

Multiple Tiers of Intervention: A Framework for Prevention and Identification of  
Students with Reading/Learning Disabilities

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How are public health and education related? As early as 1923, Edward A. Winslow described public health as the science of preventing disease and prolonging life. He indicated that public health is based on organized community efforts that improve water and air quality and reduce disease, address the education of the community, and include medical services for diagnosing and treating disease. Only recently has education accepted a similar view of preventing learning difficulties. Like public health, education has universal and valued goals. Similar to public health, education's goals are for improving academic achievement for all students are universal, including: (a) providing a comprehensive education for all students, (b) identifying students who have difficulties and providing additional support, and (c) developing more intensive interventions such as special education, for students who have persistent difficulties and need long-term support.

*The Three-tiered Framework for Public Health*

For almost a century, public health has designed and implemented a prevention system to reduce the overall prevalence of poor health conditions and to ameliorate the resulting consequences. Largely the goal was to increase worker productivity by improving overall health. To improve health, the focus needed to be on all socio-economic levels with special concentration on reducing poverty and an ultimate goal of improving national health and reducing high public expenses associated with poor health (Beaglehole & Bonita, 1997). The public health approach includes (Schneider, 2000):

1. Specifying through research the risk factors associated with the problem.
2. Identifying or developing, implementing, and evaluating interventions associated with reducing the problem.
3. Providing large-scale implementation procedures to provide the intervention to improve health.
4. Using ongoing monitoring and assessment of the interventions to determine their effectiveness.

*Public Health – Three-Tiered Framework*

These four steps are carried out through a three-tier system that involves three levels of prevention/intervention: (a) primary, (b) secondary, and (c) tertiary. These three levels are intended to provide the appropriate amount of support based on the increasing level of need at each of the levels (less need at the primary level to very intensive need at

the tertiary level). The intention is to allow most people to stay healthy through the least intensive level of prevention – primary prevention.

In public health, a primary intervention would include ongoing screening of key indicators associated with health for each age and risk group. For example, vaccinations are provided to young children as a means of prevention. Blood pressure is used to screen for cardiovascular difficulties in most individuals from young adult through life. Specific screening practices associated with gender include mammograms for woman and prostate screening for men. Furthermore, good primary prevention approaches also include promoting practices such as good nutrition, appropriate weight maintenance plans, and exercise routines.

Even with good primary prevention practices, individuals get sick and require additional supports or have minor difficulties that require ongoing treatment (e.g., allergies). Through secondary interventions many more people are put on the track to good health. This would include readily available high-quality health care when illness occurs and is either more transient or readily treated (e.g., strep throat, broken bones, treatable high blood pressure). This multi-leveled approach allows the most intensive intervention (tertiary) to be used only for those few who develop severe or chronic health problems.

Using this as a framework, primary intervention is implemented to avoid or prevent illness or injury by identifying (sometimes through mass screening) risk factors, which makes it possible to either limit exposure to risk factors or provide very early

intervention. The primary intervention is provided to everyone in the public. For example, programs designed to make the public aware of the health risks of smoking include advertisements, warnings on cigarette packages, and smoking awareness weeks are all examples of ways to provide primary intervention. These public information campaigns are designed as a way of changing behavior and improving health that are aimed at reaching everyone in the public. The goal is to keep people from smoking and thus reduce considerably the development of adverse health effects such as cancer.

Secondary intervention is implemented to minimize the severity of illness or injury once risk or illness is identified. For example, for those people who still smoke despite the primary intervention efforts, secondary intervention may consist of programs such as smoking cessation classes to assist these at-risk persons in quitting smoking before illness arises. In addition, tests for the early detection of illness such as lung cancer are provided and early intervention procedures can then be implemented. These early treatment procedures tend to be less costly, less invasive, and require a shorter period of treatment due to the early detection.

