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# Foundational Reading Comprehension Interventions for Students in Grades K-3: A Systematic Review of Recent Research

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Kentucky Department of  
**EDUCATION**

# **Foundational Reading Comprehension Interventions for Students in Grades K-3: A Systematic Review of Recent Research**

## **Abstract**

This systematic review synthesizes recent research (2014-2024) on instructional interventions aimed at improving foundational reading comprehension among students in grades K-3. Guided by a pre-specified review protocol, studies were selected based on strict eligibility criteria, including study design, population, intervention type, and outcome measures. A total of 65 studies were included to identify instructional characteristics and student factors associated with positive comprehension outcomes. Results highlight effective intervention features such as multicomponent instruction, explicit teaching strategies, and differentiated instruction. Findings suggest that specific components and implementation features can meaningfully impact the reading comprehension development of young learners, including English Learners, students with disabilities, and at-risk students.

## **Comprehension**

### **Introduction**

Comprehension is the ultimate goal of reading, requiring integration of linguistic, cognitive, and text-based processes (National Reading Panel (2000); Institute of Education Sciences (IES, 2016); Connor et al. (2014); Foorman et al. (2016)). Foundational comprehension skills developed in early childhood set the stage for later academic success (National Reading Panel (2000); Institute of Education Sciences (IES, 2016); Connor et al. (2014); Foorman et al. (2016)). This review synthesizes empirical studies to update and extend prior meta-analyses and systematic reviews, such as the 2016 WWC Practice Guide, by examining studies published between 2014 and 2024. Past syntheses emphasize the importance of direct instruction in text structures, inferencing skills, and vocabulary development. This review aims to (a) examine intervention and student characteristics studied, (b) evaluate overall and subgroup effectiveness, and (c) identify features associated with improved outcomes.

Across the reviewed studies, comprehension instruction showed a range of effect sizes, with the most notable gains observed in Tier 3 interventions, followed by Tier 2, and Tier 1. These findings emphasize the importance of intensity and differentiation based on student needs. For example, vocabulary instruction paired with visual

scaffolds for English Learners and one-on-one comprehension sessions for struggling readers were particularly effective.

### ***Factors Affecting Comprehension***

A large body of research has identified factors that influence the development of reading comprehension in early learners. These factors include language-based skills, including vocabulary knowledge, syntactic awareness, and oral language proficiency. These elements provide the foundation upon which students can build meaning from text, as they allow young readers to understand word meanings, sentence structures, and the conventions of spoken and written discourse (Perfetti & Stafura, 2014; Oakhill & Cain, 2012).

Decoding ability is also critical to comprehension development. When students can read words accurately and fluently, they can focus on constructing meaning from the text rather than focusing only on word recognition (Gough & Tunmer, 1986). Word reading fluency will allow readers to improve overall reading rate and accuracy, thus improving their ability to construct meaning from text.

Working memory also plays a pivotal role in comprehension. It enables students to retain key details, integrate new information with prior knowledge, and make sense of ideas presented across multiple sentences or paragraphs (Cain et al., 2004). Background knowledge also supports comprehension by providing students with familiar content or context. When readers can relate what they are reading to what they already know, they are more likely to make inferences and construct deeper meaning (Recht & Leslie, 1988).

Instructional approaches have a direct impact on how these cognitive resources are activated and supported. Explicit teaching of comprehension strategies—such as summarizing, predicting, questioning, and identifying main ideas—has consistently been shown to improve comprehension outcomes, especially when instruction is scaffolded and responsive to student needs (National Reading Panel, 2000; Vaughn et al., 2011). However, the nature of the texts themselves also matters. Complex vocabulary, unfamiliar sentence structures, and challenging organizational formats can either support or hinder a student's ability to engage with and comprehend a text (Mesmer et al., 2012).

Finally, motivation and engagement serve as key affective dimensions of comprehension. When students are interested in what they read and believe they are capable of understanding the material, they are more likely to engage deeply, persist through challenges, and apply learned strategies (Guthrie et al., 1999). These cognitive, linguistic, instructional, and motivational elements interact in complex and dynamic ways. Thus, effective reading instruction must be comprehensive, addressing not only skill development but also the cognitive and emotional engagement required for successful comprehension (Snow, 2002).

### ***Barriers***

Although educators and researchers agree on the importance of reading comprehension, there are barriers to improving comprehension outcomes for students in grades k-3 (Foorman et al., 2016; Shanahan et al., 2010). One issue is the low level of explicit instruction in comprehension in some elementary classrooms. Teachers often spend more time on decoding and fluency than they do on comprehension strategy instruction (Duke et al., 2011). Due to this lack of explicit instruction, students may miss out on opportunities for growth as they strive to make meaning of text.

Another barrier for improving overall comprehension achievement is the overuse of passive reading activities, such as sustained silent reading. Struggling readers need frequent feedback and guidance to improve their reading comprehension, and so passive reading activities may not provide the scaffolding they need. (Reutzel et al., 2008). Some studies also indicate that teachers may miss opportunities to tailor instruction to individual student needs. When teachers are not responsive and adaptive to their students' needs, the difficulties struggling readers face will continue to get worse (Gersten et al., 2007; Kieffer, 2010).

Additionally, many early literacy curricula and programs do not consistently teach foundational comprehension skills like inference-making, text structure awareness, or summarization (Shanahan et al., 2010). Without adequate training, teachers who implement these curricula will not successfully implement explicit comprehension instruction. Larger issues like large class sizes, limited instructional time, and competing academic priorities leave teachers with very little time to give students the targeted comprehension instruction they need. Schools also often rely on narrow and standardized comprehension measures that fail to capture deeper comprehension skills, which can lead teachers to misinterpret students' needs and make less-informed instructional decisions (Valencia et al., 2010). To overcome these challenges, schools need to rethink how they design instruction, train teachers, and allocate resources.

