Avoiding the Devastating Downward Spiral

The Evidence That Early Intervention Prevents Reading Failure

By Joseph K. Torgesen

Children who are destined to be poor readers in fourth grade almost invariably have difficulties in kindergarten and first grade with critical phonological skills: their knowledge of letter names, their phonemic awareness (ability to hear, distinguish, and blend individual sounds), their ability to match sound to print, and their other skills in using the alphabetic principle are weak. These weak phonological skills, in turn, mean it is difficult for these children to identify (decode) unknown words, and their efforts to do so produce many errors. Naturally, these children find it difficult, even unpleasant, to read independently.

Their problems then spiral. Their ability to become fluent readers is compromised because the development of fluent word reading depends heavily on learning to identify large numbers of words by sight (Schwanenflugel, Hamilton, Kuhn, Wisenbaker, and Stahl, 2004; Torgesen, Rashotte, and Alexander, 2001). Because words do not become sight words until they are read accurately a number of times, both inaccurate reading and diminished reading practice cause slow growth of fluent word-identification skills. Furthermore, the strongest current theories of reading growth link together phonemic and sight word-reading skills by showing how good phonemic decoding skills are necessary in the formation of accurate memory for the spelling patterns that are the basis of sight word recognition (Ehri, 1998).

The terrible spiral then spins even more strongly. We know, for example, that delayed development of reading skills affects vocabulary growth (Cunningham and Stanovich, 1998), alters children's attitudes and motivation to read (Oka and Paris, 1986), and leads to missed opportunities to develop comprehension strategies (Brown, Palincsar, and Purcell, 1986). If children fall seriously behind in the growth of critical early reading skills, they have fewer opportunities to practice reading. Recent evidence (Torgesen, Rashotte, and Alexander, 2001) suggests that these lost practice opportunities make it extremely difficult for children who remain poor readers during the first three years of elementary school to ever acquire average levels of reading fluency. All of this explains the very sobering fact obtained from several longitudinal studies: Children who are poor readers at the end of first

grade almost never acquire average-level reading skills by the end of elementary school (Francis, Shaywitz, Stuebing, Shaywitz, and Fletcher, 1996; Juel, 1988; Shaywitz et al., 1999; Torgesen and Burgess, 1998). (See the sidebar "Waiting Rarely Works (//www.aft.org/newspubs/periodicals/ae/fall2004/editorssb1.cfm)")

That's the bad news. The good news is we now have tools to reliably identify the children who are likely destined for this early reading failure. (See "Early Screening Is at the Heart of Prevention (//www.aft.org/sites/default/files/periodicals/EarlyScreening.pdf)"). Most importantly, given the results of a number of intervention studies, we can say with confidence that if we intervene early, intensively, and appropriately, we can provide these children with the early reading skills that can prevent almost all of them from ever entering the nasty downward spiral just described.

In this article, I want to lay out two sets of findings: (1) what we know about the kind of instruction that weak readers need in kindergarten through second grade to prevent them from ever entering the downward spiral, and (2) what we know about the effectiveness of interventions that make use of this knowledge.

Before setting forth the case for early intervention, an important point needs to be clarified. Most children who enter school at risk for reading difficulties fall into one of two broad groups. Children in the first group enter school with adequate oral language ability but have weaknesses in the phonological domain. Their primary problem in learning to read involves learning to read words accurately and fluently (Torgesen, 1999). In contrast, the second group of children, coming largely from families of lower socioeconomic or minority status, enters school with significant weaknesses in a much broader range of prereading skills (Whitehurst and Lonigan, 1998; Hart and Risley, 1995; Hecht, Burgess, Torgesen, Wagner, and Rashotte, 2000). Not only are their phonological skills and print-related knowledge weak, they have weaker vocabularies, less experience with complicated syntax, and less general background knowledge—all of which are vital for strong reading comprehension at third grade and beyond. Children with these general oral language weaknesses on top of phonological weaknesses require a broader range of instructional support and interventions than those who come to school with impairments only in phonological ability. However, both groups require special support in the growth of early word-reading skills if they are to make adequate progress in learning to read; and, with that support, both can achieve word-reading skills within the average range.*

