FOUNDATIONS AND RESEARCH ON IDENTIFYING MODEL RESPONSIVENESS-TO-INTERVENTION SITES

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Abstract. **As regulations are rewritten regarding school-based learning disabilities identification practices, the components of those practices are likely to change. For example, cognitive assessment and aptitude-achievement discrepancy might be less important. A student's responsiveness-to-intervention (RTI) is emerging as an important construct for assessing underachievement. This article provides a framework for understanding how RTI fits as one LD determination component, describes research on RTI, and outlines the NRCLD's research efforts to examine current RTI implementation in schools and model site selection.**

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Although the reauthorization of the Individuals with Disabilities Education Act (IDEA) has brought the issue of learning disabilities (LD) identification procedures and criteria to the forefront in recent years, calls for reform are not new and are based on decades of various related research agendas. One effort to integrate the research over that period was the USDE's Office of Special Education Programs (OSEP) LD Summit conference in 2001 (Bradley, Danielson, & Hallahan, 2002), during which nine commissioned papers were presented regarding LD identification issues. A second effort was the President's Commission on Excellence in Special Education final report, "A New Era: Revitalizing Special Education for Children and Their Families" (2002). A third activity was OSEP's establishment of the National Research Center on Learning Disabilities (NRCLD). These activities have focused increased scrutiny on the value of identifying students with LD and the components, procedures, and criteria of LD identification.

Among the alternative LD identification models, responsiveness-to-intervention (RTI), which can be viewed as representing the model called for in the President's Commission report, has attracted much attention among policy makers, school staffs, and researchers. One of OSEP's goals for funding the NRCLD was to synthesize existing research and conduct additional research on alternative LD determination models. With the increasing interest in RTI, OSEP directed NRCLD staff to conduct a set of research activities around it. More specifically, the NRCLD was asked to address four questions:

1. How is RTI implemented locally?
2. How is RTI used in the process of LD identification?

3. How effective is RTI in the prevention of reading problems?
4. Does RTI enhance LD identification?

The purpose of this article is twofold. First, we provide a conceptual background for RTI. In addressing that goal we will describe the theoretical framework of RTI, the research about RTI as a prevention model and as a component in LD determination decisions, as well as existing applications of RTI. Our second purpose is to describe how NRCLD staff and the staffs from the six national regional resource centers are researching the four questions posed above. An outcome of those activities is to select exemplary RTI sites that might assist in national technical assistance and scaling-up activities. The research methodology uses a mixed design of descriptive information from detailed case studies and empirical data from school and student records. We view this article as an important opportunity to inform the field about RTI and engage readers in shaping its relevant policies, procedures, practices, and criteria.

LITERATURE REVIEW

Figure 1 provides an organizational framework for the three parts of our literature review. Various writers have described RTI's application for prevention of reading problems and as a component for LD determination (Fuchs, Mock, Morgan, & Young, 2003). Our literature review begins with examining the theory for both applications, followed by a discussion of the empirical basis for RTI as a prevention framework and as an LD component. Last, we describe the research of its application in school district settings.

Part 1: Theoretical Framework for RTI

Fuchs et al. (2003) described RTI as having two principal applications: reading prevention and LD identification. For the former, RTI is described as an organizational framework for ensuring that students' reading problems can be prevented, much as public health might address the prevention and treatment of diseases. As a component of LD identification models, RTI is described as a framework for evaluating students' underachievement; that is, their learning rate and their achievement discrepancy from their peers. One of the factors shared in both RTI applications is a multi-tiered intervention model. Such an approach is commonly applied in such disciplines as public health, occupational therapy, and community psychology.

The three tiers are primary, secondary, and tertiary, distinguished by their intervention focus. In general, the first tier of intervention is a population-focused prevention activity or inoculation. Here the ecology is the most important component. Persons are examined in the ecology, in the context in which they participate. Changes made in the environment are considered to be most valuable for improving the population's functioning, and since these changes can be anticipated on the basis of previous experience and research findings, much effort is directed at improving the envi-

Figure 1. Organizational framework for literature review.

	Theory	Research	Application/Practice
Prevention		Foorman et al. (1998) Torgesen et al. (2001) Vaughn et al. (2003)	D. Fuchs et al. (2003)
LD Identification	L. S. Fuchs et al. (1998) L. S. Fuchs et al. (2002) Gresham (2002)	D. Fuchs et al. (in press) Speece & Case (2001) Vellutino & Scanlon (1987) Vellutino et al. (1996) Vellutino et al. (2000)	

ronment. In education, this tier is reflected in the emphasis on high-quality, developmentally appropriate instruction in the general education setting.

However, some persons are not responsive to or protected by the population-directed ecological interventions. In education, these students are the ones who, on the basis of screening procedures, evidence developmental or achievement lags compared to their peers, even though they have participated in a high-quality instructional environment. These individuals require a more intense intervention, which is provided at the second or secondary tier. Intensity is often considered in terms of such variables as the frequency with which instruction is provided (such as the number of days in a week or number of times in a day), the length of time an intervention is provided (often in minutes), and duration (such as the number of weeks an intervention continues). So, rather than focusing on the population, groups of individuals needing secondary tier interventions are identified. As one might expect, these interventions have a group focus.

On the basis of further data, individuals are identified whose needs were not addressed by the primary or secondary interventions. These individuals are in the tertiary level tier. Two features distinguish tertiary interventions. First, they are no longer considered as prevention but as an intervention to address an identified need. Second, they are generally individually directed, not group focused as in the primary and secondary interventions. These interventions are considered the most powerful available, which is often reflected in the severity of the individuals receiving the intervention, the quality of the instructor, and the intervention's demonstrated effectiveness. The instructional intensity, curriculum, instructional goals, and instructional setting might all be manipulated to increase the likelihood of the student responding successfully.

