielding the strongest influence on the likelihood of discriminating between the neuropsychological assessment-oriented and RTI-oriented groups were related to assessment, suggesting that participants were more sensitive to assessment-related items than they were to items relating to validity of the two methods for

identifying LDs, interventions based on these methods, or causes of LDs. This is not surprising given the large proportion of time school psychologists devote to assessment of LDs. Furthermore, in the school psychology and special education literature, much attention has been paid to assessment of LDs since the passage of the No Child Left Behind (NCLB) act and the Individuals with Disabilities Education Improvement Act (IDEIA), which ostensibly sanctioned RTI applications, questioned the ability-achievement discrepancy model, and provided the grounds upon which states and school districts could comfortably implement RTI as an assessment method. Since that time, controversy has surrounded the use of RTI for LD assessment and identification and has fueled calls for abandoning traditional assessment approaches, fears of being devalued as school psychologists, and concerns that the assessment skills specific to school psychologists will become antiquated (Allison & Upah, 2006). Indeed, since the passage of IDEIA 2004, the amount of time school psychologists devote to psychodiagnostic assessments decreased significantly, although assessment still comprises the largest proportion of school psychologists' roles (Larson & Choi, 2010). Assessment, then, appears to be a major point of contention between these opposing factions. Given the influence of the LD questionnaire assessment items on classification of orientation, including the interaction between these three items may have yielded a more accurate model.

As noted above, in general, groups did not simultaneously agree with both neuropsychological assessment and RTI favorable content. The opinions of the RTI group, who tended to agree relatively more frequently with neuropsychological assessment-favorable content, may resemble the more moderate practitioners sampled

in previous research who favor a combination model (e.g., Cangelosi, 2009; Macheek & Nelson, 2007; Mike, 2010). The neuropsychological assessment-oriented group appears to be somewhat more monolithic in their opinions than the RTI-oriented group. However, this may be a function of the types of questions on each scale, such that the RTI scale may have contained more questions that appeared radical, thereby producing disagreement. To clarify these findings, it may be beneficial to eliminate those questions that produced crossover and consensus, to perform an additional logistic regression analysis, and to examine the resulting statistics for any improvement in the model's accuracy. Likewise, prior to data collection, participants in the pilot study could be asked to identify any imbalance in radical questions across scales in order to alleviate potential bias in item wording across the LD identification orientation questionnaire scales.

Conclusions

The central hypothesis of the current study, that school psychologists who were RTI-oriented would exhibit different primary vocational personalities from those who were neuropsychological assessment-oriented, was not supported. Yet, in concert with previous research, a number of conclusions as well as theoretical and practical implications can be gleaned from the study.

Convergence With Previous Research

In general, the results of the current study converge with those of previous studies of the vocational personality of school psychologists. Similar to Toomey (2001), the current sample and both matched comparison groups produced a Social modal code. Yet, a higher percentage of her sample of school-based practitioners were Social

personality types (78%) compared to the percentage in the current study (53%). Likewise, the percentage of Investigative types (34%) was higher than Toomey's (10%) and shows greater resemblance to Roth's (2006) sample of practitioners. This could suggest a trend toward increasing resemblance to the Investigative type over the last 15 years, which may be a function of the education and training of those who are choosing to pursue school psychology as a profession. Today's school psychology graduate students are better trained in psychology and are less likely to be former classroom teachers, as in years past (Fagan, 2010). Given the classifications of psychology as an Investigative field and education as a Social field, the proportional representation of Investigative types in the sample may be related to the increase in school psychologists with a background and orientation toward psychology rather than education.

Both Toomey's and Roth's samples produced a substantial degree of variability in their vocational personalities. Yet, this was not the case in the current sample, which exhibited less variability and was more strongly oriented to the Social and Investigative types. Although speculative, this uniformity may very well be a function of the sample, which was chosen for its participants' resolute opinions on a very prominent issue in the field of school psychology. While the groups did not differ in the hypothesized ways, the relative homogeneity of personality characteristics in the present study compared to previous samples suggests that vocational personality patterns may be related to school psychologists' opinions with regard to LD identification method. This association may be more pronounced as opinions on LD identification become more resolute. This could partially help explain why the majority of school-based practitioners tend to agree more often with a combination RTI-assessment model for LD identification (Cangelosi, 2009;

Machek & Nelson, 2007; Mike, 2010), as they maintain more variability within their vocational personality and therefore exhibit more diverse skills, interests, and abilities.

General Conclusions

Research into the vocational personalities of school psychologists has been extended by disconfirming a central assumption of the present study: that school neuropsychologists are likely to maintain a vocational personality closer to that of psychology than of education. While a comparison of mean scores indicates that the school neuropsychologists resembled the Investigative type nearly as much as they resembled the Social type, a greater number of school neuropsychologists were primarily Social types. Thus, the modal code of school neuropsychologists mirrors the vocational personality of school psychologists, guidance counselors, and educators rather than developmental and educational psychologists, who are classified as primarily Investigative types. This finding was unexpected, as school psychologists who use neuropsychological assessment approaches to LD identification align assessment methods with neuroscience and tend to root their practice firmly in psychology (Schmitt & Wodrich, 2008).

The relative uniformity in the vocational personalities of the groups compared to past samples of practitioners may have been revealed in responses to the LD identification orientation questionnaire. Each group responded in a predictable, opposite fashion to the majority of items on the questionnaire. For the most part, participants' responses supported their chosen LD identification method and most did not simultaneously agree with tenets of both methods. In addition, to the extent that participants agreed with one approach, a concomitant decrease in agreement with the

other approach was evident. Although this may be related to item wording, the RTI group produced relatively more variability in opinions and tended to agree more with opposite scale content. This does not mirror the LD identification literature, in which the majority of authors with views favorable to cognitive neuropsychological assessment approaches underscored their agreement with RTI as a prereferral strategy but most RTI-oriented authors tended to disagree firmly with, or present views hostile to, cognitive neuropsychological assessment approaches.

While these predictable response patterns might otherwise confirm Batsche, Kavale, and Kovalesski's (2006) admonition that these differences in opinions are "irresolvable," the link between participants' opinions and their practices with regard to LD identification is less clear. The proportion of participants who might strongly agree with either of these LD identification methods but who might actually implement a combination model in their daily practice may have been obscured by question wording, in which participants were forced to choose between only RTI or neuropsychological assessment methods as their favored approach.

Although LD identification orientation questionnaire items were categorized into four areas: validity of the two approaches, causes of LDs, assessment of LDs, and intervention for LDs, items pertaining to assessment appeared to yield the greatest influence on orientation. Moreover, despite the inclusion of strongly-worded items designed to provoke high-levels of agreement or disagreement (e.g., "Those who oppose the RTI model are likely poorly informed"), these items were not as influential as more conventional, dispassionate items pertaining to assessment in the likelihood of being RTI or neuropsychological assessment-oriented. Similarly, questionnaire items

that resembled theoretical or academic debates, for example those that questioned the validity or philosophical underpinnings of RTI, were not influential in predicting orientation. The common thread underlying the four items in the final model was a pragmatic, student-oriented consideration over whether processing strengths and weaknesses were important for LD identification and treatment. That this point of deliberation separated the two groups is logical, given the psychological processing component of the federal SLD definition and the problem of identifying processing weaknesses in the absence of data from direct cognitive processing measures that is presented by the RTI-for-LD identification model. While even RTI-oriented researchers acknowledge that considerable evidence demonstrates the link between cognitive processes and LDs (Stuebing, Fletcher, Branum-Martin, & Francis, 2012), LD identification procedures within an RTI model minimize the need for these data. Likewise, extensive experimental research that connects cognitive processing data to identification and treatment of LDs is limited (Stuebing et al., 2012). Thus, the practical problem of how best to assess students for the presence of LDs in a research-based, technically-sound, and legally-defensible manner has not been solved. That this problem still exists appears not to have been overlooked by school psychologists.

Implications

A number of theoretical and practical implications applicable to the field of school psychology emerged from the study.

Theoretical Implications

In relation to Holland's Theory of Vocational Personalities and Work Environments, the findings provide additional support for Holland and Gottfredson's

(1996) categorization of school psychologists as primarily Social-Investigative types. However, their three-letter code includes the Enterprising personality type in the third-position, which did not figure prominently in the vocational personality of the current sample. Instead, the Artistic type, which is more similar to the Social and Investigative types than the Enterprising type (Rounds & Tracey, 1993), replaced the Enterprising type in the third position. The overall effect is that the personalities of the RTI and neuropsychological assessment groups are less variable than Holland's SEI code implies. This may be related to the extreme groups sampling method, which likely imparted less variability into the vocational personalities. The Social and Enterprising types are similar and adjacent to each other in Holland's (1985) and Rounds and Tracey's (1993) models. Yet, the Social personality tends to be rated higher in scientific and technical activities than the Enterprising type. While the link between neuropsychological assessment and scientific methods and exploration is clear, the RTI model has been criticized for ignoring advances in neuroscientific research and empirically-based theories of learning (e.g., Fiorello, Hale, & Snyder, 2006; Mather & Gregg, 2006) as well for a weak foundation in experimental research (Reynolds & Shaywitz, 2009). Still, school psychologists possess specific competencies in understanding and interpreting research; collecting, displaying and integrating data with research-based practices; and applying the scientific method, which is critical to RTI implementation (Allison & Upah, 2006). Therefore, the scientific competencies that school psychologists possess and apply within both RTI and neuropsychological assessment models may underlie their stronger Social and Investigative orientations.

The general SIA orientation observed in the sample suggests a relatively higher degree of consistency than that of Toomey's (2001) or Roth's (2006) samples as well as the SEI code of the school psychology field. Holland (1985) contended that a higher level of consistency, or the degree to which a personality type shares common characteristics (i.e., closer in proximity on the hexagon), supports higher vocational aspirations, career involvement and satisfaction and educational attainment as well as reduces the frequency of job shifts. Thus, the higher proportion of participants holding doctoral degrees and comparatively greater number of years of experience in the field, compared to Toomey's sample, may be related to the high degree of consistency in personality type. Taken in the context of lower Enterprising scores, the participants in the present study are likely to remain in the field and may fulfill their educational and career aspirations by conducting and publishing research, obtaining additional education and credentials, or supervising or training other school psychologists. Given Toomey's (2001) finding that higher Enterprising scores were correlated with a desired increase in administrative activities, relatively lower Enterprising scores suggest participants may be less likely to pursue administrative positions outside of school psychology, such as a director of special education, school principal, or superintendent.

The general SIA orientation of the comparison groups also makes the participants well-suited for contemporary school psychology practice. In addition to the aforementioned Social and Investigative traits that complement practice within RTI, cognitive-neuropsychological assessment, or combination models for LD identification, Artistic personality traits may also support success, satisfaction, and longevity within contemporary school psychology. According to Holland (1985), Artistic personality traits

support “creative performance” which results from “seeing an old problem in one or more divergent contexts” (p. 45). Holland further noted that the Artistic type tends to be nonconforming and original, traits that are not likely to be rewarded by a traditional refer-test-place model in which standard intellectual and academic assessments are given paramount importance. Over the past 10 years, there has been a steady trend toward a decreasing amount of time in these traditional assessment roles (Larson & Choi, 2010). With this decrease in the mechanical, rigid, and overly simplistic approach to testing, an approach that is more individualized, dynamic and flexible has emerged with support from the cognitive neuropsychological literature. Thus, school neuropsychologists, appear well suited to use their Artistic competencies (such as intuition, abstract-problem solving, and creativity) within this emerging paradigm. RTI-oriented participants, by re-envisioning LDs primarily as instructional problems to be solved, are in a prime position to facilitate reform-minded initiatives. The need to pathologize students to fit special education disability categories is at odds with the desired problem-solving orientation of most school psychologists, which could conceivably alter the special education culture in which they function (Burns & Coolong-Chaffin, 2006). As original, creative, problem-solvers, the Artistic, RTI-oriented participants are likely to be highly compatible with this evolving culture.

