Check for updates

Article

Hammill Institute on Disabilities

Remedial and Special Education
2015, Vol. 36(1) 45–51
© Hammill Institute on Disabilities 2014
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0741932514555023
rase.sagepub.com
SAGE

Instructional Engineering Principles to Frame the Future of Reading Intervention Research and Practice

Deborah Simmons, PhD[1]

Abstract

In this article, I outline thoughts regarding the complexities and possibilities of the next generation of reading intervention for students who do not benefit from typical instructional practices. I ground my recommendations in school-based research and observations conducted primarily in kindergarten through third grade and more recently in Grades 6 through 10. Building on principles and practices that have accrued through experimental research, I discuss the importance of enhancing the impact of reading instruction by reinforcing and articulating connections within and between intervention tiers. Specifically, I focus on the potential of (a) fortified Tier 1 foundations, (b) aligned Tier 1 and Tier 2 interventions, (c) bridged instruction to support critical reading transitions, and (d) flexible, responsive Tier 2/Tier 3 interventions.

Keywords

reading, instruction, academic achievement, early intervention

The invitation by the editors of *Remedial and Special Education* to contribute to this special issue, "Framing the Future: Visions From Senior Scholars . . .," prompted two soul-searching questions. First, when did I become a senior? And perhaps more important, when did I become a scholar? After accepting the fact that at least one of these attributes was plausible, I accepted their invitation and trust my perspectives may advance our understanding of reading intervention for students who do not benefit adequately from typical reading instruction.

I began my career as a speech-language specialist, completed graduate degrees in special education, and have spent the past 20 plus years investigating methods for improving the reading outcomes for students, including those with identified reading disabilities or students in general education who experience reading difficulty. I suppose that time span qualifies me as being a "senior." Scholar status is far more difficult to attain.

Over my career, I have collaborated with extraordinary colleagues and learned from exceptional students whose unvarnished comments kept me grounded when I thought I had the answers. In this article, I focus primarily on early reading intervention and lessons learned from our school-based research, which I draw upon to frame future research and practice. In the past few years, I have worked in Grades 6 through 10. My visions for future research and practice are grounded in multiple sources, and in this article, I draw primarily from (a) results of my own research and that of my colleagues, and (b) observations of interventions in action and discussions about them with implementers and students. Informed by the time spent in school settings and the district administrators, teachers, paraprofessionals, and students who provided a healthy dose of reality, my visions realize both the complexities and the possibilities for future reading intervention.

Designing Interventions for Real-World Contexts

My professional career has focused largely on instructional design and the science of designing interventions that positively influence early and sustained reading achievement in authentic, real-world contexts. Often, reading intervention studies are designed to evaluate newly developed or unstudied interventions under highly controlled conditions with extensive external support (Coyne, Little, et al., 2013). While such studies help shape our knowledge of the efficacy of specific curricular elements, they do not allow us to estimate the effectiveness of multiple components operating concurrently in real-school settings under typical conditions. To achieve optimal effects, we must provide schools

[1]Texas A&M University, College Station, USA

Corresponding Author:
Deborah Simmons, Texas A&M University, 725 Harrington Tower, 4225 TAMU, College Station, TX 77843-4225, USA.
Email: dsimmons@tamu.edu

better guidance on how to effectively coordinate the complex system of reading intervention.

An important first step is building on the evidence base that has accrued in early intervention and response to intervention (RtI). Recent articles and syntheses provide excellent summaries of the state of RtI in general (Fuchs & Vaughn, 2012) and reading intervention in particular (Connor, Alberto, Compton, & O'Connor, 2014; Denton, 2012). The practice guide by Gersten et al. (2009) offers specific guidance for multi-tiered interventions to assist students who struggle with reading in the primary grades. Across these research reviews and practice guides, authors identified building blocks of RtI, including (a) operating from the assumption that reading instruction is a shared responsibility of general education and specialized intervention services, (b) screening and monitoring of student progress, (c) selecting programs and materials that have evidence of effectiveness, and (d) differentiating and intensifying reading instruction based on student performance. These building blocks must be in place to effectively address the academic needs of students with significant reading difficulties.