Comprehension is a critical component of early literacy instruction at the early elementary level.

### **Research Questions:**

1. Research question 1: What instructional and intervention characteristics (e.g., use of Elkonin boxes, multicomponent instruction, intervention dosage, group size, implementer, modality) and student characteristics (e.g., age, English Learner, disability status) have been tested as part of comprehension interventions?
2. Research question 2: What does the research say about the effectiveness of comprehension instruction in improving foundational reading outcomes for readers in grades K-3?
3. Research question 3: What features of instructional interventions (e.g., type of instruction, duration, grade level) are associated with improved outcomes? Do these features differ according to student characteristics?

## **Method**

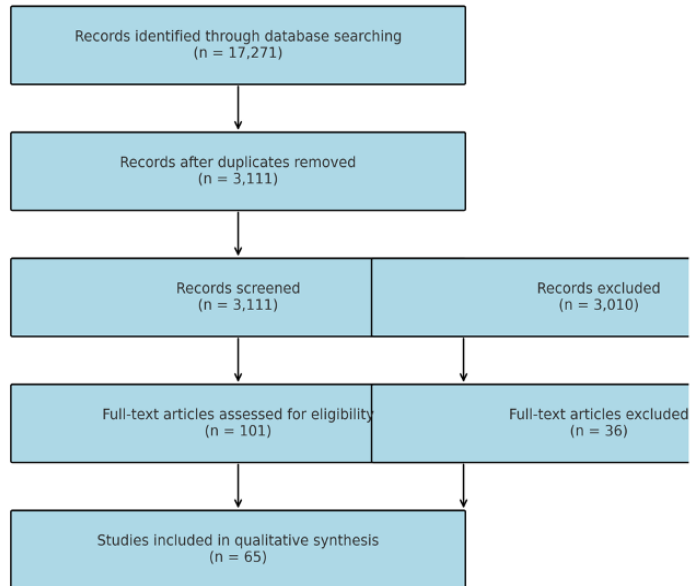
### **Study Eligibility Criteria**

Eligible Populations: Students in kindergarten through third grade (ages 5 years 0 months through 9 years 11 months), or any subset of these grades. Studies that include other grades are eligible only if disaggregated results are provided for K-3 students, or if students in K-3 represent the majority of the sample. If only mean age is reported, it must fall between 5 years 0 months and 9 years 6 months.

- Location: Studies were conducted in English and located in the United States, its territories, Canada, Australia, Ireland, New Zealand, or the United Kingdom. Acceptable settings include schools, early childhood centers, homes, or clinics.
- Eligible Interventions: Studies must evaluate comprehensive or supplemental curricula or replicable instructional strategies for teaching comprehension. Interventions must be clearly described with replicable procedures, and must not solely focus on professional development, teacher preparation, or textbook design.

## Search Strategy

Figure 1  
PRISMA Flow Diagram showing study identification, screening, eligibility, and inclusion.



The literature search involved systematic searching across multiple databases, including Academic Search Complete, APA PsycInfo, ERIC, and Teacher Reference Center. Search terms combined keywords related to comprehension (e.g., "comprehension skill," "text understanding"), intervention (e.g., "instruction," "program"), population (e.g., "K-3," "elementary"), and study design (e.g., "RCT," "quasi-experimental"). An initial search yielded 17,271 results. After refining search terms, 3,111 abstracts were screened for relevance. Only studies published between 2014 and 2024, written in English, focusing on eligible populations and interventions, and measuring comprehension outcomes were retained. [101 studies were included in full text screening](#) after screening abstracts for eligibility. 65 studies were included after full text screening each of the 101 studies for date published, eligible populations and interventions, and at least one comprehension-focused outcome.

## **Coding Procedure**

Included studies were coded for study design, participant demographics (grade level, English Learner status, disability status), intervention characteristics (components, delivery mode, group size, implementer, dosage, fidelity), and outcome measures. Independent and dependent variables were systematically identified from each study. Coding also documented subgroup analyses when reported, such as differential effects for English Learners or students with disabilities.

## **Analysis**

A narrative synthesis approach was used to summarize study characteristics, intervention features, and outcomes. Effect sizes, when reported, were noted to indicate the magnitude of impact on reading comprehension. Subgroup analyses were conducted to examine differential effects across student populations and settings. Specifically, the review analyzed effectiveness for:

- Students with disabilities
- English Learners
- At-risk students in general education settings
- Interventions implemented within Multi-Tiered Systems of Support (MTSS), categorized as Tier 1 (universal), Tier 2 (targeted), and Tier 3 (intensive)

These analyses aimed to identify which instructional features were particularly beneficial for specific subgroups and to determine how intervention effectiveness varied by intensity and context.

## **Results**

### **Characteristics of Reviewed Studies**

#### [Table 1. Overview and Demographics](#)

This review included 65 studies published between 2014 and 2024. Most were conducted in U.S. elementary schools, with varied representation across rural, suburban, and urban settings. Study designs included randomized controlled trials ( $n = 31$ ), quasi-experimental designs ( $n = 16$ ), and single-case experimental designs ( $n = 16$ ). Samples ranged from small groups of two students to large-scale studies involving more than 1,000 participants. Participant populations spanned general

education students, English learners ( $n = 20$  studies), students with disabilities ( $n = 15$ ), and academically at-risk students ( $n = 28$ ).

## **Independent Variables: Components of Interventions Examined in Synthesis**

### [Table 2. Components](#)

Across the 65 studies, interventions varied in dosage, implementer, and instructional approach. Session lengths ranged from 15 to 60 minutes, typically implemented two to four times per week over a span of 6 to 20 weeks. Interventions were delivered by classroom teachers ( $n = 35$ ), researchers ( $n = 32$ ), paraprofessionals ( $n = 3$ ), and hired interventionists ( $n = 7$ ). Most interventions were delivered in small groups ( $n = 39$ ), with others using whole-class ( $n = 13$ ) or individual ( $n = 13$ ) formats.

