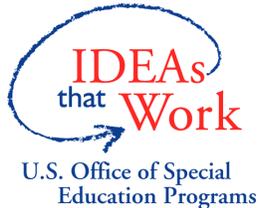




Responsiveness-to-Intervention Symposium

December 4-5, 2003 • Kansas City, Missouri

The National Research Center on Learning Disabilities, a collaborative project of staff at Vanderbilt University and the University of Kansas, sponsored this two-day symposium focusing on responsiveness-to-intervention (RTI) issues.



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Comments on Three Papers Addressing the Question: “How many tiers are needed within RTI to achieve acceptable prevention outcomes and to achieve acceptable patterns of LD identification?”

Doug Marston

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Comments on Three Papers Addressing the Question: “How many tiers are needed within RTI to achieve acceptable prevention outcomes and to achieve acceptable patterns of LD identification?”

I enjoyed reading the papers by Sharon Vaughn, Randi O'Connor and David Tilly and will try to synthesize their findings in this short commentary. The authors are to be commended for their work in addressing the concept of intervention tiers and eligibility for special education. While all three papers focus upon the impact of RTI, they do it in two distinct ways. In my mind, the articles by Vaughn and O'Connor are controlled research studies run as scientific experiments. They use random assignment of students, control groups, review treatment integrity and typically there are clear parameters for treatment variables related to duration of implementation. Tilly's article takes another route. It is a description of how the Problem Solving Model is implemented with almost a quarter of Iowa's student enrollment. His article about this impressive effort is similar to a program evaluation report one might see for any large scale project implementation. It includes large sample sizes for students and schools, and a considerable professional development component for over 130 schools. I think both approaches to research and evaluation are to be applauded and can be used to address the question, “How many tiers are needed within RTI to achieve acceptable prevention outcomes and to achieve acceptable patterns of LD identification?”

Let's first review the RTI models and the research/evaluation designs described in these papers.

“How Many Tiers Are Needed for Response to Intervention to Achieve Acceptable Prevention Outcomes” by Sharon Vaughn

Sharon Vaughn describes a three tier Response to Intervention approach to helping kindergarten through 3rd grade students in the area of literacy. Tier I is mostly core reading instruction provided by the classroom teacher to all general education students for approximately 90 minutes per day. The reading interventions are strongly tied to research-based practice in phonemic awareness, alphabetic understanding, fluency, vocabulary and comprehension. Monitoring of student performance is critical in Tier I and occurs three times per year. There is maximum effort to provide an ongoing, scientifically based professional development program to participating school staff.

Tier II for Vaughn's studies is supplemental to the core reading program. These sessions last about 30 minutes daily and progress is monitored twice per month. Recipients of this instruction are those students who have not responded to Tier I instruction and is determined by falling below documented early literacy benchmarks appropriate the student's grade level. The intervention is provided by general education, special education or project staff and lasts approximately 10-20 weeks. Students were randomly assigned to these intervention groups.

Tier III is for those students not responding to Tier II interventions and is more “intensive” and “strategic.” Whereas Tier II interventions occurred in small groups, Tier III is provided typically in 1:3 groups by an intervention specialist from the school or project staff. These custom built sessions are implemented in two 30 minute sessions per day. Monitoring of student performance continues to occur twice per month. Length of Tier III interventions can be significantly longer than the 10 to 20 week Tier II interventions.

“Tiers of Intervention in Kindergarten Through Third Grade” by Rollanda E. O’Connor

Randi O’Connor’s study, which in many ways is similar to Vaughn’s, also provides a strong experimental research design. She outlines a three tier approach for students in kindergarten through 3rd grade. Core reading instruction for all students is the centerpiece of Tier I. Again, there is a strong commitment to ongoing professional development that builds upon scientifically-based reading interventions related to the five major elements also described in the Vaughn article. Student improvement is measured three times per year with literacy indicators.

