

Three-Tier Intervention Research Studies: Descriptions of Two Related Projects

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Funded in October of 2001, but formally initiated in January of 2002, the Office of Special Education Programs (OSEP) launched a systematic and coordinated investigation into the effectiveness of multiple tiers of intervention on reading and behavior outcomes for students at-risk and with disabilities in kindergarten through 3rd grade. OSEP funded six projects and one coordinating center to assure that data collection, organization, and reporting would provide maximum influence and coherence on the effectiveness of tiered intervention models as a means of preventing or reducing reading and behavior difficulties and providing insight into the effectiveness of response to intervention (RTI) models for identifying students with learning and behavior problems.

Two projects were funded to examine behavioral interventions only (University of Oregon, Sugai and Horner; University of Nebraska, Nelson and Elliott), two projects were funded to examine both reading and behavioral interventions (University of North Carolina-Charlotte, Algozzine; University of Kansas, Kamps & Greenwood), and two projects were funded to examine reading interventions only (University of Oregon, Kame'enui, Chard, and Harn; University of Texas, Vaughn and Linan-Thompson). This paper will provide a brief overview of the two projects that are addressing tiered interventions for preventing reading difficulties and disabilities.

The University of Texas and University of Oregon Prevention/Intervention Projects

Overview. Both projects (University of Texas/University of Oregon) have implemented prevention-oriented, school-wide approaches to improving early reading performance for *all* students. Primary prevention occurs at a systems level to *reduce the number of new cases (incidence) of a potential problem* (e.g., reading difficulties, learning disabilities, reading disabilities) in the population. In contrast, secondary intervention is concerned with reducing *the number of existing cases (prevalence) of an already identified condition or problem*. Secondary prevention “involves the promotion of compensatory skills and behaviors. The extra effort is focused on children at higher risk of developing reading difficulties but before any serious, long-term deficit has emerged” (National Research Council, 1998, p. 16). Finally, tertiary intervention is concerned with *reducing the complications associated with an existing and identified problem or condition*.

Primary prevention, is based on research and development efforts over the past several years to scale up, implement, and document *school-wide systemic strategies and processes for effectively reforming a school's efforts to prevent reading difficulties for all readers* (Simmons et al., 2001; Good, Simmons, & Kame'enui, 2001). Primary prevention designed to “prevent” children from becoming at risk for reading problems should accommodate approximately 80% of the K-3 students enrolled. The comprehensive reading programs, instructional strategies, standard time allocations, and delivery features of the school represent the primary prevention investments by the K-3 teachers, paraprofessionals, parents, and administrators. Primary prevention also involves

school-wide, formative assessments of critical pre-reading and reading skills. This assessment, administered three times per year, provides educators timely information on the reading performance of all students and evidence of the effectiveness of the comprehensive instructional program.

Secondary intervention involves programs, strategies, and practices designed and employed to *supplement, enhance, and support* primary prevention for those students identified with marked reading difficulties. Secondary intervention is designed to both enhance and stabilize the primary prevention efforts and to prevent the need for tertiary intervention. Secondary intervention typically accommodates approximately 15% of the school population, specifically the K-3 students who are not benefiting adequately from primary prevention.

Tertiary intervention consists of reading instruction that is *specifically designed and customized* for students who continue to have marked difficulties in reading or reading disabilities, despite primary prevention and secondary intervention efforts. Tertiary intervention is typically reserved for 5% of the K-3 students (Simmons, et. al., 2000); (Torgeson, 2000). Tertiary intervention is customized to the individual reading and literacy needs of each student.

Layered interventions or tiered models are based on the premise that students who struggle with reading need additional supports and that the further behind students are, or the more difficulties they have, the more intensive an extensive these supports need to be (O'Connor, 2000). The first tier of intervention, primary intervention, is designed to address the majority of students' needs. The essential features of the primary intervention include: (a) a comprehensive reading program based on scientific reading research, (b) screening of all students to determine instructional needs at least three times per year (these typically occur in the fall, winter, and spring), and (c) ongoing professional development to provide teachers with the necessary tools to ensure every student is likely to succeed or if struggling, will be identified early and provided the necessary additional instruction. The second tier, secondary intervention, is designed for those students who are initially at risk and for whom a specified intervention in addition to the comprehensive reading program is required. Students who require secondary intervention are identified two ways: (a) they are students who are identified as “newly at risk” based on screening or (b) they are students whose response to intervention is promising and the team has decided to maintain their progress in secondary intervention. The secondary intervention may be provided by the classroom teacher, a specialized reading teacher, or an interventionist trained to provide the secondary (Tier II) intervention. The secondary intervention, in addition to the comprehensive reading program, may vary in time to meet students' needs but is often from 15-30 minutes per day and often is provided in group sizes of one to six. The third tier tertiary intervention is designed for those students who are: (a) very significantly behind and require extensive and intensive intervention, (b) students for whom the secondary intervention was insufficient (low responders to intervention), or (c) students with severe reading disabilities or dyslexia. Table 1 provides an overview of primary, secondary, and tertiary instruction.

