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IMPLEMENTATION OF IDEA: INTEGRATING RESPONSE TO INTERVENTION AND COGNITIVE ASSESSMENT METHODS

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The Individuals with Disabilities Education Improvement Act (IDEA) was reauthorized by the U.S. Congress in 2004, yet ongoing regulatory efforts are required to determine its operationalization and implementation. Of particular concern to school psychologists and others involved in the educational process are the guidelines for identification of children with specific learning disabilities (SLD). Two seemingly opposite camps have been arguing for either a response-to-intervention (RTI) approach for SLD identification or a methodology that includes comprehensive evaluations for SLD identification and intervention purposes. In this article, the authors propose a resolution to these critical issues by emphasizing a multitiered approach to serving children with learning problems—one that begins with RTI, but then provides for comprehensive evaluation of cognitive processes if RTI methods are not successful in ameliorating the child's learning difficulties. If a child fails to respond to intervention and demonstrates a deficit in the basic psychological processes following comprehensive evaluation, both the definitional criteria for SLD *and* the method for determining SLD eligibility will be addressed. This methodology incorporates the best aspects of both the RTI and comprehensive evaluation perspectives to forge a balanced practice model that ensures diagnostic accuracy and optimizes educational outcomes for children with SLD. © 2006 Wiley Periodicals, Inc.

As this article is being written, events are unfolding that could profoundly shape the future of school psychology. Passed by Congress in 2004, the reauthorized Individuals with Disabilities Education Improvement Act (IDEA) includes language that must be operationalized to reflect the intent of the law. Implementation will be equally challenging because this language must be examined within the context of sound school psychology and special education science and practice. Seemingly opposing factions have called for either a response-to-intervention (RTI) approach or one that includes comprehensive evaluation of basic psychological processes prior to classification of children with specific learning disabilities (SLD). These apparently disparate approaches should not necessarily lead to a politicized professional schism. Instead, both positions should be scrutinized for their individual merits and limitations, with the result being a model that incorporates the best tenets of both perspectives in a balanced practice model that maximizes SLD diagnostic accuracy and optimizes educational outcomes for this heterogeneous and enigmatic population.

Both the RTI and comprehensive assessment positions help address long-standing problems surrounding accurate identification of children with SLD. Whether the approach is a standard protocol or a more flexible problem-solving model (see Fuchs, Mock, Morgan, & Young, 2003), the RTI methods advocated by proponents are a welcome and long-awaited addition to the field. The use of research-based instruction, regular student progress monitoring, single-subject experimental designs, and empirical decision making should be required of all schools, especially when

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used within the context of a larger problem-solving model that helps all children. Through early identification and remediation of academic difficulties, RTI can serve a large minority of underachieving children (e.g., Speece, 2005) who may otherwise experience debilitating problems if intervention is delayed (Fuchs et al., 2003).

Differences among RTI and cognitive assessment proponents emerge when the former suggests failure to respond to intervention should lead to SLD classification (e.g., Reschly, 2005). In contrast, comprehensive cognitive assessment proponents argue that children identified with SLD must display a deficit in the basic psychological processes—in the presence of intact processing integrities—that leads to unexpected underachievement. Whereas the comprehensive cognitive assessment position is consistent with expert consensus (Learning Disabilities Roundtable, U.S. Department of Education, 2002) and the SLD IDEA definition (34 C.F.R. 300.7), it is incomplete unless RTI practices are incorporated into a balanced practice model. Indeed, the opposing factions become increasingly polarized when advocates of each camp minimize or demean the contributions of the other approach—namely, when RTI advocates consider cognitive assessment unnecessary or problematic and when psychoeducational assessment proponents devalue RTI techniques or merely pay lip service to the concept. The main goal of this article, and of this entire journal issue, is to integrate RTI and cognitive assessment methodologies to yield the best possible outcomes for children referred for possible SLD.

Although consensus over the SLD definition has not wavered, the law has been inconsistently applied, largely because of an overreliance on an ability–achievement discrepancy approach that has been poorly operationalized and implemented across states, districts, schools, and individuals (Reschly & Hosp, 2004; Scruggs & Mastropieri, 2002). When combined with confusion over, or the dissociation between, the definition and eligibility guidelines, some practitioners may ignore the processing deficits integral to the SLD definition, or even disregard mandated SLD guidelines to serve children in need (Gottlieb, Alter, Gottlieb, & Wishner, 1994; MacMillan, Gresham, & Bocian, 1998). If inconsistent methods are used and the definition ignored, it should not be surprising that evidence has emerged challenging the SLD construct validity (e.g., Fletcher et al., 2002); however, if explicit SLD definition and identification criteria are used, more accurate identification and intervention outcomes become likely (Kavale, 2002), suggesting we should challenge SLD practices, not the SLD construct.

Rather than focus on position differences that foster divisiveness and derision, it makes sense to incorporate RTI and cognitive assessment methods in a model that ensures children identified meet SLD definitional and eligibility requirements. To accomplish this end, we present arguments for and against both positions, concluding with a balanced practice model that incorporates the best tenets of both. This position suggests that RTI is critical for prevention of overidentification of SLD, and that gathering RTI *and* cognitive assessment data are essential not only for SLD identification but also for developing targeted individualized interventions for affected children.

Valuing RTI Principles and Practices

The ideas, concepts, and practices advocated by RTI proponents are not new, but their rise to prominence suggests that practices such as RTI and functional behavior analysis have widespread political and empirical support. Grounded in behavioral and single-subject experimental psychology, these methods require data-based decision-making derived from observable and measurable outcomes, not unseen etiologies. Not only are these methods successful at addressing a wide array of problem behaviors that children experience, but they also are seen as beneficial by both consumers and consultants (Kratochwill, Elliott, & Rotto, 1995; Sheridan, Welch, & Orme, 1996; Witt, Gresham, & Noell, 1996). Additional RTI support comes from Curriculum-Based Measurement (CBM) problem-solving practices that advocate direct repeated measurement of child

performance in curricular domains over time (e.g., Deno, Fuchs, Marston, & Shinn, 2001; Shinn, 1998) with results applied to actual classroom learning experiences that ensure ecological validity. Finally, the impetus for system-level changes resulted from RTI advocates correctly arguing that (a) all children's needs should be met regardless of disability status; (b) increased preventive services can reduce unnecessary student failure, labeling, segregation, and remediation in special education; and (c) the artificial general and special education barriers should be eliminated (e.g., Fuchs, Deshler, & Reschly, 2004; Lyon et al., 2001; Reynolds, Wang, & Walberg, 1987; Stanovich, 1999).