O’Connor’s Tier II intervention is provided in small group (typically 1:4) and is conducted three days per week at 15 minutes for kindergarten students and 20-25 minutes for older students. The project researcher provides the instruction to students who did not make literacy benchmarks during core reading instruction during Tier I. The intervention is designed specifically for the struggling student. O’Connor notes her studies differ from Vaughn’s in two important ways, (1) the O’Connor Tier II inter-

ventions focus on student weaknesses, and (2) Tier II interventions can vary in length from 8 weeks to several years.

The Tier III interventions in O’Connor’s study are provided daily by a project researcher in 1:1 or 1:2 settings. These interventions are for those students who did not make good reading progress, which was defined as “progress commensurate with the growth of average readers.”

“How Many Tiers Are Needed for Successful Prevention and Early Intervention?: Heartland Area Education Agency’s Evolution from Four to Three Tiers” by W. David Tilly III

As mentioned earlier, Tilly reports on a project of considerable magnitude, the implementation of the Problem Solving Model in the state of Iowa. He notes that Heartland AEA, where the study was conducted, serves almost 25% of the state student population. His paper provided data from 136 schools.

In his paper the author describes how Heartland AEA, over a ten year period, has evolved from a four tier Problem Solving process to a three tier system. It is the three tier system, which is central to the Heartland Early Literacy Project (HELP), which provides the data for his article. While the Tilly project lacks the experimental design of the Vaughn and O’Connor studies, it compensates with large sample sizes, many schools implementing the model, and evidence of bringing RTI to scale.

Project HELP grew from 36 schools in 1999 to 121 schools by the 2003-4 school year. In Level 1 (or Tier I) all students are involved in the Core Instructional Curriculum. Level 2 or (or Tier II) is known as Core Instruction and Supplemental Instructional Resources. Level 3 (or Tier III) is

called Core Instruction and Intensive Resources. Tilly makes clear that two important assumptions operate at each level: applied scientific method known as Problem Solving and use of scientific-based practices during intervention.

In the area of Problem Solving the practitioner must answer four interrelated questions: (1) what is the problem, (2) why is it happening, (3) what do we do about it, and (4) is the intervention working? Some of the scientific-based practices provided in Project HELP include: Curriculum-based Measurement, Curriculum-based Evaluation, Functional Analysis of Behavior and Positive Behavioral Supports, Direct Instruction, Peer Assisted Learning Strategies, Learning Strategy Instruction, and Dynamic Indicators of Basic Early Literacy Skills.

Paramount to implementation of the three levels is a large scale screening of all students. Through each of the three levels there is a strong professional development component outlining instructional strategies to be used with struggling students. Monitoring of student performance of two to three times per year is also required. Early literacy indicators focused on phoneme segmentation, nonsense word fluency, and oral reading fluency. The duration of individual sessions or the number of sessions was not specified for each level. In addition, the size of instructional groupings was not described. It appears instruction was provided “in different ways by different constellations of teachers in each building.”

How the Three Studies are Linked

One reason these three articles effectively address our key question is they contain the basic principles of the response to intervention model. In the Common Ground Report (2002), published by the

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National Research Center for Learning Disabilities, eight professional groups met to discuss and agree on the core elements of a Response to Intervention Model.

- National Association of School Psychologists
- American Speech-Language-Hearing Association
- Council for Exceptional Children/Division for Learning Disabilities
- International Reading Association
- Association for Higher Education and Disability
- International Dyslexia Association
- Learning Disabilities Association of America
- National Center for Learning Disabilities

This group generated 14 consensus statements related to Identification, Eligibility, and Intervention. If we examine each statement and the extent to which it applies to the RTI methods used in these three papers, for the most part, the models and data presented by Vaughn, O’Connor, and Tilly are consistent with these principles. Let’s look at the consensus statements with a brief comment on each.

Identification

“Identification should include a student-centered, comprehensive evaluation and problem-solving approach that ensures students who have a specific learning disability are efficiently identified.”

Comment: Vaughn, O’Connor, and Tilly all qualify here. All have elaborated on a multi-tier design in which students not responding to interventions receive increasingly more intensive instruction. There are typically several

types of assessments used to evaluate student performance.