From these bodies of research, two central findings have emerged. First, early reading intervention effectively positioned the majority of students with adequate decoding and word reading outcomes. Second, a small but significant percentage of children failed to benefit adequately from supplemental intervention (e.g., O'Connor, Fulmer, Harty, & Bell, 2005; Vellutino, Scanlon, Small, & Fanuele, 2006). The big idea I offer in this article is that the future of intervention for students who do not benefit adequately from typical instruction will require more complex and integrated approaches than have been investigated in prior research or practice. I organize my application of instructional engineering around the levels of primary, secondary, and tertiary prevention.

Pursuing the Promise of Prevention

The prevention model for addressing reading difficulties borrows from health education, which recognizes three stages of prevention (National Center on Response to Intervention, 2010). While there are multiple models, the stages of prevention efforts in reading generally align with the instructional tiers in most RtI models, as briefly outlined below. In RtI, tiers are the mechanisms within the broader system through which reading support is organized and delivered.

Primary prevention (Tier 1) aims to prevent the onset of reading difficulties by reducing risk through proactive, generalized practices that promote good reading health, including universal screening and the systematic use of evidence-based instructional practices delivered with high-quality implementation. Secondary prevention (Tier 2) includes assessment procedures that identify students at risk of reading difficulty and interventions designed to pre-empt its progression with a goal of moving students to a state of adequate reading performance. Finally, tertiary prevention (Tier 3) focuses on students with established reading difficulties and uses intensive interventions to reduce the advancement and complications of reading problems through instruction that not only remediates but also accelerates learning.

These three tiers of intervention can be likened to physical structures that by design, organize and operationalize the system of instructional services schools use to prevent and intercept the progression of reading difficulties. Structural engineers rely on the strength, flexibility, and integrity of the individual components (e.g., beams, piers, trusses) and their ability to function interdependently and withstand internal and external pressures. Similarly, instructional engineers rely on the strength, flexibility, and integrity of the individual components (e.g., programs, practices, interventions, teachers) and their ability to function interdependently within a school. Instructional engineers are concerned with design and analysis of systems that will build, support, and sustain students' reading development over time.

Whereas the extant research provides evidence of the efficacy of components such as peer/collaborative supplemental intervention and formative assessment when studied as independent components or practices (Connor et al., 2014), in reality, schools need to integrate and coordinate multiple components and practices. In the following, I present some of my thoughts related to a structural engineering approach to future reading intervention.

Recognizing the Potential of Fortified Tier 1 Foundations: Implications for General Education

Tier 1 Platform for Success

The success of early intervention depends in large part on the strength of foundational skills developed through Tier 1 instruction (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998). Just as structural engineers must consider the surface on which they are building their structure, instructional engineers for students at risk of reading difficulty must design a solid foundation built on scientific evidence to ensure the integrity of instruction provided in general education. As such, well-engineered Tier 1 instruction develops essential skills that promote reading development and can reduce the severity of reading difficulties for many students. This instructional platform is built on content components and instructional delivery systems that specify the amount of time, type of grouping, and assessment procedures used to solidify reading success.

While advances have been made in understanding the essential components of reading and the conditions that promote reading development, my classroom observations as well as interviews with general education Tier 1 teachers have revealed marked variability and difficulty in navigating the heterogeneity of classrooms and the demands of Tier 1 reading instruction. These inconsistencies range from minor unevenness in the quality and quantity of reading instructions to major cracks in instructional foundations.

Sources of Vulnerability

In schools, numerous forces contribute to or cause foundations to fail or shift, which may weaken early reading development. These faults and shifts occur when administrative changes bring about new instructional priorities, when resource reductions remove instructional coaches and supports, when new teachers enter the workforce with inadequate training, when teachers do not have access to high-quality materials and programs, or when the building blocks of reading development (e.g., phonemic awareness, vocabulary) do not receive adequate emphasis. As a result, administrators should survey Tier 1 reading instruction to evaluate whether it complies with best practices and make adjustments to ensure that components (e.g., implementation, quality of instruction) are stable and operating as intended.