From these ideas and practices emerged several RTI positions regarding the types of interventions offered and the level of service delivery required before children should be identified with SLD. These levels or tiers differ based on the model, but a three-tier model is the most common. In summarizing the multitier approach, Fuchs et al. (2003) detailed the general RTI model:

> 1) Students are provided with 'generally effective' instruction by their classroom teacher; 2) Their progress is monitored; 3) Those who do not respond get something else, or something more, from their teacher or someone else; 4) Again, their progress is monitored; and 5) Those who still do not respond either qualify for special education or for special education evaluation. (p. 159).

The implicit assumption is that individualized adaptations will benefit most children experiencing academic difficulty, and insufficient growth must indicate an "inherent" deficit or disability (Fuchs et al., 2004).

The Fuchs et al. (2003) description is necessarily vague and nonspecific, which may cause some concern among readers, but it accurately reflects differing RTI perspectives on classroom instruction (Tier 1), intervention techniques for children at risk (Tier 2), and SLD classification for children who do not respond to intervention (Tier 3). These models lead to different experimental designs (i.e., group or individual) or measurement systems (i.e., standardized or individualized) to determine responsiveness (Gerber, 2005), with research now under way to compare these approaches (Fuchs, Deshler, & Reschly, 2004). Two RTI paradigms have emerged: the standard protocol (e.g., O'Connor, Harty, & Fulmer, 2005; Vaughn, Linan-Thompson, & Hickman, 2003; Vellutino et al., 1996) and the problem-solving model (e.g., Deno, 2002; Kovaleski, 2002; Tilly, Reschly, & Grimes, 1999), with each offering slightly different models for RTI implementation and methods for determining SLD.

Recent reviews by Fuchs et al. (2004), Gerber (2005), and Marston (2005) highlighted differences between these two competing models. The standard protocol generally emphasizes scientifically-based classroom instruction and experimental group designs, attempting to determine RTI by ensuring uniform classroom instruction, regular administration of standardized CBM probes, and frequent comparisons of at-risk students to normative data regarding their acquisition of instructional benchmarks and deviation from expected curricular growth curves. Advocated by many school psychologists, the problem-solving model similarly emphasizes scientifically-based instruction and regular student-progress monitoring, but suggests increasingly individualized interventions and measurement practices for nonresponsive children as they ascend the tiers. The trade-off is one of external (standardized approach) versus internal (problem-solving model) validity for both tier level and SLD decision making. Both methods reportedly show promising achievement gains and decreases in special education placement (Marston, 2005), yet data supporting the problem-solving model approach have been limited (Fuchs et al., 2003), possibly because of the individualized interventions employed in this method. In an effort to examine these models, the National Research Center on Learning Disabilities (NRCLD; see Fuchs, Deshler, & Reschly, 2004) is exploring topics such as intervention effectiveness and outcomes, exemplary RTI models in practice, and comparing different SLD eligibility models.

RTI Limitations and Consequences

Although RTI approaches and research efforts are laudable, we believe several issues require further empirical examination before widespread adoption, especially for SLD classification purposes. For example, is RTI a standard protocol or flexible problem-solving approach? For the standardized approach, how will curricula and methods be standardized across classrooms and at what cost? When will research demonstrate that RTI can meet IDEA 2004 requirements for use of multiple assessment tools that are nondiscriminatory, reliable, and valid? Will teachers and/or other professionals be primarily responsible for implementing and funding RTI? How does standardized RTI provide instruction tailored to unique student learning needs, and if modified, will standardized modifications be documented and empirically validated? How will individualized problem-solving RTI affect measurement of instructional benchmarks or learning slopes necessary for determining RTI? How will the external validity of problem-solving RTI be demonstrated, and for how many different types of cases? How will treatment integrity and effectiveness be measured and documented, especially if different settings use different practices? When will parent notification or permission be obtained and procedural safeguards enacted or denied? Is RTI fair for culturally and linguistically diverse populations, and will it differentiate children with SLD from low achievement, attention-deficit/hyperactivity disorder (ADHD), emotional disturbance, mental retardation, and other disorders? Finally, how does RTI inform intervention for children who do *not* respond to intervention and are classified as SLD?

At a 2003 NRCLD symposium, Mastropieri (2003) carefully examined RTI claims and reported the absence of a "solid research base" regarding optimal instructional methods and curricular materials across grade levels and academic subjects, with most efforts directed only at word reading (Kavale, Holdnack, Mostert, & Schmied, 2003). Scruggs and Mastropieri (2003) argued that RTI models (a) do not address the multifaceted nature of SLD or current conceptualizations of the disorder; (b) have not identified the best methods for SLD identification, or those that will reduce SLD overidentification; and (c) lack methods and measures with verifiable technical adequacy. Scruggs and Mastropieri (2003) concluded that "Radically altering or eliminating the concept of learning disabilities because of problems with current identification procedures amounts to 'throwing the baby out with the bathwater' " (p. 165). McBride, Dumont, and Willis (2004) further challenged RTI proponents to (a) provide guidance for determining if interventions are empirically based; (b) pinpoint the level of achievement deficit necessary for RTI intervention; (c) formalize procedures for administering and interpreting a child's RTI, specifying the duration of RTI before SLD classification; (d) provide methods for resolving RTI and Independent Educational Evaluation disputes; and (e) specify what will occur after a nonresponder is classified as SLD.