Applied Implications

The contentious debate between those who advocate an RTI approach to LD identification and those who advocate cognitive neuropsychological assessment methods has played out in the school psychology literature. Some of this literature has been characterized as bitter, attacking, or defensive and has served to increase tension

and division in the field (Willis & Dumont, 2006; Reynolds & Shaywitz, 2009). Yet, response patterns on the LD identification orientation questionnaire suggest that researchers, trainers, or university faculty advocating a particular approach to LD identification would be better served by concentrating the majority of their arguments on the merits of their chosen approach while minimizing the extent to which they malign the opposite approach. Pragmatic, rather than theoretical, arguments related to assessment that outline the reasons why a particular approach yields information that is helpful to students, rooted in the latest research, and valuable to parents and teachers may be particularly effective.

While outlining the limitations of one of these approaches may be somewhat effective at persuading school psychologists of the merits of the chosen approach, the divisiveness this helps to create may be too high a cost. Furthermore, as primarily Social personality types, school psychologists are predisposed to value agreeability, cooperation, and consideration for others' feelings (Barrick, Mount, & Gupta, 2003) and will likely be more receptive to an approach that respects these values. For school neuropsychology, a burgeoning subspecialty that enjoys less exposure than RTI in official NASP publications, this may require redoubling efforts to introduce or reacquaint school psychologists with the recent and compelling neuroscientific advancements that support the practice of school neuropsychology. Conducting workshops, particularly at the NASP convention, and webinars, submitting articles to school psychology journals and periodicals, and engaging in a direct mail campaign are just a few of the approaches that support this objective. Leaders in school neuropsychology may also consider conducting updated surveys of school psychologists to determine their current

and desired levels of school neuropsychological and neuroscientific knowledge. A survey of trainers may also be helpful in identifying training programs that might benefit from increasing their degree of content related to school neuropsychology. Finally, faculty shape the culture of training programs and a program's goals, philosophy, and orientation influences what type of school psychologists students will become (Kaufman, 2010). Thus, school neuropsychology leaders might undertake focused efforts to recruit and place school neuropsychologists in faculty positions at training programs across the country.

The study has further implications for training programs. Currently, there is a shortage of qualified and interested training program faculty facing the field of school psychology (Kaufman, 2010). Seemingly, Social-Investigative types are tailor made for such positions, as university faculty members in the social sciences are classified as SIE personalities (Holland and Gottfredson, 1997). Yet, as relatively more Social than Investigative, school psychologists similar to the participants in the present study may be less interested in pursuing positions that involve research and more satisfied as practitioners functioning within the highly Social environment of the school. In addition, although these school psychologists may desire to increase the proportion of their time devoted to research activities (Toomey, 2001), they may exhibit decreased self-efficacy with regard to their research skills (Roth, 2006). Indeed, graduate students have identified the "publish or perish" expectation as a barrier to seeking faculty positions (Kaufman, 2010). Their strong Investigative resemblance, however, suggests that there may be a proportion of school psychologists who maintain research-oriented values and interests despite lower feelings of self-efficacy in research. As a remedy, developing

ways to increase self-confidence and competencies in conducting research may be helpful in encouraging school psychologists to consider academia as a career. For example, NASP could consider requiring Nationally Certified School Psychologists (NCSP) to conduct at least one research project as a condition for renewal of the NCSP credential. Alternatively, to receive NASP approval, masters and specialist-level programs that do not culminate in the completion of a thesis could be required to incorporate more applied research activities into their curricula or internship requirements.

Related to training implications is the emergence of school neuropsychology as a distinct specialty within the field of school psychology. Although it has not been formally recognized, school neuropsychology is quickly evolving into a subspecialty (Miller, 2007) and school psychologists largely believe the field should recognize subspecialties, such as school neuropsychology (Miller, Maricle, & Deornellas, 2009). School psychologists who are RTI-oriented and those who are neuropsychological assessment-oriented share similar vocational personalities and, therefore, share values, interests and competencies. School neuropsychologists, especially school-based practitioners, maintain strong beliefs regarding the use of cognitive neuropsychological assessment methods for LD identification. Currently, they appear to have the freedom to practice in accordance with their orientation, as the use of processing strengths and weaknesses assessments is not related to a school's RTI implementation status (Unruh & McKellar, 2013) or state's adoption of RTI (Larson & Choi, 2010). However, given the impact of federal legislation on school-based practitioners, which has decreased the amount of time devoted to performing psychoeducational assessments by 8% and has

increased the time spent in RTI-type activities such as prevention and collaboration (Larson & Choi, 2010), this flexibility may not continue. In addition, NASP training standards and the *Blueprint for Training and Practice III* (Ysseldyke et al., 2008) broadened school psychologists' involvement in RTI activities while at the same time deemphasized the traditional assessment role. Given that increased exposure, training, and confidence with RTI methodology supported school psychologists' preference for RTI as an LD identification method (Raso, 2009; O'Donnell & Miller, 2011), might the same be true for school neuropsychological practice as well? The emphasis on RTI and RTI-focused competencies in training programs may limit students' exposure to the newest theory-driven assessment approaches and neuroscientific research that is crucial in helping school psychologists to develop confidence, form opinions regarding best practices for their population, and improve their practice.

Fiorello, Hale, Decker, & Coleman (2010) stressed the need for practitioners to keep abreast of the neuropsychological literature and for trainers to incorporate neuropsychological principles and practices into their training programs and ensure that students become effective in applying neuropsychological knowledge and skills. Unfortunately, school psychologists report a lack of training, knowledge and confidence with neuropsychological assessments and principles as an impediment to integrating neuropsychological assessment into their practice. Eighty-two percent of school psychologists surveyed desired additional training in neuropsychology (Slonaker, 2009). Although training in the principles and practices related to RTI is worthwhile, it may be crucial to ensure that it is not incorporated into university training programs at the expense of training in neuropsychological principles and practices. To do so may

hinder students with a predilection for school neuropsychology from incorporating these principles, which may lead to role function dissatisfaction or feelings of devaluation. These feelings, as well as unequal distribution of resources within a field, may lead to conflict (Woody, 2009) and may be influential factors in the emergence of subspecialties (Miller, Deornellas, & Maricle, 2008). Rather than focus on one area of specialization, training programs, as well as the field of school psychology, may benefit from adopting a combined-integrated model of training in which programs combine at least two specialty areas, multiple theoretical orientations, practice in multiple settings, and experience with multiple procedures and populations (Givner, 2010). As RTI and cognitive neuropsychological assessment methods for LD identification are very powerful when combined and allow for quicker, more responsive interventions as well as higher-quality comprehensive assessments (Hale & Fiorello, 2004), a combined-integrated training model that includes RTI and school neuropsychology specialty areas would give graduates an advantage over those without such training. School psychologists who are neuropsychological assessment-oriented share common values, competencies, and interests with those who are RTI-oriented, therefore both are likely well-suited for a combined-integrated model.

Neuropsychological assessment-oriented participants agreed more frequently with neuropsychological assessment-favorable statements than RTI-oriented participants agreed with RTI-favorable statements. This may be related to Mike's (2010) finding that increased RTI training supports preference for RTI, but that less experience and employment in a non-RTI setting increased agreement with RTI-benefit statements. Thus, it is possible that training and exposure to RTI convinces

practitioners of the benefits of RTI, but practical experience with RTI makes them skeptical. Subsequently, skepticism regarding RTI may compel practitioners to educate themselves about recent advances in cognitive neuroscience and school neuropsychology, seek training and use new assessments, and implement research-based, cognitive neuropsychological LD identification models. For RTI supporters, this implies that there are practical issues with RTI implementation that, while perhaps not directly related to the efficacy of the RTI model itself, undermine its practicality and effectiveness in the school setting. Although there is a rich literature base on overcoming barriers to RTI implementation, some of these factors may not receive adequate attention (e.g., teacher or administrator resistance, limited training in curriculum-based measurement or single-case design). RTI supporters should attempt to identify these practical issues through open and honest discussion and then conduct outreach with school-based practitioners to support attempts to overcome them.

Finally, there are implications for the school psychology field and how effectively the conflict between RTI and cognitive neuropsychological assessment approaches to LD identification is managed. In the American Psychological Association (APA), fragmentation occurred as psychologists expanded their range of activities (Bower, 1993) and the pull between the values, interests, and goals of research-academic members and practitioners increased. Within school psychology, the results of the current study suggest that school psychologists who are RTI-oriented and those who are neuropsychological assessment-oriented are more alike than they are different and share many values, competencies and interests. Nevertheless, they maintain opposing viewpoints on an important topic that has sparked intense debate. RTI and assessment

proponents may be analogous to Bardon's (1983) *purists* and *pragmatists*, who are more likely than those he refers to as *compromisers* to generate the change that most agree is desirable, especially with regard to LD identification. Considering the degree to which conflict is managed and incorporated determines the functionality in the outcome (Speakman & Ryals, 2010), it will be important for leaders in the field to offer school psychologists an equal opportunity to learn, understand, and integrate, if desired, both approaches into their practice. Currently, RTI is ascendant and many disability advocates will choose to align themselves with the dominant approach (Kauffman, 2007). Therefore, leaders, trainers, and practitioners must be cognizant of the most recent advances in both RTI and cognitive neuropsychological assessment as well as the range of research-based, defensible, and effective alternatives for LD identification that exist.

Limitations

Limitations to research studies typically involve threats to internal validity, or the plausibility that a variable other than the hypothesized variable can explain the results, and external validity, or the extent to which findings can be generalized to other populations or settings (Gall et al., 2007).

Internal Threats to Validity

The current study used a survey format rather than true experimental manipulation, therefore, several of the common threats to validity were not applicable. Although questionnaires are typically viewed by researchers as being more accurate than tests (Gall et al., 2007), there were a number of internal threats to validity related to study design, instrumentation, and statistical analysis.

Two threats to internal validity are related to the LD identification orientation questionnaire design and the possibility of response bias. First, participants were aware of the purpose of the study and the reasons for their recruitment. This may have increased the likelihood that they responded in accordance with the questionnaire objective or in a way that was more desirable to the researcher. Second, the Likert scale items did not allow for a *Don't Know* or *Neutral* option. Therefore, participants were forced to choose between agreeing or disagreeing with items. While the lack of neutral items might limit social desirability responding, as many school psychologists are socially-oriented and favor a combination approach to LD identification, it may have inflated scores and caused participants to appear more extreme than they truly are.

