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WHY INTENSIVE INTERVENTIONS ARE NECESSARY FOR STUDENTS WITH SEVERE READING DIFFICULTIES

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This article reviews research related to intensive interventions within a Response to Intervention framework. We review the research from studies that provided different levels of intensity of intervention with the goal of establishing a case that movement through less intensive tiers of intervention may not be an effective and responsible approach to addressing the reading difficulties of some students, particularly those with significant reading difficulties or disabilities. © 2010 Wiley Periodicals, Inc.

Response to Intervention (RTI), a recommended practice in the authorized special education law (Individuals with Disabilities Education Improvement Act, 2004), has been a focus for states and school districts. Although implementation varies considerably by state (Berkeley, Bender, Peaster, & Saunders, 2009), and likely considerably even within states (National Association of State Directors of Special Education, 2008), there are several components of RTI that most educators agree are essential, including (a) universal screening in target areas (e.g., reading, math); (b) research-based instruction to assure that all students have an adequate opportunity to learn; (c) successive layers or tiers of intervention so that students who do not make adequate progress in the research-based classroom instruction are provided with opportunities for more intensive intervention; and (d) ongoing progress monitoring for students to ensure that they are making adequate progress and that instructional practices can be adapted to meet their special needs.

The purpose of this article is to address one of the significant components of RTI: intensive interventions. The Institute for Education Sciences released a guide to implementation of RTI (Gersten et al., 2009) that identified five recommended practices including the provision of a Tier 2 intervention three to five times per week for several weeks for a reasonable amount of time before providing a more intensive daily intervention identified as Tier 3. Although RTI is implemented to address a variety of academic and behavioral concerns, the focus of this article is on students at risk for reading difficulties and disabilities.

We propose that, for some students, more intensive interventions are needed immediately without first moving through successive tiers of interventions or receiving relatively low-intensity Tier 2 interventions. To build this case, we will describe ways in which interventions are typically made more intensive and their relative effects. We will compare these practices with those used in intensive interventions (e.g., Denton, Fletcher, Anthony, & Francis, 2006; Mathes et al., 2005; Torgesen et al., 2001; Vaughn et al., 2008). We will compare findings from related studies that provided different levels of intensity of intervention with the goal of establishing a case that movement through less intensive tiers of intervention may not be a reasonable approach to resolving the reading difficulties of some students.

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Tier 2 or Secondary Interventions within an RTI Framework

Although the number of tiers or layers of intervention that are typically provided to students at risk for reading difficulties within a particular state or school district may vary, what is consistent in most RTI models is that students are provided at least one lower level intensity intervention (e.g., Tier 2) before being provided with more intensive interventions (e.g., Tier 3). These Tier 2 or secondary interventions may vary somewhat in implementation, but typically include an intervention that occurs from three to five times a week for a minimum of 30-minute sessions typically in small group (e.g., three to five students with an adult) for anywhere from 8 to 24 weeks. The idea is that students are provided with an intervention that is aligned with the key components of instruction that they are learning in the classroom. Vaughn and Denton (2008) identify several key features of appropriate secondary interventions: (a) identifying students at risk for reading difficulties through universal screening, (b) determining students' instructional needs and forming same-ability, small groups, (c) providing daily, targeted instruction that is explicit and systematic, and (d) aligning reading instruction and text levels to students' needs.

Students who are provided secondary interventions either make adequate progress, limited progress, or inadequate progress toward their goals. Students who meet their instructional goals are released from secondary intervention; however, monitoring their progress is necessary as some students who meet criteria thrive in the future without further intervention and others require additional intervention later (Vaughn, Linan-Thompson, & Hickman, 2003). Those students who are making adequate progress but have not met goals continue in secondary intervention as long as they are progressively closing the gap between their current reading levels and grade-level goals. Students who are making inadequate progress are typically provided a more intensive tertiary intervention and/or are referred for special education.

Factors Affecting Intervention Intensity

The intensity of an academic intervention is related to the size of the instructional group, how frequently intervention is provided (e.g., two to five times per week), the length of each session (e.g. 30–60 minutes), the duration of the intervention (i.e., number of weeks or months for which it is provided), and other factors, including the nature of the intervention, the knowledge and experience of the teacher, and how time is used during each session. The level of intensity required for effective intervention is determined by the characteristics and needs of students.

