

Brick by Brick: A Series of Landmark Studies Pointing to the Importance of Early Reading Intervention

by Emily Solari, Colby Hall, and Anita McGinty

Most educators understand that early intervention is important for the prevention and/or remediation of word reading difficulties. But how did we come to know this? Over the past few decades, there have been a series of landmark studies that have demonstrated the importance of assessing risk for reading difficulties early on (e.g., screening at the beginning of Grade 1 or ideally in kindergarten) in order to deliver targeted, supplemental instruction to young students who show weaknesses in phonological processing and word reading skills. This article will highlight some landmark, scientific studies that have provided us with three key findings:

1. When children do not receive adequate reading instruction, early reading difficulties are likely to lead to later reading difficulties.
2. Many reading difficulties can be reduced or even eliminated as a result of evidence-based instructional interventions.
3. Evidence-based intervention provided in the early grades is more effective than intervention provided in the later grades.

Early Reading Difficulties are Likely to Lead to Later Reading Difficulties

A pivotal study that may have sown the first seeds of the idea that early reading intervention is important was published in 1988. Connie Juel tracked the reading progress of 54 children from the beginning of Grade 1 to the end of Grade 4. Tracking how students' reading skills developed over time allowed her to see if early reading difficulties would resolve on their own. This was important, because many educators used to believe that children who do not begin to read easily are "late bloomers" who will eventually catch up to their peers. Results showed that, for the children in her study, early reading difficulties did not, on average, resolve on their own. The group of 24 students who struggled most with early reading skills in Grade 1 (i.e., their scores were at or below the 25th percentile) did not catch up to their peers on any measure of reading achievement by the end of Grade 4. On a standardized reading comprehension test, their mean level of reading comprehension had been at a mid-kindergarten grade level in Grade 1; by Grade 4, their mean score was at a third-grade level. The other 30 students who had reading scores in the average or above-average range in first grade had a mean reading comprehension score near a sixth-grade level by fourth grade. With time, the gap did not close.

In 1996, David Francis and colleagues conducted a study wherein they analyzed data collected by the Connecticut Longitudinal Study, and sought to determine what happens to students' reading development over time. They

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reported findings similar to those reported by Juel. They followed 403 randomly-sampled Connecticut public school children from Grade 1 through Grade 9 (1984-1993), assessing them on a variety of cognitive, behavioral, and academic skills. Once they reached Grade 3, students were assigned to one of three groups depending on their scores:

1. "Low achieving" (reading scores were below the 25th percentile and consistent with general cognitive development)
2. "Reading disabled-discrepant" (reading scores were significantly below general cognitive development)
3. "Not reading impaired" (all remaining students)

By following these groups, the researchers could test the hypothesis that some children might "catch up" in reading—or the alternative hypothesis that reading difficulties tend to persist. On average, the "low-achieving" and "reading disabled-discrepant" groups had strikingly similar reading development trajectories. More important to the topic of this article was the finding that neither the low-achieving nor the reading disabled-discrepant students

ever caught up to their “not reading impaired” peers: 74% of children who were poor readers in Grade 3 remained poor readers in Grade 9. Studies such as these built our understanding that reading difficulties do not resolve on their own. We now understand that we should not believe there is such a thing as a “late bloomer” when it comes to reading development.

The persistence of reading difficulties over time made it important to answer the next logical question: can early intervention (i.e., supplemental reading instruction in the classroom or reading instruction delivered by interventionists in “pull-out” contexts) make a difference?

Reading Difficulties Can Be Reduced or Even Eliminated with Early Intervention

Research has shown that students can be accurately and efficiently identified as at risk for having later reading difficulties as early as kindergarten (e.g., Catts et al., 2001; Compton et al., 2006). This is important, because across the last three decades, a large body of research has revealed positive effects of intensive, evidence-based reading intervention when provided early (i.e., during a child’s first two years of school). Only 2%-7% of all students identified as being at risk continue to experience reading difficulties after receiving this type of intervention in the early elementary grades (e.g., Mathes et al., 2005; McMaster et al., 2005; O’Connor et al., 2005; Torgesen, 2000; Torgesen et al., 1999; Vellutino et al., 1996). In other words, these landmark intervention studies show us how we can ensure that up to 98% of all students learn to read successfully if we identify students at risk for difficulty early and provide evidence-based interventions that address the foundational reading skills with which students are demonstrating difficulty. For example, Mathes et al. (2005) reported that only 16% of at-risk first-graders in their study sample who received evidence-based, small-group reading intervention had a below-average score on a foundational reading skills assessment at the end of Grade 1. If trends in this sample held true for *all* at-risk students in schools similar to the study schools, only 3% of all students would score below average given access to the Mathes et al. intensive intervention. In a separate study, McMaster et al. (2005) studied the eight lowest-performing students in each of the 22 Grade 1 classrooms involved in their study. At the conclusion of their evidence-based, small-group reading intervention, only 1-2 students in each classroom, on average, continued to struggle. An important take-away from this work is that reading intervention based on scientific ev-