Prominent instructional approaches included:

- Explicit comprehension strategy instruction (e.g., summarization, prediction, text structure)
- Multicomponent models integrating vocabulary, decoding, fluency, and comprehension
- Visual and graphic scaffolds, such as story maps and semantic webs
- Dialogic reading, peer-mediated learning, and digital tools for engagement and differentiation
- Combination of narrative and informational texts, with structured guidance on genre features

## **Dependent Variables and Effects**

Across the 65 studies reviewed, effect sizes (ES) for reading comprehension interventions ranged small to large. A large majority—59 of the studies—reported statistically significant gains in at least one comprehension outcome. Interventions that combined multiple instructional components, particularly those integrating vocabulary, decoding, fluency, and comprehension strategies, tended to yield the strongest results. Visual scaffolds, such as story maps and visual organizers, also appeared consistently in higher-impact interventions.

Several studies illustrate these trends. Denton et al. (2014) reported that explicit instruction in inferencing within a Tier 2 guided reading framework significantly improved comprehension for first graders. Kim et al. (2023) found similar success

with a longitudinal, content-rich literacy intervention implemented from Grade 1 to Grade 2, which improved vocabulary and comprehension for all students, especially English Learners. Cabell et al. (2025) highlighted that a content-based curriculum boosted kindergarteners' listening comprehension and content knowledge, while Gillam et al. (2022) showed that a multidimensional language intervention led to notable improvements in both oral and written comprehension for students at risk of language impairment.

Culturally responsive approaches also showed promise. Barber et al. (2018) demonstrated that computer-based repeated reading interventions, tailored with culturally relevant texts, improved comprehension for English Learners. Similarly, Connor et al. (2017) documented gains from a content-area literacy approach focused on disciplinary reading strategies across Grades K-4.

Targeted interventions for specific subgroups further support the value of differentiated approaches. For English Learners, Baker et al. (2015) found that supplemental instruction combining vocabulary and decoding skills facilitated language transfer from Spanish to English and improved reading comprehension. Students with disabilities benefited from explicit story grammar instruction, with Alves et al. (2015) reporting gains linked to teacher modeling and graphic organizer use. Fien et al. (2015) also observed success in first grade through a multitiered intervention addressing decoding, fluency, and comprehension, while Mariage et al. (2019) described positive outcomes from a Tier 2 apprenticeship-based close reading program centered on informational text.

Taken together, these results reinforce the effectiveness of explicit, multicomponent interventions. For example, high-yield strategies included inference instruction embedded in narrative texts for early elementary students, vocabulary-focused instruction tailored for bilingual learners, and intensive Tier 3, one-on-one comprehension and fluency sessions for struggling readers. These findings highlight the importance of combining instructional intensity with thoughtful design to maximize reading comprehension outcomes for diverse learners.

### **Subgroup Analysis: What interventions are effective for English Learners, Students with Disabilities, At-Risk Students, Students in General Education—Interventions Conducted in Tiers 1- 3**

#### [Table 3. Tiered Table](#)

- **Students with disabilities:** Interventions emphasizing repeated reading, visual organizers, and structured practice for students with disabilities yielded

medium to large effect sizes. Single-case designs frequently reported functional gains in both literal and inferential comprehension.

- **English learners:** 24 studies included ELs; interventions that paired vocabulary instruction with visuals and language scaffolds showed positive outcomes. Integrated oral language routines and interactive dialogues supported deeper text understanding.
- **At-risk students:** Among 28 studies, the most successful included decoding support, strategy instruction, and high-frequency engagement. Peer-mediated programs were especially effective when paired with teacher modeling.

### **Tiered Interventions:**

- **Tier 1 (Universal):** Implemented at the whole-class level; these showed small to moderate gains, especially when strategy instruction was explicit.
- **Tier 2 (Targeted):** Typically small-group, these interventions demonstrated moderate effects, particularly when they included visual scaffolds and direct instruction.
- **Tier 3 (Intensive):** The highest effects were observed here, ranging from moderate to large, especially with one-on-one, extended-duration models targeting students with the most intensive needs.

### **Instructional Features Linked to Effectiveness**

The most effective reading comprehension interventions—regardless of study design, grade level, or student population—shared several common instructional features that contributed to their success. One of the most common characteristics was the use of explicit instruction, where teachers modeled strategies and gradually released responsibility to students. These approaches helped learners understand reading processes such as making inferences, summarizing, and monitoring their understanding during reading. Another feature of high-impact interventions was their multicomponent structure. Rather than focusing on comprehension in isolation, these programs integrated it with vocabulary development, decoding skills, and fluency practice, which are all foundational to reading performance. Many of these interventions also incorporated scaffolded visual tools—such as graphic organizers and story maps—to reduce cognitive load and support comprehension monitoring.

Oral language routines played an important role as well. Interventions that created space for peer discussion, questioning, and elaboration tended to deepen students' engagement and understanding. These routines allowed learners to process information verbally and clarify meaning through dialogue, which was especially beneficial for English Learners and students with limited background knowledge. Additionally, the most effective programs exposed students to a range of text types. By including both narrative and informational texts, these interventions helped students apply strategies across genres and build the kind of flexible reading skills necessary for academic success. Programs that incorporated culturally responsive materials and adapted instruction based on students' language, background, and learning needs were especially effective for English Learners and other diverse groups. Finally, a common thread across high-impact interventions was strong implementation fidelity. Programs were most successful when they were delivered consistently, with clear procedures, and included regular progress monitoring to ensure that instruction met students' evolving needs.