A major goal of Tier 2 or secondary intervention is to allow the majority of students with learning (e.g., reading) difficulties to attain grade-level expectations. If students with below-grade-level performance are to catch up with normally developing students, their rate of growth must be *accelerated*; simply learning at an average rate will only maintain the deficit. Thus, Tier 2 interventions must be intensive enough to not only improve students' performance, but to actually enable students with learning difficulties to progress at rates that are *faster* than the learning rates of average students. At the same time, these interventions must be feasible for teachers to implement and sustain.

In general, most students with reading difficulties make progress when provided with (a) more instruction, (b) more intensive and efficient instruction, and (c) extended opportunities to practice with and without teacher support. The level of intensity necessary to accelerate student growth is impacted by several factors, including students' grade levels and the nature and severity of their deficits. For example, many kindergarten students who require instructional support in learning letter names and letter–sound correspondences are likely to catch up more quickly than students in the intermediate grades who have word reading, vocabulary, and comprehension difficulties.

Increasing Intervention Intensity

We discuss several ways to increase the intensity of intervention, including reducing group size, increasing instructional time, and altering the treatment intervention.

Varying Group Size

Group size is strongly related to both the effectiveness and feasibility of interventions. Because of costs related to personnel, curricular supplies, and other factors, the smaller the group size, the more expensive the intervention is to implement. Therefore, if students make the same progress in groups of three as they do with one teacher working with one student over the same period of time, then one teacher with a small group of students would be considerably more cost effective. There are several studies that have systematically investigated the relative effects of group size on students' outcomes.

Iversen, Tunmer, and Chapman (2005) examined the effects of varying group size on the outcomes for first-grade students participating in the *Reading Recovery* (RR; Clay, 2005) early intervention. They identified students at risk for reading difficulties at the beginning of first grade and then formed triplets of students who had similar scores on letter identification, dictation, and word recognition. One student from each of these triplets was then randomly selected to receive traditional one-on-one RR instruction while the other two received RR in groups of two. Students were provided no more than 60 lessons for an average of 33 minutes (one-on-one condition) or 42 minutes (one-on-two condition), with some students discontinuing intervention before receiving 60 lessons if they attained predetermined benchmarks. At the end of first grade, there were no statistically significant differences in outcomes for students in the two treatment conditions. The authors conclude, "In summary, the results suggest that the same outcomes of RR can be achieved by struggling readers taught in pairs as by those taught individually by increasing the duration of the lesson an average of only 9 minutes" (p. 471).

Vaughn and colleagues (2003) conducted a study in which second-grade students at risk for reading difficulties were randomly assigned to one of three grouping conditions: one teacher with one student (1:1), one teacher with three students (1:3), and one teacher with 10 students (1:10). All students received the same reading intervention treatment for the same amount of time (approximately 30 minutes daily) for the same time period (58 sessions on average). Findings from this study indicated no statistically significant differences between outcomes of students in the 1:1 and 1:3 conditions. Effect sizes indicated that students in all groups made notable progress in reading comprehension, but that these effects were weaker for the 1:10 condition than for the other two groups. It appears as though outcomes are improved with smaller group sizes (one teacher with two or three students), yet results with a larger group (1:10) are not trivial. Research investigating group sizes of four to nine is not currently available; thus, students may make comparable progress in groups of five or six as in groups of three. Furthermore, it may be that, for some students who have severe reading disabilities, one-on-one instruction is highly beneficial, or that group size matters more for students at different stages of reading acquisition. For example, students who are learning the foundational skills of reading (e.g., word reading, phonemic decoding) may benefit from instruction in smaller groups with more opportunities to practice with feedback from an experienced adult.