My colleagues and I have invested extensive effort in developing and translating routines, practices, and interventions to enhance the reading instruction of general education teachers in preschool through high schools. While some teachers adopted and implemented these programs and practices fluently and flexibly, others were more reluctant to change their instructional practices. In the majority of instances where Tier 1 instructional change was implemented and sustained over time, principals and district-level administrators were involved in instructional decisions and committed resources to ensure success.

In general education, I believe that the factor that leads to sustained effective practice is the school administrator and the actions he or she takes to ensure that reading instruction is a priority. The lesson I learned from a forward-thinking administrator is that unless principals are on board, committed, and involved in the day-to-day practices of reading reform, things go sideways if not backward.

In the primary grades, researchers have made a significant progress in identifying programs and practices that promote reading achievement. However, many schools and districts still do not use programs with the "right stuff" for Tier 1 instruction. The future of Tier 1 intervention depends on the collective efficacy of Tier 1 programs, their implementation, and the instructional quality, conditions, and configurations that promote student learning.

Vision for Tier 1 in Primary/Elementary Grades

My vision of a fortified Tier 1 in the primary and elementary grades begins with administrators (district and school level) who are committed to improving reading outcomes for all students. Specifically, administrators assume roles as instructional leaders and allocate resources and supports to ensure that programs are delivered with high fidelity and quality and are responsive to learner performance. In this ideal world, teachers clearly understand instructional priorities for their respective grades and how the component skills relate to reading achievement. In addition, teachers receive adequate training in research-supported programs and understand how the component parts of program cohere to create solid reading development. They are trained in formative assessment and understand how to use data to make instructional decisions. Furthermore, they have solid grounding in effective pedagogy regardless of the program(s) they use and demonstrate proficiency in a set of instructional priorities such as understanding how to effectively teach vocabulary, comprehension strategies, and word recognition skills. In this vision, students are actively engaged in plentiful opportunities to read text in which they can be successful. Instruction involves multiple forms, including teacher-directed, peer-mediated, and technology-enhanced, and is differentiated based on learner needs.

While these concepts may not seem particularly visionary, my experiences suggest that far too few schools and classrooms have realized the promise of Tier 1 prevention. Therefore, further work is needed to ensure that what we know is taught in teacher preparation programs and translated into Tier 1 practices at the primary grades.

Vision for Tier 1 in Upper Grades

In upper-elementary, middle, and high schools, my vision for Tier 1 instruction is more modest but nonetheless important. Students who have significant reading difficulties require more than Tier 1 intervention; nonetheless, they require more effective practices than I have typically observed. Over the past few years, my colleagues and I have dedicated considerable effort to improving reading instruction in Grades 6 to 10 and our efforts have been met with extensive challenges. Once students have reached a level where they take multiple courses from multiple teachers, the landscape of reading instruction is filled with chasms and instructional inconsistencies that are difficult for even the most sure-footed reader to traverse. I applaud those who have spent their careers attempting to improve reading outcomes in the secondary grades.

Perhaps my greatest realization from my experiences in the secondary grades is that few teachers are adequately prepared with basic skill sets, including how to select and teach priority vocabulary, how to scan text and identify words that

must be pre-taught, or how to effectively engage a classroom of students in active and interactive strategies to promote comprehension. I fully recognize that upper-elementary and middle-school classrooms are focused on content. However, learning from content-area text cannot be realized without teachers who are prepared to support the substantial number of students who lack prerequisite knowledge.

In two recent studies (Fogarty et al., 2014; Simmons et al., 2014), we worked with middle- and high-school English language arts teachers to integrate instructional routines designed to promote reading comprehension. Findings from both studies revealed the challenges of altering the instructional practices of teachers in the face of competing priorities. Classwide interventions in heterogeneous secondary classrooms were inadequate for promoting reading comprehension. There was no clear benefit for struggling readers. Intervention did not take hold consistently, despite enhanced differentiated, and sustained professional development.