It is these early word-reading skills—and specifically how to help our weakest readers attain them—that are the focus of this article. Why make word-reading skills the focus when the ultimate goal is reading for comprehension and enjoyment? For several reasons: First, new discoveries about reading have produced a consensus belief that strong word-reading skills are central to fluent, accurate reading (Rayner, Foorman, Perfetti, Pesetsky, and Seidenberg 2001). Second, there is very strong evidence, as common sense would suggest, of both an empirical (Good, Simmons, and Kame'enui, 2001) and theoretical (Chall, 1996; Rayner, et al, 2001) nature that accurate and fluent word-reading skills are important for good reading comprehension. Third, we know how to prevent the emergence of early word-reading difficulties. Thus, if our end goal is strong comprehension, one important goal of early intervention should be to prevent the emergence of early word-reading difficulties. While strong word-reading skills don't fully equip students for advanced comprehension of texts beyond a third-grade level, they are absolutely necessary for it. (For a lengthy discussion of how to build

the broader language skills and knowledge that are vital to later reading comprehension, see the Spring 2003 (//www.aft.org/newspubs/periodicals/ae/spring2003/index.cfm) issue of *American Educator*.

I. What Weak Readers Need to Diminish Early Reading Failure

Too many children are leaving elementary school with reading skills inadequate for the next level of instruction. According to the National Assessment of Educational Progress (NCES, 2003), 37 percent of fourth-graders have "below basic" reading skills. Once this was inevitable, but no more. We now have the knowledge and the tools to bring this percentage down to a single digit.

To accomplish this, we must change the way we teach reading in three ways. First, we must ensure that core classroom instruction in kindergarten through grade three is skillfully delivered with a balanced emphasis on word-level skills (phonemic awareness, decoding, etc.) and reading comprehension (including the intensive build-up of content knowledge). Second, we must have procedures in place to accurately identify children who fall behind in early reading growth, even when they are provided strong classroom instruction. Third, we must provide these children who are behind with reading instruction that is more intensive, more explicit, and more supportive than can be provided by one teacher with a class of 20 or 30 children—and we should provide that extra support early, preferably in kindergarten and first grade.

A. Strong Core Classroom Instruction

Six years ago, in a major national consensus report, the National Research Council (Snow et al., 1998) concluded that the most efficient way to prevent reading difficulties from developing was to ensure that every child received appropriate high-quality reading instruction in grades K–3. That report and the more recent report of the National Reading Panel (2000) identified the critical components of early reading instruction as including explicit teaching to build: phonemic awareness and phonemic decoding skills, fluency in word recognition and text processing, reading comprehension strategies, oral language vocabulary, spelling, and writing skills. Instruction that includes these elements and is delivered in a consistent and skillful way is consistently more effective than instruction that does not contain these components.

Since the speed and ease with which students attain these different skills will vary, good classroom instruction needs to make regular use of small instructional groups composed of children with comparable skill levels and needs. Many children enter school with excellent phonological processing skills and a strong beginning understanding of the alphabetic principle. These children can discover, during interactions with print, most of the knowledge that must be acquired to become a skilled reader.

One frequent argument against increasing the amount and explicitness of phonics instruction in early elementary school classrooms is that not all children need the same level of instruction in this area. This is true. But, by making use of small groups within the classroom, weak readers can receive the explicit phonics instruction they need, while other readers can focus on other elements of language arts. Keep in mind, however, that research suggests that initial explicit instruction in phonics is useful for all children (Snow, Burns, and Griffin, 1998; Foorman, Francis, Fletcher, Schatschneider, and Mehta, 1998).

For children who enter first grade with less than average ability or reading readiness, explicit instruction in, and practice with, phonemic awareness and decoding skills are particularly important. Both Foorman et al. (1998) and Juel and Minden-Cupp (2000) found that explicit instruction and opportunities for extended practice with phonemically decodable texts were particularly beneficial for children at risk for reading failure. In the former study, the most phonemically explicit instruction produced the strongest reading growth for all children, but the effects were particularly striking for children whose phonological skills were weakest when they entered first grade.