Tertiary intervention is implemented to minimize the effects of an identified disability or illness by providing medical care and rehabilitation services. As the most intensive level of the three-tiered approach, tertiary intervention is only required for those persons who develop severe illness or disability despite the efforts of primary and secondary intervention. Due to the severity of the illness, a more intense treatment plan, often with a higher level of resources, is needed to treat the illness. However, if primary

and secondary intervention programs are effective, fewer individuals require the most extensive tertiary interventions. As a result, the rationale from a public health perspective is that the three-tiered system leads to overall better public health, increased productivity, as well as lower public costs for treatment of illness.

Applying a preventative model that uses a framework similar to the public health approach has been used in both the behavioral area as well as in reading to conceptualize prevention and early intervention for individuals with behavior or reading difficulties. Similar to the field of public health, poor academic performance and behavior problems are of great concern to the public at large and are prognostic of overall low quality of life. The fastest growing jobs in the United States require education beyond high school (Meeder, 2003). Students who acquire less education than a bachelor's degree are at greater risk for unemployment, overall low income, and even poor health (National Center of Education Statistics, 2005). Reading and appropriate behavior are essential for success in school, opportunity for higher education, and life success.

The goal of a preventative education model is to assure effective instruction and lower the number of students who develop severe academic difficulties. Forness (2005, p. 323) describes it this way, "Our field has, however, begun to reconceptualize its interventions for children with emotional or behavioral disorders in terms of primary, secondary, and tertiary prevention and thus brought special education research into a more comprehensive and potentially more effective public health model". Aligned with this view, the National Joint Committee on Learning Disabilities (2005) and the National

Association of State Directors of Special Education (2005) have recommended a three-tiered model for implementing a response to intervention (RtI) approach.

*Behavioral area*

For example, in the behavioral area this multi-tiered intervention can be found in the School-wide Positive Behavior Support model (Sugai & Horner, 2002). This model identifies school-wide and class-wide systems for all students as a primary intervention to prevent behavior difficulties from occurring. A school-wide plan (i.e., primary intervention) is designed to prevent behavior problems using knowledge of effective behavior techniques that are used by all school personnel.

The primary level of intervention in the application of a three-tier model for preventing behavior problems includes defining behavioral expectations for all students, teaching the expected behaviors to students, procedures for encouraging the expected behaviors and preventing problem behavior, and monitoring student progress and implementation efforts (Sugai & Horner, 2002). Despite the effective implementation of primary behavioral interventions, it is likely that some students will still exhibit behavior difficulties and require more support. These students may receive secondary targeted group or individual interventions. These interventions are implemented based on functional assessments of student behavior. Examples of secondary interventions include social skills clubs and simple student behavior reinforcement plans. The additional support and behavior intervention provided at the secondary level allow more students to

get on track with appropriate behavior and as a result these students may never develop severe behavior problems.

Tertiary intervention is provided for those students who develop severe behavior problems despite implementation of primary and secondary interventions. In other words, these are the students who need more intensive support. As a result, specialized, individualized support systems are designed by collaborative school teams in order to meet these students' individual needs.

### *Reading and learning disabilities*

How can a multi-tier approach be applied to instruction? Perhaps the academic area in which there is the most research on the application of a multi-tiered approach is reading (Dickson & Bursuck, 1999; Kamps & Greenwood, 2005; McMaster, Fuchs, Fuchs, & Compton, 2005; O'Connor, 2000; O'Connor, Fulmer, Harty, & Bell, 2005; O'Connor, Harty, & Fulmer, 2005; Vaughn, Linan-Thompson, & Hickman, 2003). Until recently schools have been reluctant to identify and provide interventions for all but the most severe cases of reading disabilities in the early grades (McCardle, Scarborough, & Catts, 2001). Within the last few years, researchers have viewed interventions in terms of increasing intensity through reducing group size, increasing time, and or situating the instruction so that it is even more carefully tailored to the instructional needs of the learner (Fletcher, Denton, Fuchs, & Vaughn, 2005; Vaughn & Linan-Thompson, 2003).