idence can not only reduce word reading difficulties; it can largely *eliminate* word reading difficulties altogether.

Despite the effectiveness of the interventions delivered in these studies, people wondered whether early intervention was the most efficient approach. Could it be better to wait and deliver interventions later, once it is clear exactly which students have the most significant needs? After all, a number of studies showed that reading interventions delivered in the upper elementary and middle grades can also accelerate reading gains. Was there a way to determine whether intervening in the early elementary grades is *more* effective than intervening later? Is there a critical window for delivering reading intervention?

Reading Intervention is More Effective When Provided During Early Elementary Grades

A number of studies have provided an answer to these questions by delivering the same reading intervention to students at different grade levels, using random assignment and controlling for other variables in order to determine if the timing of the intervention mattered. For example, Connor and her colleagues (2013) conducted a study in which whole classrooms were randomly assigned to an evidence-based, individualized reading intervention (see Connor et al., 2007) or a “control,” business-as-usual condition during students’ first, second, and third-grade years. The intervention varied the amount of time spent on different explicit, systematic instructional components/types of reading activities based on students’ initial performance on word reading, vocabulary, and comprehension assessments. Because randomization of classrooms to either the intervention condition or business-as-usual condition took place every year, some children received one, two, or three years of reading intervention. Outcomes were best for the children who received the reading intervention during all three grades. Most important for the discussion here, though, is that among the students who received only one year of the intervention, those who received it early—during Grade 1—outperformed their peers who received it in Grade 2 or Grade 3. Earlier was more effective than later.

O’Connor et al. (2014) wanted to know if access to reading intervention in kindergarten (K) versus Grade 1 had a different effect on reading achievement at the end of Grade 1 and/or Grade 2. They found that students who had access to reading intervention in kindergarten had significantly higher reading scores at the end of Grade 1

than their peers who did not. At the end of Grade 2, students who had access to reading intervention only in Grade 1 performed similarly to students who had access to reading intervention in both K and Grade 1. The only exception was for students who were English learners (ELs). ELs in Grade 2 who had access to reading intervention in K showed an advantage compared to their EL peers who did not have access until Grade 1. Notably, when all students who had access to reading intervention in K and/or Grade 1 were lumped together and compared with a historical comparison group that did not have access to reading intervention in either grade, there were significantly higher outcomes at the end of Grade 2 for students who had access to reading intervention in those early grades.

Finally, Lovett et al. (2017) delivered a multiple-component, small-group reading intervention to students in Grades 1, 2, or 3. They compared the effects of the intervention on reading performance to a series of grade-level “control” groups who did not receive the intervention. The children who received the intervention outperformed their control group peers. On tests of word reading skill, children who received the intervention earlier (i.e., in Grades 1 or 2) made gains that were almost twice the gains made by children who received the intervention in Grade 3. At follow-up (1-3 years later), the advantage of early intervention was maintained.

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Brick by Brick Takeaways

Eye-opening research studies conducted by Juel (1988) and Francis et al. (1996) showed us that students who have reading difficulties in the early elementary grades do not “catch up” to their peers naturally, over time, in the absence of intervention. A later series of revealing studies built our understanding that we can accurately identify students who are at risk for reading difficulties as early as kindergarten (e.g., Catts et al., 2001), and that early reading interventions can reduce or even eliminate reading difficulties (Mathes et al., 2005; McMaster et al., 2005; O'Connor et al., 2005; Torgesen,

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2000; Torgesen et al., 1999; Vellutino et al., 1996). Perhaps most importantly, a final series of research studies provided evidence that reading interventions are more effective in the earliest grades (Connor et al., 2013; O'Connor et al., 2014; Lovett et al., 2017). All of this research, brick by proverbial brick, has accumulated so that it is now a foundation of evidence supporting the provision of early intervention to students at risk for reading difficulties. School leaders and educators of all kinds should push for early screening of all students in K and Grade 1, to determine which students are at risk for reading difficulties. Evidence-based reading intervention can then be provided for school-age students who are identified as being at risk—the earlier the better. ■