Phonemic awareness tasks require children to identify or manipulate the phonemes in words that are presented orally. For example, a simple task in this domain would ask children to say which of three words (*bat*, *car*, *fork*) begins with the same sound as *bike*. A more difficult task might ask the child to pronounce the first sound in the work *bike*, and a still more difficult task might ask the child to say what word was left when the word *card* was pronounced without saying the /*d*/ sound. Both conscious awareness of the phonemes in words *and* the ability to accurately identify them within words are necessary in learning to phonemically decode words in print (Ehri, 2002; Ehri, et al., 2001; Wagner et al., 1997). Children who are delayed in the development of phonemic awareness have a very difficult time making sense out of "phonics" instruction, and they certainly have little chance to notice the phonemic patterns in written words on their own. A simple way to say this is that for individual children, phonemic awareness is what makes phonics instruction meaningful. If a child has little awareness that even simple words like *cat* and *car* are composed of small "chunks" that are combined in different ways to make words, our alphabetic way of writing makes no sense.

B. Screening to Identify Children at Risk of Reading Failure

In recent years, a "technology" of early screening has developed that allows teachers, with a very brief assessment, to identify which children in their classes are at risk of failing to develop their early reading skills on time. In the beginning, the assessment covers such early reading skills as letter-name knowledge, phonemic awareness, letter-sound knowledge, and vocabulary. After reading instruction begins in first grade, the best way to identify children who are falling behind in the ability to read words accurately and fluently is to measure that skill directly. Therefore, by the end of first grade, the assessments should also be measuring oral reading fluency.

In second and third grade, the development of word-level reading ability should continue to be monitored using direct assessments to identify children who are falling behind their peers. At this point, group- or individually-administered measures of reading comprehension may prove useful in identifying children who can continue to profit from more intensive work to build vocabulary and reading comprehension strategies.

These screening assessments are administered individually and should not be confused with group-administered standardized tests, to which they bear no likeness. Screening assessments are typically very brief, often just 5–10 minutes per child and, with proper training, can be administered by the teacher, aides, or specialists in reading or special education, with one or more adults screening the children while the teacher or others conduct the class. These screening and progress-monitoring measures are usually administered several times a year, beginning in kindergarten and going through third grade. Because they identify who needs special help, these screens enable teachers and

schools to target extra resources to the small group of children that needs the most help. They can also aid teachers in forming small instructional groups of children with similar skill development needs. For a fuller discussion of these assessments, see "Early Screening Is at the Heart of Prevention (//www.aft.org/sites/default/files/periodicals/EarlyScreening.pdf)." For an account of how one school made use of such assessments to provide appropriate, effective instruction to its weakest readers, see "Practicing Prevention (//www.aft.org/newspubs/periodicals/ae/fall2004/paglin.cfm)."

C. Appropriate—and Extra—Instruction that Matches At-Risk Students' Needs

Kindergarten through third-grade classrooms typically include children with widely different preparation and talent for learning to read. For example, Hart and Risley (1995) documented enormous differences in opportunities to acquire oral language vocabulary at home among toddlers from different socioeconomic strata. We also know that there are very significant differences among entering school children in their knowledge about letters, print conventions, and phonological sensitivity (Whitehurst and Lonigan, 1998). For schools and teachers, one of the biggest challenges is to provide, within the regular classroom, a range of instructional opportunities in reading that matches this huge diversity in children's talent and preparation for learning to read. As noted, this inevitably requires that a great deal of reading instruction be provided in small groups comprised of children working to develop similar skills. For those children at risk of reading failure, the instruction must be more explicit, more intensive, and more supportive than instruction typically is.

Instruction for at-risk children must be more *explicit* than for other children. Children who enter first grade with weaknesses in their knowledge about letters, letter-sound correspondences, and phonological awareness require explicit and systematic instruction to help them acquire the knowledge and strategies necessary for decoding print. As Gaskins, Ehri, Cress, O'Hara, and Donnelly (1997) pointed out, "first-graders who are at risk for failure in learning to read do not discover what teachers leave unsaid about the complexities of word learning. As a result, it is important to teach them procedures for learning words" (p. 325).

Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own. For example, explicit instruction requires teachers to directly make connections between the letters in print and the sounds in words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group of highly at-risk children during kindergarten, first grade, and second grade (Torgesen, Wagner, Rashotte, Rose, et al., 1999). Of three interventions that were tested on children with phonological weaknesses, the most phonemically explicit one produced the strongest growth in word-reading ability. In fact, of the three interventions tested, *only* the most explicit intervention produced a reliable increase in the growth of word-reading ability over children who were not provided any special interventions. Other studies (Brown and Felton, 1990; Hatcher, Hulme, and Ellis, 1994; Iversen and Tunmer, 1993) combine with this one to suggest that schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire word-reading skills at grade level by third grade.

Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text (Beck, McKeown, and Kucan, 2002). Finally, it requires not only direct practice to build fluency (Mercer, Campbell, Miller, Mercer, and Lane, 2000), but also careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning (Mastropieri and Scruggs, 1997).

Intervention researchers currently have a good understanding of the kinds of knowledge and skills that must be taught and they know that such instruction must be explicit and systematic. However, the exact mix of instructional activities that is most effective almost certainly varies depending on the individual needs of each struggling reader. Furthermore, the range of instructional methods that can be used to effectively teach specific skills to struggling readers may also be quite broad. For example, in one remedial study (Torgesen, Alexander et al., 2001), my colleagues and I found that two methods that both taught phonics explicitly, but that used quite different methods and distributed instructional activities quite differently, produced essentially the same long-term outcomes on reading growth for a sample of children with severe reading disabilities. Richard Olson and his colleagues at the University of Colorado (Olson, Wise, Johnson, and Ring, 1997; Wise, Ring, and Olson, 1999) also demonstrated that a variety of explicit instructional methods are equally effective in accelerating reading growth for children with reading disabilities in second through fifth grades.

Instruction for at-risk children must be more *intensive* than for other children. If at-risk children do not receive more teaching/learning opportunities per day than other children, it is highly likely that their reading skills will develop too slowly and thus they will be pulled into the downward spiral outlined in the beginning of this article. Some children are at risk because they learn more slowly than other children; they will thus require more repetition in order to solidly establish critical word-reading and comprehension skills. Other children are at risk because of a lack of instructional opportunities before they started school. Such children may learn at average rates, but they have much more to learn than children who come to school with typical levels of preparation (Hart and Risley, 1995) and thus must be given more learning opportunities in order to catch up to their peers.

There are essentially two ways to increase intensity of reading instruction in elementary school: either instructional time can be increased or instruction can be provided individually or in small groups. While increasing whole-class instructional time in reading helps many children with mild risk status, the most practical method for increasing instructional intensity for smaller numbers of highly at-risk students is to provide small-group instruction. There can be no question that children with reading difficulties, or children at risk for these difficulties, will learn more rapidly under conditions of greater instructional intensity than they learn in typical classroom settings. Meta-analyses consistently show positive effects of reducing instructional group size (Elbaum, Vaughn, Hughes, and Moody, 1999). Further, the intensive small group work must be frequent; in the studies my colleagues and I have reviewed, success has been produced when groups met 20 to 45 minutes per day, 4 to 5 days per week.

There are a number of practical and feasible ways to provide small group instruction to at-risk students during the school day. The most common way is for the classroom teacher to devote part of the daily reading period to work with small groups of children with similar instructional needs. While the teacher is providing intensive and

focused instruction to one group of four or five children, the other children are working independently on academically engaging literacy activities. The biggest challenge for teachers in this arrangement is the development of productive activities for independent practice and management of student behavior during independent center activities. Another option is to use special education or reading resource teachers to provide intervention instruction during the small group time of the reading period. The regular classroom teacher might work with one group, the resource teacher another, while two more groups were engaged in independent literacy activities. Well-trained and supervised paraprofessionals may also be used effectively to help guide small group instructional and practice sessions (Grek, Mathes, and Torgesen, 2003).

Peer tutoring is another effective strategy for increasing instructional intensity. For example, Doug and Lynn Fuchs and others (1997) reported success in using peer assisted learning strategies to improve reading skills in mid-elementary school, and Mathes and colleagues (Mathes, Torgesen, and Allor, 2001) have reported similar success with students in early elementary school.