Multi-tiered instruction combines prevention and intervention through ongoing assessment and implementation of successive levels of support increasing in intensity and

specificity to assist students with behavioral and/or academic difficulties. Effective instructional practices are implemented and monitored class-wide in general education as a primary level of intervention. All students are screened for the presence of risk characteristics that predict a reading problem (e.g., inadequate knowledge of letter sounds) as early as Kindergarten. Students identified as at-risk or with an academic or behavioral deficit who do not respond adequately to primary intervention are provided successive levels of intervention as needed. These levels of intervention function as secondary or tertiary interventions.

To establish the rationale for a multi-tiered approach to preventing, remediating, and identifying students with reading/learning disabilities, we describe five dimensions that characterize different interventions, including: (a) screening and ongoing progress monitoring, (b) differentiating instruction through small group instruction or tutoring, (c) increasing the duration of the intervention, (d) targeting instruction to students' specific needs, and (e) the content of the instructional approach.

*Screening and ongoing progress monitoring.* Fundamental to the effective implementation of any prevention or remedial program is the use of screening measures to identify students at-risk and in need of further support. Screening is a rapid process of determining competency in the fundamental skills in reading with the sole purpose of identifying students at risk for reading difficulties. The essential feature of a good screening instrument is predictive validity so that students who require additional intervention can be identified (Kame'enui et al., 2002) and so that we are firm about

which students are *not* at risk (Foorman & Ciancio, 2005). Since interventions are expensive, it is essential that screening measures precisely target students most in need of supplemental reading practices and interventions (Speece, 2005). After students are identified as at-risk using screening measures, ongoing progress monitoring measures for students identified as at-risk are implemented frequently (every couple of weeks) so that the effectiveness of alternative or supplemental interventions can be documented. The use of school-wide screening with ongoing progress monitoring is critical to implementing a response-to-intervention (RtI) approach since screening and progress monitoring are the essential tools for determining who requires secondary intervention and then ultimately whether students' response to secondary intervention is sufficient or whether they require more intensive tertiary interventions.

*Instructional Group Size.* Class or school-wide primary interventions can be effective practices for supporting the reading instruction of a large percentage of students – as many as 90% with effective school-wide instruction in reading (Fletcher et al., 2005; Lyon, Fletcher, Fuchs, & Chhabra, 2006; Torgesen, 2000). Approaches to enhancing classroom instruction involve a) implementation of scientifically-based comprehensive reading programs with professional development of teachers and enhanced assessment (e.g., Simmons, Kuykendall, King, Cornachione, & Kameenui, 2000; Vaughn & Chard, in press) and b) peer tutoring programs, such as Peer Assisted Learning Strategies (PALS; Fuchs, Fuchs, & Burish, 2000), in which better readers are paired with less able readers for peer tutoring usually 30 minutes daily for 3-5 times per day.

Despite the overall effectiveness of the school and class-wide efforts (often reducing reading difficulties to below 10 %), some students will require additional instruction to either prevent or remediate reading difficulties (Denton & Mathes, 2003; O'Connor, 2000; Torgesen, 2000). For these students, additional instruction typically involves small group or individual support. We know that interventions provided to students with reading difficulties in large groups (more than 8 in a group) are unlikely to be associated with improved outcomes (Elbaum, Vaughn, Hughes, & Moody, 1999, 2000; Foorman & Torgesen, 2001; Swanson, Hoskyn, & Lee, 1999; Torgesen, 2004). Thus, small groups or individual tutoring are often provided to accelerate students learning so that the school and class-wide efforts are profitable. Even with more extensive interventions (Tiers 2 and 3) the numbers of students identified for special education are unlikely to decrease (O'Connor, 2000) and some students who have received individual or very small group intensive interventions have not sufficiently closed the gap between their reading performance and expected reading performance (McMaster et al., 2005; Vaughn et al., 2003). Consistent findings suggest that there are students whose response to reading interventions is low despite highly focused instruction from well-trained adults and often provided in one-on-one instruction or very small groups (Mathes et al., 2005; McMaster et al., 2005; Torgesen, 2004; Vaughn & Linan-Thompson, 2003). These findings leave open the possibility that “we may be seriously overestimating the effects of our short-term interventions on the long-term trajectory of reading growth” (O'Connor, p. 53).