## **Discussion**

### **Discussion of Overall Independent Variable Effectiveness**

These findings extend previous syntheses (e.g., Vaughn et al., 2011; NICHD, 2000) by systematically examining multicomponent and scaffolded comprehension instruction within specific learner groups across MTSS tiers. While prior reviews highlighted the value of explicit strategy instruction, the current analysis demonstrates how dosage, visual scaffolds, and culturally responsive elements elevate outcomes, particularly for English Learners and students with disabilities. Compared to earlier meta-analyses which often grouped K-5 students, this review isolates findings specific to K-3 and affirms the importance of alignment between intervention design and developmental stage.

The findings from the 65 included studies align closely with prior research and recommendations from the Institute of Education Sciences (IES), particularly the 2016 What Works Clearinghouse (WWC) Practice Guide on Improving Reading Comprehension in Kindergarten Through Third Grade. Consistent with prior syntheses (NICHD, 2000; Vaughn et al., 2011), the reviewed studies confirm that explicit instruction in comprehension strategies—such as summarizing, predicting, questioning, and identifying text structure—is critical for improving student outcomes. Studies that incorporated these practices reported medium to large effect sizes, demonstrating that explicit strategy instruction remains a cornerstone of effective comprehension teaching.

The integration of multicomponent interventions—those that simultaneously address vocabulary, decoding, fluency, and comprehension—also echoed previous findings from IES. The WWC emphasized that comprehension does not develop in isolation but is deeply connected to language and word-level reading skills. This review similarly found that interventions targeting multiple skill domains generally achieved higher effect sizes than single-focus programs. Interventions that used scaffolded visual supports, such as graphic organizers and story maps, showed especially strong effects, validating prior IES guidance on the importance of supporting text structure awareness and inferential thinking.

Subgroup analyses highlighted important nuances. Students with disabilities, English Learners, and at-risk readers all benefited from explicit and scaffolded instruction, but the highest gains were observed when instruction was systematically differentiated to address specific linguistic and cognitive needs. For example, studies involving English Learners emphasized the importance of combining vocabulary development with oral language supports and visuals, mirroring IES recommendations to build language-rich environments for dual language learners. Interventions delivered in Tier 3 settings (intensive, individualized formats) produced the largest gains, reaffirming the WWC's emphasis on tailoring support intensity to student needs within Multi-Tiered Systems of Support (MTSS). Small-group Tier 2 interventions also demonstrated moderate success, particularly when they integrated structured comprehension routines with frequent feedback.

This review extends prior syntheses by capturing emerging trends in technology-assisted comprehension interventions and increased attention to culturally responsive practices. Several newer studies demonstrated promising effects when digital tools were used to scaffold comprehension processes or when texts were selected to reflect students' cultural backgrounds. However, technology integration alone was insufficient; gains were larger when digital interventions incorporated structured modeling, feedback, and strategy instruction—again aligning with IES principles that instructional quality is paramount.

In sum, the findings across the 65 studies reinforce and extend the evidence base summarized in earlier IES and WWC guidance. They confirm that explicit, scaffolded, multicomponent comprehension instruction—delivered with attention to students' linguistic, cognitive, and cultural needs—is critical for supporting early reading development in diverse learners.

## **Discussion of Components Effectiveness**

The review revealed that specific instructional components—particularly when implemented in combination—had consistent, positive effects on early reading comprehension. Multicomponent interventions that integrated vocabulary, decoding, and fluency alongside comprehension strategies produced higher effect sizes than those focusing on a single domain. Instructional scaffolds such as graphic organizers, story structure maps, and question stems were frequently associated with improved inferential and literal comprehension outcomes.

Explicit instruction remained a core component across successful interventions. In studies targeting Grades K–3, effective approaches often included teacher modeling, think-alouds, and gradual release methods. Programs that embedded oral language development through discussion routines, peer interaction, and dialogic reading also supported comprehension growth, particularly for multilingual learners and at-risk populations. English Learners (ELs) benefited most from interventions that combined vocabulary instruction with visual and linguistic scaffolds. Baker et al. (2015) and Barber et al. (2018) demonstrated that pairing oral language supports with culturally relevant materials resulted in moderate to large effects. Interactive reading routines and bilingual supports were especially impactful for dual language learners. Students with Disabilities showed gains when interventions were highly structured and repetitive. Alves et al. (2015) and Fuchs et al. (2018) reported that explicit modeling of story grammar, coupled with frequent practice and visual aids, facilitated meaningful growth in comprehension. Individual or small-group settings improved accessibility.

General Education Students in Tier 1 settings benefited from whole-class comprehension strategy instruction, but effects were enhanced when paired with small-group follow-up sessions and scaffolding. For example, Kim et al. (2016) found that even low-cost, whole-class interventions had lasting benefits when guided practice was embedded.

## **Tiered Interventions Across MTSS**

Tier 1 (Universal) interventions demonstrated modest but reliable gains, particularly when strategy instruction was explicit and teachers used scaffolded tools. Whole-class delivery was effective when coupled with formative assessment and classroom discussion.

Tier 2 (Targeted) interventions, often delivered in small groups, showed stronger effects, especially when they included structured routines, visual supports, and progress monitoring. Examples include Fien et al. (2015), who implemented a

multitiered early reading model with high fidelity.

Tier 3 (Intensive) interventions produced the largest gains. These one-on-one or highly individualized formats were especially effective for students with the most intensive needs. Studies such as Telesman et al. (2019) and Gillam et al. (2022) emphasized the importance of tailoring instruction and extending duration for struggling readers.

Programs should make extensive use of visual supports such as graphic organizers and include a balance of narrative and informational texts. Teachers should build in peer discussion routines and oral language activities, particularly for English Learners and at-risk students, and differentiate supports based on learner profiles. Professional development should focus on helping educators recognize and implement multicomponent approaches, manage small-group instruction effectively, and collect and use comprehension data to inform instruction.