An additional threat to internal validity related to instrumentation concerns the content sampled in the LD identification orientation questionnaire. The questionnaire items were based directly on the arguments made in the LD identification, neuropsychological assessment, and RTI literature. All attempts were made to include similar content on each scale across four areas (validity, causes, intervention, assessment) and to include the same number of items with both moderate and more extreme statements. Yet, the extent to which differences in the RTI and neuropsychological assessment scales impacted participants' responses is unclear. Both scales were highly reliable, however, the RTI scale exhibited more low correlations between items and was therefore less unitary than the neuropsychological assessment scale. Thus, the extent to which statistical differences between groups are an artifact of scale content rather than a reflection of true differences is not known.

Study design constituted a threat to internal validity with regard to the variables on which the comparison groups were matched. Although the matching variables of years of experience, sex, and highest degree earned were chosen because they are likely to exert an influence on choice of LD identification approach, there is insufficient evidence to show that these were the most important or influential variables. While these variables are likely to be more accurately reported than variables that have been shown to impact preference for RTI or assessment methods (e.g., exposure to RTI, more or less than nine days of training), matching groups on additional variables such as school-based practitioner status or role function may have allowed for greater control when comparing vocational personalities and LD questionnaire scores.

There were five internal validity threats related to the statistical analysis of the data. First, in most of the analyses, sample sizes were at or above 30 participants. However, due to missing data, a number of analyses included samples of slightly less than 30 participants, which likely decreased power to detect a true difference between groups. The groups were formed to represent the extremes of a target population, which may increase the effect size and offset the loss in power that resulted from smaller sample size. However, this assumption is based on speculation rather than previous research.

A second, statistically-based threat to internal validity involves the violation of the assumption of normality. A number of distributions in variables exhibited moderate skewness and kurtosis. Where necessary, variables were transformed in order to reach adequate normality. However, in other cases, variables with non-normal distributions were not transformed. Although the statistical analyses were chosen for their

robustness and ability to overcome mild violations of assumptions, the statistical power may have been decreased due to the mild violations of the normality assumption.

The final three threats to internal validity are related to the logistic regression analysis. Primarily, due to sample size issues, the total sample of participants was entered into the analysis rather than the matched groups. While this sample size was generally adequate given the 5-10 cases per variable guideline, the sample was highly unbalanced among groups, which can distort the model's coefficients (Hosmer & Lemeshow, 2000). In addition, the higher than normal standard error values, which are likely a function of sample size, led to extremely large confidence intervals around the estimated odds ratios of two items. These abnormally large confidence intervals are essentially meaningless, making it difficult to make comparisons between the plausible true odds ratios derived from both models. Finally, the forward, stepwise approach to logistic regression analysis was used due to the large number of variables. This procedure is best employed as a screening or hypothesis-generating technique, as variables are included or removed from the model based purely on statistical criteria (Tabachnick & Fidell, 2007). Thus, the possibility that LD questionnaire items that did indeed share a significant relationship with orientation were excluded from the final model based on mathematical criteria was increased by using this approach.

External Threats to Validity

Assessing external validity requires a review of the extent to which the results can be generalized from the sample to a larger group (population validity) and to another set of environmental conditions (ecological validity; Gall et al., 2007). The results of the current study are likely to be valid for that population of school

psychologists who are less likely to prefer a combination approach to LD identification and who maintain strong opinions on the use of either RTI or neuropsychological assessment methods. It is unclear whether the obtained sample constitutes the most extreme members of this group due to the purposive, nonrandom sampling method used. Therefore, to gain a truer representation of the target population it would be necessary to obtain a random sample of school psychologists, administer the LD identification orientation questionnaire, and identify participants at the extremes of the distribution. Another barrier to generalizing the results to the target population concerns the extent to which the sample was similar in critical respects. As this constitutes the first study of school psychologists with opposite views on LD identification, there is no demographic or professional role function data on which to compare these two populations. Therefore, it is unclear whether the sample resembled the target population on important variables such as highest degree earned, years of experience, role function, school-based practitioner status, and sex.

Factors related to the individual participants can also interact with the study design to limit population validity. As volunteers, the participants in the study may have been different in one or more ways from the target population or from those who chose not to participate (selection bias). For example, non-participants may have held less extreme opinions on LD identification methods and therefore may have been less motivated to express themselves. Furthermore, non-participants could have been less informed, less interested, or not engaged in role functions in which LD identification is as relevant as it is to school-based practitioners (e.g., consultant; administrator).

Several threats to ecological validity are not relevant due to the non-experimental nature of the study and the fact that experimental treatments were not directly applied to participants. However, some factors related to study design may have been influential. Primarily, some participants may have overstated their resolve, simply because they were aware of the purpose of the study or the orientation to which they were presumed to gravitate (response bias). Out of necessity, the introductory letter insinuated that participants would be grouped according to their orientation toward LD identification method, which may have created additional motivation to respond in a certain way. Likewise, participants recruited via peer nomination may have been motivated to respond in the manner they assumed to be desirable by their nominator, even if they maintained less steadfast opinions. Participants chosen for their American Board of School Neuropsychology (ABSNP) diplomate may have been motivated to respond in a particular manner or in concert with the goals and philosophies of their organization. Thus, the extent to which the participants would produce similarly resolute opinions given changes in study design is unclear.

The final limitation to external validity is related to possible alterations in vocational personality over time. While there is evidence to demonstrate that vocational personality is quite stable over the long term (e.g., Miller, 2002), occupational environments can reward and encourage the expression of specific traits (Gottfredson & Johnstun, 2009; Holland, 1985). Thus, just as participants in the study appeared to develop Conventional personality characteristics due to their strengthening of skills, the Social environment of the school may encourage and reward Social competencies. Over time, then, the degree to which participants resemble the Social personality may

have increased even if they were not naturally predisposed to maintaining the values, interests, and competencies of the Social personality.

Recommendations for Future Research

Additional research may help to explain, clarify, or extend the findings of the current study. First, a replication of the study using a random sample of school psychologists could overcome a number of threats to internal and external validity as well as allow for a more accurate examination of vocational personality. Including Likert choices of *Neutral* or *No Opinion* as well as the option to choose a combination model as the preferred LD identification method may also help to identify only those school psychologists with the most resolute opinions on RTI or cognitive neuropsychological assessment. With a replication study that utilizes a larger, random sample, additional statistical analyses are possible. Including the interaction between LD questionnaire items in the logistic regression analysis and conducting a multiple linear regression with all variables to determine the strongest predictor of orientation toward LD identification method may clarify and extend the findings of the current study. Furthermore, including additional variables such as region or state of employment, training program, preferred sources of information relevant to the school psychology field, or beliefs regarding the origin of LDs may further clarify findings.

Using a larger, random sample of school psychologists, an exploratory factor analysis of the LD identification orientation questionnaire is suggested. Although questionnaire items were categorized under assessment, intervention, validity, and causes of LDs, to reflect the arguments made within the RTI, neuropsychology, and LD identification literature, an exploratory factor analysis could determine whether these

constructs underlie participants' scores on the LD questionnaire. Once the factor structure of the LD questionnaire is determined, scores from the extreme 10% of respondents on opposite ends of the distribution could be analyzed to determine which factors produced the highest and most consistent levels of consensus, crossover, and disagreement. For example, do school psychologists who are strongly RTI-oriented and neuropsychological assessment-oriented agree on the causes of LDs but disagree on their preferred approach to assessment or intervention? Is it possible to achieve consensus among even the most resolute school psychologists on the validity of both models? This information could be helpful for trainers, academics, and proponents who wish to persuade school psychologists of the benefits and value of their respective approach or for those who wish to cultivate the idea that these two seemingly opposite approaches can actually complement one another. Given the divisiveness in the field wrought by this debate, it would be beneficial to discuss the points on which school psychologists agree rather than disagree and to identify the areas on which greater consensus might be achieved.

Taking this a step further, after identifying factors which might foster greater agreement, one or more different approaches to disseminating information on each approach that targets these factors could be implemented. The LD questionnaire could be administered as a post-test to determine the impact of the training program on attitudes toward each approach. For example, are experiential programs or workshops that include case studies and role plays more effective at changing or strengthening attitudes than approaches designed to simply inform school psychologists of recent advances in each of the LD identification approaches? Do focused internships that

include in-depth experience with RTI or evidence-based cognitive neuropsychological assessment methods impact attitudes more than traditional internships? How effective are traditional, peer-reviewed journal articles at altering opinions? Are they more or less effective than books, periodicals, or NASP Communiqué articles? Does having frequent contact with a supervising school psychologist or work-alike group alter opinions on LD identification?

Vocational personality provides a fruitful area for the exploration of school psychologists' preferred practices. Level of differentiation, or the degree to which an individual resembles a single personality type (Holland, 1985), could be included as a potential predictor of orientation to LD identification method in a multiple linear regression analysis. Given that minor differences were seen in the vocational personality patterns of school psychologists who were RTI- and neuropsychological assessment-oriented, it may also be worthwhile to obtain a larger sample of school psychologists and form groups based on their vocational personalities, as well as level of consistency and differentiation. Using these groups, comparisons could be made between scores and response patterns on the LD identification orientation questionnaire as well as exploration of their relationship to other variables of interest.

Holland's (1985) construct of congruence, or the level of agreement between one's vocational personality and his or her work environment, may be a useful principle for exploring the possibility of subspecialty emergence. Holland's (1985) theory stipulates that as congruence increases, so do job performance, satisfaction, and stability. Toomey (2001) found support for the congruence construct at the role level. For example, school psychologists with higher Social scores desired increased time in

counseling but decreased time in assessment. Likewise, those with higher Investigative scores desired increased time in research activities and those with higher Enterprising scores desired increased time in administrative activities. Might the congruence construct apply at the microlevel as well? RTI and neuropsychological assessment approaches to LD identification require similar competencies (e.g., consultation) but also dissimilar competencies (e.g., in-depth exploration of the root causes of a problem). Therefore, incongruence between the vocational personalities of school psychologists with differing orientations toward LD identification and their role function at the microlevel is warranted. Examining the existence, or prevalence, of incongruence at this level could assess the possibility that (a) some school psychologists feel dissatisfied or unfulfilled within their current role, and (b) whether they may feel more fulfilled if practicing as a subspecialist in school neuropsychology or RTI.

Summary

The purpose of this study was to examine the vocational personalities of school psychologists at opposite ends of the debate over LD identification approaches and to examine the capacity of a questionnaire to discriminate between these two groups. The results of the study did not support the central hypothesis of the study, that school psychologists who are RTI-oriented exhibit different vocational personalities than those who are neuropsychological assessment-oriented. Both RTI and neuropsychological assessment-oriented groups produced Social primary codes using both modal codes and mean raw scores. This was consistent with Holland's (1985) Social categorization of school psychologists as well as with previous research. However, the current sample was also more highly oriented to the Investigative personality than the random sample

of practitioners and produced less overall variability in vocational personality than previous samples. The Social-Investigative personality may be related to the increasing proportion of graduate students, who are trained in psychology and less likely to be former teachers, or to the sample, which was chosen for its participants' strong opinions on LD identification. Both groups also exhibited Artistic tendencies, which suggests they are more consistent than the general SEI classification and samples used in previous studies, given the proximity of the Social, Artistic, and Investigative types within the Hexagonal model. The school neuropsychologists that comprised the neuropsychological assessment group produced modal personality codes closer to that of psychology than of education, which disconfirms a central assumption of the study.