*Duration of the intervention.* Another element of instruction that is likely to influence the effectiveness of the intervention is the duration or time allocated to providing the intervention. The time of the intervention can be spread over years (Blachman, Tangel, Ball, Black, & McGraw, 1999; O'Connor, Fulmer, et al., 2005; O'Connor, Harty, et al., 2005), months (Blachman et al., 2004; Lovett et al., 1994) or weeks (Denton, Fletcher, Anthony, & Francis, in press; Torgesen et al., 2001) with the greatest gains realized early in the implementation of the intervention. Duration is also related to the amount of time allocated each day to provide the intervention.

The group size and amount of time allocated to the intervention determine the intensity of the intervention and are related to the outcomes. For example, Iversen, Tunmer and Chapman (2005) report that when one-on-one tutoring was compared with one-on-two (one teacher and two students) using a modified Reading Recovery format (adding explicit training in phonological awareness and orthographic analogies), results were the same for one-on-one instruction and one-on-two instruction. However, the intervention time increased from 33 minutes per day to 42 minutes per day. Thus, twice as many students were provided effective intervention by minimally increasing the time allocated for intervention.

*Targeting instruction.* We think of targeting instruction as the application of systematic and explicit instruction matched to the instructional needs of students with consideration of those skills that are the highest priority. Critical to the success of

targeted instruction is scaffolding instruction that provides increasingly more difficult instruction with many opportunities for success.

Since the 1970's research has documented the links between explicit instruction and academic achievement for students from low-income families (Brophy & Evertson, 1978). This finding has been supported in research examining effective early reading practices for high risk students. In research conducted by Foorman and colleagues (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998), the effects of several class-wide instructional approaches were examined in Title 1 classrooms. These approaches were: (a) direct instruction in controlled vocabulary texts, (b) less direct instruction in trade books, and (c) implicit instruction while reading trade books. The end of year scores for the group of students receiving direct instruction in word reading were significantly higher than for the implicit instruction with trade books. The direct instruction with controlled text approach served to normalize the group of below average readers. Juel and Minden-Cupp (2000) reported similar findings with first-grade students with reading difficulties who fared better in classrooms where phonics was directly taught and practiced in controlled texts than when trade books were employed.

“Specifically, instruction for children who have difficulties learning to read must be more explicit and comprehensive, more intensive, and more supportive than the instruction required by the majority of children” (Foorman & Torgesen, 2001, p.206). Explicit and systematic instruction is associated with improved outcomes for at risk learners who are native English speakers (Blachman, Ball, Black, & Tangel, 2000; Hatcher, Hulme, &

Ellis, 1994; Vellutino et al., 1996) as well as those who are not (Gunn, Smokowski, Biglar, Black, & Blair, 2005; Quiroga, Lemos-Britton, Mostafapour, Abbott, & Berninger, 2002; Vaughn, Mathes, et al., in press; Vaughn, Linan-Thompson, et al., in press).

Targeting instruction also refers to prioritizing the instruction most needed for students at risk for reading problems. Coyne and colleagues (Coyne, Kame'enui, & Simmons, 2001, p. 69) refer to this as “drawing a line in the sand and mapping backwards”. Thus, school personnel have clearly articulated goals for students and realize that to reach these goals critical benchmarks along the way need to be reached. For example, while reading comprehension is unquestionably the reading goal for all students – whether they are at risk for reading difficulties or not – the instruction targeted for at risk students may not be reading comprehension strategies if students are unable to read words. In the very beginning stages of reading acquisition, students with reading difficulties will require extensive and explicit instruction on applying the alphabetic principle (mapping sounds of language to print) through decoding and encoding (Brown & Felton, 1990; Torgesen, et al., 1999). Thus, the target of their instruction would be application of the alphabetic principle and word reading.