Although NRCLD projects are under way to address these issues, we feel the real problem with RTI lies not in the procedures offered but rather the substantial leap of faith necessary to identify children with SLD because they did not respond. The RTI position, which confuses measurement of the construct with the construct itself, suffers from the same circular reasoning that "intelligence" is "what IQ tests measure" (Gerber, 2005). Different methods for determining responsiveness result in different subsets of children identified (Fuchs, Fuchs, & Compton, 2004), and the much-lauded growth curve analysis does not, unfortunately, provide for the predicted diagnostic sensitivity (Speece, 2005). Recommendations for a "dual discrepancy approach," including failure to respond to intervention and an achievement deficit, have been suggested (Fuchs, Fuchs, & Compton, 2004; Kovaleski & Prasse, 2004; Speece & Case, 2001). But these perspectives differ regarding the use of local versus national norms and the method for setting instructional benchmarks; the implication is that variations in approach will lead to the same unreliable classification that results from the use of an ability–achievement discrepancy (Fuchs, Fuchs, & Compton, 2004).

The standardized approach for instruction and measurement might improve external validity, but it is difficult and costly. It also leads to high initial rates of false positives (Gerber, 2005; O'Connor et al., 2005) or can produce false negatives—if children who receive increasingly intensive interventions attain the minimal improvement necessary to prevent access to needed special education services (Fuchs, Fuchs, & Compton, 2004), a likely result because the amount of time children should remain in tiers has not been adequately addressed (Mastropieri & Scruggs, 2005). Problem-solving approaches may provide the individualized programming necessary for success (Reschly, 2005), but it is often associated with easier access to special education services or many false positives (Fuchs, Fuchs, & Compton, 2004). Gerber (2005) noted that teacher tolerance of learner difficulties varies based on instructional resources and teacher individual differences, which will directly affect classification decisions regardless of the RTI method used. As Gerber cautioned, extraordinary expenditures will be required to standardize training, instruction, curricula, and measurement to ensure that it is the child who failed to respond to intervention, not the teacher or system.

RTI identifies students at risk for continued learning failure, but RTI alone cannot address the *definition* of SLD. SLD is a deficit in some (but not all) of the basic psychological processes that interfere with academic achievement. If applied in isolation, RTI methods will not increase diagnostic sensitivity and specificity but will result in a generic "learning problems" category, comprising a considerable portion of the population (Hale, Naglieri, Kaufman, & Kavale, 2004). While children with low achievement deserve additional academic and behavioral supports, children fail to achieve for a plethora of reasons, one of which could be SLD. Was it the instruction, the measure, the contingencies, or the child? The potential for numerous false positives and negatives is likely given the inability to articulate what a true positive is. If RTI is used as the sole criterion for diagnosis of SLD, then the discordance between the RTI model and the SLD construct and definition will prevent accurate classification. The NRCLD is exploring alternative SLD classification methods, but these researchers are comparing only RTI methods to a traditional discrepancy model rather than examining alternative methods that could increase diagnostic sensitivity and specificity (e.g., Flanagan, Ortiz, Alfonso, & Mascolo, 2002; Hale & Fiorello, 2004; Kavale et al., 2003; Naglieri, 2003).

Comprehensive Evaluation of Cognitive Processes for SLD

In the early days of the SLD field, pioneers such as Kirk, Kephart, Frostig, and Cruickshank constructed instruments and conducted research that failed to establish adequate construct or treatment validity. Reviewing these negative findings, Cronbach (1975) rejected cognitive–intervention relationships (i.e., aptitude-treatment interactions; ATI) in favor of an experimental approach, a position still held by many who support RTI today (e.g., Reschly, 2005). Their conclusion, accepting the null hypothesis about the relevance of cognitive processes and existence of ATIs, could be considered premature given the state of knowledge, measures, and practice at that time (e.g., Braden & Kratochwill, 1997). Over the past 25 years, hundreds of cognitive and neuropsychological studies have demonstrated that evaluation of psychological processes is essential for elucidating individual differences in academic achievement (for discussion, see Berninger, 2002; Hale & Fiorello, 2004; Naglieri, 2003; Semrud-Clikeman, 2005).

The presence of processing competencies and deficits, along with unexpected learning failure, represents the essence of SLD (Kavale, Kaufman, Naglieri, & Hale, 2005). There are numerous well-validated cognitive measures (see Kaufman & Kaufman, 2001) and neuropsychological measures (see Hale & Fiorello, 2004) that enable practitioners to document the essential operational marker for SLD—namely, a consistency between cognitive deficits and academic deficits coupled with a significant discrepancy between cognitive assets and cognitive deficits (e.g., Hale

& Fiorello, 2004; Kavale et al., 2003; Naglieri, 1999, 2001, 2003). According to 10 professional organizations that comprised the Learning Disabilities Roundtable, U.S. Department of Education (2002), "The identification of a core cognitive deficit, or a disorder in one or more psychological processes, that is predictive of an imperfect ability to learn, is a marker for a specific learning disability." Cognitive and neuropsychological evaluations of psychological processes are needed to determine the presence of this marker because children with SLD process information differently than do others (Semrud-Clikeman, 2005) and they have specific neuropsychological *deficits*, not delays (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996). As would be expected, cognitive instruments are critical for differentiating children with SLD from low achievers (Kavale, Fuchs, & Scruggs, 1994), especially when neuropsychological functions underlying achievement domains are examined (Semrud-Clikeman, 2005).