The LD identification orientation questionnaire produced Cronbach's Alpha coefficients of .90 or above, indicating high reliability for the RTI and neuropsychological assessment scales. Participants responded in predictable ways and high levels of agreement with content on either of the scales were associated with lower levels of agreement with content on the opposing scale. Logistic regression models containing four items of the LD questionnaire were able to distinguish readily between participants who were RTI-oriented and participants who were neuropsychological assessment-oriented at a rate significantly higher than chance. This model was able to correctly classify over 98% of participants into their respective orientation. Items related to assessment of LDs predominated in the best-fitting model.

Recommendations for future research included conducting a study replication using a random sample of school psychologists, which may overcome several threats to internal validity. Conducting an exploratory factor analysis on the LD identification

orientation questionnaire would be helpful in determining if the intended factor structure of the questionnaire is present and for identifying those factors upon which opposite groups agree. Within the vocational personality domain, researchers were encouraged to form groups based on their vocational personalities, consistency, and differentiation and make comparisons between scores and response patterns on the LD identification orientation questionnaire. Finally, examining incongruence between the vocational personalities of school psychologists with differing orientations toward LD identification and their role function at the microlevel was suggested.

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Appendix A

Demographic Data Form

All information contained in this form will remain confidential and is intended only to describe the sample obtained in the present study.

Please provide the following information:

1. What is your primary role designation:

____ Practitioner, employed full-time in a public or private school
____ Consulting school psychologist, employed in a private or state-level agency
____ Trainer of school psychologists, employed in an academic or other training setting
____ Supervisor/Administrator in a public or private setting
____ Student, Graduate or Specialist Level
____ Other: _____
2. What is your age: _____
____ I prefer not to answer
3. What is your sex?: _____ Male _____ Female
4. What is your highest degree obtained?

____ Master's Degree (M.Ed., M.A., M.S.) Psy. D)
____ Specialist (Master's + 30, Ed. S., CAS, CAGS)
____ Doctoral (Ph.D, Ed.D., Psy.D.)
5. How many years of experience do you have as a school psychologist: _____
6. Of what professional school psychology or psychology organization(s) are you a member:
____ NASP _____ State school psychology association
____ APA (Any division) _____ ABPP
____ ABSNP _____ ABSP
____ Other: _____
7. Please indicate any professional credentials or specializations in the fields of school psychology or psychology you have earned:

____ NCSP _____ ABSNP Other: _____
____ ABPP _____ ABSP
8. For full time school-based practitioners, please indicate your primary employment setting:

____ Elementary School _____ Middle School
____ High School _____ Multiple Settings
____ N/A

Thank you very much for your participation!

Appendix B

References for LD Identification Orientation Questionnaire

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Appendix C

Learning Disabilities Identification Orientation Questionnaire

This questionnaire is designed to gain a better understanding of your attitude toward two differing approaches for identifying and treating learning disabilities (LDs): Response-to-Intervention (RTI) and Neuropsychological/Cognitive process-based assessment. Please rate how strongly you agree with the statements below by checking the box that best corresponds to your professional opinion. Please check only one box per item. Your responses will be kept strictly confidential and will not be used to identify you by name. Please give honest responses related to your attitudes on the two differing approaches.

If necessary, please refer to the following definitions when responding to questionnaire items:

Response-to-Intervention: A behaviorally-oriented model of service delivery that focuses on improved achievement for all students by matching student need with intensity of intervention. Using multiple-tiers, a student is provided with increasingly intense and individualized interventions depending on his or her response to prior interventions. Use of a problem-solving model, evidence-based interventions, consistent progress monitoring using curriculum-based measurement, and treatment integrity checks are core components of RTI.

Comprehensive psychoeducational evaluation: An evaluation conducted by a trained school psychologist designed to identify cognitive, psychological processing, and academic strengths and weaknesses as well as illuminate barriers or facilitators of learning. This evaluation usually involves, but is not limited to, the use of standardized tests of cognitive processing, executive functioning, language capacity, memory and academic achievement. This evaluation may also include the use of intellectual assessment instruments such as the Wechsler scales or Stanford-Binet Intelligence Test. In the present questionnaire, this term also refers to evaluations commonly referred to as "cognitive processing," "cognitive" or "neuropsychological" and is used interchangeably.

Please answer every question and check only one box for each question below:

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. A well-implemented RTI process can replace a comprehensive psychoeducational evaluation for identifying LDs.	☐	☐	☐	☐
2. It is important to identify how children with LDs process information differently from typical children.	☐	☐	☐	☐
3. The extant literature clearly supports the existence of cognitive processes that can be directly linked to academic functioning.	☐	☐	☐	☐
4. Providing an accurate diagnosis is helpful in treating LDs.	☐	☐	☐	☐
5. Matching instructional treatments to cognitive processes leads to positive educational outcomes for LD students.	☐	☐	☐	☐

		Strongly Agree	Agree	Disagree	Strongly Disagree
6.	Legislation should be passed that requires all states to adopt RTI as the only acceptable method of identifying LDs.	☐	☐	☐	☐
7.	Children with LDs can be differentiated from each other based on differences in their cognitive, memory, language, motor and executive functioning profiles.	☐	☐	☐	☐
8.	RTI is a more promising approach for identifying LDs than neuropsychological/cognitive processing assessment.	☐	☐	☐	☐
9.	Cognitive functioning is not directly related to learning to read.	☐	☐	☐	☐
10.	The "processing disorder" component of the federal definition of LD should <u>not</u> be considered in the determination of eligibility for special education under the Specific Learning Disability (SLD) category.	☐	☐	☐	☐
11.	The failure of the child-school interaction is the primary cause of most LDs.	☐	☐	☐	☐
12.	A child's neuropsychological profile can predict response to various instructional approaches.	☐	☐	☐	☐
13.	RTI alone provides the information necessary to develop appropriate interventions for struggling students.	☐	☐	☐	☐
14.	The resources expended in conducting comprehensive neuropsychological and cognitive processing evaluations is worthwhile given the benefits for the child.	☐	☐	☐	☐
15.	RTI ignores a vast body of literature on individual cognitive differences.	☐	☐	☐	☐
16.	Research validates the use of RTI for LD identification.	☐	☐	☐	☐
17.	Learning failures are also teaching failures.	☐	☐	☐	☐
18.	Those who oppose the RTI model are likely poorly informed.	☐	☐	☐	☐
19.	The RTI model fails to meet modern scientific standards of evidence for acceptance as a method for identifying LDs.	☐	☐	☐	☐

		Strongly Agree	Agree	Disagree	Strongly Disagree
20.	There is no doubt that brain functioning is impaired in students with true LDs.	☐	☐	☐	☐
21.	Children who do not respond to instructional methods that have been shown to be effective with the majority of children should be considered LD.	☐	☐	☐	☐
22.	RTI ignores alternative explanations, other than poor instruction, for learning difficulties.	☐	☐	☐	☐
23.	LDs can be reliably differentiated from generalized low achievement using neuropsychological measures.	☐	☐	☐	☐
24.	High-incidence disabilities (such as LDs and intellectual disabilities) should be grouped into one disability category.	☐	☐	☐	☐
25.	Administration of standardized, norm-referenced assessments of neuropsychological functioning/ cognitive processing is essential for accurate identification of LDs.	☐	☐	☐	☐
26.	Given the prior implementation of multiple, well-designed interventions that are monitored for fidelity and effectiveness, which method most closely resembles your favored approach to the identification of learning disabilities when conducted as part of the special education eligibility determination?				

Please check one box only:

- ☐ Response-to-Intervention (RTI)
- ☐ Comprehensive assessment that incorporates cognitive processing or neuropsychological tests

Thank you for participating!

Appendix D

Electronic Web-Based Version of Study Questionnaire

Would you prefer to complete a paper/pencil version of this questionnaire?

- ☐ Yes, please send me a hard copy of the study questionnaire. (1)
- ☐ No, I'd like to begin the questionnaire now (2)

Please provide the following information so we may send you a hard copy of the questionnaire.

- Name (1)
- Address (2)
- Address 2 (3)
- City (4)
- State (5)
- Zip Code (6)

The first block of questions asks you to provide some brief biographical information. All information provided will remain confidential and is intended only to describe the characteristics of the sample obtained in the present study. Please provide the following information:

What is your primary role designation?

- ☐ Practitioner, employed full-time in a public or private school (1)
- ☐ Consulting school psychologist, employed in a private or state-level agency (2)
- ☐ Trainer of school psychologists, employed in an academic or other training setting (3)
- ☐ Supervisor/Administrator in a public or private setting (4)
- ☐ Student, Graduate or Specialist Level (5)
- ☐ Other (6) _____

What is your age?

- ☐ Enter age in years (1) _____
- ☐ I prefer not to answer (2)

What is your sex?

- ☐ Male (1)
- ☐ Female (2)

What is your highest degree obtained?

- ☐ Master's Degree (M.Ed., M.A., M.S.) (1)
- ☐ Specialist (Master's + 30, Ed. S., CAS, CAGS) (2)
- ☐ Doctoral (Ph.D, Ed.D., Psy. D) (3)

How many years of experience do you have as a school psychologist?

Of what professional school psychology or psychology organization(s) are you a member: (check all that apply)

- ☐ NASP (1)
- ☐ APA (2)
- ☐ ABSNP (3)
- ☐ State School Psychology Association (4)
- ☐ ABPP (5)
- ☐ ABSP (6)
- ☐ Other (7) _____
- ☐ Other (8) _____

Please indicate any professional credentials or specializations in the fields of school psychology or psychology you have earned:

- ☐ NCSP (1)
- ☐ ABPP (2)
- ☐ ABSNP (3)
- ☐ ABSP (4)
- ☐ Other (5) _____
- ☐ Other (6) _____

For full time school-based practitioners, please indicate your primary employment setting:

- ☐ Preschool (1)
- ☐ Elementary School (2)
- ☐ Middle School/Junior High School (3)
- ☐ High School (4)
- ☐ Multiple Settings/Levels (5)
- ☐ N/A (6)

The next block of questions is designed to gain a better understanding of your attitude toward two differing approaches for identifying and treating learning disabilities (LDs): Response-to-Intervention (RTI) and Neuropsychological/Cognitive process-based assessment. Please rate how strongly you agree with the statements below by checking the box that best corresponds to your professional opinion. Please check only one box per item. Your responses will be kept strictly confidential and will not be used to identify you by name. Please give honest responses related to your attitudes on the two differing approaches. If necessary, please refer to the following definitions when responding to questionnaire items:

Response-to-Intervention: A behaviorally-oriented model of service delivery that focuses on improved achievement for all students by matching student need with intensity of intervention. Using multiple-tiers, a student is provided with increasingly intense and individualized interventions depending on his or her response to prior interventions. Use of a problem-solving model, evidence-based interventions, consistent progress monitoring using curriculum-based measurement, and treatment integrity checks are core components of RTI.