Scaffolding students' instruction refers to the thoughtful and responsive sequencing of instruction so that students have ample opportunities to succeed and yet new learning is always occurring. Fundamental to instruction that is scaffolded effectively is the interaction between the teacher and the learner that involves

questioning, responding, supporting (cognitively and motivationally), and extending new learning. Similarly, methods that involve student reading of a wide range of materials are more effective when the materials are scaffolded to the reading level of the student, than when students simply read silently for extended periods (Stahl, 2004). These practices are particularly necessary for students at risk for reading difficulties/disabilities.

*Content of the instructional approach.* Recently, reading researchers have agreed that the previous debates about the appropriate content of reading instruction have often consisted of simplistic interpretations of whether phonics or whole language were superior. Consensus reports of summaries of research on effective reading instruction and effective practices for teaching students with reading difficulties/disabilities concur that learning to read requires explicit instruction in components of reading involving decoding words effectively, fluency, and comprehension (Biancarosa & Snow, 2004; National Reading Panel, 2000; RAND Reading Study Group, 2002; Snow, Burns, & Griffith, 1998; Donovan & Cross, 2002; Swanson, et al., 1999; Vaughn, Gersten, & Chard, 2000). For example, the National Research Council Report, *Preventing Reading Difficulties in Young Children* (Snow et al.), reported that for students to become successful in reading, teachers must *integrate* instruction involving the alphabetic principal (word recognition), teaching for meaning (comprehension), and opportunities to read (fluency). Five essential components for learning to read were identified by the National Reading Panel: phonemic awareness, phonics, fluency, comprehension, and vocabulary.

Research on students identified with learning disabilities reveals that the most effective instruction uses a combination of explicit and strategic instruction in both word recognition and reading comprehension strategies, with scaffolded instruction that provides modeling and feedback to promote internalization and use of the practice through active engagement to build sight word vocabulary and fluency (Foorman & Torgesen, 2001; Swanson, 1999). The message from all these syntheses is that successful reading programs help teachers integrate instruction that involves different domains of reading – prioritizing those domains most essential in the development of proficient reading. Thus, even students with severe word recognition problems need to have opportunities to access print, almost from the beginning of reading intervention, and reading must be taught with a goal of understanding, learning from, and appreciating different text-types. Denton, Vaughn, and Fletcher (2003) summarize the multiple syntheses on reading difficulties and identify these features as essential to enhance reading development of all students: (a) a teacher who has both content and procedural knowledge, (b) integration of key instructional elements with emphasis on those elements that are most appropriate developmentally, (c) differentiated instruction particularly for students with special needs, (d) explicit and systematic instruction, and (e) making connections between research knowledge and practice.

In examining the instructional content of more recent reading intervention studies, successful interventions combine instruction across multiple domains (e.g., integrating word reading with reading for meaning) in different ways. Programs vary considerably

in the amount of instructional time devoted to sublexical word recognition skills. For example, Wise, Ring, and Olson (2000) found that a computer-based program that primarily corrected errors was as effective as intervention with a program providing extensive attention to the sublexical component of word recognition. Similarly, another remedial study found relatively little difference between an intense sublexical program and an intervention that provided about 20% explicit instruction in alphabetic principle and 50% time reading and writing connected text (Torgesen et al., 2001). Mathes and colleagues (2005) compared a program that integrated instruction in the alphabetic principal, comprehension, and fluency, including use of highly decodable text in a scripted scope and sequence with a program based on guided reading principles that included explicit instruction in the alphabetic principle, but also emphasized reading and writing of connected text. There were no major differences on the effects of these programs on students' outcomes in reading.

These studies provide evidence that effective reading instructional programs must integrate explicit instruction in word recognition, fluency, and comprehension. Programs may vary in how they do this, and in how intensely they teach different components of word recognition, fluency, and comprehension. But it is the integration of these components that appears to be critical. We believe that there is now compelling evidence that there is no one component of reading instruction that in isolation will yield superior results (e.g., either phonics only instruction or literature only). Rather, the issue is how to

integrate components of learning to read so that the individual needs of students can be met.