Table 1. Primary (Tier I), Secondary (Tier II), and Tertiary (Tier III) instruction.

	Primary Intervention (Tier I)	Secondary Intervention (Tier II)	Tertiary Intervention (Tier III)
Definition	The “comprehensive” curricular and instructional reading programs and strategies in the general education setting, including ongoing professional development and assessment three times per year to determine whether students are meeting benchmarks.	Programs, strategies, and procedures designed and employed to enhance and support Primary intervention.	Specifically designed and customized reading instruction that is extended beyond the time allocated for Primary intervention - may require extensive and ongoing intervention.
Focus	For all students in K through 3	For students identified at risk for reading difficulties and who have not responded to Primary instruction.	For students with marked difficulties in reading or reading disabilities and who have not responded adequately to Primary or Secondary intervention.
Program	Scientifically based reading instruction and curriculum emphasizing the essential components of beginning reading.	Specialized, scientifically based reading instruction emphasizing the essential components of beginning reading. <ul style="list-style-type: none"> • Additional attention, focus, and support. • Additional opportunities to practice embedded throughout the school day. 	Sustained, intensive, scientifically based reading instruction emphasizing the essential components of beginning reading. <ul style="list-style-type: none"> • Carefully designed and implemented, explicit, systematic instruction. • Fidelity of implementation carefully maintained.
Instruction	Many opportunities to practice embedded throughout the school day.	<ul style="list-style-type: none"> • Pre-teach and review skills; frequent opportunities to practice skills. 	

Table 1. Primary (Tier I), Secondary (Tier II), and Tertiary (Tier III) instruction.

	Primary Intervention (Tier I)	Secondary Intervention (Tier II)	Tertiary Intervention (Tier III)
Interventionist	General education teacher	Intervention provided by personnel determined by the school.	Intensive intervention provided by personnel determined by the school.
Setting	General education classroom.	Appropriate setting designated by the school.	Appropriate setting designated by the school.
Grouping	Grouping appropriate for implementing comprehensive program effectively.	Homogeneous small group instruction (e.g., 1:1 to 1:6)	Homogeneous very small group instruction (e.g., 1:1 to 1:4)
Time	Minimum of 90 minutes per day	Minimum of 20 minutes per day (Time adjusted based on students' needs)	Intensive intervention requires extensive time based on students' needs
Assessment	Screening three times a year.	Progress monitoring twice a month on target skill to ensure adequate progress and learning.	Progress monitoring twice a month on target skill to ensure adequate progress and learning.

What Type of Professional Development Was Provided to Teachers as Part of Primary Intervention?

Professional development activities were conducted at the grade level with those high impact activities and the practices associated with improved outcomes for students as the target. For example, the professional development for kindergarten teachers focused on letters and sounds, alphabetic principle, and initial sound blending and word reading. In all grade levels we addressed the importance of vocabulary and comprehension - however in kindergarten we addressed listening comprehension through expository and narrative text and in 2nd and 3rd grad we addressed independent use of comprehension strategies to promote understanding and learning from text. All teachers at each grade level across all elementary schools in the district (approximately 55 teachers per grade level)(and all principals participated collectively in approximately 27 hours of professional development each year for two years. The topics covered in the professional development sessions included effective features of instruction, progress monitoring, reading comprehension instruction, partner read king, the use of progress monitoring data to make instructional decisions, targeting instruction in small groups, vocabulary instruction, and phonics in early grades and advanced word study instruction in older grades. In addition to the professional development sessions, limited in-class caching (approximately two times per month) was provided as a follow-up by the research team

to assist teachers in the implementation of strategies provided during the professional development sessions.

Study Design-University of Texas. The University of Texas research project employs a longitudinal design including treatment and control groups at each of the three tiers. The primary intervention involves a treatment and historical control condition. The secondary and tertiary interventions are experimental students with random assignment to treatment and comparison conditions. Student progress over time is analyzed using multiple assessments individually administered by our research team. During the first year of the study, a historical control group was identified and assessed. Teachers at each of the participating schools were not provided professional development nor were any of their students provided supplemental instruction by the research team. The historical control group has been followed through the end of the third grade. During the second year of the study, implementation of the tertiary intervention model began with the primary intervention provided to all kindergarten teachers and the secondary intervention provided to a randomly selected group of at risk kindergarten students. Each subsequent year we are working with the next grade level so that during the 2005-2006 year we will be working with 34d grade teachers and their students. As students move from one grade to the next, teachers at each successive grade level participate in the ongoing professional development program and students continue to be provided primary and secondary intervention (grades K and 1st) and then primary and tertiary intervention (grades 2nd and 3rd). Students receive secondary or tertiary intervention based on their lack of adequate progress in reading.