Comprehensive psychoeducational evaluation: An evaluation conducted by a trained school psychologist designed to identify cognitive, psychological processing, and academic strengths and weaknesses as well as illuminate barriers or facilitators of learning. This evaluation usually involves, but is not limited to, the use of standardized tests of cognitive processing, executive functioning, language capacity, memory and academic achievement. This evaluation may also include the use of intellectual assessment instruments such as the Wechsler scales or Stanford-Binet Intelligence Test. In the present questionnaire, this term also refers to evaluations commonly referred to as “cognitive processing,” “cognitive” or “neuropsychological” and is used interchangeably.

Please rate how strongly you agree with the statements below by checking the box that best corresponds to your professional opinion. Please check only one box per item.

	Strongly Agree (1)	Agree (2)	Disagree (3)	Strongly Disagree (4)
A well-implemented RTI process can replace a comprehensive psychoeducational evaluation for identifying LDs. (1)	☐	☐	☐	☐
It is important to identify how children with LDs process information differently from typical children. (2)	☐	☐	☐	☐
The extant literature clearly supports the existence of cognitive processes that can be directly linked to academic functioning. (3)	☐	☐	☐	☐
Providing an accurate diagnosis is helpful in treating LDs. (4)	☐	☐	☐	☐
Matching instructional treatments to cognitive processes leads to positive educational outcomes for LD students. (5)	☐	☐	☐	☐
Legislation should be passed that requires all states to adopt RTI as the only acceptable method of identifying LDs. (6)	☐	☐	☐	☐
Children with LDs can be differentiated from each other based on differences in their cognitive, memory, language, motor and executive functioning profiles. (7)	☐	☐	☐	☐
RTI is a more promising approach for identifying LDs than neuropsychological/cognitive	☐	☐	☐	☐

processing assessment. (8) Cognitive functioning is not directly related to learning to read. (9)	☐	☐	☐	☐
The “processing disorder” component of the federal definition of LD should not be considered in the determination of eligibility for special education under the Specific Learning Disability (SLD) category. (10)	☐	☐	☐	☐
The failure of the child-school interaction is the primary cause of most LDs. (11)	☐	☐	☐	☐
A child’s neuropsychological profile can predict response to various instructional approaches. (12)	☐	☐	☐	☐
RTI alone provides the information necessary to develop appropriate interventions for struggling students. (13)	☐	☐	☐	☐
The resources expended in conducting comprehensive neuropsychological and cognitive processing evaluations is worthwhile given the benefits for the student. (14)	☐	☐	☐	☐
RTI ignores a vast body of literature on individual cognitive differences. (15)	☐	☐	☐	☐
Research validates the use of RTI for LD identification. (16)	☐	☐	☐	☐
Learning failures are also teaching failures. (17)	☐	☐	☐	☐
Those who oppose the RTI model are likely poorly	☐	☐	☐	☐

informed. (18)				
The RTI model fails to meet modern scientific standards of evidence for acceptance as a method for identifying LDs. (19)	○	○	○	○
There is no doubt that brain functioning is impaired in students with true LDs. (20)	○	○	○	○
Children who do not respond to instructional methods that have been shown to be effective with the majority of children should be considered LD. (21)	○	○	○	○
RTI ignores alternative explanations, other than poor instruction, for learning difficulties. (22)	○	○	○	○
LDs can be reliably differentiated from generalized low achievement using neuropsychological measures. (23)	○	○	○	○
High-incidence disabilities (such as LDs and intellectual disabilities) should be grouped into one disability category. (24)	○	○	○	○
Administration of standardized, norm-referenced assessments of neuropsychological functioning/cognitive processing is essential for accurate identification of LDs. (25)	○	○	○	○

Given the prior implementation of multiple, well-designed interventions that are monitored for fidelity and effectiveness, which method most closely resembles your favored approach to the identification of learning disabilities when conducted as part of the special education eligibility determination?

- ☐ Response-to-Intervention (RTI) (1)
- ☐ Comprehensive assessment that incorporates cognitive processing or neuropsychological tests (2)

The next few blocks of questions ask you to indicate activities that interest you, skills you have or would like to acquire, jobs that appeal to you, and your abilities in relation to others your age. Again, please remember that all information will be kept strictly confidential. Adapted and reproduced by special permission of the publisher, Psychological Assessment Resources, Inc., 16204 North Florida Avenue, Lutz, Florida, 33549, from the Self-Directed Search Form E Assessment Booklet by John L. Holland, Ph.D., Copyright 1970, 1973, 1979, 1985, 1991, 1996. Further reproduction is prohibited without permission from PAR, Inc.

Below are lists of ACTIVITIES. Mark a YES for those activities that you like to do or think you might like to do. Mark a NO for those activities that you would not like to do.

	YES (1)	NO (0)
Fix electrical things (1)	☐	☐
Fix mechanical things (2)	☐	☐
Build things with wood (3)	☐	☐
Use machine tools (4)	☐	☐
Take an auto mechanics course (5)	☐	☐
Take a woodworking course (6)	☐	☐
Use electrical or gas-powered machines (7)	☐	☐
Work on a car (8)	☐	☐
Work with a good mechanic (9)	☐	☐
Drive a truck or tractor (10)	☐	☐
Read scientific books or magazines (11)	☐	☐
Work in a research laboratory (12)	☐	☐
Take a physics course (13)	☐	☐
Work on a research project (14)	☐	☐
Take a biology course (15)	☐	☐
Study things through a microscope (16)	☐	☐
Study the stars or planets (17)	☐	☐
Do a scientific experiment (18)	☐	☐
Work with chemicals (19)	☐	☐
Study a scientific theory (20)	☐	☐
Work with a good artist, sculptor or writer (21)	☐	☐
Play in a band, group or orchestra (22)	☐	☐
Practice a musical instrument (23)	☐	☐
Read or write poetry (24)	☐	☐

Take an art course (25)	☐	☐
Read about art, books or music (26)	☐	☐
Draw, sketch or paint (27)	☐	☐
Dance, sing or act (28)	☐	☐
Work as an entertainer (29)	☐	☐
Write articles, books, plays or poems (30)	☐	☐
Teach adults or children (31)	☐	☐
Work with mentally ill people (32)	☐	☐
Take a human relations course (33)	☐	☐
Work for a charity (34)	☐	☐
Learn more about psychology (35)	☐	☐
Work with an outstanding teacher or therapist (36)	☐	☐
Help people find jobs (37)	☐	☐
Learn about crime and juvenile delinquency (38)	☐	☐
Work as a volunteer (39)	☐	☐
Help others solve their problems (40)	☐	☐
Go to a sales conference (41)	☐	☐
Be an officer of a group (42)	☐	☐
Direct the work of others (43)	☐	☐
Meet important business leaders (44)	☐	☐
Lead a group (45)	☐	☐
Run my own business (46)	☐	☐
Sell something (47)	☐	☐
Give a public talk (48)	☐	☐
Be a project leader (49)	☐	☐
Take a business management course (50)	☐	☐
Type papers or letters (51)	☐	☐
Keep records of expenses (52)	☐	☐

Take a bookkeeping course (53)	☐	☐
File letters or reports (54)	☐	☐
Write business letters (55)	☐	☐
Check paperwork or products for errors (56)	☐	☐
Set up a filing system (57)	☐	☐
Fill out business forms (58)	☐	☐
Balance a checkbook (59)	☐	☐
Work in an office (60)	☐	☐

Below are lists of SKILLS. Mark a YES for those skills that you have or would like to learn. Mark a NO for those skills that you do not have or would not like to learn. For each skill listed below, ask yourself..."I know how or would like to learn to..."

	YES (1)	NO (0)
Use power tools such as a saw, drill, or sewing machine (1)	☐	☐
Make simple electrical repairs (2)	☐	☐
Repair furniture (3)	☐	☐
Change a car's oil or tire (4)	☐	☐
Use carpenter's tools (5)	☐	☐
Fix a car (6)	☐	☐
Make simple furniture (7)	☐	☐
Read blueprints (8)	☐	☐
Fix a leaking faucet (9)	☐	☐
Use a lawn mower (10)	☐	☐
Understand the role of DNA in genetics (11)	☐	☐
Use scientific equipment of any kind (12)	☐	☐
Use a microscope (13)	☐	☐
Describe what white blood cells do (14)	☐	☐
Know why satellites do not fall to the earth (15)	☐	☐
Write a scientific report (16)	☐	☐
Perform a scientific experiment (17)	☐	☐
Understand the "Big Bang" theory (18)	☐	☐
Understand the half-life of a radioactive element (19)	☐	☐
Read scientific charts or graphs (20)	☐	☐
Do a painting, watercolor or sculpture (21)	☐	☐
Write a script for a commercial (22)	☐	☐

Sing in a choir (23)	☐	☐
Read music (24)	☐	☐
Play an instrument (25)	☐	☐
Write stories or poetry well (26)	☐	☐
Arrange or compose music (27)	☐	☐
Draw cartoons well (28)	☐	☐
Act in a play (29)	☐	☐
Design clothing, posters or furniture (30)	☐	☐
Be good at explaining things to others (31)	☐	☐
Help people who are upset or troubled (32)	☐	☐
Teach children easily (33)	☐	☐
Work as a volunteer in a hospital (34)	☐	☐
Be a good judge of people (35)	☐	☐
Talk easily with all kinds of people (36)	☐	☐
Teach adults easily (37)	☐	☐
Make people feel at ease (38)	☐	☐
Be good at teaching others (39)	☐	☐
Work better with people than with things or ideas (40)	☐	☐
Supervise the work of others (41)	☐	☐
Get people to do things my way (42)	☐	☐
Be a good manager (43)	☐	☐
Be a good salesperson (44)	☐	☐
Become a good leader (45)	☐	☐
Organize a club or group (46)	☐	☐
Start my own business (47)	☐	☐
Organize the work of others	☐	☐

(48)		
Be an ambitious person (49)	☐	☐
Manage a sales campaign (50)	☐	☐
File letters and other papers (51)	☐	☐
Use a copy machine well (52)	☐	☐
Hold an office job (53)	☐	☐
Do a lot of paperwork in a short time (54)	☐	☐
Use word processing programs well (55)	☐	☐
Write business letters (56)	☐	☐
Keep accurate records of payments or sales (57)	☐	☐
Add, subtract, and multiply numbers accurately (58)	☐	☐
Use two or more office machines (59)	☐	☐
Get information over the phone (60)	☐	☐

Below are lists of JOBS. Mark the YES for those jobs that you like or think you might like to do. Mark the NO for those jobs that you do not think you would like to do.