The group for whom we are least confident about the content and ways of integrating instruction are those students who have failed to respond adequately to typically effective interventions (McMaster et al., 2005; O'Connor, Harty, et al., 2005; Vaughn et al., 2003). For example, after 30 weeks of small group supplemental reading instruction for at risk students, Vaughn and colleagues found that almost 25% of these at risk students were responding at a minimal rate to the intervention. Relatedly, McMaster and colleagues did not report statistically significant findings for students identified as “nonresponding” to a class-wide intervention when they were subsequently provided peer tutoring or tutoring by an adult. O'Connor and colleagues followed students from kindergarten through 3<sup>rd</sup> grade reporting that even students who had participated in multiple tiers of intervention over years – even intensive interventions that provided very small group instruction for five days a week – yielded approximately 8% of students who were still significantly behind in reading.

#### *Initial Findings from a 3-Tier Framework in Reading*

We are in the process of implementing a K-3 reading framework of primary, secondary, and tertiary interventions in a large school district consisting of six elementary schools. The research project is a longitudinal design including treatment and comparison groups at each of the three tiers. Student progress over time is being analyzed using multiple reading and language assessments.

During the first year of the study, we began with assessment of a historical control group. We assessed this cohort of students beginning in kindergarten and followed them through third grade as they participated in the classroom instruction and interventions typically provided by the schools. We did not provide primary, secondary, or tertiary interventions to this group. During the second year of the study, implementation of the three-tiered intervention model began with the cohort of students who entered kindergarten the year after the historical control group. This group of students comprised our first treatment cohort of students (cohort 1). We are in the process of following this first treatment cohort of students through third grade while providing primary, secondary, and tertiary intervention as they progress through each grade. Similarly during the third year of the study, we intervened with a second cohort of students beginning in kindergarten (cohort 2). Again, we are in the process of providing intervention for these students as they progress through the grades.

As students move from one grade to the next, teachers at each successive grade level participate in the primary intervention. With regard to students, the focus is on growth in reading. With regard to teachers, the focus is on improved teaching skills and on perceptions concerning barriers and facilitators related to school-wide implementation of the model.

Students who do not make adequate progress in the primary intervention (core classroom instruction) qualify for secondary intervention. For this research project, the students qualifying for secondary intervention are randomly assigned to receive either a

research-implemented secondary intervention or school-implemented services. Thus, a treatment and comparison group of at-risk readers is utilized for examining effects of secondary intervention. Each classroom teacher has students in the secondary intervention treatment and comparison group to control for teacher effects.

Students who do not make adequate progress in secondary intervention are provided a more intensive tertiary intervention. The students qualifying for tertiary intervention continue in their assigned treatment or comparison group allowing for examination of effects over time. At each level of the three-tiered model individual characteristics, background, school experiences, and outcomes of students who do, and do not, make adequate progress in response to intervention are documented.

We currently have complete data for all three cohorts, historical control, treatment cohort I, and treatment cohort II related to primary intervention through their first grade year. In addition we have complete data for secondary and tertiary intervention students for cohort I through second grade. Below is a summary of preliminary findings for these cohorts of students. Complete data analysis is in process and will be published in full at a later date.

*Primary Intervention.* Primary intervention consisted of two elements: on going professional development for teachers (approximately 27 hours each year) and application of progress monitoring practices for all students three times per year and six to eight times per year for students at risk for reading problems. The first treatment year the kindergarten teachers participated in primary intervention (when cohort I was in

kindergarten). The second treatment year the first grade teachers participated in primary intervention and the kindergarten teachers continued to implement primary intervention (when cohort II was in kindergarten).