We know appreciably less about optimum group size for interventions provided to older readers. In a study of the relative effects of group size for students with reading difficulties in Grades 7 and 8, Vaughn and colleagues (in press) found that group size was not associated with differential outcomes. Students were randomly assigned to one of three conditions: small-group instruction (with 3–5 per group), large-group instruction (with 10–15 per group), or a comparison condition. Treatment-group students participated in a year-long daily intervention emphasizing word study, vocabulary

development, fluency, and comprehension for approximately 50 minutes per day. Students in the two treatment conditions varied only on group size and were provided the same treatment for the same amount of time daily. Findings indicated few statistically significant results associated with group size or intervention, although the results were in the direction of favoring small-group, researcher-provided intervention. Furthermore, the provision of a 50-minute daily reading class, even in groups of three to five students, did not significantly accelerate the reading progress of the middle-school students from high-poverty schools who participated in this study. The researchers concluded that successful intervention for such students may require more comprehensive models including (a) more intensive intervention (e.g., more time, even smaller groups), possibly provided over multiple years, and (b) interventions that vary in emphasis based on specific students' instructional needs.

In addition to studies that directly examined the effects of differing group sizes in reading intervention, syntheses of intervention research have evaluated the effects of various intervention characteristics, including group size, on student outcomes in reading (e.g., Elbaum, Vaughn, Hughes, & Moody, 2000; Swanson, Hoskyn, & Lee, 1999). For example, Wanzek and Vaughn (2007) synthesized reading-intervention studies published between 1995 and 2005 that examined the effects of extensive interventions (defined as having been provided for more than 100 sessions) on reading outcomes for students in kindergarten through third grade. Findings from this synthesis indicated that higher effects were demonstrated by studies in which intervention was provided one-on-one or in small groups than by those with intervention provided in larger groups. The authors recommend caution when interpreting these findings, however, because none of the synthesized studies experimentally manipulated group size. Rather, their conclusions are based on a description of the outcomes of interventions delivered across various studies. Thus, differences may be related to factors other than group size.

Summary. Overall, research suggests that, at least for primary-grade students, group sizes of 1:1 and 1:3 are associated with more significant outcomes than are larger groups, and that, for many children, intervention delivered in groups of three is as effective as one-on-one intervention. Less is known about the effects of group size on the progress of older readers with reading difficulties. We do not yet know with confidence the largest group size associated with positive effects. Because providing extended opportunities to respond and receive feedback is associated with improved outcomes for impaired learners (Hattie & Timperley, 2007), groups should be small enough so that active student involvement is maximized and the teacher is able to monitor and respond appropriately to both correct and incorrect responses from all students in the group.

Varying Time for Intervention

Only a few studies have directly examined the relative effects of time in intervention on students' outcomes. Wanzek and Vaughn (2008) compared outcomes from two non-overlapping samples of students who were provided varying amounts of intervention in the spring of Grade 1. Two cohorts of students, all of whom had demonstrated low response to intervention provided in the fall of first grade, were randomly assigned to receive either (a) intervention for 30 minutes daily for 50 sessions, for a total of approximately 25 hours of intervention, (b) a "double dose" of the same intervention (i.e., two 30-minute daily lessons for 50 sessions), for a total of approximately 50 hours of treatment, or (c) no researcher-provided intervention (comparison group). Examination of data for students in the treatment conditions (single-dose and double-dose) revealed few differences in students' responses. Increasing the time in the intervention in the spring of first grade was not associated with an increase in the number of students with an adequate intervention response. Results indicated, however, that more students in the treatment groups demonstrated gains from pretest to posttest on

standardized measures of word identification, word attack, and passage comprehension than students in the comparison group.

Vaughn and Linan-Thompson (2003) examined the effects of time in intervention on the intervention responsiveness of second-grade students with reading difficulties. Intervention was provided in groups of three for 30 minutes daily outside of the regular classroom. The researchers established criteria for exiting the intervention based primarily on oral reading fluency (ORF) and evaluated students' performance after 10, 20, and 30 weeks. Students who met criteria at each of these points exited intervention, and the researchers continued to monitor their progress in ORF. Ten of the students (22%) met the criteria and were able to exit intervention after 10 weeks, and seven of these students continued to make adequate postintervention growth. After 20 weeks of intervention, 14 more students (31%) were able to exit. Eight of these students continued to make adequate progress after exiting. At the 30-week assessment, another 22% of the students met criteria, whereas 24% never met the benchmark for adequate intervention response. The group that met the benchmark after 10 weeks had the highest average pretest ORF score, 33 words correct per minute (wcpm). The 20-week and 30-week groups had pretest ORF means of 20 wcpm and 13 wcpm, respectively, and the group that never met criteria was the most severely impaired at pretest, with an average score of 11 wcpm. Based on this study, it appears that students with the most severe reading impairments are likely to require more extended interventions to attain grade-level benchmarks.