	YES (1)	NO (0)
Helicopter Pilot – flies a helicopter (1)	☐	☐
Construction Inspector – inspects buildings, bridges and roads that are being built. (2)	☐	☐
Electrician – installs and fixes electrical wiring (3)	☐	☐
Heavy Equipment Operator – runs large machines (like cranes) (4)	☐	☐
Locksmith – installs and fixes locks (5)	☐	☐
House Painter – paints houses (inside and outside) (6)	☐	☐
Auto Mechanic – fixes cars (7)	☐	☐
Carpenter – builds things (8)	☐	☐
Farmer – raises crops or animals (9)	☐	☐
Airplane Mechanic – fixes airplanes (10)	☐	☐
Welder – joins metal parts using heat (11)	☐	☐
Truck Driver – drives a truck route (12)	☐	☐
Meteorologist – studies the weather (13)	☐	☐
Biologist – studies plants and animals (14)	☐	☐
Zoologist – studies the history of animals (15)	☐	☐
Chemist – studies and makes chemicals (16)	☐	☐
Geologist – studies the history of the earth (17)	☐	☐
Scientific Research Worker – helps to find the answer to scientific questions (18)	☐	☐

Physicist – studies the laws of nature (like gravity) (19)	○	○
Environmental Analyst – studies changes in the environment (20)	○	○
Pathologist – looks for causes of illness (21)	○	○
Medical Laboratory Technician – works with medical equipment (22)	○	○
Astronomer – studies the solar system (23)	○	○
Botanist – studies plant life (24)	○	○
Poet – writes poems (25)	○	○
Musician – plays a musical instrument (26)	○	○
Art Dealer – buys and sells paintings and other pieces of art (27)	○	○
Composer – writes music or songs (28)	○	○
Stage Director – directs actors and actresses how to perform (29)	○	○
Actor/Actress – performs in a play or story (30)	○	○
Artist – creates paintings, drawings, and other types of art (31)	○	○
Entertainer – sings, dances, or tells jokes (32)	○	○
Sculptor/Sculptress – creates sculptures or statues (33)	○	○
Playwright – writes plays (34)	○	○
Cartoonist – draws comic strips (35)	○	○
Singer – sings for an audience (36)	○	○
Youth Offender Worker –	○	○

helps young people who are in trouble with the law (37)		
Clinical Psychologist – helps people who are having trouble with their emotions (38)	○	○
Speech Therapist – helps people who have speech problems (39)	○	○
Marriage Counselor – helps couples with their problems (40)	○	○
Playground Director – sets up activities at a playground (41)	○	○
Social Worker – helps people who have problems with friends, family, or work (42)	○	○
Career Counselor – helps people make decisions about work (43)	○	○
Teacher – teaches in a school (44)	○	○
Substance Abuse Counselor – helps people who have drug or alcohol problems (45)	○	○
Youth Camp Director – sets up activities at a camp (46)	○	○
Rehabilitation Counselor – helps injured people find work (47)	○	○
Probation Officer – works with people after release from prison (48)	○	○
Hotel Manager – runs a hotel (49)	○	○
Business Executive – oversees many people in a business (50)	○	○
Real Estate Agent – sells houses and land (51)	○	○
Sales Manager – oversees a team of salespeople (52)	○	○

Sales Representative – sells products to other companies (53)	☐	☐
Stockbroker – buys and sells stocks and bonds (54)	☐	☐
Buyer – decides what products a store will sell (55)	☐	☐
Salesperson – sells goods or services (56)	☐	☐
TV Station Manager – runs a TV station (57)	☐	☐
Airport Manager – runs an airport (58)	☐	☐
Advertising Executive – oversees an ad campaign (59)	☐	☐
Small Business Owner – runs his or her own shop or business (60)	☐	☐
Bookkeeper – keeps track of money in a business (61)	☐	☐
Bank Teller – helps customers at a bank (62)	☐	☐
Payroll Clerk – makes sure workers get paychecks in the right amount (63)	☐	☐
Bank Examiner – checks bank records for mistakes (64)	☐	☐
Tax Expert – helps people do their tax returns (65)	☐	☐
Medical Records Clerk – keeps track of records in a hospital (66)	☐	☐
Budget Reviewer – helps a business decide how to spend and save money (67)	☐	☐
Accountant – keeps track of financial transactions (68)	☐	☐
Proofreader – checks written materials for errors (69)	☐	☐
Secretary – helps with office work (70)	☐	☐

Credit Investigator – looks into a person’s or a company’s debts (71)	☐	☐
Inventory Controller – keeps a count of supplies or merchandise (72)	☐	☐

RATING YOUR ABILITIES: Rate yourself on each of the following abilities as you really think you are when compared with others your own age. Mark the appropriate number representing your ability, with 1 = Low, 4 = Average, and 7 = High. Try not to rate yourself the same in each ability.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Mechanical (Fixing things, using tools and machines) (1)	☐	☐	☐	☐	☐	☐	☐
Scientific (biology, math, reading) (2)	☐	☐	☐	☐	☐	☐	☐
Artistic (music, art, writing, drama) (3)	☐	☐	☐	☐	☐	☐	☐
Teaching (helping others to learn) (4)	☐	☐	☐	☐	☐	☐	☐
Sales (supervising salespeople or selling) (5)	☐	☐	☐	☐	☐	☐	☐
Clerical (filing, spelling, adding) (6)	☐	☐	☐	☐	☐	☐	☐

Would you like to receive an electronic copy of the results of this study?

- ☐ Yes (1)
- ☐ No (2)

Please provide the e-mail address to which you would like the results sent:

Name (1)

E-mail where you would like the results sent (2)

Would you like to be entered in a drawing to win a \$75.00 Amazon.com gift card?

- ☐ Yes (1)
- ☐ No (2)

Please provide the following contact information for the drawing:

Name (1)

E-mail address where you can be notified in case you are selected: (2)

Thank you very much for your participation in this study. Your time and cooperation will help to make an important contribution to the field of school psychology.

Appendix E

License Agreement to Modify and Use the Self-Directed
Search Form E

and

Reproduce Holland's Hexagonal Model



Creating Connections. Changing Lives.

16204 N. FLORIDA AVENUE • LUTZ, FLORIDA 33549
Telephone: 813.968.3003 • Fax: 813.968.2598 • Web: www.parinc.com

LICENSE AGREEMENT

THIS AGREEMENT, made this October 17, 2013, by and between Psychological Assessment Resources, Inc., a Florida Corporation, with its principal offices located at 16204 North Florida Avenue, Lutz, Florida 33549, hereinafter referred to as PAR, and Bridget L. O'Connell, with her principal offices located at 3 Cousins Street, Salem, MA 01970, hereinafter referred to as Licensee.

1) RECITALS

PAR has developed and holds all copyrights and distribution rights to certain psychological tests and related materials as listed in Schedule A, hereinafter called "Test". The Test consists of PAR's items, scoring keys, scales, profiles, standard-score conversion tables, norms tables, interpretive Information, and related materials created, prepared, devised, and combined by PAR for the administration, scoring, reporting, and analysis of the Test, and includes the words, symbols, numbers, and letters used to represent the Test. Licensee desires to develop automated procedures for the secure and encrypted administration of the Test through Licensee's secure internet assessment website. The access to Licensee's website will be by invitation only in connection with Licensee's research study titled, *The Vocational Personality of Two Types of School Psychologists* and to subjects for this research purpose only (the "Limited Purpose(s)"). Unless permitted to do so by a separate license agreement, Licensee only has the right to use the Test for the Limited Purpose described above.

In consideration of the mutual covenants and promises expressed herein and other good and valuable considerations, it is agreed as follows:

2) LICENSE

PAR hereby grants to Licensee, subject to the terms of this Agreement, a non-transferable, non-exclusive license to place the Test on Licensee's Website for the Limited Purpose described in Section 1 above. Licensee agrees to hold secure and treat as proprietary all information transferred to it from PAR. Licensee shall carefully control the use of the Test for the

Limited Purpose described in this Agreement. Licensee's use of the Test will be under the supervision or in consultation with a qualified psychologist or other qualified individual and consistent with the then current edition of the Standards for Educational and Psychological Testing published by the American Psychological Association.

3) TERMS AND TERMINATION

The initial term of this Agreement shall extend from November 1, 2013 through February 28, 2014, and may be extended only by mutual agreement of the parties. Notwithstanding any other provision of this Agreement, this Agreement may be terminated if any of the following events occur:

- (a) Termination is mutually agreed to by the parties.
- (b) Licensee defaults in the performance of any of its duties hereunder.

On the effective date of expiration or termination of this Agreement pursuant to subsections (a) and (b) above, all rights in this Agreement revert to PAR. Computer software programs written by or for Licensee remain the property of Licensee. Licensee warrants that upon expiration or termination of this Agreement under subsections (a) and (b) above, and except as set forth in any separate license agreement relating thereto, all portions of the Test licensed hereunder shall be removed from Licensee's Website. Failure to cease all uses of the Test shall constitute copyright infringement.

4) TERMINATION RIGHTS

In the event of termination pursuant to paragraph 3 above for any reason, PAR shall not be liable to Licensee for compensation, reimbursement or damages for any purpose, on account of any expenditures, investments, leases or commitments made or for any other reason whatsoever based upon or growing out of this Agreement.

5) CONDITIONS OF USE

PAR shall have the right to review, test, and approve that portion of Licensee's Website which includes the Test. Following PAR's approval of that portion of Licensee's Website containing the Test, the manner in which the Test appears on such Website shall not be changed in any material way without prior approval of PAR.

The computer programs developed by Licensee and used in any phase of administration and scoring of the Test shall be fully tested by Licensee and shall be encrypted and reasonably protected from access, intrusion and changes by persons who are not authorized agents of Licensee. In addition to the foregoing, Licensee shall exert all reasonable commercial efforts to prevent the Programs, and any accompanying code for the administration of the Test from being accessed, viewed or copied by others. Licensee warrants the accuracy of such scoring and reporting.

6) PROPRIETARY RIGHTS

PAR is the owner of all right, title and interest in the Test. Licensee shall acquire no right or interest in the Test, by virtue of this Agreement or by virtue of the use of the Test, except the right to use the Test in accordance with the provisions of this Agreement. Licensee shall not modify or revise the Test in any manner without written approval by PAR. All uses of the Test by Licensee shall inure to the benefit of PAR. Licensee agrees not to challenge or otherwise interfere with the validity of the Test or PAR's ownership of them.

7) ROYALTIES

Licensee agrees to pay PAR a royalty fee for 227 administrations of the Test and copyrighted materials contained therein. Licensee will also provide PAR with an itemized accounting of all administrations of each Test administered by Licensee during the term of this agreement. Licensee shall pay to PAR Two Hundred Fifty Dollars (\$250.00) as an initial license fee which is due and payable upon the signing of this License Agreement. Licensee shall also pay PAR \$1.10 per each test administered for any tests administered above 227 by March 15, 2014.

8) ACCOUNTING

Licensee shall develop secure computerized accounting methods acceptable to PAR. Such accounting methods must include an electronic counting mechanism which will accurately record the number of administrations of each Test used. Licensee will keep accurate financial records of all transactions relating to the use of the Test, and PAR shall have the right to examine the software and records of Licensee pertaining to the use of the Test. Licensee will make such software and records accessible to PAR or its nominee during normal working hours upon not less than five (5) business days' prior written notice. Licensee shall retain such software and records for at least one year from the date this Agreement expires or the effective termination date.

The Website shall contain the following copyright notice:

"Adapted and reproduced by special permission of the Publisher, Psychological Assessment Resources, Inc., 16204 North Florida Avenue, Lutz, Florida 33549, from the Self-Directed Search Form E Assessment Booklet by John L. Holland, Ph.D., Copyright 1970, 1973, 1979, 1985, 1991, 1996. Further reproduction is prohibited without permission from PAR, Inc."

9) INDEMNITY

Licensee agrees to indemnify PAR and hold PAR harmless against any claim or demand or against any recovery in any suit (including taxes of any kind, reasonable attorney's fees, litigation costs, and other related expenses) that may be:

- (a) brought by or against PAR, arising or alleged to have arisen out of the use of the Test by Licensee;
- (b) sustained or incurred by PAR, arising or alleged to have arisen in any way from the breach of any of Licensee's obligations hereunder; or

- (c) incurred by PAR in any litigation to enforce this Agreement, including litigation against Licensee.