Ouch! The results of these studies still sting but offer important perspectives. Our findings clearly did not align with our predictions that we could enhance struggling readers' comprehension through fortified Tier 1 intervention. Moreover, they revealed the complexity of middle and secondary classrooms. My instinct is that Tier 1 instruction that effectively promotes reading comprehension requires an even greater level of institutional and instructional commitment than is necessary at the elementary grades if we are to realize demonstrable changes in teacher behavior and student achievement.

Next Steps for Tier 1 Intervention

In summary, while we have a solid knowledge base of what needs to be taught and the conditions that promote early reading development, in too many classrooms, the foundation of Tier 1 instruction is unstable. In some cases, the foundations are not firmly established, and in other cases, the foundations shifted due to administrative and instructional changes. At the middle and secondary level, methods to establish instructional foundations across teachers may require an extraordinary engineering feat that spans grades, content-areas, and student heterogeneity. My vision is that the typical practices of Tier 1 instruction in the primary, elementary, and secondary grades can be fortified to enhance the quality and impact of general education reading instruction. However, the supports necessary to attain and sustain quality instruction will require significant changes in the administrative and instructional infrastructure.

The Potential of Aligned Between-Tier Interventions: Implications of Instructional Disequilibrium

Schools are complex environments that require a functional organizational structure to be able to teach their large and increasingly diverse student populations. In multi-tiered systems, the functional structure has relied on Tier 1 instruction delivered by the classroom teacher and Tier 2 instruction which is typically provided by a different teacher, often in a pullout setting. In structural engineering, equilibrium is essential and refers to the ability of a structure to remain stable while withstanding the internal and external forces (e.g., gravity, wind; Bozzo & Fenves, 1994).

Finding the Constant Between the Tiers

Unfortunately, the structure of Tier 1 and Tier 2 instructions creates the opportunity for disequilibrium, which may compromise the effects of instruction in both settings. The big issue is that in many cases, the student is the only constant in the instructional scenario. Teachers differ, programs differ, instructional scope and sequence differ, and it is the responsibility of the learner to bridge Tier 1 and Tier 2. When the force (i.e., instruction) of Tier 1 instruction and the force of Tier 2 instruction are inconsistent or incompatible, the potential for disequilibrium is created. Instructional disequilibrium can affect learning whenever students are taught different strategies in different contexts. There is plentiful evidence to support the benefits of Tier 2 intervention for students with early reading risk (Gersten et al., 2009). Nonetheless, few researchers have attempted to study or align the instructional methods in Tier 1 and Tier 2 to minimize the possible confusion for students who are most vulnerable to instructional inconsistencies. Although empirical evidence is limited, there is promise that coordinating instructional supports across tiers of support can accelerate reading development among primary-grade students (Harn, Chard, Biancarosa, & Kame'enui, 2011).

An important area for research involves examining how to optimize intervention effects by investigating connections that reinforce Tier 1 and Tier 2. In structural engineering, joints are places where two or more surfaces or ends are connected through fasteners. My experiences suggest that in practice, limited attention is paid to the connections between Tier 1 and Tier 2 and that the absence of these fasteners compromises the strength and impact of instruction.

In interviews where we asked classroom teachers to describe the Tier 2 instruction their students received, we found that most were unaware of programs their students received when out of their classroom. We would not expect Tier 1 and Tier 2 instructions to teach the same content. However, we would expect Tier 1 and Tier 2 instructions to use consistent instructional language and strategies to create an equilibrium or synergy between both instructional settings. I recognize the challenges of Tier 1–Tier 2 communications, yet until we understand how to effectively coordinate and align instruction between settings, we may not realize the full potential of early intervention.

The Potential of Instructional Bridges: Implications of Critical Reading Transitions

In structural engineering, permanent buildings are designed and constructed to withstand the test of time. Similarly, a fundamental assumption of early intervention research is that benefits accrued in earlier grades maintain over time and position students for lasting reading success. Increased expectations for students to read complex text coupled with the significant number of students who do not read proficiently on national assessments underscore the need to examine the permanence and sufficiency of early intervention.