Instruction for at-risk children must be more *supportive* than for other children. The needs of at-risk children for more positive emotional support in the form of encouragement, feedback, and positive reinforcement are widely understood. However, their potential need for more cognitive support, in the form of carefully "scaffolded" instruction, is less widely appreciated. Instruction for at-risk children should involve two types of scaffolding. One type of scaffolding involves careful sequencing so that skills build very gradually: The child is always systematically taught and given opportunities to practice the skills required for any task he/she is asked to do (Swanson, 1999). This type of scaffolding is typically provided in well-designed, systematic instructional programs for students with learning disabilities. Another type of scaffolding involves teacher-student dialogue that directly shows the child what kind of processing or thinking needs to be done in order to complete the task successfully. This type of scaffolding in instruction usually involves four elements: (1) the student is presented with a task such as reading or spelling a word (i.e., tries to spell the word "flat"); (2) the student makes a response that is incorrect in some way, or indicates that he/she doesn't know how to proceed (i.e., spells it "fat"); (3) the teacher asks a question that focuses the child's attention on a first step in the solution process, or that draws attention to a required piece of information ("If you read that word, what does it say?" Child responds, "fat." "So, what do you need to add to make it say flat?" No answer. "When you say flat, what do you hear coming right after the beginning sound /*f*/?"); and (4) another response from the child ("I hear the /*l*/ sound."). This kind of interaction between teacher and child continues until the child had been led to successfully accomplish the task. The point of this type of instructional interaction is that the child is led to discover the information or strategies that are critical to accomplishing the task, rather than simply being told what to do. As Juel (1996) showed, the ability to offer scaffolded support while children are acquiring reading skills may have increasing importance as the severity of the child's disability increases.

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I have described three broad ways in which instruction for children who are at risk for reading failure needs to be different from the instruction that is typically provided to all children in the classroom. Ensuring that all three of these elements are part of the instruction for our most at-risk children represents an enormous challenge for our schools. The

requirement for more explicit and supportive instruction demands a higher level of training and skill for teachers than is usually provided at present (Moats, 1994). The requirement for more intensive instruction for at-risk children must involve a reallocation of resources to make more teacher time available for preventive instruction and, in many cases, will probably require entirely new resources to adequately meet the instructional needs of all children who are at risk for reading failure.

II. How Effective Is Early Intervention in Preventing Early Reading Failure?

The obvious questions are: Will all these changes, as sketched above, be worth it? Is instruction that makes use of the ideas above actually effective in preventing reading difficulties in most children?

In order to answer questions about effectiveness, we must first decide what outcome measure should be used to measure success, and what level of performance constitutes success for a preventive intervention. As a nation, we have (through many state laws and the No Child Left Behind Act) identified the end of third grade as the point at which all students should be reading adequately. Although we do not have a universal performance standard in place at this point, states have typically adopted group administered measures of reading comprehension as the most efficient and thorough way to assess whether students have met their standards for reading proficiency.

The use of reading comprehension measures to assess third-grade standards is appropriate, since the ultimate goal of all reading instruction is to ensure that students have the knowledge and skills they need to gain meaning from text. However, most studies that have focused on the prevention of early reading difficulties do not report scores for their participants on third-grade reading comprehension measures. More typically, they report student growth in early word-level reading skills and, as noted earlier, those skills are a necessary, though not sufficient, ingredient for strong comprehension. Thus, in this discussion of effectiveness, I have also adopted word-reading ability as the primary outcome measure. As a reasonable goal for early intervention, I have adopted as the performance standard that children should not fall below the 30th percentile (which is the low end of the average range) on critical word-reading skills at any time during their early elementary years. While this cannot be considered the ultimate standard for the effectiveness of early preventive instruction (which should involve proficient performance on a reliable and valid measure of reading comprehension at the end of third grade), it is one that can be examined in current research. Further, it does represent one important goal of early intervention, which is to establish a firm foundation for future reading growth through mastery of the alphabetic principle and attainment of high levels of accuracy in reading text. I also recognize, as noted earlier, that any standard involving a percentile score is unstable in an environment in which reading scores are generally improving. The data provided in Table 1 (below) are only meant to show what can be accomplished relative to current norms for reading achievement. If reading achievement in this country gradually improves, then achievement at the 30th percentile would obviously mean something different, in terms of absolute level of performance, than it does at this time.