RTI as a theoretical framework for addressing reading problems. In the context of improving students' reading, RTI models have a theoretical framework that parallels our understanding of students' learning and integration of reading components (e.g., phonological processing, word recognition, fluency, vocabulary development, and reading comprehension). At the first tier, the general education classroom teacher teaches these reading components in the general education classroom as part of a high-quality reading curriculum to prevent reading problems. While most students respond to this instruction, some will need a more intense intervention delivered in the second tier for a variety of reasons (e.g., lack of academic preparedness, sensory deficits, low cognitive ability, and lack of English language competency). In many schools, a peer-level or cross-age tutoring program, parent volunteers, paraprofessionals, or Title 1 or remedial reading program might deliver tier two instruction as part of a supplement to general education instruction. Finally, tier three instruction follows for those students for whom tier two is ineffective.

The emphasis on reading problems in this article largely reflects the fact that reading is the academic area in which the vast majority of research has been focused. This emphasis may be further narrowed to beginning or early readers. Thus, little research has examined the application of RTI in academic areas other than reading or with school-age students beyond third grade.

RTI as a theoretical framework for determining LD. Two of the most commonly accepted characteristics of LD are that a student demonstrates a profile of different strengths and deficits and significant underachievement. The deficits and resulting underachievement are due to underlying neurological or information processing dysfunctions (OSEP, 2001). In the past 30 years, these constructs have led to different assessment frameworks for LD determination.

Up until the mid-70s, the paradigm emphasized the assessment and determination of underlying processing deficits that would account for the student's underachievement. LD identification involved assessing students on a hypothesized processing deficit and the question was: Does an underlying processing deficit account for the student's academic deficits? The validity data did not support this assessment paradigm, but the problem of how to identify students with LD persisted and has become more urgent after LD was included as a disability category in IDEA.

After the mid-70s, the processing component was largely abandoned in favor of examining the degree of a student's underachievement. The logic was that since valid assessment of the underlying basis of LD was questionable, the assessment should focus on a student's achievement in a deficit area and in comparison to an estimate of ability or aptitude. Thus, the question was: Is the student demonstrating significant underachievement? For the student to meet the underachievement construct, a significant aptitude-achievement discrepancy must be demonstrated.

The prime consideration was that students with LD were characterized as deficient in a specific academic-related area. Federal regulations identified seven possible areas (Reschly & Hosp, this issue). The trouble was that many students other than students with LD also evidenced a specific aptitude-achievement discrepancy (Reynolds, 1984). So a framework was needed to further explore the basis for underachievement. The *exclusion clause* in the federal regulations was one

framework for examining underachievement. It was intended as a *rule-out* component. That is, the assessment team would rule out whether other disability conditions or environmental, cultural, and economic disadvantage factors could explain a student's underachievement. If so, the student would not be considered as LD.

Another alternative explanation for underachievement was a student's learning opportunities. One procedure for assessing that hypothesis consisted of evaluating if the student had received *appropriate learning experiences*. Students who received high-quality instruction and persisted to demonstrate underachievement might have an LD. If a student's underachievement could not be explained by an exclusion clause factor or inadequate learning opportunities, the probability of learning disability was considered higher.

This concept of underachievement had a theoretical connection to LD from experimental research and also was foundational to the relevance of the RTI construct to LD determination. Milton Budoff's research (Budoff, 1975; Budoff & Corman, 1976) serves as an important example for linking underachievement and RTI. Budoff examined the learning potential of students on an experimental learning task in a controlled setting. The common task was to pretest students with Raven's Progressive Matrices (Raven, 1956) or Koh's block design task (which is similar to the Wechsler Block Design subtest). Based on the pretest results, students were grouped into high and low scorers. Students with low scores were given specific instruction intended to improve the performance on the task, and all students were then retested. Students who made gains from pretest to posttest were called gainers. Other students did not benefit from the instruction and were called non-gainers. Thus, Budoff's learning potential assessment model identified students who would benefit and would not benefit from specific, intense instruction and provided another view of low achievement and underachievement.

In subsequent years, a number of other researchers (e.g., Fuchs, Fuchs, Hamlett, Phillips, & Bentz, 1994; Fuchs, Fuchs, Karns, Hamlett, Katzaroff, & Dutka, 1997; Haines & Torgesen, 1979; Vellutino & Scanlon, 1987) used controlled experiments to examine the underachievement and learning of students with LD. The research question examined was whether the low performance of students with LD should be considered a production deficiency or a capacity deficit.

According to the production deficiency hypothesis, students with LD were capable, but were not performing at a desired level or rate such as appropriately applying efficient strategies or lacking the motivation to do so. According to the capacity hypothesis, on the other hand, students had specific, intrinsic limitations (e.g., attention disorder, perception problems, poor memory, inadequate meta-cognitive processing abilities, poor phonological processing) so that the task was truly beyond their abilities. The students with LD were considered more resistant to instruction, but a specific dysfunction was not clearly described.

These testing-instruction-retesting research designs revealed a pattern that LD students were a unique group. The findings also suggested that the results of assessing a student's responsiveness to an intervention were important for distinguishing among learners who on the surface appeared as garden-variety low achievers. This emerged as an important theoretical framework for understanding learning disabilities as well as its assessment on ecologically valid tasks (e.g., word analysis and problem-solving strategies). Assessing students' RTI in classroom settings builds on this experimental research.