### ***Subgroup Analysis: Implications for English Learners, Students with Disabilities, Students in General Education***

- ***English learners:*** Instruction should emphasize explicit vocabulary teaching, oral language development, and culturally relevant texts. Use of visuals and bilingual supports can strengthen comprehension.
- ***Students with disabilities:*** Instruction should include repeated modeling, story structure instruction, and one-on-one or small-group supports with individualized scaffolds.
- ***Students in general education:*** Whole-class comprehension strategies are beneficial when delivered with fidelity, but effectiveness increases substantially when paired with small-group instruction and opportunities for strategy practice.

### **Limitations**

Despite rigorous inclusion criteria, several limitations affect the generalizability of this review. Studies varied in implementation fidelity and reporting detail, limiting cross-study comparability. There was considerable heterogeneity in comprehension measures, and some studies lacked standardized assessments. Few studies included long-term follow-up to assess sustained effects. Additionally, while some studies reported subgroup-specific outcomes, many aggregated data across student groups, limiting our ability to draw definitive subgroup conclusions.

## **Future Research**

Future research should address gaps by including long-term follow-up assessments, increasing transparency around implementation fidelity, and reporting disaggregated outcomes by subgroup. Further studies are needed to explore the use of digital comprehension tools, especially those embedded in classroom practice. Researchers should also examine dosage and instructional delivery formats to optimize efficiency and effectiveness across MTSS tiers. Finally, future interventions should continue to integrate culturally and linguistically sustaining pedagogies to ensure equity in early reading development.

## **Conclusion**

This systematic review analyzed 65 studies published between 2014 and 2024 to examine the effectiveness of reading comprehension interventions for K-3 students. Findings confirmed and extended existing guidance from the Institute of Education Sciences (IES), particularly emphasizing the value of explicit comprehension strategy instruction and multicomponent approaches that integrate vocabulary, decoding, and fluency. The results demonstrated consistent effectiveness across diverse instructional formats and contexts, with the strongest gains observed in Tier 3 intensive interventions and when instruction was adapted to meet the linguistic, cognitive, and cultural needs of learners.

The review found that students with disabilities, English Learners, and at-risk students particularly benefited from structured, scaffolded interventions using visual supports and frequent opportunities for guided practice. Interventions delivered in small groups or one-on-one settings, especially those emphasizing oral language, text structure, and comprehension monitoring, were most successful. These conclusions align with prior IES guidance and extend the knowledge base by highlighting effective practices across different tiers of support and student subgroups.

Instructional effectiveness was greatest when interventions were implemented with high fidelity and included professional development for educators. Despite variability in measures and implementation, the overall evidence base suggests that early, targeted comprehension instruction can significantly enhance foundational reading skills and close achievement gaps among young learners. By integrating new findings with established best practices, this review provides strong support for adopting explicit, scaffolded, and multicomponent instruction as a foundational element of K-3 literacy education. These strategies, when tailored to student needs and delivered with consistency, hold promise for improving comprehension outcomes at scale.

## References

- Cain, K., Oakhill, J., & Bryant, P. (2004). Children's reading comprehension ability: Concurrent prediction by working memory, verbal ability, and component skills. *Journal of Educational Psychology, 96*(1), 31-42.
- 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.
- Duke, N. K., Pearson, P. D., Strachan, S. L., & Billman, A. K. (2011). Essential elements of fostering and teaching reading comprehension. In S. J. Samuels & A. E. Farstrup (Eds.), *What research has to say about reading instruction* (4th ed., pp. 51-93). International Reading Association.
- Foorman, B., Beyler, N., Borradaile, K., Coyne, M., Denton, C. A., Dimino, J., & Wissel, S. (2016). *Foundational Skills to Support Reading for Understanding in Kindergarten through 3rd Grade. Educator's Practice Guide. NCEE 2016-4008. What works clearinghouse.*
- Gersten, R., Fuchs, L. S., Williams, J. P., & Baker, S. (2001). Teaching reading comprehension strategies to students with learning disabilities: A review of research. *Review of Educational Research, 71*(2), 279-320.
- Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*(1), 6-10.
- Guthrie, J. T., Wigfield, A., Metsala, J. L., & Cox, K. E. (1999). Motivational and cognitive predictors of text comprehension and reading amount. *Scientific studies of reading, 3*(3), 231-256.
- Institute of Education Sciences. (2016). *What Works Clearinghouse practice guide: Improving reading comprehension in grades K-3.*
- Kieffer, M. J. (2010). Socioeconomic status, English proficiency, and late-emerging reading difficulties. *Educational Researcher, 39*(6), 484-486.
- Mesmer, H. A. E., Cunningham, J. W., & Hiebert, E. H. (2012). Toward a theoretical model of text complexity for the early grades: Learning from the past, anticipating the future. *Reading Research Quarterly, 47*(3), 235-258.

- National Reading Panel. (2000). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction. National Institute of Child Health and Human Development.
- Oakhill, J., & Cain, K. (2012). The precursors of reading ability in young readers: Evidence from a four-year longitudinal study. *Scientific Studies of Reading*, 16(2), 91-121.
- Perfetti, C. A., & Stafura, J. (2014). Word knowledge in a theory of reading comprehension. *Scientific Studies of Reading*, 18(1), 22-37.
- Recht, D. R., & Leslie, L. (1988). Effect of prior knowledge on good and poor readers' memory of text. *Journal of Educational Psychology*, 80(1), 16-20.
- Reutzel, D. R., Fawson, P. C., & Smith, J. A. (2008). Reconsidering silent sustained reading: An exploratory study of scaffolded silent reading. *The Journal of Educational Research*, 102(1), 37-50.
- Shanahan, T., Callison, K., Carriere, C., Duke, N. K., Pearson, P. D., Schatschneider, C., & Torgesen, J. (2010). Improving reading comprehension in kindergarten through 3rd grade: A practice guide (NCEE 2010-4038). *What Works Clearing House*.
- Snow, C. E. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. RAND Corporation.
- Valencia, S. W., Wixson, K. K., & Pearson, P. D. (2014). Putting text complexity in context: Refocusing on comprehension of complex text. *The Elementary School Journal*, 115(2), 270-289.
- Vaughn, S., Wanzek, J., Murray, C. S., & Roberts, G. (2012). Intensive Interventions for Students Struggling in Reading and Mathematics. A Practice Guide. *Center on Instruction*.