Several important studies provide guidance on what O'Connor and colleagues (2005) termed the "transience of catching up" (p. 452). In their cross-year study of intensive layers of reading instruction, they found that as the complexity of reading demands increased, some students who had previously met reading benchmarks required additional interventions. In our study of kindergarten students identified as at risk of reading difficulty (Coyne, Kame'enui, Simmons, & Harn, 2004), we examined whether there was an inoculation effect of intervention. Findings indicated that for students who responded strongly to kindergarten intervention, there was a sustained benefit in first grade over students who did not participate in the intervention. However, we did not examine the durability of effects beyond first grade. In a study examining longitudinal effect, Connor et al. (2013) found that individualized reading intervention in first grade was necessary but not sufficient for students from high-poverty schools.

Designing Instructional Bridges

Thus, current findings suggest both the benefit of early intervention and the need for instructional bridges that support students through curricular transitions where the reading landscape is often steep and difficult to traverse. In particular, there is need for instructional bridges in the upper-elementary and middle grades. In our work in upper-elementary and middle schools, we observed the impact of underdeveloped reading and comprehension skills. Whether these students have experienced sustained reading difficulty across grades or developed late emerging reading difficulties (Catts, Compton, Tomblin, & Bridges, 2012) is not clear. What is clear is the need for instructional supports in the upper-elementary and middle grades that transcend typical instruction. For example, in a study of 790 students in Grades 6 to 10, we found that 278 (40%) performed below the 30th percentile on a standardized reading comprehension test (Clemens, Simmons, Oslund, & Coyne, 2014). Of these students, 41% had both vocabulary and word reading difficulties. Interventions to promote reading comprehension in the upper-elementary and middle grades must recognize that the pillars of vocabulary and word identification must be developed to support reading for understanding.

Planning for Transience

For some students, the jumpstart of early intervention is sufficient; for others, the durability of effects is more transient, and vulnerable to curricular and content demands. Implications of these findings require nuanced responses that vary by resources and personnel. In particular, a significant number of students will not benefit from typical instruction due to underlying word recognition and vocabulary/background knowledge deficits.

To realize the promise of intervention will require that we revisit the assumption of the permanence of early reading intervention effects and construct instructional supports to bridge important transitions. Places where instructional bridges are needed include transitions from (a) single-syllable to multi-syllable words, (b) literal to inferential comprehension, (c) narrative to informational text, (d) teacher-regulated to student-regulated reading, (e) shorter to longer passages, and (f) familiarity to technical vocabulary.

The Potential of Tier 2–Tier 3 Flexibility: Implications for Enhancing Instructional Responsiveness

As physical structures, buildings are constructed to withstand a certain degree of sway or give. In her book, *The Heights: Anatomy of a Skyscraper*, Ascher (2011) noted that the upper tiers of skyscrapers pose huge challenges for engineers. In particular, they must take into consideration both high-probability events such as strong winds and low-probability (but nonetheless devastating) events such as earthquakes or hurricanes. She suggests that to withstand these forces, engineers must build in joints at the corners of beams that can expand or contract depending on weather changes. These joints allow for movement at the upper tiers.

Factoring in Flexibility

As in skyscrapers, the upper tiers in a prevention model are perhaps the most challenging and least understood. A central feature of RtI involves adjusting instruction based on student response. Although teachers and schools are advised to make ongoing instructional adjustments, there is limited direct experimental evidence to show how to flexibly build in instructional "give" at the upper tiers. In a recent study, Coyne, Simmons, et al. (2013) found that when a Tier 2 intervention was adjusted in ways often recommended by RtI guidance documents (e.g., teaching to mastery, adjusting the pace of instruction; Gersten et al., 2009), student learning was accelerated, particularly the learning among students most at risk. It should be noted that while this study was conducted in authentic settings, the interventionists

received extensive support in how to use data to make instructional adjustments. In addition, instructional adjustments were relatively simple within-program changes that required interventionists to repeat specific lessons, skip certain lessons, or stay on course. Implications suggest the need for interventions with built-in flexibility and highly qualified professionals with sufficient training in implementing interventions responsively. Currently, there are more studies that have examined standard protocol interventions (Fuchs & Vaughn, 2012) than studies that have examined "flexible" implementation. This makes sense given the complexity of designing responsive instruction that can be implemented in authentic settings. However, responsive interventions may need to better reflect learner heterogeneity.