A term frequently linked with RTI as applied to LD identification is *treatment validity* (Fuchs & Fuchs, 1998; Fuchs, Fuchs, & Speece, 2002; Gresham, 2002). Some clarification of the term may help the reader understand its relationship to RTI. Treatment validity is espoused as a value or a desired quality of an assessment framework, as opposed to an assessment approach with specific assessment methods, scores, and criteria like a framework associated with curriculum-based assessment. Gresham (2002) described treatment validity as the degree to which any assessment procedure (e.g., RTI) contributes to beneficial outcomes, suggesting that the validity of identification procedures is whether they lead to better treatments (e.g., better educational programs and teaching strategies). Fuchs et al. (2002) suggested that

> a treatment-oriented approach to identification strives to eliminate the inequity potentially associated with over-representation of minority students in special education by maximizing regular education's potential effectiveness for all students and reserving judgment about the need for special education until the effects of individual adaptations in the regular classroom have been assessed and until evidence verifies that a special education program enhances learning. (p. 34)

Fuchs et al.'s elaboration of treatment validity makes a link to the relationship of general education and special education and assessing the benefits for all students. This distinction is not trivial, and understanding treatment validity can provide a basis for how alternative assessment frameworks (e.g., RTI, neurological assessments, psychoeducational assessments, and achievement testing) may be compared.

Summary of Part 1 review. RTI has much in common with other disciplines' multi-tiered models for prevention and treatment. In the schools, multi-tiered models are applied to address reading and behavior problems. Some school district staffs, researchers, and policy makers are suggesting that RTI may serve an important component of LD determination. In the LD determination model, RTI allows staff to evaluate alternative explanations for a student's underachievement. Such alternatives might include intrinsic processing problems, motivation problems, lack of preparation, poor teaching, or a combination of such factors.

Part 2: Research Support for RTI

Rather than reviewing all available research findings regarding RTI as a prevention model for reading problems and as a component of LD identification, we have selectively included data-based articles that were readily accessible and recently published. This research illustrates many features of high-quality RTI implementation. We begin with a review of several advantages ascribed to RTI applications over current practices.

In the reading intervention and LD identification applications, researchers have found several advantages of RTI applicable to both applications. One of RTI's most significant contributions is that the procedures lend themselves to a better understanding of instructional quality and informed decision making. Instructional quality includes planning interventions, assessing intervention outcomes, and manipulating the variables likely to improve outcomes (e.g., pinpointing students' skills, frequency and duration of interventions, matching resources to students' needs, and fidelity of implementation). This feature has positive implications for general and special education teachers, parents, and staff.

Another advantage is that RTI procedures can yield information that accurately ranks a student within his peer group and his performance in the school's curriculum. As a result, students at risk for learning difficulties can be identified and receive appropriate interventions (e.g., Vaughn & Fuchs, 2003; Vaughn, Linan-Thompson, & Hickman, 2003).

Speece, Case and Molloy (2003) identified the following advantages of RTI relevant to LD identification: (a) reduced reliance on teachers' initiating referrals; (b) focus on academic skills, not presumed processing deficits; (c) focus on students' learning, not just current achievement; (d) elimination of the need for aptitude-achievement discrepancy and intelligence testing; and (e) reduction in the false-positive error rate. Further, Vaughn and Fuchs (2003) noted that the RTI model may provide an opportunity to move from a deficit model to a risk model for identifying and intervening with students with LD.

Findings from research on RTI application to reading interventions. In this review, our intent is to present an overview of various features of the high-quality interventions provided to students considered as at risk for reading problems or previously diagnosed as LD. An understanding of these features provides a framework in which the NRCLD staff developed data- collection measures and criteria for selecting model RTI sites.

Vaughn et al. (2003) provided intense reading interventions (10 weeks, 50 sessions, 35 minutes each) to assess the feasibility of such a model for determining students with reading/learning disabilities. The participants were second graders identified as at risk for reading disabilities based on teacher nominations and failing the screening criteria of the Texas Primary Reading Inventory (Texas Education Agency, 1998). The intervention focused on five elements of reading development: "phonemic awareness, phonics with special attention to systematic mastery of sound-letter relationships as well as word families, fluency (word and text), instructional level reading and comprehension, and spelling" (p. 396). Tutors taught students who had been divided into groups of three, according to their reading knowledge and needs. Students' progress was formally monitored weekly with 1-minute readings. After each 10-week session, the students were posttested to see if they had met a priori exit criteria. Students who met the criteria no longer received the supplemental instruction. For students who did not respond, the intensity of the intervention was increased.

The value of such research to RTI is that it demonstrates that students receiving intensive, high-quality instruction in small groups can make significant gains in a relatively short time (10 weeks). Further, about 66% of the students continued to perform well after the intervention stopped. Some students did not respond and did not meet a priori criteria even after 30 weeks of intervention. Students in this latter group (< 25% of the students) differed from students meeting exit criteria and could be further evaluated for special education services. For these students to benefit from their educational experience, extensive supplemental instruction was needed (Vaughn et al., 2003).

Torgesen et al. (2001) investigated the power of two standardized reading intervention programs (Auditory Discrimination in Depth [Lindamood & Lindamood, 1979] and Embedded Phonics [developed by the authors]) to improve the word-level skills of students diagnosed with LD in reading. The students, ages 8 to 10, participated in an intense intervention of 1:1 in two 50-minute sessions (separated by a brief break) each

day of the school week. The intervention was provided over eight to nine weeks, until 67.5 hours of instruction had been completed. Following the intervention phase, generalization training occurred with the student in the LD class for one 50-minute session each week for eight weeks. Using the classroom materials, the teacher "focused on helping the child apply the skills learned in the intensive training to tasks in the LD class" (p. 37). Students were posttested three times: after training, after one year, and two years later.