## Included Studies

- Al Otaiba, S., Connor, C. M., & Crowe, E. (2018). Promise and feasibility of teaching expository text structure: A primary grade pilot study. *Reading and Writing, 31*(9), 1997-2015.
- Alves, K. D., Kennedy, M. J., Brown, T. S., & Solis, M. (2015). Story grammar instruction with third and fifth grade students with learning disabilities and other struggling readers. *Learning Disabilities: A Contemporary Journal, 13*(1), 73-93.
- Baker, D. L., Burns, D., Kame'enui, E. J., Smolkowski, K., & Baker, S. K. (2016). Does supplemental instruction support the transition from Spanish to English reading instruction for first-grade English learners at risk of reading difficulties? *Learning Disability Quarterly, 39*(4), 226-239.
- Baker, D. L., Santoro, L., Biancarosa, G., Baker, S. K., Fien, H., & Otterstedt, J. (2020). Effects of a read aloud intervention on first grade student vocabulary, listening comprehension, and language proficiency. *Reading and Writing, 33*, 2697-2724.
- Barber, M., Cartledge, G., Council III, M., Konrad, M., Gardner, R., & Telesman, A. O. (2018). The effects of computer-assisted culturally relevant repeated readings on english learners' fluency and comprehension. *Learning Disabilities: A Contemporary Journal, 16*(2), 205-229.
- Bennett, J. G., Gardner III, R., Cartledge, G., Ramnath, R., & Council III, M. R. (2017). Second-grade urban learners: Preliminary findings for a computer-assisted, culturally relevant, repeated reading intervention. *Education and Treatment of Children, 40*(2), 145-185.
- Blonder, M., Skinner, C. H., Ciancio, D., Cazzell, S., Scott, K., Jaquett, C., Ruddy, J., Thompson, K. (2018). A comparison of comprehension accuracy and rate: Repeated readings and listening while reading in second-grade students. *Contemporary School Psychology, 23*, 231-244.
- Cabell, S. Q., Kim, J. S., White, T. G., Gale, C. J., Edwards, A. A., Hwang, H., Petscher, Y., Raines, R. M. (2025). Impact of a content-rich literacy curriculum on kindergarteners' vocabulary, listening comprehension, and content knowledge. *Journal of Educational Psychology*.
- Cartledge, G., Bennett, J. G., Gallant, D. J., Ramnath, R., Keesey, S. (2015). Effects of culturally relevant materials on the reading performance of second-grade

African Americans with reading/special education risk. *Multiple Voices for Ethnically Diverse Exceptional Learners*, 15(1), 22-43.

- Cassady, J. C., Smith, L. L., Thomas, C. L. (2018). Supporting emergent literacy for English language learners with computer assisted instruction. *Journal of Research in Reading*, 41(2), 350-369.
- Connor, C. M., Dombek, J., Crowe, C. E., Specner, M., Righe, E. L., Coffinger, S., Zargar, E., Wood, T., & Petscher, Y. (2017). Acquiring science and social studies knowledge in kindergarten through fourth grade: Conceptualization, design, implementation, and efficacy testing of content-area literacy instruction (CALI). *Journal of Educational Psychology*, 109(3), 301.
- Connor, M. C., May, H., Sparaphani, N., Hwang, J. K., Adams, A., Wood, T. S., Siegal, S., Wolfe, C., & Day, S. (2022). Bringing Assessment-to-Instruction (A2i) technology to scale: Exploring the process from development to implementation. *Journal of Educational Psychology*, 114(7), 1495.
- Council, M. R., Gardner, R., Cartlege, G., & Telesman, A. O. (2019). Improving reading within an urban elementary school: computerized intervention and paraprofessional factors. *Preventing School Failure: Alternative Education for Children and Youth*, 63(2), 162-174.
- Dawes, E., Leitao, S., Claessen, & Kane, R. (2019). A randomized controlled trial of an oral inferential comprehension intervention for young children with developmental language disorder. *Child Language Teaching and Therapy*, 35(1), 39-54.
- Denton, C. A., Fletcher, J. M., Taylor, P. W., Barth, A. E., & Vaughn, S. (2014). An experimental evaluation of guided reading and explicit interventions for primary-grade students at-risk for reading difficulties. *Journal of Research on Educational Effectiveness*, 7(3), 268-293.
- Downs, J. D., Mohr, K. A., & Barrett, T. S. (2020). Determining the academic and affective outcomes of dyad reading among third graders. *The Journal of Educational Research*, 113(2), 120-132.
- Fien, H., Smith, J. L. M., Smolkowski, K., Baker, S. K., Nelson, N. J., & Chaparro, E. (2015). An examination of the efficacy of a multitiered intervention on early reading outcomes for first grade students at risk for reading difficulties. *Journal of Learning Disabilities*, 48(6), 602-621.