The fields of standardized cognitive and neuropsychological assessment are evolving at a rapid pace, and modern theory-based measures with excellent technical quality can be used to measure basic psychological processes. These advances includes tests such as the Kaufman Assessment Battery for Children, Second Edition (KABC-II; Kaufman & Kaufman, 2004), the Cognitive Assessment System (CAS; Naglieri & Das, 1997), the NEPSY (Korkman, Kirk, & Kemp, 1998), and the Woodcock-Johnson Tests of Cognitive Abilities (WJ-III COG; Woodcock, McGrew, & Mather, 2001). Even the recent editions of the Wechsler Intelligence Scale for Children, Fourth Edition (Wechsler, 2003) and the Stanford-Binet Intelligence Scales, Fifth Edition (SB5; Roid, 2003) place more emphasis on separate cognitive processes than on global intelligence. These measures can be used to identify intact and impaired cognitive processes, and the impaired processes should be related to the achievement deficits if the child has an SLD. Practitioners can objectively operationalize these relationships using Naglieri's (1999) Discrepancy/Consistency Model (see Figure 1) or the similar Concordance/Discordance Model of Hale and colleagues (Hale & Fiorello, 2004; Hale, Fiorello, Bertin, & Sherman, 2003), which was recently advocated for neuropsychological evaluation of SLD (Miller, Getz, & Leffard, 2006). Moreover, these modern tools are far more dynamic than were previous conceptions of cognitive abilities, allowing practitioners not only to identify cognitive processing strengths and weaknesses but also develop individualized intervention strategies that could ameliorate academic difficulties (e.g., Semrud-Clikeman, 2005).

For example, using the CAS (Naglieri & Das, 1997) and the Planning, Attention, Simultaneous, Successive (PASS) theory, Naglieri and colleagues demonstrated strong relationships between

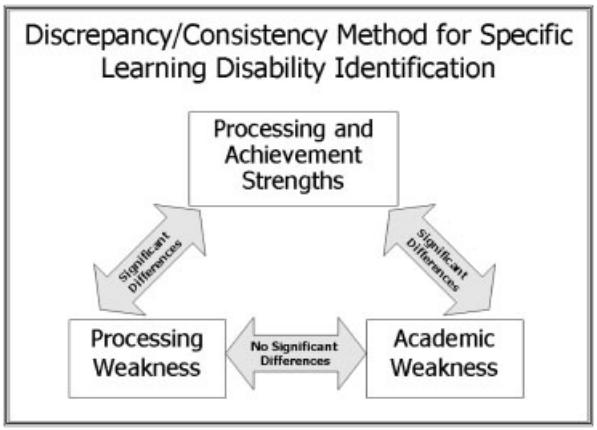

FIGURE 1. Naglieri's (1999) Discrepancy/consistency method for SLD identification.

processing measures and academic domains. They have shown that Successive processing scores identify processing deficits related to reading failure and that Planning measures can guide academic interventions for children with executive disorders (Das, Naglieri, & Kirby, 1994; Naglieri, 1999, 2001, 2003; Naglieri & Bornstein, 2003; Naglieri & Das, 1997). Hale and colleagues (Fiorello, Hale, McGrath, Ryan, & Quinn, 2001; Fiorello et al., in press; Hale & Fiorello, 2004; Hale et al., 2003; Hale, Fiorello, Kavanagh, Hoeppner, & Gaither, 2001) demonstrated that examination of cognitive and neuropsychological processes is essential for understanding reading, math, and written language achievement and providing individualized interventions. Similarly, numerous studies have shown relationships between Cattell-Horn-Carroll (CHC)-based measures and academic competency (e.g., Evans, Floyd, McGrew, & Leforgee, 2002; Flanagan et al., 2002; Floyd, Evans, & McGrew, 2003). In addition to these studies, hundreds of neuropsychological and neuroimaging studies have attested to the relevance of understanding psychological processes associated with achievement competency and psychosocial functioning (see Berninger, 2002; Hale & Fiorello, 2004; Naglieri, 2003; Semrud-Clikeman, 2005). These studies support the view that comprehensive evaluation of cognitive and neuropsychological processes is relevant to academic performance and can be useful for understanding, identifying, and helping children with SLD, with and without comorbid conditions—a position now shared by many invested in the RTI debate (Fuchs et al., 2003; Gerber, 2005; Johnson, Mellard, & Byrd, 2005; Kavale, 2005; Mastropieri & Scruggs, 2005; Mather & Gregg, 2006, Semrud-Clikeman, 2005).

Limitations of Traditional Standardized Cognitive Assessment

If reliable and valid measures of psychological processes are available, then why do some RTI advocates admonish against their use in SLD evaluations? One explanation is that many of the measures detailed by Kaufman and Kaufman (2001) are considered IQ tests, and IQ tests have been under relentless attack as irrelevant for determining SLD. Most of the criticism is predicated on IQ being the best measure of a unidimensional "g" factor, first posited by Spearman in 1904 and reified in modern times by studies that have used inappropriate achievement measures (e.g., Herrnstein & Murray, 1994; see Roberts et al., 2000) or statistical methods (e.g., Glutting, Youngstrom, Ward, Ward, & Hale, 1997) to conclude that only global intelligence is relevant for predicting meaningful life outcomes. Yet, these conclusions have been questioned in recent times, both theoretically and empirically (e.g., Fiorello et al., 2001; Hale et al., 2001; Horn, in press; Lezak, 1988; Roberts et al., 2000). In addition, as noted, the major cognitive tests developed or revised during the past 5 to 10 years—the CAS, KABC-II, SB5, WISC-IV, and WJ-III COG—all minimize the importance of "g" and global IQ scores by emphasizing cognitive processes or a multidimensional, multifactorial view of intelligence.