The findings have significant implications for RTI. "Both instructional methods produced very large alterations in the children's growth rates for broad reading ability when compared with the rate they had been growing during the previous 16 months' instruction in the LD resource rooms" (Torgesen et al., 2001, p. 51). Further analysis indicated that both interventions produced substantial and long-term benefits for the students previously diagnosed as LD. The authors cited other studies using similar explicit, intense reading word-analysis interventions that reported comparable gains. A major implication for RTI is that the intensity and explicitness of an intervention is an important consideration. Thus, the two interventions in the study could be considered for tier two (secondary) or tier three (tertiary). A second implication for RTI is that interventions based on different theoretical reading models can be appropriate. The features and implementation fidelity of the interventions might be more important for judging their quality.

Foorman, Francis, Fletcher, Schatschneider, and Mehta (1998) conducted a large-scale (N = 285, eight schools) study to assess alphabetic code instruction and phonological processing on word-reading skill development. The participants were first and second graders eligible for Title 1 services. Students were assigned instruction in one of three possible reading methods. Direct instruction in letter-sound correspondences practiced in decodable text was the first method. Here the emphasis was on a balance of phonemic awareness, phonics, and literature activities. Method two used less direct instruction in systematic spelling patterns embedded in connected text. The emphasis was on phonemic awareness and spelling patterns in predictable books. Finally, the third method was indirect, incidental instruction in the alphabetic code embedded in connected text. This third method was the focus of the district's staff development activities for reading instruction. In this approach, the emphasis was on a print-rich environment with the following characteristics: teacher as a facilitator rather than a director of learning; children's construction of meaning as a central component; the integration of reading, spelling, and writing into literary activities that provide a context for phonics; emphasis on classroom interaction and on response to literature; learning centers; and assessment based on portfolios rather than norm-referenced tests. The instruction occurred in 30-minute blocks as part of the state-mandated 90-minute language arts block. In addition, Title 1 teachers delivered 1:1 or small-group tutorials with 3 to 5 students for 30 minutes each day. The fidelity of instruction was monitored during the school year.

The results indicated that early instructional intervention makes a positive difference for first and second graders at risk for reading failure. Further, type of instruction makes a difference on learner outcomes. "Children who were directly instructed in the alphabetic principle improved in word-reading skill at a significantly faster rate than children indirectly instructed in the alphabetic principle through exposure to literature" (p. 51). In the scope of analysis, a number of other findings also supported the value of an intensive classwide reading instructional model. The relevance of this study to RTI is that the findings substantiate the value of tier one as a prevention method of later reading problems. The reading methods are quite adaptable to other districts and schools and ensure that students are receiving appropriate learning opportunities.

Findings from research on RTI application to LD identification. Assessing a person's functioning within the environments in which s/he participates is a central concept to disability determination (e.g., World Health Organization, 2002). RTI provides an assessment of a student's functioning within one environment, the academic setting. The purpose of that assessment is to rule out the contextual features of the academic environment as a basis for the student's academic failure; that is, to ensure that the general education environment did not account for the learner's difficulties (e.g., Vaughn & Fuchs, 2003). Fuchs, Fuchs, and Compton (this issue) provided one example of applying RTI to LD identification. We will offer brief reviews of two similar lines of research.

Vellutino and Scanlon (1987) examined the relationship between phonological coding and phonemic segmentation and reading ability among second and sixth graders who had been dichotomized into poor and normal reader groups. On the pretests, the second-grade good readers performed about as well as the sixth-grade poor readers. Even in the short training sessions (30 minutes on each of five to six days), learners in the treatment conditions made significant gains, but the poor readers did not improve as much as the normal readers. For the poor readers, difficulties in linguistic coding, characterized by dysfunction in storing and/or retrieving phonetic representations, were strongly associated with reading acquisition and

development. In several instances, poor readers exposed to effective treatments performed as well as or slightly better than typically reading students in the control groups. These findings help us understand how a clinical teaching situation can help in differentiating students who are going to need specific, intense interventions to profit from their educational opportunities (related studies include Vellutino, Scanlon, & Lyon, 2000, and Vellutino et al., 1996).

The second line of research activities relevant to the topic is that of Speece and Case (2001), who evaluated the validity of alternative methods of identifying children with reading difficulty in the children's response to the general education instructional environment. Unlike the previously reviewed studies, this research did not include its own intervention. All first and second graders (N = 694) in three schools were screened on curriculum-based measurement reading probes. Children were identified as at risk for reading failure if their mean performance on the CBM probes placed them in the lowest quartile of their classroom. A second sample (purposeful sample) of students was also identified in each classroom. This sample included five students: two children who scored at the class median and one child at the 30th, 75th, and 90th percentiles each. Participants were administered a battery of intelligence subtests, a phonological processing battery, reading achievement subtests, and classroom behavior ratings. All children received six oral reading fluency probes over a three- to four-week period. Thereafter, participants at one school received weekly probes through May. Participants at the other two schools received monthly probes through May.