“Regular education must assume active responsibility for delivery of high-quality instruction, research-based interventions, and prompt identification of individuals at risk while collaborating with special education and related services personnel.” *Comment: For all three research studies Tier I is primarily a general education activity. All three specify the significance of using research-based interventions and there appears to be considerable professional development in literacy instruction. Two II interventions are delivered by a mix of general and special educators. Indeed, the level of collaboration of general and special education staff is increased at Tier II. Tier III also is a mix of general and special education, although it seems the provision of services may begin tilting toward specialists with more experience with intensive interventions and students with greater needs.*

Eligibility

“The ability-achievement discrepancy formula should not be used for determining eligibility.” *Comment: A foregone conclusion – the formula is not even mentioned by any of the authors, although Tilly provides a brief review of traditional eligibility systems using IQ tests.*

“Decisions regarding eligibility for special education services must draw from information collected from a comprehensive individual evaluation using multiple methods and sources of relevant

information.” *Comment: For all three papers there are a variety of indices, typically literacy measures, used to select those students that need increasingly more intensive instruction. It should also be noted here that the content of the evaluation summary report used during special education eligibility would look different in the RTI model. That is, in addition to the reporting of a variety of assessments often used during evaluation, there would be a detailed description of the interventions tried with the student and the extent to which the student did not respond. The specificity of these descriptions will improve the “comprehensive” nature of the individual evaluation which should improve IEP planning and lead to more appropriate interventions in special education.*

“Decisions on eligibility must be made through an interdisciplinary team, using informed clinical judgment, directed by relevant data, and based on student needs and strengths.” *Comment: The three articles do not describe in any detail the activities of the interdisciplinary team in the RTI model. Given federal law and the role of the team in eligibility decisions, it is an area to be included, if not emphasized, in future research.*

“Decisions on eligibility must be made in a timely manner.” *Comments: Timelines in Tier II are specified by Vaughn and implemented in a timely manner. O’Connor and Tilly were less specific. This is an important area and researchers should also include this in future studies.*

“Based on an individualized evaluation and continuous progress monitoring, a student who has been identified as hav-

ing a specific learning disability may need different levels of special education and related services under IDEA at various times during the school experience.” Comments: Since the articles focus on the “pre-referral and referral” stages of RTI that lead up to special education, this element does not directly impact the work of the researchers. However, the multi-tiered models described can be expanded to include special education intervention tiers for students later identified as needing LD services. This element is remindful of Evelyn Deno’s Cascade of Special Education Services.

Intervention

“The field should continue to advocate for the use of scientifically based practices. However, in areas where an adequate research base does not exist, data should be gathered on the success of promising practices.” Comment: All three researchers identify the critical elements of the National Reading Panel as major components of their professional development activities and essential to the interventions implemented in Tiers I, II, and III. Tilly, in fact, lists eight research-based practices used in the HELP project. It can also be noted that typically frequent, data collection occurs within Tiers II and III and could be utilized by teachers and researchers to examine the effectiveness of any interventions implemented.

“Schools and educators must have access to information about scientifically based practices and promising practices that have been validated in the settings where they are to be implemented.”

Comment: As mentioned in the prior statement, the researchers have made a concerted effort to incorporate scientifically based practices and make professional development in these areas available to school staff. This reviewer is impressed with the considerable resources the researchers have devoted to this area.

“Students with specific learning disabilities require intensive, iterative (recursive), explicit scientifically based instruction that is monitored on an ongoing basis to achieve academic success.”

Comment: All of the researchers have made it clear that the Problem Solving process includes best practice treatments provided with fidelity and monitored on a frequent basis. All describe intensive efforts to train staff on progress monitoring and using data to make instructional changes when necessary. While all three papers seem to remain true to these essential requirements, it should be noted that Vaughn and O’Connor describe more frequent measurement efforts (twice per month) in Tiers II and III of their studies.

“Students with specific learning disabilities require a continuum of intervention options through regular and special education across all grades and ages.” Comments: These articles certainly address a continuum of interventions leading up to identification. However, the focus of the studies was not on special education interventions, and therefore does not address special education intervention tiers after eligibility.