The ability–achievement discrepancy approach does not discriminate between children with SLD and those who are low achieving (e.g., Fletcher et al., 1994; Francis et al., 1996; Stanovich & Siegel, 1994). This finding is further supported by the results of meta-analyses that showed considerable overlap between SLD and low achievers—suggesting that most practitioners label low achievers as SLD (Fuchs et al., 2003), possibly just to get services for children (e.g., Gottlieb et al., 1994; MacMillan et al., 1998). In addition, discrepancy criteria have been applied inconsistently or arbitrarily (e.g., Reschly & Hosp, 2004; Scruggs & Mastropieri, 2002), and there are inevitable measurement, interpretation, and classification errors that result from single administrations of multiple tests or subtests (e.g., Fletcher, Denton, & Francis, 2005; Macmann & Barnett, 1997; McDermott, Fantuzzo, & Glutting, 1990). Taken together, these factors have led many to question the SLD construct altogether. The discrepancy approach does not lead to successful interventions or differentiated instruction and fails to serve children in need who do not meet criteria (Dombrowski, Kamphaus, & Reynolds, 2004). As a result, some have argued that low

achievement could serve as a model for SLD identification (e.g., Dombrowski et al., 2004; Fletcher et al., 2002), but these definitions do not account for historical or clinical perspectives on SLD, incorporate current research documenting the relevance of cognitive assessment in defining SLD, or acknowledge that underachievement may be due to multiple causes that may have nothing to do with SLD (Mather & Gregg, 2006).

Using RTI and Comprehensive Evaluation

It is clear that system-level changes will be required to make SLD identification more rigorous and systematic, but we must make sure provisions benefit children with and without disabilities (Fuchs, Fuchs, & Compton, 2004). In contrast to the extremist position that practitioners must do *either* RTI or comprehensive evaluations to determine SLD (which IDEA 2004 never suggested or implied), the logical solution is to do both. RTI and ability–achievement discrepancy approaches each ignore or minimize relevance of psychological processes, but any rational system would *demand* a logical association between the statutory and regulatory definitions of SLD. Scientists and practitioners alike should work toward the convergence of these essential components of SLD, not perpetuate the problem by solely relying on statistical discrepancy or RTI alone. We suggest that RTI methods should be an integral part of a systematic prevention, intervention, and identification process, and if the child responds appropriately to the intervention, there will be no need for standardized cognitive assessments; however, comprehensive evaluation of the basic psychological processes following failure to respond to intervention allows for the convergence of the IDEA statutory and regulatory components. Although the authors of this article may have different approaches for measuring basic psychological processes, we agree that the methods used to identify a child with SLD must be connected to the definition, and using RTI and cognitive assessment will allow this to happen—a point now recognized by many RTI proponents (see Fuchs et al., 2003).

Our model consists of a three-tier SLD identification process that includes a standardized RTI protocol at Tier 1, a problem-solving RTI model at Tier 2, and a comprehensive evaluation model at Tier 3. At Tier 1, the standard protocol would be carried out by classroom teachers using repeatable standardized CBM probes to evaluate student progress in relationship to instructional benchmarks and learning curves. In this way, a child who is a nonresponder will have been exposed to a standardized, scientific, research-based instructional format and compared to other children using measures of known technical quality. If an intervention team concludes that the child is a nonresponder at Tier 1, an individualized problem-solving approach would be undertaken at Tier 2, allowing the teacher and other support staff (e.g., school psychologist) to operationally define the problem, analyze the problem determinants, brainstorm and implement individualized interventions, and then develop a relevant measurement system to evaluate results. Depending on the child and environment, Tier 2 interventions could happen in the general education classroom, in small groups, or individually. This approach would require flexible problem solving and a single-subject experimental design, and ensure that the previously unmodified Tier 1 environment includes accommodations designed to meet the child's individual needs. While Tier 1 would ensure external validity, internal validity would be paramount at Tier 2. If the child is unresponsive at Tiers 1 and 2 (or even after Tier 1 if response was very poor), a comprehensive multidisciplinary team evaluation would be undertaken at Tier 3 and include a standardized evaluation of the basic psychological processes. If this Tier 3 evaluation reveals the child has cognitive processing and achievement deficits in the context of processing integrities, we can be assured that the child meets the definition of SLD and begin to develop targeted instructional strategies that may be unique to the individual and situation; however, these individualized interventions also would require ongoing, intensive progress monitoring to ensure that the cognitive assessment findings do indeed have ecological and treatment validity.

This three-tier model is similar to the ones advocated by some RTI proponents (e.g., Fuchs et al., 2003), some neuropsychologists (e.g., Semrud-Clikeman, 2005), and the National Association of School Psychologists (2003). This model would not only allow teachers and school psychologists to identify difficulties and intervene early to prevent SLD but also result in assessment practices that increase diagnostic sensitivity and specificity for SLD. In addition, because many children will likely be served in Tiers 1 and 2, this will free up time for school psychologists to do both RTI and cognitive assessment well, or as Hale and Fiorello (2001, 2004) suggested, we must *intervene* to *assess*. Multiple types of assessment data would be collected not only to improve diagnostic accuracy but also to have direct implications for intervention (Hale & Fiorello, 2004; Mather & Gregg, 2006; Semrud-Clikeman, 2005), including CBM data during Tiers 1 and 2, functional analysis and single-subject data during Tier 2, cognitive and neuropsychological data at Tier 3, and targeted intervention data should SLD identification be necessary. Like any measure in psychology, standardized cognitive and neuropsychological tests are only tools for use within a larger problem-solving paradigm, one that incorporates the best methods available in psychology. Much work will be needed to operationalize and implement this or a similar model and modify it based on empirical study results, but we feel this approach brings together the best of what our field has to offer, benefiting children with and without SLD.

The following case study highlights the need to incorporate both cognitive and behavioral assessment methods in a multitier approach for serving children with special needs. Although the initial intervention was not successful, a comprehensive evaluation proved essential for understanding the nature of Jon's problem and developing effective interventions for him. Luckily for Jon, using both cognitive and behavioral methods and measures has resulted in steady improvement in his learning and behavior.

Case Study

The case study that follows summarizes the methods previously used by the first author. The case is presented to illustrate our view that comprehensive assessment is not necessarily the first step but rather part of a larger problem-solving model for children with learning problems. The case of Jon begins with relevant background information, a description of initial intervention attempts, the results of a comprehensive evaluation completed after he did not respond, and finally, the implementation of interventions designed to meet his needs.