Denton (2009) compared the effects of Tier 2 intervention provided on three schedules in the spring of Grade 1. In this study, all students in participating schools were screened at the beginning of first grade. Then the researchers monitored the reading progress of the students who had failed the screen to reduce false-positive identification, and identified a sample of students at risk for reading difficulties. In November of first grade, all of these at-risk students were randomly assigned to receive supplemental Tier 2 intervention in 30-minute lessons on one of three schedules: (a) 4 days per week for 16 weeks (32 hours of instruction), (b) 4 days per week for 8 weeks (16 hours of instruction), or (c) 2 days per week for 16 weeks (16 hours of instruction). Beginning in January, all students received the same intervention in groups of three students delivered by well-prepared and coached paraprofessionals. The intervention included explicit, systematic instruction in phonemic awareness, phonics, and word identification, with application of skills in decodable text, as well as instruction in vocabulary and reading comprehension. The researchers found no significant differences in student outcomes on any reading measure among the three groups that had received differing amounts of intervention on different schedules. In addition, there were no statistical differences in the percentage of students in each condition who demonstrated adequate response to intervention. When applying a word-reading and phonemic decoding benchmark for RTI (Woodcock-Johnson Tests of Achievement-III [WJ III], 2001; Basic Reading Skills Cluster score $\geq$ 93), 74–81% of the students had an adequate intervention response. This result was appreciably lower when even a minimal ORF benchmark was applied (oral passage reading fluency $\geq$ 20 wcpm); using this criterion, only 62–66% of students had adequate RTI. The researchers also examined the percentages of adequate responders for the group of students who had pretest word reading and decoding scores 1 standard deviation or more below the mean, finding that few students who began the intervention at this level of impairment had an adequate response. There were 26 students in this category, combined across all three of the research conditions. Of these, only three students (12%) met the Basic Skills Cluster score criteria at posttest and seven students (27%) met the ORF criteria of 20 wcpm.

Interventions That Provided More Instructional Sessions. Denton and her colleagues provided reading intervention over a longer period of time in other studies. Although these did not directly

evaluate the effects of different amounts of time in intervention, we describe them here to illustrate outcomes related to more extended interventions. Mathes and colleagues (2005) and Denton and coworkers (in review) studied the effects of supplemental reading intervention provided for 24 (Denton et al.) to 30 (Mathes et al.) weeks beginning in the fall of Grade 1. Mathes and colleagues evaluated two intervention approaches, and Denton and coworkers evaluated one. Both compared the progress of students in intervention to that of students who received typical school instruction (i.e., classroom reading instruction along with whatever interventions were typically provided to at-risk first graders in their schools). In the study by Mathes and colleagues, few students in the comparison group received school-provided intervention, whereas in that by Denton and coworkers, approximately 40% of comparison group students received an alternate intervention not provided by the researchers. In both studies, students received daily intervention in 40-minute sessions in groups of three to four children with one certified teacher. Results of both studies indicated that students who received supplemental intervention had significantly higher year-end outcomes on multiple measures of reading and spelling than did those who received typical school instruction. The researchers in both studies applied the RTI criterion of a WJ III Basic Reading Skills Cluster score $\geq$ 93. Mathes and colleagues reported that 93% of students in one intervention and 99% in the other met this benchmark, whereas 84% of students who received Tier 1 only (along with typical school interventions) achieved the benchmark. Denton (2009) similarly reported that 91% of students in their study had WJ III Basic Skills standard scores $\geq$ 93, whereas 79% of students in the typical practice group met the benchmark. As in the Denton study described previously, student response to intervention was lower when fluency criteria were applied. In the study by Mathes and coworkers, 75% of the intervention students met an ORF benchmark of 40 wcpm at the end of Grade 1, whereas in the study by Denton and colleagues (in review), only 25% of the students who received the research intervention met this goal.

Wanzek and Vaughn (2007) conducted a synthesis of research on the effects of extensive reading interventions for students in kindergarten through Grade 3, defining extensive interventions as those providing 100 or more sessions. Eighteen studies were located that met the synthesis criteria, only three of which were conducted with second- or third-grade students. Overall, students with reading difficulties or disabilities who were provided extended interventions benefited, with several studies reporting outcomes within the average range. Because the vast majority of these studies were conducted with beginning readers, outcomes for older students are less clear. Although this synthesis is encouraging with respect to the relative benefits of extensive interventions, the synthesis does not inform educators about the amount of intervention that students need to effectively progress in secondary interventions at various grade levels.