Table 1 provides data from six early intervention studies in which it was possible to identify the percentage of children who obtained scores above or below the 30th percentile on measures of word-reading ability at the end of the intervention. The children who received the

preventive instruction were selected because they were at risk for reading failure on the basis of either weak phonological processing skills or weak development of early word-reading ability. In most of the studies, the children had to have IQ scores of 75 or above to be included, though in some cases there was no IQ cut-off, and in one case, the cut-off was 85. The preventive instruction was provided at some point during kindergarten, first grade, or second grade. The number of hours of special instruction varied between 340 hours of first- and second-grade instruction delivered to groups of eight (Brown and Felton, 1990), and 35–65 hours of one-on-one instruction delivered in the second semester of first grade and the first semester of second grade (Vellutino et al., 1996).[‡] These studies all contained at least one instructional condition that offered skilled delivery of explicit and systematic instruction in phonemic awareness, phonemic decoding, and fluent text reading.

Table 1: How Many Children Remain Below Average Readers after Intervention?

Study	Amount of Instruction (Hours)	Teacher-Student Ratio	Sample Failure Rate	Population Failure Rate
Foorman et al., 1998	174	Whole class divided into small groups	35%	6%
Brown and Fleton, 1990	340	1:8	29%	5%
Vellutino et al., 1996	35–65	1:1	44%	6%
Torgesen et al., 1999	88	1:1	34%	4%
Torgesen, Rashotte, Wagner, et al., 2003	80	1:3	11%	2%
Torgesen, Rashotte, Mathes, et al., 2003	91	1:3 or 1:5	8%	1.6%

Using six early intervention studies with good instructional practices, this chart shows the percentage of intervention students who fail to reach the 30th percentile in word-reading ability and estimates the percentage of all students who would fail to reach the 30th percentile if the early intervention was universally provided to weak readers. Source: Torgesen, 2004.

As Table 1 shows, while the exact effects of the interventions varied, they all were successful in bringing most students (56 percent to 92 percent) to well within the average range of reading ability. Nonetheless, from eight percent to 44 percent of the children in these studies still had word-reading skills below the 30th percentile, even after the intervention. In reflecting on these numbers, keep in mind that the children in these studies represented the 12 percent to 18 percent of children most at risk for reading failure—they were not a random sample of all children.

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So what if the instructional approaches used in these six studies were implemented across the country? How many students would still be struggling with reading? To use each study's failure rate to estimate a failure rate for the whole population, we can multiply the percentage of students who failed to reach the 30th percentile by the percentage of at-risk students they represent. Taking the first study in Table 1 (Foorman et al., 1998) as an example, the students who received the intervention came from the 18 percent most at risk for reading failure. At the conclusion of the intervention, 35 percent of this bottom 18 percent remained weak readers. Multiplying .18 by .35 yields a population failure rate of six percent. In Table 1, these population failure estimates are reported in the column on the far right.

Although there are a number of important caveats to the estimation of population failure rates reported in Table 1 (Torgesen, 2000), one point is well established. Intervention research has not yet discovered the conditions that need to be in place to enable every child to acquire adequate word-level reading skills in early elementary school. However, research has clearly shown how to sharply reduce the number of children who leave first and second grades with weak skills. Most of the estimates reported in Table 1 suggest that between four and six percent of those children with general learning ability in the broadly normal range (above an IQ of 75) would still have weak word reading skills even if they were exposed to the effective interventions reported here.

As a counterpoint to this estimate of population failure rates, Scanlon, Vellutino, Small, and Fanuele (2000) recently reported a study in which the failure rate was essentially zero in the most effective condition. This condition involved a combination of small group intervention in kindergarten and one-on-one instruction in first grade, and it suggests that it may be possible to improve on past results with multilayered interventions in the early grades.