Background

Jon is a 10-year 10-month-old boy who was first diagnosed by his pediatrician with ADHD–Inattentive Type and Developmental Coordination Disorder using physical examination, some limited clinical assessment including standardized parent and teacher rating scales, and *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 2000) criteria. That evaluation showed that Jon had difficulty with sustained attention, following directions, organization skills, and work completion, but he was not impulsive or hyperactive. Graphomotor skills and fine motor coordination also were reported to be weaknesses. Jon showed math and written language deficits, but had "excellent" reading skills, according to the teacher report and grades. Described as a "nice" kid who was somewhat quiet, anxious, and withdrawn, Jon had some difficulty with peer and adult relationships, but he was "cooperative" and "not a behavior problem." However, Jon seemed to "tune out" and be "in a world of his own" at times.

The pediatrician then provided Jon with a trial of stimulant medication and suggested the school provide occupational therapy. The school developed an Americans With Disabilities Act/Section 504 plan that included drill and repetition in math facts and occupational therapy for "fine

motor problems." To evaluate Jon's response to medication intervention, Conners' Teacher Rating Scale-Revised: Long (CTRS-R:L; 2003) data were used. After baseline data were collected, the medication trial was started (see Figure 2). Although he seemed to initially improve, the twice per day 10-mg dose of Ritalin was ineffective, and his dose was increased, but he still did not respond. Medication was not the only initial intervention applied. A systematic math intervention also was initiated using flash cards to develop math-fact automaticity. The teacher reported that Jon showed good acquisition of math facts, but he continued to have problems with math computation, math word problems, and written language. As Jon's response to intervention was not successful in addressing his needs, he was referred for a comprehensive evaluation to gain a better understanding of his difficulties and to develop more targeted recommendations for intervention.

Comprehensive Evaluation Phase

An interview with the teacher, classroom observation, and examination of class work revealed that Jon was very good at reading decoding, and he had an excellent knowledge base. Although the developmental history suggested initial language and fine and gross motor delays, his language improved dramatically in the late preschool years, and he currently can be quite verbose when he talks about trains and animals. He knew facts and details that astonished his parents and teachers, and in second grade, they had even considered a gifted program for him; however, Jon was often ignored by peers and had no real friends. He appeared to have difficulty following multistep directions, and was inattentive and disorganized, primarily in unstructured or ambiguous situations. Jon worked slowly and methodically, but he seldom completed tasks and sometimes "forgot" to turn in assignments.

During the evaluation, Jon was initially quiet, reticent, and fidgety, but then he became more talkative when discussing his interests and even told two "knock-knock" jokes. However, his comments were often out of context and sometimes unrelated to the questions posed of him. Throughout the evaluation, Jon had minimal eye contact, flat affect, and a stilted prosody (i.e., no change in voice rate or pitch). He reported having many friends and no difficulty with academic subjects, but he did note his dislike of sports, saying they were "stupid" and "boring." He also said he hated taking tests because they made him "sick."

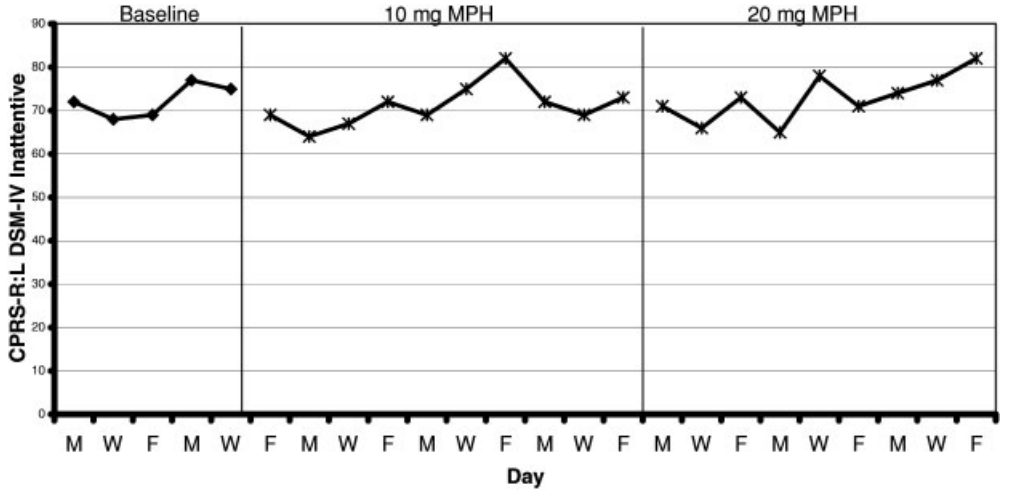

FIGURE 2. Jon's medication response.

Jon's teacher and parent behavior ratings suggested some difficulty with internalizing symptoms (e.g., anxious, withdrawn, dysphoric, poor self-esteem) and significant attention problems. Jon also was rated as having social problems (i.e., peer rejection, preferred younger friends, poor social discourse) and some thought problems (i.e., repetitive speech, peculiar interests, perseverative behaviors), but few externalizing problem behaviors.

As can be seen in Table 1, Jon was intellectually functioning in the average range. Although there were no significant Index score differences, subtest differences were notable, suggesting the global scores may not accurately reflect his overall functioning (e.g., Fiorello et al., in press; Fiorello et al., 2001). As a result, Hale and Fiorello's (2004) Demands Analysis, based on a Lurian idiographic approach (Luria, 1973), was used for interpretation. Jon had little difficulty with categorical or convergent thought (e.g., Similarities, Picture Concepts), and although his language was somewhat tangential and pedantic, he showed a good knowledge base, verbal concept formation, and crystallized abilities (e.g., Vocabulary, Information); however, his social knowledge, judgment, and common sense problem-solving skills (e.g., Comprehension) were relatively impaired. He did well with auditory working memory (e.g., Letter-Number Sequencing, Digit Span), and his Digits Forward [Scaled Score (ss) = 11] and Digits Backward (ss = 9) scores were comparable, which would be inconsistent with attention deficit and executive dysfunction (see Hale, Hoeppner, & Fiorello, 2002). Jon made two configuration errors when asked to reproduce a model (e.g., Block Design), complaining that he did not have enough blocks. This finding, when combined with other Perceptual Reasoning measures, suggests global-spatial-holistic or simultaneous-processing, nonverbal problem-solving, and fluid-reasoning difficulties. His psychomotor speed was inconsistent (e.g., Coding low, Symbol Search fine), but his use of a trial-and-error approach on Symbol Search could explain these results.