The UT research project began with the goal of examining a model of a school-wide program incorporating best practices in all the critical areas of effective instruction including: (a) effective reading instruction for all students, (b) professional development, (c) early identification of students at risk for reading problems, (d) effective interventions for students at risk, (e) the deployment of resources to sustain the program, and (f) the involvement of parents and families. the UT project is designed not only to demonstrate the feasibility and effectiveness of the increasingly intensive layers of intervention, but also to address a number of critical research questions, including the following:

- What percentage of K-3 students in the treatment and control groups compared to the historical control, are identified as at-risk?
- Are K-3 students in the treatment and control groups comparable to students in the historical control with respect to ethnicity, SES, ELL, and other demographic variables?
- What percentage of at-risk K-3 students fail to meet the end-of-year benchmarks after receiving secondary intervention? Tertiary intervention? Typical School Services?
- Is response to intervention (RTI) a feasible practice to implement in schools and does it assist in referral and placement in special education?

Thus far, we have implemented primary intervention with kindergarten, first-grade, and second-grade teachers and students and collected data to determine the effects on

teachers' practices and students' outcomes. We have also implemented secondary intervention for two cohorts of at-risk students during their first grade year and are currently involved in tertiary intervention implementation with both cohorts of students. We have collected data to determine the effects of these interventions and student response to each level of intervention.

Initial comparisons between the historical control group and kindergarten and first-grade students participating in intervention indicates that, overall, students participating in primary intervention demonstrated improved reading outcomes when compared with students in the historical control group, and the number of students needing secondary intervention has decreased. Implementation of secondary intervention for kindergarten and first-grade at-risk readers improves student reading outcomes over time and allows most students to exit intervention (all but about 5%). The results indicate that increasingly intensive layers of intervention hold promise as a means of reducing the number of students at risk for reading difficulties and increasing the likelihood that students who demonstrate persistent difficulties are being appropriately identified for further interventions. Our data also suggests that we can identify students as early as January of first-grade, based on response to intervention, who are not adequate responders. Our intention is to further examine progress as students move into higher grades. We are also interested in how students perform on an end of third grade group administered reading comprehension measure, the SAT-10.

How do we identify response to intervention? In most cases, response to an intervention is defined based on meeting a specific criteria and/or a students' slope of progress (Fuchs, Fuchs, McMaster, & Al Otaiba, 2003). A student who meets criteria for being an on-level reader has responded to the intervention. Additionally, educators may consider a student's slope of progress in determining response. A student demonstrating a slope of progress that is steep enough to indicate the student will meet on-level criteria may be considered a "responder". The student then continues in the intervention until on-track status is achieved. Frequent monitoring of progress is needed to be certain the slope of progress continues to indicate the student will reach on-track status. Alternatively, if a student's slope of progress is not steep enough to indicate they will be on-level readers, that student may be considered a "non responder". Changes in the instructional program or a more intensive intervention may be required for this student.

Study Design of the CIRCUITS Model: University of Oregon

Project CIRCUITS employs a mixed methodology, including a longitudinal design as well as several experimental designs, to answer specific instructional questions. In Year 1, we studied the implementation of primary prevention in two fast growing school districts in the Pacific Northwest. our goal in Year 1 was to document instructional behaviors associated with primary prevention in schools that had been implementing a research-based comprehensive reading program to meet the majority of its students' needs in the general education classroom.

During the second year of the study, implementation of secondary and tertiary interventions began with first graders. In subsequent years we worked in the subsequent grade level so that during the 2005-2006 year we are working with 3rd grade students. Students receive secondary or tertiary intervention based on their lack of adequate progress in reading as measured by the DIBELS assessment system.

In addition to following a group of students across multiple grades to document the effectiveness of the CIRCUITS prevention model on at-risk readers, we have also designed experimental studies to answer the following questions:

- What are the instructional features of secondary and tertiary interventions that accelerate student reading development?
- Are there differential effects for students who receive secondary and tertiary comprehensive curriculum versus non-project interventions?
- What are the effects of using controlled text versus less controlled text on increasing the reading fluency of second grade students at risk for reading disabilities in secondary intervention?