Interventions That Provided Extended Daily Intervention Sessions. Even interventions provided for a few weeks can be highly intensive. Three studies evaluated reading interventions provided over 8–16 weeks, but for extended periods each day either one-on-one or in groups of two. The first was conducted by Torgesen and his colleagues (2001), who provided intervention to a group of students in Grades 3–5 who had severe reading difficulties (i.e., with average word-reading pretest score in the second percentile) and had identified disabilities and received their primary reading instruction in learning disability resource rooms. Intervention was provided one on one by experienced teachers in a clinical setting over an 8-week period. Each day, students received two 50-minute intervention sessions separated by a 10-minute break. This instruction replaced their resource room reading instruction. This 8-week intervention was followed by an 8-week generalization period in which the interventionists worked with students for 50 minutes 1 day per week in the resource room settings, prompting the students to apply what they had learned in intervention and, at the same time, modeling instruction for their special education teachers. The results were dramatic, as students

made large gains in word reading and reading comprehension over this 8-week intervention and maintained these gains over a 2-year period. Although students still performed below grade level in ORF, probably because they needed more practice reading text, 40% of the students were removed from special education following the intervention.

Simos and colleagues (2002) provided the same 8-week intervention schedule and level of intensity within the context of a brain-imaging study. In this study, eight adolescents who had severe reading difficulties (pretest word reading 1st to 18th percentile) received one-on-one tutoring in a clinical setting for nearly 2 hours per day over 8 weeks, with brain scans before and after the intervention period. Like the students in Torgesen and colleagues (2001), those in the study by Simos and coworkers made impressive gains in word reading, with posttest word-reading scores in the 38th to 60th percentiles. Interestingly, the brain imaging also revealed dramatic pre–post changes in the way their brains processed information during reading activities.

Denton and colleagues (2006) approximated the intervention schedule implemented by Torgesen and coworkers (2001) in a school, rather than a clinical, setting. For 8 weeks, students with severe reading difficulties in Grades 2 and 3 received a phonologically based decoding intervention daily for two 50-minute periods separated by a 10-minute break, in groups of two students with one certified teacher. This intervention was followed by 8 weeks of fluency-oriented intervention provided in the same groups for 1 hour per day. The decoding intervention was associated with significant gains on decoding and reading comprehension measures, whereas the fluency intervention was associated with significant fluency gains. These gains contrasted with the low progress that students had made during a no-treatment baseline phase. Although the full 16-week intervention resulted in large pre–posttest, within-subject effect sizes across all spelling and reading domains, intervention response was highly variable; individual students gained from −6 to 26 standard score points in WJ III Basic Reading across the 16-week intervention period.

Summary. There are relatively few studies that have directly compared student outcomes when they receive larger or smaller doses of the same treatment. These limited studies do not provide convincing evidence that increasing the amount of treatment of a relatively low-intensity intervention by a small amount is associated with improved outcomes. Some studies in which students received intervention for more extended time periods have resulted in high rates of RTI when response is measured using word-reading criteria, with many students achieving word-reading performance levels in the average range. Intervention response in these studies is lower when fluency criteria are applied. Studies in which intervention was provided for extended periods every day (i.e., approximately 2 hours) over only 8–16 weeks have resulted in dramatic student gains for students with severe reading difficulties. When this schedule was implemented in one-on-one tutoring in reading clinics, results were overwhelmingly positive, but RTI was more variable when a similar schedule was implemented in groups of two in a school setting. Finally, there is evidence that students with more seriously impaired reading require more time in intervention to meet grade-level standards.

Varying Type of Treatment

As we have demonstrated, interventions can be made more intensive for students with reading difficulties by altering grouping formats so that students have more opportunities to respond with feedback and by providing additional time for intervention. It is also essential to consider the relative effects of different intervention approaches. In this section, we review studies that have examined the relative effects of contrasting treatments for students at risk for or experiencing significant reading difficulties.