Future flexible designs may not need to be as dynamic as individualized problem-solving models that adjust instruction formatively and are difficult to design, implement, and codify. If there is too much "give" or flexibility—the stability of the overall structure is compromised. Yet at the upper-elementary and middle-school levels particularly, interventions need to be structured around critical skill deficits and build in sufficient instructional sway. Across grades, the future of reading intervention must recognize the need for highly specialized teachers (i.e., special educators) with knowledge and skills to design and implement highly responsive intervention for students who do not benefit from typical instruction.

Conclusion

My visions for the future of reading intervention are based more on the students our interventions did not reach than on those they did. They are for the first-grade student who received three reading classes per day and whose words, "No more letters," still echo in my head. Surely, we can do better than have children participate in three reading classes, none of which were aligned or coordinated. My visions are also for the kindergarten student who at the end of the intervention period asked one of our data collectors, "How do you learn to read?" They are for the ninth-grade student who pleaded with the classroom teacher not to ask him to read a passage aloud because of embarrassment and for the seventh-grade students who when participating in a remedial reading class gently asked the teacher to close the door, so that other students passing in the hall would not realize that they were being taught to read.

My visions come from the forward-thinking and resilient principals who participated in every professional development session because they knew it was important for their teachers. They come from the district administrators who protected resources and committed personnel to ensure that teachers had adequate support. They stem from districts whose typical practices were as powerful as our experimental interventions and caused us to ask harder questions than "Does it work?" They come from teachers who persevered with faithful intervention implementation and from the implementation failures when demands exceeded capacity or resources. They have emerged from the paraprofessionals who demonstrated their capacity to positively affect the reading achievement of the most struggling readers in their schools.

I used the metaphor of structural engineering to reinforce the importance of structures/systems that build, support, and sustain reading development over time. Just as structural engineers base their practices on tested principles, should we expect any less of educators? We know the sources of reading problems for many of our students who do not benefit adequately from typical instruction, and we have accruing knowledge of effective solutions. I am hopeful that through focusing on the engineering principles of fortified foundations, aligned instruction, bridged transitions, and flexible interventions, we may realize the promise of prevention that adequately supports the range of readers.

Acknowledgment

I would like to thank my colleagues Nathan Clemens, Michael Coyne, and Beth Harn for reviewing drafts of this article and for their valuable feedback.

Author's Note

The opinions expressed are those of the author and do not represent views of the Institute or the U.S. Department of Education.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Dr. Simmons is a coauthor of one of the interventions, the Early Reading Intervention (Scott Foresman, 2004) that is the subject of research findings reported in this manuscript.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305F100013 as part of the Reading for Understanding Research Initiative, as well as through Grant R324E060067 to Texas A&M University.

References

Ascher, K. (2011). *Heights: Anatomy of a skyscraper*. London, England: Penguin Press.

Bozzo, L. M., & Fenves, G. L. (1994). Qualitative reasoning and the representation of fundamental principles in structural engineering. *Research in Engineering Design*, *6*, 61–72. doi:10.1007/BF01579984

Catts, H. W., Compton, D., Tomblin, J. B., & Bridges, M. S. (2012). Prevalence and nature of late-emerging poor readers. *Journal of Educational Psychology*, *104*, 166–181. doi:10.1037/a0025323

Clemens, N., Simmons, D., Oslund, E., & Coyne, M. (April, 2014). *Examining the role of vocabulary knowledge in struggling comprehenders*. Invited session at the Annual conference of the Council for Exceptional Children, Philadelphia, PA.