On the other hand, my colleagues and I have some data from one study reported in Table 1 (Torgesen, Rashotte, Mathes, et al., 2003) that these estimates of 94–98 percent success may be a bit optimistic in projecting the percentage of children who would reach grade level on a group-administered reading comprehension test at the end of third grade. In this study, we provided intensive instruction to the 20 percent of first-grade children most at risk for reading failure from five suburban schools in which effective classroom instruction was also provided to all children. Children received systematic and highly explicit supplemental instruction in groups of three or five for 45 minutes a day from October through May. Whereas all children in the intervention groups began the intervention with scores on a word-reading accuracy measure below the 25th percentile, only 8 percent had scores below the 30th percentile on the same measure at the end of first grade. Using the same technique as before, we can estimate the population failure rate for word-level reading skills in this study at 1.6 percent (.2 x .08).

These same children were then followed through to the end of second grade (with no further intervention from us), and our estimation of the population failure rate for the word-reading measure was the same for second grade as for first grade (Torgesen, Rashotte, Mathes, et al., 2003). However, when the outcome measure was a group-administered measure of silent reading comprehension at the end of second grade, the population failure rate (the estimated percentage of the total population remaining below the 30th percentile) was 4.1 percent rather than 1.6 percent. I project that this failure rate will be even higher for a comprehensive measure of reading comprehension at the end of third grade for the simple reason that as reading material becomes more complex (with increasing vocabulary demands and more difficult

concepts), the role of broad verbal ability and knowledge in accounting for reading comprehension difficulties becomes larger (Adams, 1990; Hirsch, 2003).[‡]

How effective is intervention with older students? It works—but not as well or as efficiently as when we intervene with younger students. I've also reviewed the results of interventions conducted with older children (ages 9–12) who were provided 50–100 hours of relatively intense (one-to-one or small group), phonemically explicit, systematic instruction. In some ways the results are promising: These older students made substantial progress in the essential skills of phonemic decoding, reading accuracy, and reading comprehension. But only students with very mild reading problems made any real progress in fluency. Table 2 shows the results of intensive, remedial interventions conducted with five samples of nine- to 12-year-olds who had mild, moderate, or severe reading impairments. Even an intervention that made use of the most effective strategy known to increase fluency (repeated reading of words, phrases, and passages) had very little impact on the relative reading fluency of students with severe impairments (Torgesen, Rashotte, Alexander, Alexander, and MacPhee, 2003). It is important to understand that all of these older students in the studies in Table 2 increased in reading fluency in *absolute* terms (they were able to read passages of equivalent difficulty more fluently after the intervention than prior to the intervention). However, for students with moderate to severe problems with word-level fluency, their increased fluency on low-level passages did not produce a significant "closing of the gap" in fluency compared to peers who were reading at average levels for their age.

Table 2: How Effective Are Interventions With Older Students?

Sample		Amount of instruction (Hours)	Instructional type (teacher-to-student ratio)	Post-intervention percentile scores: Phonemic decoding	Text reading accuracy	Reading comprehension	Reading fluency
Mild impairment (roughly normal intelligence, word reading accuracy around 30th percentile, fluency around 2nd percentile)		60	small group	82	80	70	68
Moderate impairment (intelligence around 30th percentile, word reading accuracy around 10th percentile, fluency below 1st percentile)	Group 1	50	small group	55	25	35	7
	Group 2	100	small group	77	39	39	8
Severe impairment (intelligence around 30th percentile, word reading accuracy around 2nd percentile)	Group 1	67.5	1:1 and 1:2	39	25	27	5
	Group 2 (which appeared to have even more severe impairments than group 1)	133	1:1 and 1:2	39	16	19	5

Results of intensive remedial interventions with five samples of children aged nine to 12. *Source: Torgesen, 2004.*

These studies reflect one of the consistent findings in our research on interventions with late elementary children: If children's impairments in word-reading ability have reached moderate or severe levels, our current interventions cannot typically bring their reading fluency rates to the average range. Although the gap in reading accuracy and comprehension can be substantially or completely closed by current interventions even with these older children, the gap in fluency has remained much less tractable to intervention for moderately and seriously impaired older children. (Fortunately, preventive studies with younger children have not found such problems with later fluency.)