In their analyses, the authors compared students (a) exhibiting a dual discrepancy (CBM-DD) of level and rate (> 1 *SD* below the classroom mean), (b) with an IQ-achievement discrepancy (≥ 1.5 *SD* of the difference), (c) considered low achieving (standard score < 90 on the WJ-R Basic Reading Skill Cluster), and (d) not classified as exhibiting reading problems. The students in the CBM-DD group showed more deficits than the other groups and were more proportional to the racial make-up of the classrooms. The CBM-DD group had lower intelligence test scores than the IQ-achievement discrepancy group, means of 87 and 110, respectively. The authors concluded that "there are possibly many reasons to use criterion scores for intelligence in defining reading disabilities, but performance differences on reading and phonological tasks are not among them" (p. 747). For identification of reading problems, intelligence tests do not provide a diagnostic marker. The authors concluded that their findings provide initial support for the validity of the CBM-DD dual-discrepancy approach to defining reading failure.

Summary of Part 2 review. The preceding research review illustrated the application of several procedures and features for RTI implementation. Procedures included assessments for monitoring students' progress in the general education curriculum (e.g., weekly or biweekly) and for screening to identify students at risk for failure. Assessments were also frequently (e.g., weekly) administered to monitor students' progress in the interventions. CBM was the most frequently cited assessment method. Decision rules were explicitly stated to indicate students who were at risk for reading failure, who were making adequate and inadequate progress in an intervention, and who were prepared to exit the intervention. These rules did not use descriptors as "a preponderance of evidence" or a "team decision," but a numerical criterion typically linked to either a national standard such as a standard score or a classroom criterion such as one standard deviation below the class mean or median.

In a second procedure students received a uniform intervention for a specified time period (e.g., 10 weeks) delivered for a specified number of minutes (e.g., 35 minutes) at a fixed frequency (e.g., daily). The setting in which the intervention was delivered was also specified (e.g., classroom, Title 1, or resource room setting) as were the qualifications of the staff providing the intervention. The description of the intervention was very specific and linked to theoretical frameworks of children's reading acquisition. The interventions were standard protocols, meaning that the students in tier two received the same intervention.

A third feature involved attention to the skill level of the instructors and staff development activities. The staff development activities included ongoing support to problem solve challenges that instructors confronted. The researchers directed much effort at ensuring that the interventions were delivered consistently and as designed. Observational checklists and independent observers in the instructional settings were used to assess the fidelity of the interventions.

Part 3: RTI in Applied Settings

In practice, RTI refers to an individual, comprehensive student-centered assessment and intervention concept. It has generated several models used in schools (Fuchs et al., 2003) and has resulted in calls for caution in its widespread implementation (Fuchs et al., 2003; Kavale, Holdnack, Mostert, & Schmied, 2003). Our examination of the literature revealed a particularly effective and enlightening analysis of RTI in applied settings completed by Fuchs et al. (2003). Thus, we use their published article to describe the small amount of literature available in this area.

Problem-solving model. In their review of the literature on RTI in applied settings, Fuchs and colleagues (2003) described the problem-solving model (PSM) as one of two primary approaches to RTI. According to Fuchs et al. (2003), this model, generally favored by practitioners, evolved from two types of prereferral intervention: behavior problem solving and collaborative consultation. A new model emerged when practitioners began combining the two types, resulting in "collaborative problem-solving" – a seemingly predominant/preferred practice among practitioners (Fuchs et al., 2003).

Despite its historical use as prereferral intervention, the PSM is evolving as a process that includes both prereferral intervention and eligibility for many districts/schools (Fuchs et al., 2003). According to Fuchs et al. (2003), Heartland Area Educational Agency (Heartland AEA) and Minneapolis Public Schools (Minneapolis) have created two of the "best known exemplars of this approach" (p. 163).

The problem-solving models used in Heartland AEA and Minneapolis are similar in design and function. In both, PSM represents a large-scale effort to employ a system of increasingly intensive interventions planned and implemented by school personnel with increasing levels of knowledge and expertise that ultimately results in a program of remediation (but not disability identification). Similar four-step PSM models have been instituted in each district. In general, the four steps include:

1. Identifying/describing/analyzing the problem;
2. Designing and implementing targeted interventions;
3. Monitoring student progress and modifying the interventions according to the student's responsiveness; and
4. Planning for the next steps in the PSM process.

Further, inasmuch as the PSM is a multi-level model, each of the steps occurs at each of the four levels of the PSM. For example, during step one, the problem is identified, described, and analyzed; this identification/description/analysis process occurs at the first level (teacher/parent level), at the second level (Building Assistance Team level [BAT]), and so forth.

Fuchs and colleagues (2003) identified four commonalities between Heartland and Minneapolis in their efforts to implement PSM, including that both districts:

1. Use RTI for special education identification in place of a traditional psychometric approach;
2. Use a four-level problem-solving model;
3. Rely on a "convergence of evidence" to determine progress and eligibility rather than on commercial tests and cut scores; and
4. Promote a noncategorical approach to student eligibility for special education.

Findings from research in school district settings. There is growing concern about the lack of supporting evidence for prereferral interventions in the form of evaluations that demonstrate improvements in student achievement and behavior (Fuchs et al., 2003). Accordingly, concerns exist about the scientific validity of RTI as prereferral interventions provide the basis for such an approach (Fuchs et al., 2003). Moreover, although RTI has been implemented for over a decade in both Heartland AEA and Minneapolis Public Schools, neither seems to provide strong empirical evidence in support of its efficacy and feasibility (Fuchs et al., 2003).

Fuchs et al. (2003) reported findings from two evaluations completed by Ikeda and Gustafson (2002a, 2002b) in Heartland AEA. The first included a review of data on students involved with the BAT in 15 schools; the second evaluation entailed a survey of 29 schools that participated in the PSM. As noted by Fuchs et al. (2003), Ikeda and Gustafson (2002a, 2002b) largely reported positive results. However, Fuchs and colleagues (2003) posited several concerns related to these findings, such as methodological (e.g., low number of study participants) and measurement issues (e.g., lack of fidelity data).