Each year we provided professional development in a variety of formats including workshops, in-class support, and grade level meetings. All of the teachers attended 1-2 full day introductory sessions during the summer and five 3-hour after school workshops each year (for 2 years total). The topics related to high priority grade level specific outcomes including phonics and word recognition, differentiated instruction, vocabulary, comprehension, and the use of data to make instructional decisions. These workshop sessions were followed by in-class support (e.g., demonstration lessons of specific reading content and/or features of effective instruction, assistance with implementing specific content, grouping, or features of effective instruction, assistance with planning and implementation of progress monitoring, and recommendations of resources to supplement instruction) and grade level meetings to discuss data, instruction for at-risk students, and instructional questions. During the initial year in-class support was provided approximately twice a month for 30 minutes each session; however support was differentiated according to teacher need. During the follow-up year (the second year we worked with teachers at a specific grade level), in-class support was decreased to approximately once a month or less and most information was shared/discussed at monthly grade level meetings. Teachers used data collected three times per year on all students and also monitored the progress of at-risk students throughout the school year.

We were particularly interested in the effect of primary intervention on the outcomes for at-risk students. Students were identified as at-risk in winter of kindergarten if they were below grade level expectations on pre-reading measures of phonemic awareness and letter knowledge. To examine the effects of primary intervention only, we analyzed the data from at-risk students who were assigned to a comparison group and did not receive the research-implemented secondary or tertiary intervention. We then followed the students' progress through the end of first grade as their kindergarten teachers and first grade teachers received professional development and began monitoring the progress of the students in their classes.

Preliminary data indicate no significant differences between the historical control, cohort 1, and cohort 2 groups at the end of first grade on word identification measures. Word attack measures revealed significant differences between cohort 2 and the historical control group and between cohort 2 and cohort 1. There were also significant differences found between the historical control and cohort 2 on end of first grade passage comprehension measures. In addition we found a decrease in the number of at-risk students over time as teachers implemented primary intervention. The at-risk students identified achieved higher levels of reading each year. As a result, primary intervention appears to have reduced the incidence of reading difficulties in this school district.

*Secondary Intervention.* In addition to providing primary intervention to all students, secondary intervention was provided to students identified as at-risk for reading difficulties. Students were assessed in fall of first grade and the winter of first grade and

identified at each time point as at-risk or on track in reading development. Once identified as at-risk, students were randomly assigned to either a treatment or a comparison group, provided secondary intervention when at risk status was identified (fall only, spring only, or fall and spring), and followed through the end of second grade.

The students randomly assigned to the treatment group received secondary intervention from the research team. The intervention included daily 30-minute sessions provided in instructional groups of 4-6 students. Students received instruction in phonics and word recognition, fluency, text reading and comprehension with weekly progress monitoring used to make instructional decisions. The students randomly assigned to the comparison group continued to receive typical school services.

Preliminary results indicate that secondary intervention was sufficient for many of the students to get on track as readers and they did not qualify for further intervention after first grade. We examined the sample of students who were identified as at-risk during first grade and followed the students through the end of second grade. Of the students who participated in the treatment group, there were 27 students who exited from secondary intervention and did not require further intervention. These 27 students represented 61.4% of the sample assigned to the treatment group. Twenty-five students who participated in the comparison group and received typical school services were able to exit from intervention and did not require further intervention (50% of the sample assigned to the comparison students). The total number of students in the treatment and comparison groups on track with reading after first grade risk identification was 52

students and represented 15.3% of the total number of students in the cohort. It is important to note that treatment and comparison students differed only with respect to secondary intervention – all students participated in primary intervention. We examined the data for students exiting secondary intervention by the end of first grade in the treatment and comparison groups. Overall, the first-grade treatment group achieved higher levels of reading after receiving secondary intervention and these gains continued through the end of second grade.

*Tertiary Intervention.* Students in the treatment condition who did not respond sufficiently to secondary intervention by the end of first grade were provided tertiary intervention in second grade. For 7 students in the treatment group and 15 students in the comparison group tertiary intervention was provided after insufficient response to a secondary intervention was provided in both the fall and spring of first grade. These students were the lowest students in secondary intervention demonstrating at-risk status continuously through first and second grade. This tertiary subsample represented 15.9% of the original at-risk treatment sample and 30% of the original at-risk comparison sample. These 22 students qualifying for intervention throughout first and second grade (treatment or comparison group) represented 6.6% of the total number of students in their grade level cohort. There were also 10 students in the treatment group and 10 students in the comparison group that qualified for tertiary intervention in second grade after receiving one dose of secondary intervention in first grade. These 20 students represented an additional 6% of the total number of students in the grade level cohort.