References

- Catts, H. W., Fey, M. E., Zhang, X., & Tomblin, J. B. (2001). Estimating the risk of future reading difficulties in kindergarten children. *Language, Speech, and Hearing Services in Schools, 32*(1), 38-50. doi: 10.1044/0161-1461(2001/004)
- Connor, C. M., Morrison, F. J., Fishman, B., Crowe, E. C., Al Otaiba, S., & Schatschneider, C. (2013). A longitudinal cluster-randomized controlled study on the accumulating effects of individualized literacy instruction on students' reading from first through third grade. *Psychological Science, 24*(8), 1408-1419.
- Connor, C. M., Morrison, F. J., Fishman, B. J., Schatschneider, C., & Underwood, P. (2007). The early years: Algorithm-guided individualized reading instruction. *Science, 315*(5811), 464-465.
- Compton, D. L., Fuchs, D., Fuchs, L. S., & Bryant, J. D. (2006). Selecting at-risk readers in first grade for early intervention: A two-year longitudinal study of decision rules and procedures. *Journal of Educational Psychology, 98*(2), 394.
- Ehrhardt, J., Huntington, N., Molino, J., & Barbaresi, W. J. (2013). Special education and later academic achievement. *Journal of Developmental and Behavioral Pediatrics, 34*(2), 111-119.
- Francis, D. J., Shaywitz, S. E., Stuebing, K. K., Shaywitz, B. A., & Fletcher, J. M. (1996). Developmental lag versus deficit models of reading disability: A longitudinal, individual growth curves analysis. *Journal of Educational Psychology, 88*(1), 3-17.
- Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology, 80*(4), 437-447.

Lovett, M. W., Frijters, J. C., Wolf, M., Steinbach, K. A., Sevcik, R. A., & Morris, R. D. (2017). Early intervention for children at risk for reading disabilities: The impact of grade at intervention and individual differences on intervention outcomes. *Journal of Educational Psychology, 109*(7), 889-914.

Mathes, P. G., Denton, C. A., Fletcher, J. M., Anthony, J. L., Francis, D. J., & Schatschneider, C. (2005). The effects of theoretically different instruction and student characteristics on the skills of struggling readers. *Reading Research Quarterly, 40*, 148-182.

McMaster, K. N., Fuchs, D., Fuchs, L. S., & Compton, D. L. (2005). Responding to nonresponders: An experimental field trial of identification and intervention methods. *Exceptional Children, 71*, 445-463.

Morris, R. D., Lovett, M. W., Wolf, M., Sevcik, R. A., Steinbach, K. A., Frijters, J. C., & Shapiro, M. B. (2012). Multiple-component remediation for developmental reading disabilities: IQ, socioeconomic status, and race as factors in remedial outcome. *Journal of Learning Disabilities, 45*(2), 99-127.

O'Connor, R. E., Bocian, K. M., Sanchez, V., & Beach, K. D. (2014). Access to a responsiveness to intervention model: Does beginning intervention in kindergarten matter?. *Journal of Learning Disabilities, 47*(4), 307-328.

O'Connor, R. E., Fulmer, D., Harty, K., & Bell, K. (2005). Layers of reading intervention in kindergarten through third grade: Changes in teaching and child outcomes. *Journal of Learning Disabilities, 38*, 440-455.

Torgesen, J. K. (2000). Individual differences in response to early interventions in reading: The lingering problem of treatment resisters. *Learning Disabilities Research and Practice, 15*(1), 55-64.

Torgesen, J. K., Wagner, R. K., Rashotte, C. A., Rose, E., Lindamood, P., Conway, T., & Garvan, C. (1999). Preventing reading failure in young children with phonological processing disabilities: Group and individual responses to instruction. *Journal of Educational Psychology, 91*(4), 579-593.

Vellutino, F. R., Scanlon, D. M., Sipay, E. R., Small, S. G., Pratt, A., Chen, R., & Denckla, M. B. (1996). Cognitive profiles of difficult-to-remediate and readily remediated poor readers: Early intervention as a vehicle for distinguishing between cognitive and experiential deficits as basic causes of specific reading disability. *Journal of Educational Psychology, 88*(4), 601-638.



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