“Interventions must be timely and matched to the specific learning and be-

havioral needs of the student.” Comment: To a large extent our researchers offer documentation of using timely interventions matched to student needs. Student data dictated movement through the continuum of interventions. Vaughn was quite specific about the parameters for Tier II, with an emphasis on 10 week intervals. O’Connor notes Tier II interventions ranged from 8 weeks to years. Tilly’s article did not provide details on the duration of the tiers in the HELP model. Regarding “matched” to needs, the investigators trained staff to use data to determine movement through tiers. O’Connor made a point of saying Tier II interventions were customized as a function of student weaknesses.

“An intervention is most effective when it is implemented consistently, with fidelity to its design, and at a sufficient level of intensity and duration.” Comment: Fidelity of treatment played a central role in the research conducted by Vaughn and O’Connor. In Vaughn’s study each interventionist was observed for eight validity checks. Treatment fidelity is not addressed to a large degree

in the paper by Tilly, although its importance is acknowledged.

“Regular and special education must be coordinated as part of a coherent system which is held accountable for the educational outcomes of students with specific learning disabilities.” Comment: It is apparent in all three studies that a significant degree of collaboration exists between regular and special education. The professional development activities include all staff. It appeared there was also cooperation among staff in planning and delivering interventions across the three tiers.

Results of the Three Studies

Vaughn, O’Connor and Tilly all provide intriguing results regarding the implementation of RTI. Essentially, the researchers presented two types of outcomes to evaluate the RTI models. The first set of outcomes they report offered contrasts of student performance on early literacy measures across Tiers. A second set of outcomes focused on the movement of students through the Tiers and into special education. These results are summarized in Table 1.

Table 1. Results: Contrasts of Student Performance

Vaughn	O'Connor	Tilly
GAINS:	GAINS	GAINS
Early Exit Tier 2 60+ words No Exit 20+ words	Average students gained .5 SD words	K: 15 seg. (W-S) 1: 30 words 2: 30+ words 3: 30+ words
COMPARISONS:	COMPARISONS:	COMPARISONS:
T1 vs. Control Significant	T1 vs. Control E.S.: .19-.52 Mean E.S. = .34	Yr 1 vs. Yr 2 (Kind.) E.S. = .71
T1 & T2 vs. Control Significant	T2 vs. Control E.S.: .40-.67 Mean E. S. = .55	Yr 1 vs. Yr 2 (1st) E.S. = .26
	T2 & T3 vs. Control E. S. < .55	Yr 1 vs. Yr 3 (Kind.) E.S. = 1.08
		Yr 1 vs. Yr 3 (1st) E.S. = .39

Contrasts of Student Performance.

The Vaughn and O'Connor studies are experimental comparisons of control groups with Tier I, Tier II, and Tier III interventions. Both studies include control groups, random assignment of students, and measures of student growth on letter naming, phonemic awareness, word identification, fluency and comprehension. Vaughn determined that Tier I students made more progress than control group students not receiving Tier I support. Students needing

both Tier I and Tier II interventions also made significantly more progress than an equivalent control group. O'Connor provided effect sizes for comparisons. In her study students in Tier I outscored students in control groups across all measures with effect sizes ranging from .19 to .52 with an average of .34. Comparisons of Tier II students with controls resulted in effect sizes ranging from .40 to .67 with an average of .55. O'Connor reports even greater effect

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sizes for the contrast of Tier II and III students with controls.

Tilly also studied the early literacy growth of all students served in Tiers I, II, and III. For all schools participating in the project he reports raw scores associated with the 20th-50th-80th percentile at each school for the beginning, middle, and end of year. In order to quantify and summarize the extent to which schools improved, Tilly examined the amount schools changed from Year 1 of participation in the HELP project to Year 2 or Year 3 of implementation. Effect sizes were based upon this change and reported for dependent measures of phonemic segmentation and oral reading fluency. For the phonemic awareness task the effect size was .71 for Year 1 to Year 2 change at 85 schools and 1.08 for Year 1 to Year 3 change at 36 schools. On the oral reading fluency task the effect sizes were .26 for Year 1 to Year 2 growth at 86 schools and .39 for Year 1 to Year 3 improvement at 32 schools.