As part of Project CIRCUITS we have implemented secondary and tertiary intervention and collected data to determine the effects on students' reading outcomes. Preliminary results suggest that across the grades, students identified as at-risk for reading difficulties need sustained support to improve reading outcomes over time. With this sustained support, however, most students were able to achieve at or near grade level on measures of reading fluency. Our data also seem to suggest that CIRCUITS interventions in first and second grade that were closely aligned with primary prevention and responsive to student growth resulted in greater gains in reading fluency than comparison interventions. These results suggest that the CIRCUITS model may be an effective system to reduce the number of students who experience reading difficulties in the primary grades.

Currently, we are working on secondary and tertiary interventions for third graders that focus on teaching vocabulary and comprehension skills and strategies while continuing to build reading fluency in connected texts. Additionally, we are examining the differences between secondary vocabulary and comprehension interventions that are designed by commercial textbook publishers and interventions that are designed to more closely mirror the comprehensive instructional components. We anticipate that the results of this study will help schools make decisions about the nature of effective vocabulary and comprehension interventions for at-risk readers.

Common Features of the Models

Both the University of Texas and the University of Oregon intervention models are designed to prevent reading difficulties by implementing strong comprehensive reading instruction in general education classrooms in the primary grades. Both models also focus on using a system of assessments for determining which students need additional support beyond the comprehensive instruction. Finally, both models are designed to provide high quality reading interventions focused on the key knowledge and skills associated with

successful reading development in the primary grades. Schools interested in implementing one of these models should consider the following tips for implementation.

Tips for implementation:

1. Focus on improving the comprehensive classroom reading instruction (Primary) that all students receive.
2. Provide high-quality intervention (Secondary and Tertiary) for struggling readers.
3. Participate in ongoing professional development to enhance classroom implementation of research-based practices.

Further considerations for implementation are presented in Table 2.

Table 2. Planning Checklist for School-wide Implementation of Primary (Tier I), Secondary (Tier II), and Tertiary Interventions (Tier III)

Review current reading practices within the school.

Is the comprehensive reading program aligned with scientifically based reading research (SBRR)?

Are supplemental reading programs and materials aligned with the comprehensive reading program and SBRR?

Is the reading intervention program aligned with the comprehensive reading program and SBRR?

How are assessment data used to inform instructional decision-making?

Are teachers adequately trained in the comprehensive, supplemental, and intervention reading programs?

Are instructional practices aligned with the state standards?

Develop a data management system for collecting, reporting, and analyzing assessment data.

Develop a school-wide plan for improving Primary comprehensive reading instruction (i.e., assessment-driven differentiated instruction aligned with SBRR).

Is adequate time allocated for the comprehensive reading instruction? Is instructional time protected against disruption?

Does Primary instruction focus on the grade-appropriate essential reading components?

How will student progress be assessed three times per year?

Is a system established for Primary problem solving and decision making?

Is a plan for ongoing professional development in place? Is assessment used to inform professional development needs?

Develop a school-wide plan for Secondary intervention for struggling readers.

Who will provide Secondary intervention (e.g., classroom teacher or specialized reading teacher)?

Is additional time scheduled for Secondary intervention (e.g., during centers, before or after school)?

Where will Secondary intervention be delivered (e.g., within the general education classroom)?

Is a system in place for frequently monitoring progress of students in Secondary interventions (e.g., every two weeks)?

How will assessment data be used to group and regroup students (small same-ability groups; one-on-one tutoring), to plan targeted instruction, and to make adaptations to ensure students meet grade-level benchmarks/objectives?

Are criteria established for entry into and exit from Secondary interventions?

is a system established for problem solving and decision-making regarding selection and monitoring of secondary interventions?

Develop a school-wide plan for small group Tertiary intensive intervention for struggling readers with extreme reading difficulties (e.g., who do not make adequate progress in Primary and Secondary interventions).

Who will provide Tertiary intervention (e.g., specialized reading teacher or special education teacher)?

Where will Tertiary intervention be delivered (e.g., within or outside the general education classroom)?

Is additional instructional time for Tertiary intervention determined and scheduled?

Is the relationship of Tertiary intervention with 504 and special education services determined? Is a system established for Tertiary problem solving and decision-making?

How will assessment data be used to group and regroup students to plan targeted, more intensive instruction, and to make adaptor to ensure students meet grade-level benchmarks/objectives?

Are criteria established for entry into and exit from Tertiary interventions?

Is a system in place for frequently monitoring of student progress (e.g., every two weeks)?

Adapted from the University of Texas Center of Reading and Language Arts. (2003a). *3-tier reading model: Reducing reading difficulties for kindergarten through third grade studnets*. Austin: UT Systems/Texas Education Agency.

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