Even though these preliminary findings provide us with hypotheses about Jon's strengths and weaknesses, our Cognitive Hypothesis Testing (CHT; Hale & Fiorello, 2004) model requires further data collection to corroborate results. Although the CHT model requires neuropsychological interpretation of test data, this does not preclude the use of standardized cognitive/intellectual measures for screening or hypothesis-testing purposes. Although tests such as the CAS, K-ABC, SB5, WISC-IV, and WJ-III COG are not necessarily "neuropsychological," they can be used in CHT if they demonstrate the requisite reliability and validity for idiographic interpretation. The

Table 1
WISC-IV Intellectual Assessment Results for Jon

Measure/Subtest	SS/ss	Measure/Subtest	SS/ss
Global Scores			
Verbal Comprehension	96	Perceptual Reasoning	92
Working Memory	102	Processing Speed	94
Subtest Scores			
Similarities	10	Block Design	8
Vocabulary	12	Picture Concepts	13
Comprehension	6	Matrix Reasoning	5
(Information	11)	(Picture Completion	4)
Digit Span	11	Coding	7
Letter–Number Sequencing	10	Symbol Search	11

Note. Global Scores are reported in SS, Subtest Scores are reported in ss; SS = Standard Score, $M = 100$, $SD = 15$; ss = Scaled Score, $M = 10$, $SD = 3$.

choice of instruments depends on the practitioner's knowledge of the case prior to and during the evaluation. During CHT, it is important to choose instruments that have specificity and sensitivity for the disorder in question. Unlike cognitive/intellectual tasks, which tend to be multifactorial and share substantial variance with other tasks, neuropsychological measures that tap few constructs may be more useful during the hypothesis-testing stage; however, note that even cognitive/intellectual measures have more unique than shared variance in disabled populations, suggesting idiographic interpretation is warranted even on these measures (Fiorello et al., in press).

Two major hypotheses were examined during the CHT phase. Based on his diagnosis and other data (but not WISC-IV results), Jon's attention, working memory, and executive function required further examination. It also was important to examine his visual-spatial-holistic and novel-problem-solving skills to see if he had a "nonverbal" learning disorder. In addition, although explicit language skills appeared to be adequate, children with "nonverbal" LD or right-hemisphere learning disorder (RHLD) have difficulty with implicit, ambiguous, or contextual language (see Bryan & Hale, 2001; Rourke, 1994), which could explain his difficulty using social judgment and applying social knowledge.

As seen in Table 2, results suggest that Jon's "fine motor" difficulty is related to visual-spatial-simultaneous processing deficits, which could be due to problems with an area of the brain associated with poor self-awareness and poor attention to surroundings (i.e., neglect; see Hale & Fiorello, 2004). Although Jon may have attention problems, he is not as likely to benefit from medication treatment, as children with "true" ADHD have problems with *executive control* of attention, inhibition, and activity level (Hale, Fiorello, & Brown, 2005). Jon also had considerable

Table 2
Cognitive Hypothesis Testing Results for Jon

Measure/Subtest	SS	Measure/Subtest	SS
Woodcock Johnson-III		Developmental Test of VMI	
Concept Formation	80	Visual	76
Analysis and Synthesis	92	Motor	100
Cognitive Assessment System		Visual-Motor Integration	86
Figure Memory	75	NEPSY	
Planned Connections	90	Arrows	75
Expressive Attention	100	Memory for Faces	80
Continuous Performance Test-II (CPT-II)		Visuomotor Precision	95
Omissions	98	Finger Tapping	95
Commissions	111	Tower	100
Reaction Time	94	Test of Memory and Learning	
Detectability	87	Memory for Location	70
Perseverations	91	Hale Cancellation Task	
Reaction Time Block Change	104	Correct	92
Reaction Time ISI Change	102	Time	89
Comprehensive Assessment of Spoken Language			
Nonliteral Language	70		
Inference	80		
Pragmatic Judgment	75		

Note. VMI = Visual-Motor Integration. All scores have been converted to *SS*, with higher scores = better performance for ease of interpretation. The Conners' CPT-II results were changed from *T* to *SS* with reversed scoring for consistency.

difficulty on the Memory for Faces and CASL Supralinguistic subtests. Taken together, these findings suggest that Jon has an RHLD. Instead of interventions for executive and motor problems, we now had a better understanding of Jon's true difficulties and could provide more targeted interventions as a result.

Targeted Intervention Phase

During the subsequent teacher problem-solving meeting, we decided to increase self-awareness and attention using apparently intact executive skills to improve spatial-simultaneous processing feedback to the apparently intact motor system, improving attention through self-monitoring of on-task performance, and improving processing of language prosody and vocal/facial affect. For the spatial-holistic processing problems, we provided structure for handwriting by using graph paper to foster letter shape, formation, and spacing. After Jon completed his writing sample, he compared his letter writing and word spacing to a "best writing" template he created during instruction to determine if he showed adequate performance for 10 words embedded within his writing sample. He received 1 point for each word with the letters written correctly and 1 point for each correct word spacing (total possible = 19). As can be seen in Figure 3, Jon's letter and word spacing improved with this intervention, and he reached the goal of 90% accuracy on several occasions.