Connor, C. M., Alberto, P. A., Compton, D. L., & O'Connor, R. E. (2014). *Improving reading outcomes for students with or at risk for reading disabilities: A synthesis of the contributions from the Institute of Education Sciences Research Centers* (NCSER 2014-3000). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Special Education Research. Available from http://ies.ed.gov/

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*, 1408–1419. doi:10.1177/0956797612472204

Coyne, M. D., Kame'enui, E. J., Simmons, D. C., & Harn, B. A. (2004). Beginning reading intervention as inoculation or insulin: First-grade reading performance of strong responders to kindergarten intervention. *Journal of Learning Disabilities*, *37*, 90–104. doi:10.1177/00222194040370020101

Coyne, M. D., Little, M., Rawlinson, D., Simmons, D., Kwok, O., Kim, M., . . . Civetelli, C. (2013). Replicating the impact of a supplemental beginning reading intervention: The role of instructional context. *Journal of Research on Educational Effectiveness*, *6*, 1–23. doi:10.1080/19345747.2012.706694

Coyne, M. D., Simmons, D. C., Hagan-Burke, S., Simmons, L. E., Kwok, O., Kim, . . . Rawlinson, D. M. (2013). Adjusting beginning reading intervention based on student performance: An experimental evaluation. *Exceptional Children*, *80*, 25–44.

Denton, C. A. (2012). Response to intervention for reading difficulties in the primary grades: Some answers and lingering questions. *Journal of Learning Disabilities*, *45*, 232–243. doi:10.1177/0022219412442155

Fogarty, M., Oslund, E., Simmons, D., Davis, J., Simmons, L., Anderson, L., . . . Roberts, G. (2014). Examining the effectiveness of a multicomponent reading comprehension intervention in middle schools: A focus on treatment fidelity. *Educational Psychology Review*, *26*, 425–449. doi:10.1007/s10648-014-9270-6

Foorman, B. R., Francis, D. J., Fletcher, J. M., Schatschneider, C., & Mehta, P. (1998). The role of instruction in learning to read: Preventing reading failure in at-risk children. *Journal of Educational Psychology*, *90*, 37–55. doi:10.1037/0022-0663.90.1.37

Fuchs, L. S., & Vaughn, S. (2012). Responsiveness-to-intervention: A decade later. *Journal of Learning Disabilities*, *45*, 195–203. doi:10.1177/0022219412442150

Gersten, R., Compton, D., Connor, C. M., Dimino, J., Santoro, L., Linan-Thompson, S., & Tilly, W. D. (2009). *Assisting students struggling with reading: Response to intervention and multi-tier intervention in the primary grades—A practice guide* (NCEE 2009-4045). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. Retrieved from http://ies.ed.gov/ncee/wwc/publications/practiceguides/

Harn, B. A., Chard, D. J., Biancarosa, G., & Kame'enui, E. J. (2011). Coordinating instructional supports to accelerate at-risk first-grade readers' performance. *The Elementary School Journal*, *112*, 332–355.

National Center on Response to Intervention. (2010, March). *Essential components of RTI—A closer look at response to intervention*. Washington, DC: U.S. Department of Education, Office of Special Education Programs, National Center on Response to Intervention. Retrieved from http://www.rti4success.org/resourcetype/essential-components-rti-closer-look-response-intervention

O'Connor, R. E., Fulmer, D., Harty, K. R., & Bell, K. M. (2005). Layers of reading intervention in kindergarten through third grade: Changes in teaching and student outcomes. *Journal of Learning Disabilities*, *38*, 440–455. doi:10.1177/00222194050380050701

Simmons, D. C., Fogarty, M., Oslund, E. L., Simmons, L. E., Hairrell, A., Davis, J., . . . Fall, A. (2014). Integrating content knowledge-building and student-regulated comprehension practices in secondary English language arts classes. *Journal of Research on Educational Effectiveness*, *7*, 309–330. doi:10.1080/19345747.2013.836766

Vellutino, F. R., Scanlon, D. M., Small, S., & Fanuele, D. P. (2006). Response to intervention as a vehicle for distinguishing between children with and without reading disabilities: Evidence for the role of kindergarten and first-grade interventions. *Journal of Learning Disabilities*, *39*, 157–169. doi:10.1177/00222194060390020401