10) ASSIGNMENT

Licensee shall not assign this Agreement or any license, power, privilege, right, or immunity, or delegate any duty, responsibility, or obligation hereunder, without the prior written consent of PAR. Any assignment by PAR of its rights in the Test shall be made subject to this Agreement.

11) GOVERNING LAW

This Agreement shall be construed according to the laws of the State of Florida of the United States of America. Venue for any legal action relative to this Agreement shall be in the appropriate state court in Hillsborough County, Florida, or in the United States District Court for the Middle District of Florida, Tampa division. Licensee agrees that, in any action relating to this Agreement, the Circuit Court in Hillsborough County, Florida or the United States District Court for the Middle District of Florida, Tampa Division, has personal jurisdiction over Licensee, and that Licensee waives any argument it may otherwise have against the exercise of those courts' personal jurisdiction over Licensee.

12) SEVERABILITY

If any provision of this Agreement shall, to any extent, be invalid and unenforceable such provision shall be deemed not to be part of this Agreement, and the parties agree to remain bound by all remaining provisions.

13) EQUITABLE RELIEF

Licensee acknowledges that irreparable damage would result from unauthorized use of the Test and further agrees that PAR would have no adequate remedy at law to redress such a breach. Therefore, Licensee agrees that, in the event of such a breach, specific performance and/or injunctive relief, without the necessity of a bond, shall be awarded by a Court of competent jurisdiction.

14) ENTIRE AGREEMENT OF THE PARTIES

This instrument embodies the whole Agreement of the parties. There are no promises, terms, conditions, or obligations for the Test licensed hereunder other than those contained herein; and this Agreement shall supersede all previous communications, representations, or agreements, either written or verbal, between the parties hereto, with the exception of any prior agreements that have not previously been terminated by written consent of both parties or by one party if the terms of the agreement allow. This Agreement may be changed only by an agreement in writing signed by both parties.

15) NOTICES AND MODIFICATIONS

Any notice required or permitted to be given under this Agreement shall be sufficient if in writing and if sent by certified or registered mail postage prepaid to the addresses first herein above written or to such addresses as either party may from time to time amend in writing. No letter, telegram, or communication passing between the parties hereto covering any matter during this contract, or periods thereafter, shall be deemed a part of this Agreement unless it is distinctly stated in such letter, telegram, or communication that it is to constitute a part of this Agreement and is to be attached as a right to this Agreement and is signed by both parties hereto.

16) SUCCESSORS AND ASSIGNS

Subject to the limitations on assignments as provided in Section 10, this Agreement shall be binding on the successors and assigns of the parties hereto.

17) PARAGRAPH HEADINGS

The paragraph headings contained in this Agreement are inserted only for convenience and they are not to be construed as part of this Agreement.

18) AUTHORIZATION AND REPRESENTATION

Each party represents to the others that it has been authorized to execute and deliver this Agreement through the persons signing on its behalf.

IN WITNESS WHEREOF, the parties have executed this Agreement in duplicate on the date first herein above written.

ACCEPTED AND AGREED:

BY: Bridget L. O'Connell

BRIDGET L. O'CONNELL

Title: School Psychologist
Doctoral Student

DATE: 10/18/13

ACCEPTED AND AGREED:

BY: [Signature]

R. BOB SMITH III, PH.D.

Title: CHAIRMAN AND CEO

DATE: 10-29-2013

PAYMENT RECEIVED: VISA
PAR CUSTOMER No.: 155733

SIGNATURE OF PROFESSOR REQUIRED:

I hereby agree to supervise this student's use of these materials. I also certify that I am qualified to use and interpret the results of these tests as recommended in the *Standards for Educational and Psychological Testing*, and I assume full responsibility for the proper use of all materials used per this Agreement.

BY: Mark R. McGowan, PhD (PA Licensed Psychologist #PS96568)

Printed Name: MARK R. MCGOWAN

SCHEDULE A

The Test licensed to Licensee pursuant to the above license consist of PAR's items, scoring keys, scales, profiles, standard-score conversion tables, norms tables, and related materials created, prepared, devised, and combined by PAR for the administration, scoring, reporting, and analysis of the Test, and include the words, symbols, numbers, and letters used to represent the Test. However, PAR and Licensee acknowledge and agree that Licensee may use only the PAR items and scoring information for the Test as appropriate for the Limited Purpose. The Test referred to in the body of this Agreement is defined as follows:

- 1) Self-Directed Search Form E (SDS-E)
Assessment Booklet

Permission is also granted for you to include up to a total of three (3) sample items from the SDS Form E and to include Holland's Hexagonal model illustrating the relative distances among personality types and environments and their interactions in your dissertation.

Appendix F

Introductory and Follow-up e-mails for Initial Recruitment Groups

Peer nominated RTI Group

Dear _____:

I am a doctoral student at Indiana University of Pennsylvania. As part of my dissertation research, I am studying the personalities of school psychologists who are strongly oriented toward either a Response-to-Intervention (RTI) approach or a cognitive processing/neuropsychological assessment approach to the identification of learning disabilities (LDs). As you may know, this topic has sparked prolonged and intense debate within our field.

Dr. Joseph Kovalski has indicated that you would be an appropriate participant for my study and that you might appreciate the opportunity to express your views on this controversial topic. I am hopeful that you will welcome that opportunity and complete the attached questionnaire, which should take only 10-15 minutes of your time. All information you provide will be kept strictly confidential.

I understand your time is very valuable. Should you choose to spend some of it completing the attached questionnaire, I would like to show my appreciation by offering you the chance to win a \$75.00 Amazon.com gift card. To complete the questionnaire, please click on the link below.

As response rate is always a concern, I would be very appreciative if you choose to forward this e-mail and survey link to colleagues or students who might hold strong opinions in favor of either RTI or assessment approaches to LD identification. Every response is valuable!

Once again, thank you very much for your cooperation.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

ABSNP Diplomates

Dear _____:

I am a doctoral student at Indiana University of Pennsylvania. As part of my dissertation research, I am studying the personalities of school psychologists who are strongly oriented toward either a Response-to-Intervention (RTI) approach or a cognitive processing/neuropsychological assessment approach to the identification of learning disabilities (LDs). As you may know, this topic has sparked prolonged and intense debate within our field.

As an ABSNP diplomate, you may appreciate the opportunity to express your views on this controversial topic. I am hopeful that you will welcome that opportunity and complete the attached questionnaire, which should take only 10-15 minutes of your time. All information you provide will be kept strictly confidential.

I understand your time is very valuable. Should you choose to spend some of it completing the attached questionnaire, I would like to show my appreciation by offering you the chance to win a \$75.00 Amazon.com gift card. To complete the questionnaire, please click on the link below.

As response rate is always a concern, I would be very appreciative if you choose to forward this e-mail and survey link to other school psychologists who might hold strong opinions in favor of cognitive or neuropsychological assessment approaches to LD identification. Every response is valuable!

Once again, thank you very much for your cooperation.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Appendix G
Introductory Informed Consent Letter



Indiana University of Pennsylvania
www.iup.edu

Department of Educational and School Psychology
Stouffer Hall, Room 246
1175 Maple Street
Indiana, PA 15705-1058

P 724-357-2316
F 724-357-6946
www.iup.edu/schoolpsychology

October XX, 2013

Dear Colleague:

I am a doctoral candidate in the School Psychology Program at Indiana University of Pennsylvania. As part of my dissertation research, I am comparing the personalities of school psychologists who subscribe to different modes of practice. I am inviting you to volunteer information that will be important for the field of school psychology.

As you may know, the school psychology field is embroiled in a debate over how best to identify learning disabilities (LDs). This debate, between supporters of a Response-to-Intervention (RTI) approach and a cognitive/neuropsychological assessment approach, has become contentious due to the frequency of LD categorization as well as the large proportion of time school psychologists spend conducting LD assessments. Thus, the outcome of this debate is likely to exert a considerable impact on the field of school psychology.

The purpose of the study is to explore the personalities, conceptualized according to Holland's Theory of Vocational Personalities, of those school psychologists who are strongly aligned with either the RTI or cognitive/neuropsychological assessment position. Respondents will be asked to answer questions about themselves and their interests, their preferred mode of practice, and their professional beliefs regarding LD identification. The information collected will be utilized to investigate the relationship between demographic variables, personality, and professional beliefs concerning the most appropriate method of identifying LDs. An understanding of these relationships may be helpful in predicting changes in the field of school psychology or in school psychologists' role functions, the possible emergence of subspecialties, or job satisfaction.

Indiana University of Pennsylvania supports the practice of human subjects participating in research. This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724-357-2223). Although no risks to participation have been identified in the literature, please discontinue if you experience any discomfort or negative reactions to the items contained within the study's instruments. While your participation is solicited, it is strictly voluntary. If you do agree to participate in this study, you are free to withdraw at any time and you may do so without penalty. All information you submit will be kept strictly confidential. Your name will not appear on any study materials and will not, in any way, be associated with the study's findings. The study is quantitative in nature and all data will be analyzed at the group level.

Please use the link provided to complete the attached questionnaire, which should take about 15-20 minutes of your time. Your completion of the questionnaire implies consent. Respondents will be entered into a drawing for a \$75.00 Amazon gift card. If you do not wish to participate, simply reply to this e-mail so that follow-up communications will not be sent to you. If you have any questions or require additional information, please feel free to contact either of us as listed below. I understand your time is very valuable and greatly appreciate your time and cooperation. I look forward to receiving your completed questionnaire.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall, Indiana, PA 15705
(508) 843-0345
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall, Indiana, PA 15705
(724) 357-1274
mmcgowan@iup.edu

Appendix H

First and Second Follow-up Reminders for Peer Nomination and ABSNP Recruitment Groups

Follow-up reminder: Peer Nominated RTI Group

Dear _____:

Approximately one week ago, you should have received an e-mail containing a link to a questionnaire seeking information on your values and interests, professional beliefs concerning RTI and assessment, and demographic profile. This information is sought as part of my study on the personalities of school psychologists who subscribe to either an RTI or cognitive/neuropsychological assessment approach to LD identification. As Dr. Joseph Kovalski has suggested that you may be likely to subscribe to a particular point of view, your participation is especially valuable.

If you have already completed your questionnaire, thank you very much for your participation. If not, please do so today. Your input is critical, yet voluntary. Please remember that respondents will be entered into a drawing for a \$75.00 Amazon gift card. If you do not wish to participate, please click the "opt out" link below so that additional study communication will not be forwarded to you.

If by some chance you did not receive the e-mail or link, please reply to this e-mail (rprq@iup.edu) or call me at (508) 843-0345 and I will immediately provide you with the missing information. I understand your time is very valuable and I greatly appreciate your willingness to spend it completing this questionnaire.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Follow-up reminder: ABSNP diplomates:

Dear _____:

Approximately one week ago, you should have received an e-mail containing a link to a questionnaire seeking information on your values and interests, professional beliefs concerning RTI and assessment, and demographic profile. This information is sought as part of my study on the personalities of school psychologists who subscribe to either an RTI or cognitive/neuropsychological assessment approach to LD identification. As you have been identified as a school psychologist who is likely to subscribe to a particular point of view, your participation is especially valuable.