- Frates, A., Spooner, F., Collins, B., & Peterson, P. (2024). The effects of an instructional package on reading skills for multilingual learners with extensive support needs. *Research and Practice for Persons with Severe Disabilities*, 49(3), 190-207.
- Fuchs, D., Hendricks, E., Walsh, M. E., Fuchs, L. S., Gilbert, J. K., Tracy, W. Z., Patton III, S., Davis-Perkins, N., Kim, W., Elleman, A. M., & Peng, P. (2018). Evaluating a multidimensional reading comprehension program and reconsidering the lowly reputation of tests of near-transfer. *Learning Disabilities Research & Practice*, 33(1), 11-23.
- Gibson Jr, L., Cartledge, G., Keyes, S. E., & Yawn, C. D. (2014). The effects of a supplementary computerized fluency intervention on the generalization of the oral reading fluency and comprehension of first-grade students. *Education and Treatment of Children*, 37(1), 25-51.
- Gillam, S. L., Vaughn, S., Roberts, G., Capin, P., Fall, A.-M., Israelsen-Augenstein, M., Holbrook, S., Wada, R., Hancock, A., Fox, C., Dille, J., Magimairaj, B. M., & Gillam, R. B. (2022). Improving oral and written narration and reading comprehension of children at-risk for language and literacy difficulties: Results of a randomized clinical trial. *Journal of Educational Psychology*, 115(1), 99.
- Gray, A. M., Sirinides, P. M., Fink, R. E., & Bowden, A. B. (2022). Integrating literacy and science instruction in kindergarten: Results from the efficacy Study of Zoology One. *Journal of Research on Educational Effectiveness*, 15(1), 1-27.
- Hodges, T. S., McTigue, E., Wright, K. L., Franks, A. D., & Matthews, S. D. (2018). Transacting with characters: Teaching children perspective taking with authentic literature. *Journal of Research in Childhood Education*, 32(3), 343-362.
- Jackson, E. M., & Hanline, M. F. (2020). Using a concept map with RECALL to increase the comprehension of science texts for children with autism. *Focus on Autism and Other Developmental Disabilities*, 35(2), 90-100.
- Jackson, V. (2016). Applying the think-aloud strategy to improve reading comprehension of science content. *Current Issues in Education*, 19(2).
- Jefferson, R. E., Grant, C. E., & Sander, J. B. (2017). Effects of tier I differentiation and reading intervention on reading fluency, comprehension, and high stakes measures. *Reading Psychology*, 38(1), 97-124.

- Jiang, H. & Davis, D. (2017). Let's know! Proximal impacts on prekindergarten through grade 3 students' comprehension-related skills. *The Elementary School Journal*, 118(2), 177-206.
- Jiang, H., & Logan, J. (2019). Improving reading comprehension in the primary grades: Mediated effects of a language-focused classroom intervention. *Journal of Speech, Language, and Hearing Research*, 62(8), 2812-2828.
- Kelly, J., & Cummings, K. (2024). Teaching theme using theory of mind during interactive read alouds. *Reading Psychology*, 45(3), 261-289.
- Kim, J. S., Burkhauser, M. A., Relyea, J. E., Gilber, J. B., Fitzgerald, J., Mosher, D., McIntyre, J. (2023). A longitudinal randomized trial of a sustained content literacy intervention from first to second grade: Transfer effects on students' reading comprehension. *Journal of Educational Psychology*, 115(1), 73.
- Kim, J. S., Guryan, J., White, T. G., Quinn, D. M., Capotosto, L., & Kingston, H. C. (2016). Delayed effects of a low-cost and large-scale summer reading intervention on elementary school children's reading comprehension. *Journal of Research on Educational Effectiveness*, 9(sup1), 1-22.
- Kim, J. S., Relyea, J. E., Burkhauser, M. A., Scherer, E., & Rich, P. (2021). Improving elementary grade students' science and social studies vocabulary knowledge depth, reading comprehension, and argumentative writing: A conceptual replication. *Educational Psychology Review*, 33(4), 1935-1964.
- Kim, J. S., Burkhauser, M. A., Mesite, L. M., Asher, C. A., Relyea, J. E., Fitzgerald, J., & Elmore, J. (2021). Improving reading comprehension, science domain knowledge, and reading engagement through a first-grade content literacy intervention. *Journal of Educational Psychology*, 113(1), 3.
- Kim, S. Y., Rispoli, M., Lory, C., Gregori, E., & Brodhead, M. T. (2018). The effects of a shared reading intervention on narrative story comprehension and task engagement of students with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 48, 3608-3622.
- Lindo, E. J., Weiser, B., Cheatham, J. P., & Allor, J. H. (2018). Benefits of structured after-school literacy tutoring by university students for struggling elementary readers. *Reading & Writing Quarterly*, 34(2), 117-131.
- Lysenko, L. V., & Abrami, P. C. (2014). Promoting reading comprehension with the use of technology. *Computers & Education*, 75, 162-172.

- Mariage, T. V., Englert, C. S., & Mariage, M. F. (2020). Comprehension instruction for Tier 2 early learners: A scaffolded apprenticeship for close reading of informational text. *Learning Disability Quarterly*, 43(1), 29-42.
- McBreen, M., & Savage, R. (2022). The impact of a cognitive and motivational reading intervention on the reading achievement and motivation of students at-risk for reading difficulties. *Learning Disability Quarterly*, 45(3), 199-211.
- McCartney, E., Boyle, J., & Ellis, S. (2015). Developing a universal reading comprehension intervention for mainstream primary schools within areas of social deprivation for children with and without language-learning impairment: A feasibility study. *International Journal of Language & Communication Disorders*, 50(1), 129-135.
- McMaster, K. L., Kendeou, P., Kim, J., & Butterfuss, R. (2024). Efficacy of a technology-based early language comprehension intervention: A randomized control trial. *Journal of Learning Disabilities*, 57(3), 139-152.
- Mendez, L. M. R., Pelzmann, C. A., Frank, M. J. (2015). Engaging struggling early readers to promote reading success: A pilot study of reading by design. *Reading & Writing Quarterly*, 32(3), 273-297.
- Moedt, K., & Holmes, R. M. (2020). The effects of purposeful play after shared storybook readings on kindergarten children's reading comprehension, creativity, and language skills and abilities. *Early Child Development and Care*, 190(6), 839-854.
- Mosher, D. M., Burkhauser, M. A., & Kim, J. S. (2024). Improving second-grade reading comprehension through a sustained content literacy intervention: A mixed-methods study examining the mediating role of domain-specific vocabulary. *Journal of Educational Psychology*, 116(4), 550.
- Mosher, D. M., & Kim, J. S. (2025). Building a science of teaching reading and vocabulary: Experimental effects of structured supplements for a read aloud lesson on third graders' domain-specific reading Comprehension. *Scientific Studies of Reading*, 29(1), 7-31.
- Ortlieb, E., & McDowell, F. D. (2016). Investigating the effects of an experimental approach to comprehension instruction within a literacy clinic. *Current Issues in Education*, 19(1).