The Proportion and Nature of Phonics Instruction and Text-Reading Practice. Two studies (Mathes et al., 2005; Torgesen et al., 2001) directly contrasted intervention approaches that varied

in (a) the amount of time spent teaching phonemic awareness and phonics skills in isolation versus the amount of time spent in engaged reading and writing practice, (b) how phonics instruction was delivered, and (c) the type of text provided to students (i.e., decodable vs. nondecodable text).

In the study by Torgesen and colleagues (2001), which we described in the previous section, the researchers contrasted two treatment conditions for upper elementary-grade students with reading disabilities. All students were randomly assigned to one of the treatment conditions, with no comparison group included in the design of the study. The treatments were similar in many ways; both provided explicit and systematic instruction in letter- and word-level skills along with practice reading connected text. The two treatments differed, however, in the extent of isolated skills instruction in phonemic awareness and phonemic decoding and in their approach to instruction. In one intervention, students spent approximately 95% of each lesson working with sounds and individual words, including instruction and practice in identifying individual phonemes and in reading and spelling regular and irregular words in isolation. They applied their word-level knowledge by reading decodable text and were cued to monitor their reading to assure that what they read matched what they knew about letters and sounds. They were not prompted to use context to read unfamiliar words. Students who were randomized to the second treatment condition spent approximately 50% of the instructional time in word-level instruction and practice and 50% in connected text activities. Instruction included mapping sounds to print and reading and spelling regular and irregular word patterns. Students in this group practiced reading trade books and basal reading program materials and wrote sentences containing words from their sight word lists. As they were reading, they were prompted to correct errors by using cues from the context, as well as with their knowledge of letter–sound associations and sight words. Students in both groups received intervention on the same highly intensive schedule for 8 weeks, as described earlier in text.

A number of standardized measures of reading, spelling, and oral language were administered at posttest, 1-year follow-up, and 2-year follow-up. The immediate and long-range effects of the two intervention approaches were quite similar; both resulted in robust standard score gains in word reading and reading comprehension, but not in reading fluency. There were no significant between-group differences on any reading variables at 1- and 2-year follow-up testing; both maintained their gains in word reading and reading comprehension.

Similar findings are reported by Mathes and colleagues (2005), who contrasted the effects of two first-grade interventions. All first graders at risk for reading difficulties were recipients of the school district's efforts to enhance classroom reading instruction (Tier 1), and two-thirds were randomly assigned to receive the two pull-out interventions. Both interventions were completed in groups of three to four for 40 minutes per day, 5 days per week, over a 30-week period. Teachers in both conditions provided explicit instruction in phonics and phonemic awareness along with practice in reading connected text, but their instructional approaches differed in important ways.

One intervention was based on the Direct Instruction model developed by Engelmann and his colleagues in the 1960s, now the basis for the Reading Mastery and Corrective Reading programs (National Institute for Direct Instruction, n.d.). In this intervention, teachers implemented fully scripted lessons that were based on a carefully developed scope and sequence, in which the majority of each lesson was spent in word-level instruction and practice with daily application of skills in fully decodable text. Students were exclusively taught to use synthetic phonics to read unknown decodable words. In the second intervention, students spent relatively more of their time reading and writing connected text with teacher support and feedback. Students were taught to use both synthetic and analogy phonics to read unknown words, but they were not taught to use context cues for word identification. They applied skills and strategies in text that was carefully leveled but not phonetically decodable. Teachers did not follow a script, but selected from a set of well-described teaching activities as they designed individualized lessons based on daily diagnostic assessment.

At posttest, both intervention groups performed significantly better than the typical practice group in word reading, phonemic awareness, and reading fluency. There were small differences in effect sizes for the two intervention groups that reflected the nature of the intervention, but, on the whole, these differences were not statistically significant. The researchers concluded that both approaches to reading instruction were effective and that characteristics that were shared by the two interventions may be important to their success. These included explicit, systematic instruction in phonemic awareness and phonics, high levels of active student engagement in hands-on activities, extended opportunities for practice with feedback, and daily text reading with feedback.