Fuchs et al. (2003) also reviewed three studies involving Minneapolis Public Schools. In the first study by Minneapolis Public Schools (2001), schoolwide reading gains in PSM schools were compared to reading gains in non-PSM schools. The second study investigated the quality of interventions for targeted students (SNAPs) at PSM sites compared to those for similar students at non-PSM sites (as cited in Fuchs et al., 2003). Finally, the third study evaluated the district's kindergarten literacy initiative (Marston, Muyskens, Lau, & Canter, 2003). Again, Fuchs et al. (2003) raised several concerns about the results from these investigations, citing a lack of evidence regarding (a) whether students who participated in PSM demonstrated improved performance, (b) the nature of the specialized interventions employed during PSM, and (c) the fidelity of the implementation.

Minneapolis Public Schools also studied child count rates over a period of 10 years to determine whether PSM altered the number and type of students identified for special education (Fuchs et al., 2003). Their results suggested that there were no significant increases in the special education population and that the type of student identified through the PMS (a SNAP student) was similar to a student who is traditionally identified (Fuchs et al., 2003). As noted in Fuchs et al. (2003), these findings are seemingly contested by evidence

Table 1
Response Data from Critical RTI Model Features Survey

RTI Feature	Positive Responses
At least two tiers of intervention	100%
Reliable, valid system for monitoring learner progress	100%
Leadership and professional development supporting RTI	86%
Scientifically based reading practices in general education	86%
Scientifically based reading practices with appropriate intensity (additional tiers)	86%
Objective cut point or procedure for demarcating responsiveness	71%
LD identification following regulatory requirements	43%

from two other studies (Heistad & Casey, 2002; and a study that measured students personal goals that had been de-veloped by the state) showing that SNAP students may not be the same as traditionally identified students as purported by Marston (2001).

Summary of Part 3 review. In summary, findings from an analysis of the empirical research related to RTI in applied settings show that few studies actually exist (Fuchs et al., 2003). Further, several critical commonalities have been observed among the existing studies, including (a) they typically involve small or undefined samples; (b) they reveal little information about the targeted interventions (e.g., identification/description of the intervention and the degree of accuracy and effectiveness related to implementation); and, (c) they do not report the duration of the students' unresponsiveness prior to engaging in effective remediation (Fuchs et al., 2003).

METHODS

Presently, the NRCLD is collaborating with representatives from the six Regional Resource Centers (RRCs) to evaluate local schools' use of RTI in LD identification. This research is organized into four specific phases: Phase I aims to select exemplary or model RTI sites; Phase II will evaluate the selected sites' use of RTI; Phase III intends to provide technical assistance to the selected model sites; and Phase IV involves scaling the selected model sites and broad dissemination related to responsiveness to intervention. In this article, we outline the methods employed for Phase I – the selection process – including the research design, data collection instruments, and procedures.

Research Design

This study was intended to provide detailed case study descriptions of the participating sites and, as appropriate, empirical comparisons among the sites and between the groups of students who underwent the assessments. We anticipate that this information will assist the NRCLD in its ultimate mission of providing technical assistance and information dissemination to other school sites moving to an RTI model for LD identification.

Instruments

To formulate a working model of RTI, we conducted a two-part survey of practitioners, researchers, and federal policy makers. The first part of the survey instrument, "Critical RTI Model Features," asked respondents to review a list of RTI model features and indicate which ones they considered to be critical features of an RTI model for use in LD identification. Table 1 presents the results from this part of the survey. In part two, "Critical RTI Evidence," respondents were asked to indicate critical evidence of an RTI Model for use in LD identification. Table 2 presents these results.

The survey results and the literature review contributed to the development of a working model of RTI and three data collection instruments designed to describe school sites that are using an RTI model. These instruments were (a) a Screening Tool, (b) an Application for Jury Consideration for use during Phase I, and (c) a Jury Application for use during Phase II. Each instrument is accompanied by a set of written directions.

Screening tool. A tool for screening potential model sites was developed to determine whether a school's RTI implementation contained sufficient elements of the RTI working model to warrant additional data collection. This instrument also conveyed to the potential school site the scope of the subsequent activities and assessed the school's interest in proceeding with further data collection. Specifically, this 37-item instrument was divided into two sections. The first section, "Descriptive Information," included eight items seeking basic school contact information along with data about the general extent to which the LD identification model was implemented within the school and district, the numbers of students with LD, the types of services the students with disabilities received, and student demographic data (e.g., grade, gender, race, ELL status).

The second section, "Screening Information," included 27 items organized in the following five categories: (a) general education practices (5 items), (b) student assessment practices (7 items), (c) intervention model practices (10 items), (d) disability determination practices (3 items), and (e) student outcome data (2 items). All items are rated on both accuracy (the degree to which the practice or characteristic accurately reflected the school) and documentation (whether written documentation of the practice existed) using a "yes," "no," or "unknown" response. The final two items asked about the district's willingness to (a) participate in staff surveys and interviews, and (b) enable surveys and interviews with school personnel and parents related to satisfaction with the current SLD determination models.

RTI model site application for jury consideration (Phase I data collection form). Sites found eligible to advance based on the Screening Tool subsequently completed the RTI Model Site Application. RRC staff completed this application during interviews with school staff.