- Peng, P., & Fuchs, D. (2017). A randomized control trial of working memory training with and without strategy instruction: Effects on young children's working memory and comprehension. *Journal of Learning Disabilities*, 50(1), 62-80.
- Phillips, B. M., Kim, Y. S. G., Lonigan, C. J., Connor, C. M., Clancy, J., & Al Otaiba, S. (2021). Supporting language and literacy development with intensive small-group interventions: An early childhood efficacy study. *Early Childhood Research Quarterly*, 57, 75-88.
- Phillips, B. M., Lonigan, C. J., Kim, Y. S. G., Clancy, J., & Connor, C. M. (2024). Impact of supplemental multicomponent early childhood language instruction. *Journal of Educational Psychology*.
- Pilonieta, P., Hathaway, J., Medina, A., & Casto, A. (2019). The impact of explicit comprehension strategy instruction on first-and second-grade at-risk students. *Journal of Education*, 199(3), 128-141.
- Redcay, J. D., & Preston, S. M. (2016). Improving second grade student's reading fluency and comprehension using teacher-guided iPad® app instruction. *Interactive Technology and Smart Education*, 13(3), 218-228.
- Risueño, R. J., Gray, S., & Romeo, S. (2024). The efficacy of story champs for improving oral language in third-grade Spanish-English bilingual students with developmental language disorder. *Language, Speech, and Hearing Services in Schools*, 55(3), 938-958.
- Roberts, G. J., Capin, P., Handy, A., Coté, B., & Jimenez, Z. (2024). A family-based intervention for early elementary students with reading and behavioral difficulties: A pilot study. *Journal of Learning Disabilities*.
- Schechter, R., Macaruso, P., Kazakoff, E. R., & Brooke, E. (2015). Exploration of a blended learning approach to reading instruction for low SES students in early elementary grades. *Computers in the Schools*, 32(3-4), 183-200.
- Shurr, J., & Kromer, G. (2018). Picture plus discussion with partners: peer centered literacy supports for students with significant disabilities. *International Journal of Developmental Disabilities*, 64(4-5), 262-270.
- Solari, E. J., Denton, C. A., Petscher, Y., & Haring, C. (2018). Examining the effects and feasibility of a teacher-implemented Tier 1 and Tier 2 intervention in word reading, fluency, and comprehension. *Journal of Research on Educational Effectiveness*, 11(2), 163-191.

- Taylor, K. L. H., Skinner, C. H., Ciancio, D. J., Daniels, S., Wright, S., Ryan, K., Ruddy, J., Moore, T., McCurdy, M., Cihak, D. F. (2020). Effects of unfamiliar diverse names on elementary students' passage comprehension. *School Psychology, 35*(3), 215.
- Telesman, A. O., Konrad, M., Cartledge, G., Gardner III, R., & Council III, M. (2019). Preventing reading failure for first-grade students in an urban school. *The Journal of Special Education, 53*(2), 85-95.
- Vollebregt, M., Leggett, J., Raffalovitch, S., King, C., Friesen, D., & Archibald, L. M. (2021). Evidence for complementary effects of code-and knowledge-focused reading instruction. *Child Language Teaching and Therapy, 37*(3), 300-320.
- Vousden, J. I., Cunningham, A. J., Johnson, H., Waldron, S., Ammi, S., Pillinger, C., & Wood, C. (2022). Decoding and comprehension skills mediate the link between a small-group reading programme and English national literacy assessments. *British Journal of Educational Psychology, 92*(1), 105-130.
- Williams, J. P., Pollini, S., Nubla-Kung, A. M., Snyder, A. E., Garcia, A., Ordynans, J. G., & Atkins, J. G. (2014). An intervention to improve comprehension of cause/effect through expository text structure instruction. *Journal of Educational Psychology, 106*(1), 1.
- Wright, T. S., Cervetti, G. N., Wise, C., & McClung, N. A. (2022). The impact of knowledge-building through conceptually-coherent read alouds on vocabulary and comprehension. *Reading Psychology, 43*(1), 70-84.
- Young, C., Lagrone, S., & McCauley, J. (2020). Read like me: An intervention for struggling readers. *Education Sciences, 10*(3), 57.
- Young, C., Mohr, K. A., & Landreth, S. (2020). Improving boys' reading comprehension with readers theatre. *Journal of Research in Reading, 43*(3), 347-363.
- Young, C., Pearce, D., Gomez, J., Christensen, R., Pletcher, B., & Fleming, K. (2018). Read two impress and the neurological impress method: Effects on elementary students' reading fluency, comprehension, and attitude. *The Journal of Educational Research, 111*(6), 657-665.
- Zugel, K. (2020). The effectiveness of a combined word study and reading curriculum with EL and NonEL students. *Reading Improvement, 57*(2), 58-70.