Jenkins, Peyton, Sanders, and Vadasy (2004) compared the use of decodable and nondecodable text in preventative first-grade reading intervention. First graders who were at risk for reading difficulties were randomly assigned to receive reading intervention with practice reading decodable text, the same intervention with practice in nondecodable text, or to a control group. The two intervention groups received one-on-one intervention provided 4 days per week for 30 minutes per day over 25 weeks by paraprofessional tutors using scripted lessons. The intervention included daily instruction in word reading and phonemic decoding, along with daily text-reading practice. The ratio of time spent in text reading versus word-level instruction and practice increased over the course of the intervention; in the early lessons the text-reading segment lasted for 10 minutes, whereas in the most advanced lessons students read for 20 of the 30 minutes. Although all students received the same intervention, they applied their reading skills in text with different characteristics. One group read text during their lessons that was designed to be decodable using taught letter–sound associations, and the other group read text not designed with this kind of phonetic control (i.e., nondecodable text). Posttest results indicated that students in both intervention groups had significantly better outcomes than students in the control group on measures of word reading, decoding, spelling, and reading comprehension. Following intervention, the majority of students in both intervention groups performed in the average range in word reading and decoding. There were no significant differences in posttest performance on any outcome associated with the type of text students read in intervention.

Individualized and Standardized Instructional Approaches. Another dimension on which interventions may differ is the extent to which they are individualized to address the needs of individual students with reading difficulties. Although a hallmark of instruction for students with disabilities is the individualization of instruction (Cook & Schirmer, 2003), individualized intervention has been seriously understudied. For example, in a synthesis of Tier 3 interventions with early elementary grade students, Wanzek and Vaughn (2007) identified *no* quasi-experimental or experimental studies that provided individualized interventions (e.g., teachers specifically selected and implemented materials/approaches to respond to students' needs). All of the studies that met criteria used more or less standardized interventions. Similarly, in their synthesis of interventions with older students with reading difficulties, Scammacca, Vaughn, Roberts, Wanzek, & Torgesen (2007) reported that all of the studies used some variation on a standardized intervention approach.

A recent study directly contrasted more and less individualized interventions for middle-school students with reading difficulties. Vaughn and Wexler (2009) examined the relative effects of two intervention treatments with students in Grades 7 and 8 with reading disabilities. Students had participated in a year-long intervention the previous year in which they were provided large-group (i.e., 10–15 students per class) reading intervention for 50 minutes daily by trained reading specialists (Vaughn et al., 2008). Students who demonstrated low RTI continued in the study the following year and were randomized to one of two treatment conditions: standardized intervention or individualized intervention. The standardized intervention was a continuation of the intervention provided the previous year. Because these students had made minimal progress, it seemed reasonable to determine if a more responsive, individualized approach might be more effective. Findings from

the study indicated outcomes for both treatment groups that were higher than those for a typical school practice comparison group; however, there were no statistically significant differences favoring either the individualized condition or standardized condition. Although all effect sizes comparing the two approaches were small, they were in favor of the individualized condition.

Summary. Based on findings of the studies we reviewed, as well as meta-analyses and syntheses of reading intervention research, it appears that interventions for students with severe reading difficulties might be made more intensive (resulting in increased effectiveness) by assuring that students receive explicit instruction in phonemic decoding with high levels of active student engagement and extended opportunities to practice skills in isolation and when engaged in reading and writing with teacher support and feedback. It seems to matter less whether the students spend the majority of their time practicing isolated word-level skills or engaged in text reading with teacher support. Similarly, whether young children in the early stages of reading acquisition or severely impaired older readers are provided with decodable or nondecodable text in their intervention lessons does not seem to influence outcomes. With respect to the relative effects of individualized and standardized instruction, we have little direct research evidence. One study of intervention provided to students in middle school indicated minimal differences in outcomes related to the two approaches.

Providing Intensive Interventions for Students with Reading Difficulties

We have illustrated that, to attain the goal of having the majority of students in a school read on grade level, students who perform at low levels must make accelerated progress, and these students benefit from interventions providing more effective instruction and extended opportunities for practice. The studies reviewed in this article have addressed key ways to increase intensity for students with reading difficulties—studies that examined instructional grouping, time in intervention and how that time is scheduled, as well as treatments varying on different dimensions.