For focusing attention and improving self-awareness, we used self-monitoring using a 1 (*unfocused/off-task*) to 3 (*highly focused/on-task*) Likert scale that he completed after the teacher randomly tapped his desk five different times per class period (total possible = 15 points, see Figure 4). The intervention improved Jon's on-task performance in Language Arts class, and self-charting was reportedly reinforcing for him; however, he continued to struggle with on-task behavior in math class, probably because he still struggles with math. This tells us that the math intervention attempted previously may not be sufficient for Jon, and further problem solving to develop a specific math intervention may be needed. During this problem-solving phase, it would be important to consult resources that suggest academic interventions based on individual cognitive processing assets and deficits (e.g., Berninger, 2002; Hale & Fiorello, 2004; Mather & Jaffe, 2002; Naglieri & Pickering, 2003).

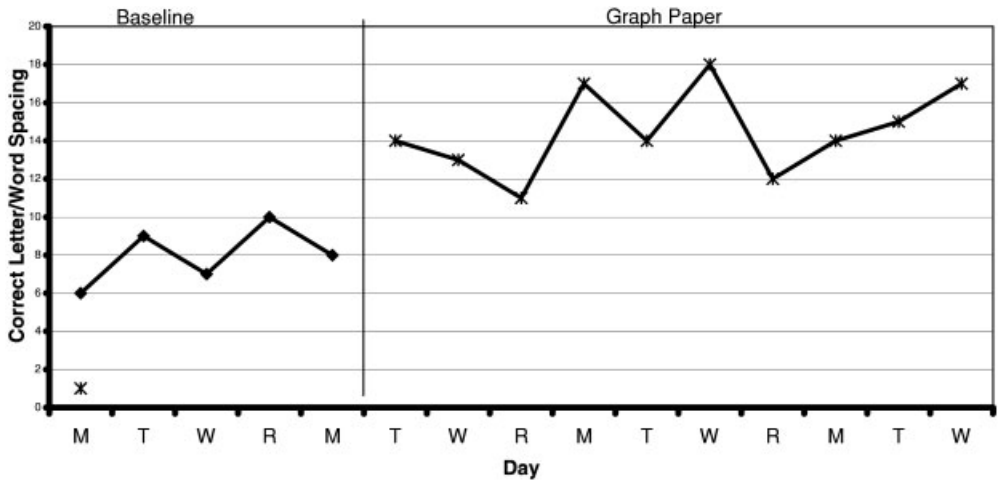

FIGURE 3. Jon's letter/word spacing.

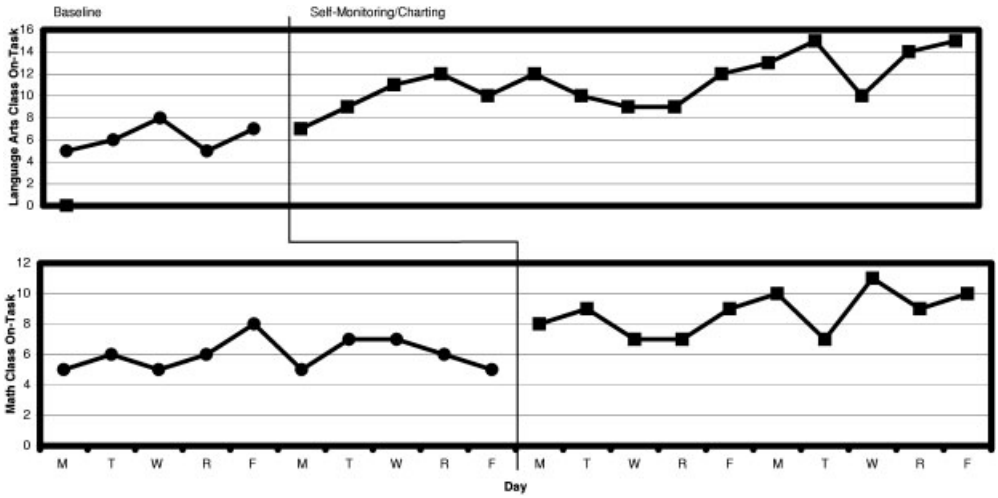

FIGURE 4. Jon's on-task behavior.

Finally, to improve social skills, we focused on discrimination of facial expressions and tape recordings of vocal affect. Completed in individual sessions, Jon had to rate the pictures and voices on a Likert scale of −1 (*negative affect*), 0 (*neutral affect*), or 1 (*positive affect*), and indicate whether they were the same or different. He received 1 point for judging valence (2 points total per trial) and 1 point for judging the congruence of facial and vocal affect (3 points possible/trial). The number of points was rewarded with computer game time (1 min/point) during free time. Given that this intervention occurred only one time per week, a pre–post design was used, with the Social Skills Rating System (Gresham & Elliott, 1990) as the dependent measure. In the 11 weeks of social skills instruction Jon received, teacher ratings of Jon's Total Social Skills went from the lower end (SS = 73) to the upper end (SS = 82) of the Below Average range. With targeted intervention, Jon's social skills may have improved, according to teacher report.

CONCLUSION

A majority of children presenting with learning difficulties can be served through a RTI approach that emphasizes early intervention, standardized classroom instruction, collaborative problem solving, and regular progress monitoring. The RTI methods advocated by proponents will allow for early identification of learning problems and prevention of SLD overidentification; however, RTI methods alone cannot be used to identify children with SLD because a child can fail to respond to intervention for a number of reasons, one of which may be SLD. In addition, both RTI and traditional ability–achievement discrepancy methods do not address the IDEA (2004) definition of SLD, which requires determination of whether a child has a deficit in the basic psychological processes. This determination can be accomplished best using direct measurement of child performance on standardized cognitive and/or neuropsychological measures. The three-tier model described here incorporates the best RTI and cognitive assessment practices in a balanced practice approach that ensures children identified with SLD meet the IDEA definition *and* eligibility requirements. The information gained from the RTI standard protocol, RTI problem-solving, and comprehensive evaluation tiers will not only provide for more accurate identification of children with SLD but also will provide the impetus for individualized instruction designed to meet the unique needs of those who do not respond sufficiently to initial intervention.

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