The application is composed of three parts addressing the school's RTI implementation in kindergarten through grade 5 during the 2002-03 school year. Part I, "Site Information," includes seven items on student demographic information (e.g., size of student population, number of students receiving free/reduced-cost lunch services) and information about the school's involvement with the Reading First initiative and external consultation/collaboration related to RTI.

Part II,"RTI Implementation," requires extensive descriptive information about the site's RTI implemen-

Table 2
Response Data from Critical RTI Evidence Survey

Evidence	Positive Responses
Reading achievement of lowest third of the population higher in RTI site than contrast site	100%
RTI model features implemented with fidelity	86%
Students identified younger in RTI site than contrast site	71%
Recidivism of responders at an acceptable level at RTI site	57%
Grade retention lower at RTI site than contrast site	43%
Reading achievement of students with LD lower in RTI site than contrast site	43%
Proportion of the student body identified as having LD lower in RTI site than contrast site	43%

tation. The application requests general implementation information: the grade levels at which RTI occurs; the number/names of tiers employed within the RTI model, and the number of students in each tier; the level of school principal involvement; the frequency, type, and process for checking fidelity of implementation of professional development activities; and a description of other RTI implementation activities (e.g., changes in staff roles/assignments or hiring new staff).

Part II also seeks more specific information about RTI implementation. Items are organized according to the multiple-tiered framework of RTI. Thus, schools are required to provide information about their Tier 1 Services (General Education); Tier 2 Services; Tier 3 Services; and additional tier services provided. The Tier 1 Services (general education) section includes six items related to the following: measures used to track reading improvement in general education and the frequency of those measurements; the index used to demarcate inadequate response to general education; the cut point for determining inadequate response; and the major reading curriculum and other research-based reading programs used. The Tier 2 Services, Tier 3 Services, and additional tier services sections each include the same 24 items. These items request information about the approach used for the particular tier services; the methods employed to select students for participation in the particular tier; personnel who typically plan and provide the tier services; the location, frequency, and duration of the tier services; the number of students participating in the group during the intervention and the frequency of regrouping; the major reading instructional approach and other research-based reading programs used; a description of a representative instructional lesson for the tier; the measures used to track the response to the tier services and the frequency of that measurement; the index used to demarcate inadequate response to the tier services; and information about the cut-point for determining inadequate response.

Additionally, schools are asked to provide the numbers of students in the particular tiers during the 2002-2003 school year. Schools are also asked about the number of cycles of each tier permitted for individual students and the number of students who received more than one cycle of a particular tier along with the number of weeks intervening between cycles. Finally, the Tier 3 and any additional tier sections are to be completed only if they precede (and are not synonymous with) special education. Thus, in this part of the application, schools are directed to provide information only about pre-special education programming/services.

Part III, "RTI for LD Eligibility," focuses on how RTI is used for LD eligibility. Schools are asked to provide the grade levels at which RTI is used for eligibility determination of a learning disability, a description of additional assessment procedures (if any), a description of due process procedures, and specification of the information on which LD determination is made.

To complete the application, schools are required to submit extensive supporting documentation, including copies of all measures documented in the application, representative service plans for students who participate in Tiers 2, 3, and additional tier interventions, and representative IEP's.

Jury application for RTI model site (Phase II data collection form). For sites selected during Phase I activities, additional descriptive information is obtained in Phase II data collection. This instrument is organized by the four questions that provided the framework for this study (for these questions, please refer to the introduction of the Methods section) and is intended to extend and complement the data collected during Phase I. Part I of this instrument addresses RTI implementation. This section includes 17 items regarding fidelity of implementation as related to (a) general education instruction, (b) tier-level instruction, (c) special education instruction, and (d) general questions. Part II addresses RTI as part of an LD eligibility determination system. This section includes five items regarding the characteristics of LD eligible and ineligible students and parental involvement. Part III addresses RTI as an effective prevention system. This section includes 12 items related to schoolwide reading assessment and referrals (students for whom IDEA's due process procedures and protections apply). Finally, Part IV addresses RTI as an enhancement for LD identification. This part contains seven items pertaining to disability determination and service delivery and four items pertaining to progress monitoring and exit criteria.

Procedures

The Human Subjects Committee at the University of Kansas granted permission to conduct this study. Further, the Internal Review Board (IRB) processes within the participating RRCs approved all research activities. In some cases, additional permission to conduct the research was obtained at the local school district level (i.e., potential model site).

As partners in the model site selection project, the RRCs have played a substantial role in the research process, including participating in the development of data collection instruments to evaluate the RTI model sites; serving as liaisons to the local education agencies; recruiting potential model sites; interviewing school

personnel; collecting and reviewing data; and preparing the data for submission to the NRCLD.

Throughout the summer of 2003, NRCLD staff worked with RRC staffs in reviewing the instruments and data collection process in terms of the perceived efficiency/utility, palatability (i.e., extent to which local schools would find the process of participating acceptable/appealing), and real-life application (i.e., availability/accessibility of data).

In September 2003, the NRCLD trained the RRC participating staff on the use of both the Screening Tool and the RTI Model Site Application for Jury Consideration (Phase I Data Collection Form). Following September's training meeting, the RRCs identified potential model RTI sites from their respective regions and initiated the nomination process using the Screening Tool; interested schools completed the Application for Jury Consideration; and the RRCs submitted completed RTI Model Site Applications and all supporting documentation to the NRCLD. (Nominations for model site designation were requested by March 2004.) In order to ensure school anonymity and student confidentiality, all identifiable information (e.g., school/district name, student names) was removed from the data prior to submission to the reviewers.