The guidance document published by the U.S. Department of Education's Institute of Education Sciences (Gersten et al., 2009) recommends that the provision of more intensive Tier 3 intervention follow reasonable time in Tier 2 intervention. We suggest that what constitutes a "reasonable time" in Tier 2 varies greatly depending on two factors: (a) student characteristics, particularly the degree of reading impairment prior to intervention, and (b) intervention characteristics, particularly the level of intensity with which Tier 2 intervention is provided. Our interpretation of the research literature indicates that effective reading interventions, particularly for students at the greatest risk for reading failure, are implemented at a high level of intensity. Although research in some areas is not definitive, characteristics that appear to be related to effective intensive reading interventions for younger students most at risk for serious reading difficulties include providing instruction (a) in small groups, (b) for extended daily sessions, (c) over an extended period of time (e.g., at least 20–30 weeks), and (d) that includes explicit, systematic word-level instruction, high levels of active student engagement, and practice reading-connected text. We have less empirical evidence regarding the characteristics of effective interventions for secondary-level students who have severe reading difficulties and disabilities. We do know, however, that remediation of severe difficulties for older students is highly challenging. It seems clear that accelerating the reading progress of older students who perform considerably below grade level so that they attain performance in the average range will require the provision of highly intense interventions over several years.

Syntheses of research that has examined differences in students' responses to intervention indicate that phonological processing, rapid naming ability, and verbal ability may differentiate levels of student response (Al Otaiba & Fuchs, 2002; Schatschneider, Fletcher, Francis, Carlson, & Foorman, 2004). Consistently, one of the best predictors of students' response to treatments is their performance on measures of these domains prior to the treatment. Students with low scores prior

to treatment are the students who typically make the lowest gains over time (Chapman, Tunmer, & Prochnow, 2001; Vaughn Linan-Thompson, & Hickman, 2003; Vellutino, Scanlon, & Lyon, 2000; Vellutino et al., 1996).

Thus, we propose that students' current performance relative to grade-level peers should be a critical consideration in the selection of appropriate intervention approaches. Specifically, we suggest that schools should consider placing students with the lowest overall initial scores in the most intensive interventions. In fact, in some cases, it may be inappropriate to provide Tier 2 or secondary interventions to students with significant reading difficulties before moving them into more intensive Tier 3 interventions, particularly if the Tier 2 interventions are provided at relatively low levels of intensity. Placing these students in an intervention in which they are not likely to make appreciable progress seems to be just another "wait to fail" model (a term often used to describe approaches to the identification of learning disabilities in which students must develop a severe ability–achievement discrepancy to qualify for special education services).

In particular, we suggest that educational decision makers should consider placing students in Grade 3 and higher who have low reading scores directly into Tier 3 interventions that are highly intensive and responsive to their needs. Even if students who are reading two or more years below grade level are provided with minimally intensive Tier 2 interventions prior to entering Tier 3, they will normally require more significant treatments to close the performance gap with their normally developing peers. This observation appears more and more salient as students progress through the grades.

We also recommend that preventative Tier 2 intervention provided to first graders at risk for reading difficulties be provided with sufficient intensity to make it likely that the majority will achieve grade-level performance by the end of Grade 1. Based on the studies reviewed in this article, these interventions include instruction in groups of three to four students provided 4–5 days per week for 20–30 weeks. If these students' reading growth is regularly measured through repeated progress-monitoring assessments, the students may be exited from intervention when they meet preestablished benchmarks. Their progress should be monitored following exit from intervention so that, should their learning rate level off or decline, additional intervention can be provided. Students who exit intervention may benefit from a generalization intervention like that provided by Torgesen and colleagues (2001).

As educators design Tier 2 preventative or remedial interventions, they must consider the balance between the costs associated with the provision of higher-intensity interventions and the probability that the intervention will result in the majority of students performing in the average range in reading. For example, we suggest that, for many students, having classroom teachers provide low-level supplemental tutoring for a few minutes two or three times per week or providing intervention to students in the primary grades in groups of six to ten may not result in high rates of adequate intervention response, particularly for students with the most impaired reading. This kind of approach may not be cost effective in the long run, if a large percentage of students will ultimately require much more intensive intervention. Determining individual students' needs for highly intensive intervention before placing them in low-intensity Tier 2 intervention may be the most cost-effective approach, and it certainly appears to be more ethical than placing students in low-intensity interventions that are likely to be ineffective for them and waiting for them to fail before moving them into more intensive interventions.

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