Students in the treatment group received 50-minute intervention sessions daily in addition to continued primary intervention. The students were instructed in groups of 2-4 for approximately 13 weeks in the fall and 13 weeks in the spring. Students received explicit instruction in advanced word study, vocabulary, application of word study and vocabulary to text reading, fluency, and comprehension. Students in the comparison group continued to receive typical school services.

Examining the data for students consistently qualifying for intervention through first and second grade, the treatment students (n=7) were reading an average of 46.57 words per minute (median=48) after one year of tertiary intervention while the students in the comparison group (n=15) achieved an average of 29.47 words per minute (median = 25). However, there were no students in either the comparison or treatment group that achieved grade level expectations in oral reading fluency. These students may need sustained intensive interventions in order to continue making progress.

#### *Summary*

There are no “silver bullets” for effectively teaching all students to read. Approaches to enhancing reading success have been well-developed and documented including tutoring approaches (Torgesen et al., 1999; Vellutino et al., 1996; Wasik & Slavin, 1993), using peer partners in learning (Fuchs et al., 2000; Greenwood, Delquadri, & Hall, 1989), and interventions that involve small group instruction from group sizes of two (Iversen et al., 2005) to larger groups of 3-5 students (Rashotte, MacPhee, & Torgesen, 2003; Mathes et al., 2003). Engaging students in active responding often through small groups or pairs with a focus on higher level comprehension questions is

associated with improved outcomes (Taylor, Pearson, Peterson, & Rodriguez, 2003). All research-based approaches regardless of intensity yield a small percentage of students whose response to instruction is less than expected. In fact, students' response to intervention may be the most valuable information for identifying students with significant reading disabilities. Vellutino, Scanlon, and Jaccard (2003, p.117) examined follow-up data on first grade students identified as at risk and provided tutoring. They confirm "that there are small but significant numbers of children who will require intensive and individualized remedial assistance for a period of time beyond that provided by the intervention project in order for them to become functionally independent readers."

We contend that the students whose response to interventions is very low are the students for whom special education is most suited. While numbers vary in research studies from 1.5% to 8% depending upon the age of students and the criteria for response to intervention (e.g., Mathes et al., 2005; McMaster et al., 2005; O'Connor, Fulmer, et al., 2005; O'Connor, Harty, et al., 2005; Vaughn et al., 2003), these are precisely the students for whom additional research on effective interventions is most needed and for whom we have the fewest examples of effective practice (Reschly, 2005). In the spring of 2006, several LD Centers will be funded by National Institute for Child Health and Human Development to address research issues related to RtI and students who are minimal responders.

A major need is the development of effective interventions for students who do not respond adequately to primary and secondary level interventions. Such students have rarely been specifically isolated, but can only be identified through a multi-tiered

framework in when they emerge as a small subset of inadequate responders. In addition, using multiple layers or tiers of interventions provides a framework for integrating best practices in reading instruction including screening and progress monitoring, differentiating instruction through grouping and tutoring, targeting appropriate instructional needs, and integrating reading content so that students are provided early and effective interventions and students requiring more sustained and intensive interventions can be identified. Multiple tiers of instruction hold promise for: (a) identifying students at risk rather than by deficit, (b) identifying and treating students with LD early rather than waiting for more significant and often insurmountable learning problems, (c) reducing bias in the identification process, and (d) linking identification assessment with instructional planning and progress monitoring (Vaughn & Fuchs, 2003). O'Connor's work (O'Connor, Fulmer, et al., 2005; O'Connor, Harty, et al., 2005) exemplifies the positive outcomes afforded when multiple layers of effective interventions are provided to students over time. Students who are typical achievers benefit, as do students who are struggling. Even students identified as having a learning disability had near average standard scores on word attack and comprehension compared with controls (also identified as having learning disabilities) whose scores were more than 1 standard deviation below the average.

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