If you have already completed your questionnaire, thank you very much for your participation. If not, please do so today. Your input is critical, yet voluntary. Please remember that respondents will be entered into a drawing for a \$75.00 Amazon gift card. If you do not wish to participate, please click the "opt out" link below so that additional study communication will not be forwarded to you.

If by some chance you did not receive the e-mail or link, please reply to this e-mail (rprq@iup.edu) or call me at (508) 843-0345 and I will immediately provide you with the missing information. I understand your time is very valuable and I greatly appreciate your willingness to spend it completing this questionnaire.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Second Reminder: Peer Nominated RTI group

Dear _____:

Happy New Year!

In early December, you should have received an e-mail containing a link to a questionnaire seeking information on your professional beliefs concerning RTI and assessment as well as your values and interests. This information is sought as part of my study on the personalities of school psychologists who subscribe to either an RTI or cognitive/neuropsychological assessment approach to LD identification. In that e-mail, I noted that Dr. Joseph Kovalski nominated you as one who would appreciate the opportunity to sound off about this topic. I would love to obtain your perspective and would like to offer you one last chance to participate as well as to enter the drawing for a \$75.00 Amazon gift card. Please remember that your input, while important, is voluntary.

In addition, if you know others who may share strong opinions on this debate and might like to participate, please forward this e-mail and link to them. I would be very appreciative, as every response is valuable!

If by some chance you did not receive the e-mail or link, please reply to this e-mail (rprq@iup.edu) or call me at (508) 843-0345 and I will immediately provide you with the missing information. I understand your time is very valuable and I greatly appreciate your willingness to spend it completing this questionnaire.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Second Reminder: ABSNP Diplomates

Dear _____:

Happy New Year!

In early December, you should have received an e-mail containing a link to a questionnaire seeking information on your professional beliefs concerning RTI and assessment as well as your values and interests. This information is sought as part of my study on the personalities of school psychologists who subscribe to either an RTI or cognitive/neuropsychological assessment approach to LD identification. I would love to obtain your perspective and would like to offer you one last chance to participate as well as to enter the drawing for a \$75.00 Amazon gift card. Please remember that your input, while important, is voluntary.

In addition, if you know others who may share strong opinions on this debate and might like to participate, please forward this e-mail and link to them. I would be very appreciative, as every response is valuable!

If by some chance you did not receive the e-mail or link, please reply to this e-mail (rprq@iup.edu) or call me at (508) 843-0345 and I will immediately provide you with the missing information. I understand your time is very valuable and I greatly appreciate your willingness to spend it completing this questionnaire.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Appendix I

Introductory e-mails and Follow Up Reminders for Additional Recruitment Groups

Introductory e-mail: Second Peer nominated RTI group

Dear _____:

I am a doctoral student at Indiana University of Pennsylvania. As part of my dissertation research, I am studying the personalities of school psychologists who are strongly oriented toward either a Response-to-Intervention (RTI) approach or a cognitive processing/neuropsychological assessment approach to the identification of learning disabilities (LDs). As you may know, this topic has sparked prolonged and intense debate within our field.

Dr. Joseph Kovalski has indicated that you would be an appropriate participant for my study and that you might appreciate the opportunity to express your views on this controversial topic. I am hopeful that you will welcome that opportunity and complete the attached questionnaire, which should take only 10-15 minutes of your time. All information you provide will be kept strictly confidential.

I understand your time is very valuable. Should you choose to spend some of it completing the attached questionnaire, I would like to show my appreciation by offering you the chance to win a \$75.00 Amazon.com gift card. To complete the questionnaire, please click on the link below.

As response rate is always a concern, I would be very appreciative if you choose to forward this e-mail and survey link to colleagues or students who might hold strong opinions in favor of either RTI or assessment approaches to LD identification. Every response is valuable!

Once again, thank you very much for your cooperation.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Introductory e-mail: Handbook of Response to Intervention in Early Childhood Co-Authors

Dear _____:

I am a doctoral student at Indiana University of Pennsylvania. As part of my dissertation research, I am studying the personalities of school psychologists who are strongly oriented toward either a Response-to-Intervention (RTI) approach or a cognitive processing/neuropsychological assessment approach to the identification of learning disabilities (LDs). As you may know, this topic has sparked prolonged and intense debate within our field.

As a co-author of the Handbook of Response to Intervention in Early Childhood, I thought you might appreciate the opportunity to express your views on this controversial topic. I am hopeful that you will welcome that opportunity and complete the attached questionnaire, which should take only 10-15 minutes of your time. All information you provide will be kept strictly confidential.

I understand your time is very valuable. Should you choose to spend some of it completing the attached questionnaire, I would like to show my appreciation by offering you the chance to win a \$75.00 Amazon.com gift card. To complete the questionnaire, please click on the link below.

As response rate is always a concern, I would be very appreciative if you choose to forward this e-mail and survey link to colleagues or students who might hold strong opinions in favor of either RTI or assessment approaches to LD identification. Every response is valuable!

Once again, thank you very much for your cooperation.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rpra@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Introductory e-mail: Lehigh University RTI Specialist Program Graduates

Dear _____:

I am a doctoral student at Indiana University of Pennsylvania. As part of my dissertation research, I am studying the personalities of school psychologists who are strongly oriented toward either a Response-to-Intervention (RTI) approach or a cognitive processing/neuropsychological assessment approach to the identification of learning disabilities (LDs). As you may know, this topic has sparked prolonged and intense debate within our field.

As a graduate of the Lehigh University RTI Specialist program, I thought you might appreciate the opportunity to express your views on this controversial topic. I am hopeful that you will welcome that opportunity and complete the attached questionnaire, which should take only 10-15 minutes of your time. All information you provide will be kept strictly confidential.

I understand your time is very valuable. Should you choose to spend some of it completing the attached questionnaire, I would like to show my appreciation by offering you the chance to win a \$75.00 Amazon.com gift card. To complete the questionnaire, please click on the link below.

As response rate is always a concern, I would be very appreciative if you choose to forward this e-mail and survey link to colleagues or students who might hold strong opinions in favor of either RTI or assessment approaches to LD identification. Every response is valuable!

Once again, thank you very much for your cooperation.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rpra@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Introductory e-mail: Minneapolis Public Schools Psychologists

Dear _____:

I am a doctoral student at Indiana University of Pennsylvania. As part of my dissertation research, I am studying the personalities of school psychologists who are strongly oriented toward either a Response-to-Intervention (RTI) approach or a cognitive processing/neuropsychological assessment approach to the identification of learning disabilities (LDs). As you may know, this topic has sparked prolonged and intense debate within our field.

As a school psychologist practicing in a district known for its strong orientation toward the use of RTI for LD Determination, I thought you might appreciate the opportunity to express your views on this controversial topic. I am hopeful that you will welcome that opportunity and complete the attached questionnaire, which should take only 10-15 minutes of your time. All information you provide will be kept strictly confidential.

I understand your time is very valuable. Should you choose to spend some of it completing the attached questionnaire, I would like to show my appreciation by offering you the chance to win a \$75.00 Amazon.com gift card. To complete the questionnaire, please click on the link below.

As response rate is always a concern, I would be very appreciative if you choose to forward this e-mail and survey link to colleagues or students who might hold strong opinions in favor of either RTI or assessment approaches to LD identification. Every response is valuable!

Once again, thank you very much for your cooperation.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rpra@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Follow-up Reminder: Second Peer Nominated RTI Group

Dear _____:

Approximately three weeks ago, you should have received an e-mail containing a link to a questionnaire seeking information on your professional beliefs concerning RTI and assessment as well as your values and interests. This information is sought as part of my study on the personalities of school psychologists who subscribe to either an RTI or cognitive/neuropsychological assessment approach to LD identification. In that e-mail, I noted that Dr. Joseph Kovalski nominated you as one who would appreciate the opportunity to sound off about this topic. I would love to obtain your perspective and would like to offer you one last chance to participate as well as to enter the drawing for a \$75.00 Amazon gift card. Please remember that your input, while important, is voluntary.

In addition, if you know others who may share strong opinions on this debate and might like to participate, please forward this e-mail and link to them. I would be very appreciative, as every response is valuable!

If by some chance you did not receive the e-mail or link, please reply to this e-mail (rprq@iup.edu) or call me at (508) 843-0345 and I will immediately provide you with the missing information. I understand your time is very valuable and I greatly appreciate your willingness to spend it completing this questionnaire.

Sincerely,

Bridget O'Connell, Doctoral Student
Indiana University of Pennsylvania
Educational and School Psychology
Stouffer Hall
Indiana, PA 15705
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Second Follow-up Reminder – Second Peer Nomination Group:

Dear _____:

In mid-February, you should have received an e-mail containing a link to a questionnaire seeking information on your professional beliefs concerning RTI and assessment as well as your values and interests. This information is sought as part of my study on the personalities of school psychologists who subscribe to either an RTI or cognitive/neuropsychological assessment approach to LD identification. In that e-mail, I noted that Dr. Joseph Kovalski nominated you as one who would appreciate the opportunity to sound off about this topic. I would love to obtain your perspective and would like to offer you one last chance to participate as well as to enter the drawing for a \$75.00 Amazon gift card. Please remember that your input, while important, is voluntary.

In addition, if you know others who may share strong opinions on this debate and might like to participate, please forward this e-mail and link to them. I would be very appreciative, as every response is valuable!

If by some chance you did not receive the e-mail or link, please reply to this e-mail (rprq@iup.edu) or call me at (508) 843-0345 and I will immediately provide you with the missing information. I understand your time is very valuable and I greatly appreciate your willingness to spend it completing this questionnaire. Again, thank you!

Sincerely,

Bridget O'Connell, Doctoral Student
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Stouffer Hall
Indiana, PA 15705
rprq@iup.edu

Dr. Mark R. McGowan, Assistant Professor
Indiana University of Pennsylvania (IUP)
Educational and School Psychology
242A Stouffer Hall
Indiana, PA 15705
mmcgowan@iup.edu

Follow-up Reminder: Minneapolis Public Schools Psychologists:

Dear _____:

Approximately one week ago, you should have received an e-mail containing a link to a questionnaire seeking information on your values and interests, professional beliefs concerning RTI and assessment, and demographic profile. This information is sought as part of my study on the personalities of school psychologists who subscribe to either an RTI or cognitive/neuropsychological assessment approach to LD identification. As a school psychologist practicing in a district known for its strong orientation toward the use of RTI for LD Determination, your input is incredibly valuable. I am hopeful that you will take about 10-15 minutes of your time to complete the attached questionnaire. All information you provide will be kept strictly confidential.

If you have already completed your questionnaire, thank you very much for your participation! If not, please do so today. Your input is critical, yet voluntary. Please remember that respondents will be entered into a drawing for a \$75.00 Amazon gift card. If you do not wish to participate, please click the "opt out" link below so that additional study communication will not be forwarded to you.

If by some chance you did not receive the e-mail or link, please reply to this e-mail (rprq@iup.edu) or call me at (508) 843-0345 and I will immediately provide you with the missing information. I understand your time is very valuable and I greatly appreciate your willingness to spend it completing this questionnaire.

Sincerely,

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