My colleagues and I have proposed elsewhere (Torgesen, Rashotte et al., 2001) several possible explanations for this troubling fact. The most important factor appears to be the difficulty in making up for the huge deficits in reading practice the older children have accumulated by the time they reach late elementary school. These differences in reading practice emerge during the earliest stages of reading instruction (Allington, 1984; Beimiller, 1977–1978) and they become more pronounced as the children advance across the grades in elementary school. For example, in "What Reading Does for the Mind" in the Spring/Summer 1998 (//www.aft.org/newspubs/periodicals/ae/springsummer1998/index.cfm) issue of *American Educator*, Cunningham and Stanovich (1998) reported

evidence suggesting enormous differences in the amount of reading done by good and poor fifth-grade readers outside of school. A child at the 90th percentile of reading ability may read as many words in two days as a child at the 10th percentile reads in an entire year outside of school. Reading practice varies directly with the severity of a child's reading disability, so children with severe reading disabilities receive only a very small fraction of the total reading practice obtained by children with typical reading skills. Nevertheless, research to refine and increase the effectiveness of remedial interventions continues. An ongoing study of four different remedial programs for third- and fifth-grade students in 50 schools is designed to figure out which strategies work best with which students and which programs are most cost effective for schools to implement. Preliminary results will be available in January 2005.

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The results of intervention research have several important implications for education practice. First, schools must focus powerfully on preventing the emergence of early reading weaknesses—and the enormous reading practice deficits that result from prolonged reading failure—through excellent core classroom instruction and intensive, explicit interventions for children who are identified through reliable indicators as at risk of failure. One of the most important goals of preventive instruction should be to maintain fundamental word-reading skills for at-risk children within the average range so that they can read independently and accurately—and with enjoyment. If they do, it is likely that they will experience roughly typical rates of growth in their sight word vocabularies and thus be able to maintain more nearly average levels of reading fluency as they progress through the elementary school years.

Second, schools must find a way to provide interventions for older children with reading disabilities that are appropriately focused and sufficiently intensive. The evidence presented here shows that with such instruction older students can make substantial gains. Simultaneously, our expectations about what constitutes reasonable progress in reading for older children with reading disabilities needs to be adjusted; until our methods are greatly improved, fluency is not likely to rise to average levels over any reasonable intervention period.

Providing the instruction that children at risk of reading failure need will require a great deal of staff development. As an AFT publication is titled, *Teaching Reading* Is *Rocket Science* (//www.aft.org/sites/default/files/periodicals/rocketscience0304.pdf)—and most teachers have not been provided with the training necessary. It will also require that schools incorporate into their regular life the use of early reading screening and progress-monitoring assessments on a regular basis beginning in kindergarten. And it will require both a reallocation of staffing resources and new resources to assure that children who need an intervention get it—immediately. It will take work and it will be expensive. But we know it can be done. And we know it works.

Joseph K. Torgesen is professor of psychology and education at Florida State University and director of the Florida Center for Reading Research. He is author of roughly 100 research articles and several books, including A Basic Guide to Understanding, Assessing, and Teaching Phonological Awareness.

*In this article, the average range is defined as the 30th percentile or above and refers to current national norms. Once strong core curricula and early interventions are widespread, average levels of achievement will increase. Eventually, we will have to stop relying on percentile ranking and establish a benchmark for adequate reading ability that virtually all students ought to meet. (back to article)

†In Table 1 and Table 2, information on the amount of instruction and teacher-student ratio is provided as a glimpse of each intervention, not as an indication of which type of intervention might be most effective. Comparing the effectiveness of the various interventions would require a meta-analysis of a much larger set of studies. (back to article)

‡Forty-six percent of the children in our intervention sample had estimated verbal intelligence below the 30th percentile. Thus, although our intervention students were doing better on a measure of reading comprehension in second grade than would be predicted by an estimate of their broad verbal abillity, we would expect verbal ability to play an increasingly important role as reading material becomes more complex. Although research has shown how to prevent word-level reading difficulties for almost all children, specific methods fro substantially and permantenly incresing relative verbal ability (i.e., verbal intelligence) once children enter elementary school remain to be discovered (Lee, Brookes-Gunn, Schnur, and Liaw, 1990). (back to article)

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