Movement of students through tiers and special education. Another approach to evaluating the impact of the multi-tier RTI model is to examine the placement outcomes for students participating in the studies. All three researchers did a follow-up on eventual placement of students. These data are shown in Table 2. Vaughn studied 45 second grade students who qualified for Tier II intervention. She reported the number of students needing further intervention or returned to the general education setting at 10 week intervals. Near the beginning of the study 10 students had progressed enough to warrant “early exit” (10 weeks), 14 students qualified for “mid-term exit” (20 weeks), 10 students improved enough for “late exit” (30 weeks), and 11 students (24.4% of the sample) did not meet the criteria for success in Tier II. Vaughn theorized most students identified at risk need at a minimum 20 weeks of intervention before concluding they are non-responders.

Table 2. Results: Movement of Students Through Tiers

Vaughn	O'Connor	Tilly
45 Tier II Students	Control: 15% to Spec. Ed.	Decreases in Spec. Ed. Placement Rate At 36 Schools
Early Exit: 10	Tier I: 12% to Spec. Ed.	Decrease in Placements: Kindergarten 55%
Mid Exit: 14	Tier II & III 8% to Spec. Ed.	1 st Grade 32%
Late Exit: 10		2 nd Grade 21%
No Exit: 11		3 rd Grade 19%
24.4% to Tier III		

For O'Connor, about half the students in Tier II did not make good reading progress. In Tier III she notes almost 40% of the students maintained average performance without needing additional assistance. She went on to examine student outcome by tabulating the number of students needing special education after interventions in the multi-tiered process. For her control group, 15% of the students were ultimately determined eligible for special education. For students who were engaged only in Tier I interventions the percentage of students going on to special education was 12%. For those students that participated in the total three tier model (Tiers I, II, and III) the rate of students placed in special education was 8%.

Tilly also examined placement rate in special education. He reviewed the spe-

cial education placement files at schools with the longest implementation of the HELP project (n=36). He compared placements rates from the three year period prior to implementation of HELP to the four year period after implementation. Placements in special education decreased at all grade levels, including: 39% in kindergarten, 32% in first grade, 21% in second grade, and 19% in third grade.

Summary of Findings

So what do our three papers tell us about the question, "How many tiers are needed within RTI to achieve acceptable prevention outcomes and to achieve acceptable patterns of LD identification?" If we aggregate the results across the papers with caution, we can discern some trends. But first, let's divide our question into two parts.

“How many tiers are needed within RTI to achieve acceptable prevention outcomes?” The Tier I data indicate students made gains and the interventions were effective, but based on low to moderate effect sizes, it would be fair to question whether enough students made large enough gains when compared to controls. The Tier II data shows students did significantly better than controls and generated moderate effect sizes (about .55) to support this finding. It would appear 50-75% of students receiving Tier II interventions responded to instruction. It was not, however, possible to determine what percentage of the total population responded in Tier II. Tier III data provided the best data for achieving acceptable prevention outcomes. The gains of students receiving both Tier II and III were significantly greater than controls and the effect sizes higher than those reported for Tier I and II. There is some data to indicate close to 40% of Tier III students made satisfactory gains. If we look at the entire student population of one of the studies, we can estimate that about 92% of students responded to either Tier I, II, or III interventions.

“How many tiers are needed within RTI to achieve acceptable patterns of LD identification?” Regarding Tier I results there was little data reported

supporting this tier alone as a means of determining special education eligibility. A review of Tier II data shows approximately 25-50% of the students receiving Tier II interventions were nonresponders. It was not possible to calculate what percentage of the total student population this represents. Tier III data from one study showed 7 out of 10 Tier III students entered special education. Data from the same study indicated about 6% of the student population participating in the three tier model was eligible for LD services.

Summary

The Vaughn, O’Connor and Tilly studies provide positive outcomes showing the efficacy of the three tier approach to response to intervention. The RTI models had considerable impact on elementary student achievement in the area of reading. Additional factors that investigators may want to consider in future research include: other academic domains, grade level of students, and scalability. In all, the studies of Vaughn, O’Connor and Tilly describe promising approaches to RTI.

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