To date, 41 schools have been nominated as potential model sites. Upon receipt, applications are reviewed by the NRCLD to evaluate the evidence for potential model RTI designation using a selection criteria worksheet based on the elements highlighted in our survey and subsequent working model of RTI previously described. Reviewers rate each application on 27 selection criteria using a 5-point scale: .5 or 1 or 1.5 (addresses feature but incomplete or insufficient), 2 (meets expectation for feature), or 0 (no data on feature). Sites demonstrating the most complete, well-documented, and experienced implementation will be selected for further data collection in Phase II based on two independent, blind reviews.

In Phase II, to evaluate sites, the NRCLD, in conjunction with the RRCs, will collect data on the fidelity of implementation and effectiveness of study sites' RTI models, including associated student outcomes such as academic progress. Upon completion of Phase II, all data from Phases I and II will be forwarded to an OSEP-designated jury for deliberation. At the completion of Phase II, we hope to have selected and evaluated schools that can be considered Model Sites – sites that can become beacons or exemplars for other schools or districts as they begin to implement RTI.

Summary of Methods

In summary, the NRCLD has created a working model of RTI based on the published research literature and input from various stakeholders, including school staffs, administrators, researchers, and policy makers. This model guided the development of the data collection instruments. Representatives from the six RRCs helped locate potential school sites and worked with local district staff to complete the screening tool and an application. The application is reviewed anonymously through an NRCLD and OSEP jury process in two phases.

DISCUSSION

RTI is a multi-tiered framework for preventing reading problems and intervening for students who are not successful in the general education curriculum. Several studies have demonstrated the effectiveness of RTI for preventing reading problems through curricular and instructional interventions. When one considers secondary or tertiary tiers of intervention for students not succeeding in the general education classroom, research has shown that some students benefit from intense interventions beyond what is available in the general education classroom. Other students have not made significant improvements in spite of high-quality, intense interventions; some practitioners and researchers would consider these students as having LD.

As alternative LD identification models are examined, students' response to intervention is considered an important component. From a theoretical perspective, it may be argued that students who do not respond to high-quality instruction when they might otherwise be expected to benefit pose a challenge. One explanation is that the students have a disability that warrants special education intervention. In the research literature, controlled studies examining how RTI might be implemented by schools and districts as a means of identifying students as having learning disabilities demonstrate that RTI should be pursued as a viable option for identifying students with reading disabilitie (Speece et al., 2003; Vaughn et al., 2003). Of interest to many policy makers and practitioners is a description and outcomes of RTI implementation in local schools apart from research applications.

The OSEP has directed NRCLD staff to address several research questions related to RTI. NRCLD staff is working with staffs from the RRCs to identify model RTI sites in a process that includes the following steps:

1. Identify districts using an RTI model;
2. Describe the school-level implementation;
3. Collect data on the effectiveness of the schools' RTI model including associated student out comes; and
4. Provide assistance to enable RRCs to assist states across the nation in scaling up RTI models.

This research process is intended to identify instances of effective RTI use that may become beacons or exemplars and that can be scaled up for broad adoption. In the event that the evaluation does not uncover enough appropriate sites as training venues, the NRCLD can provide useful information for others with interest in developing effective and feasible RTI models.

Major concerns about the wide-scale adoption of an RTI approach include its instructional implications across both special and general education. The reliance on general education to implement research-based instruction and routine, systematic progress monitoring represents an enormous shift from current practice and would require general education to adopt an educational reform in which they may have had little input. Obstacles to widespread implementation of research-validated reading instruction practices in schools have been noted as (a) beliefs by stakeholders that differ from the research findings and (b) the disbelief that research-based practices are more effective than those currently used (Allington, 2002). Other concerns have to do with reaching consensus on the specifics of an RTI approach, such as how screening for secondary intervention should occur, how secondary intervention should be formulated, and how many tiers are needed to achieve acceptable patterns of LD identification (NRCLD, 2003). Still other concerns have focused on larger, theoretical issues such as moving toward a noncategorical approach to service delivery and the pedagogical implications of eliminating cognitive assessments (Fuchs et al., 2003). These concerns have led RTI advocates, who are cognizant of the limitations of the research and the difficulties inherent in scaling up such a system, to support a call for careful and comprehensive evaluations of various RTI approaches with subsequent deliberate scaling up of approaches that have proven effective and can be implemented with fidelity (Fuchs et al., 2003; Kavale et al., 2003).

The results of this work will have profound implications for practice at all levels. If RTI is identified as a viable alternative to LD identification, the designation, study, and analysis of model sites will provide critical information in the scaling up of this practice. If model sites cannot be reliably designated, the work will provide critical areas that need to be addressed through research-to-practice collaborative activities. Ultimately, we hope model site identification will allow the NRCLD to further refine and define the critical elements of RTI in a manner that provides guidance for constituents at all levels. One anticipated outcome of this work is the development of a sourcebook of best practices in RTI, which will become a resource document for SEAs and LEAs. We also anticipate that our work will define other areas of needed technical assistance and that our relationships with the RRCs will continue as we move through subsequent phases of our research.

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ACKNOWLEDGMENTS

This research was supported by the U.S. Department of Education, Office of Special Education Programs (Grant No. H324U010004). Opinions expressed herein are those of the authors and do not necessarily represent the position of the U.S. Department of Education, Office of Special Education Programs.

We wish to thank the principal investigators of the National Research Center on Learning Disabilities – Don Compton, Doug Fuchs, Lynn Fuchs, Dan Reschly, and Don Deshler – for their support in completing this work. Additionally, we wish to express our gratitude to the six Regional Resource Center Representatives for their enthusiastic participation in this research process.

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