

# Elementary Grade Intervention Approaches to Treat Specific Learning Disabilities, Including Dyslexia

Stephanie Al Otaiba,<sup>a</sup> Amy Gillespie Rouse,<sup>a</sup> and Kristi Baker<sup>a</sup>

**Purpose:** The purpose of this narrative review of the literature is to provide a description of intensive interventions for elementary grade students with dyslexia, students with learning disabilities, and students with intensive reading and writing needs.

**Method:** First, we provide a brief overview of response to intervention. Second, we explain our theoretical framework for the review. Third, we describe evidence-based interventions, which are divided into predominantly

reading or writing interventions. Fourth, we explain data-based individualization for these programs based on a taxonomy of intensity, and we provide an illustrative case study.

**Conclusion:** We conclude by describing a set of links to websites and technical assistance resources that may be helpful for speech-language pathologists, teachers, and other interventionists to stay current with this research base and to lead professional learning communities.

Only about 36% of fourth graders can read on grade level in schools in the United States (National Assessment of Educational Progress [NAEP], 2015). More disturbingly, for minority children (e.g., African American, Hispanic) this rate is much lower (18%–21%). It is also lower (21%) for children living in poverty (i.e., qualify for the National School Lunch Program). A majority (67%) of students with disabilities read below even a basic level (NAEP, 2015). As a consequence of poor reading, students may also face an array of related social, emotional, and behavioral issues, including a higher risk for high school dropout, delinquency (Criminal Justice Initiative, 1997), and future unemployment (National Center for Education Statistics, 2012).

National statistics for student performance in writing are similarly alarming. A majority of students in Grades 4, 8, and 12 in the United States do not demonstrate grade-level writing skills (National Center for Education Statistics [NCES], 2012; Persky, Daane, & Jin, 2003). In the most recent assessment years, only 28% of fourth graders (Persky et al., 2003) and 27% each of eighth and twelfth graders

(NCES, 2012) met or exceeded grade-level writing expectations on the NAEP writing assessment. Furthermore, compared to their nondisabled peers, only 7% of fourth-grade students with disabilities and 5% each of eighth- and twelfth-grade students with disabilities performed at or above grade-level expectations on the most recent NAEP writing assessments (NCES, 2012; Persky et al., 2003). These statistics are particularly disconcerting given the writing difficulties many students who struggle with writing or who have disabilities demonstrate.

The purpose of this article is to describe evidence-based reading and writing instruction and interventions that speech-language pathologists (SLPs), teachers, and interventionists can provide to struggling learners. This information is critical to SLPs in light of the American Speech-Language-Hearing Association (ASHA, 2010) Guidelines for the role of SLPs in schools and the ASHA (2001) Practice Policy for SLP's role in reading and writing. Specifically, this knowledge about evidence-based interventions can support SLPs as they select programs, collect diagnostic and progress monitoring assessment data, use data to inform intervention decisions, collaborate to improve outcomes for students, and provide leadership and advocacy. We focus on children in the elementary grades who have elevated risk for specific learning disabilities (SLD), who experience difficulty in learning to decode and encode words, who are slow or dysfluent readers, or

<sup>a</sup>Southern Methodist University, Dallas, TX

Correspondence to Stephanie Al Otaiba: salotaiba@smu.edu

Editor-in-Chief: Tiffany Hogan

Received January 31, 2018

Revision received March 20, 2018

Accepted April 20, 2018

[https://doi.org/10.1044/2018\\_LSHSS-DYSLC-18-0022](https://doi.org/10.1044/2018_LSHSS-DYSLC-18-0022)

**Publisher Note:** This article is part of the Clinical Forum: Dyslexia.

**Disclosure:** The authors have declared that no competing interests existed at the time of publication.

who have challenges with comprehending or composing written text. Nearly 50% of students who receive special education services do so under the category of SLD, which has been defined under the Individuals With Disabilities Education Act (IDEA, 2004) as a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The SLD category excludes learning problems that are attributable to visual, hearing, motor, or intellectual disabilities. As we describe in the following section in greater depth, IDEA also allowed states and local education agencies to consider whether students respond adequately to intensive interventions as one aspect of identification.

Because many students who qualify for speech-language support also demonstrate significant reading and writing difficulties, the role of the SLP is vital in the selection of effective intensive interventions, determining ways to monitor progress or response, and collaborating to further intensify as needed. Often, the role of reading/writing intervention falls to special education teachers and school specialists. However, because of SLP's specific knowledge of language disorders, ASHA highlights that SLPs should also be involved in the process. Therefore, the role of SLPs includes a spectrum of responsibilities that include involvement in evaluation, decision making, and intervention to support reading and writing needs (ASHA, 2001, 2010).

The prevalence of students with specific learning disabilities (SWSLD) varies widely within the United States from 5% to 20%, depending on the criteria for identification. This variability in prevalence rates may be related to confusion about identification criteria. For example, states have not yet adopted a universally accepted definition of dyslexia (cf. Tolson & Krnac, 2015; Youman & Mather, 2015). In some states with dyslexia laws, dyslexia refers to struggling readers and writers generally; in other states, the term dyslexia is reserved for students with a profile that includes struggles with phonemic awareness, rapid naming, spelling, decoding, encoding, and fluency despite having typical intelligence.

## Response to Intervention and Multitiered Systems of Support

Since 2004, at which time the IDEA (2004) was reauthorized, states and local education agencies have begun to use models of response to intervention (RTI) or multitiered systems of support (MTSS) to provide early literacy intervention. In general, MTSS models incorporate behavior and social/emotional learning supports and a broader array of academic skills than RTI models, which have mostly been implemented for reading or math. These systems replaced the need to identify SLD by demonstrating a significant discrepancy between IQ and reading or writing ability with the option to identify SLD after demonstrating inadequate response to effective instruction and

intensive intervention (e.g., Blachman et al., 2004; L. S. Fuchs & Fuchs, 1998; Torgesen et al., 2001; Vellutino et al., 1996). However, there remains a lack of consistent guidance from a legal and policy perspective; for example, Zirkel and Thomas (2010) reported considerable variability in state laws and guidelines informing local education agencies about how to implement RTI (see also Miciak, Fletcher, & Stuebing, 2016). Even though there are many RTI models currently being implemented, SLPs may be aware that most models provide three tiers of increasingly intensive intervention, beginning with Tier 1, or the general core language arts instruction. Students move into more intensive tiers based on performance relative to grade-level expectations and benchmarks using screening or progress monitoring assessments (e.g., Gersten et al., 2009; Jimerson, Burns, & VanDer Heyden, 2016). Tier 2 provides small group and more targeted intervention, and Tier 3 is meant to be the most intensive intervention, which may involve special education services, a 504 plan, dyslexia treatment, or speech and language services. Generally, there is an agreement that MTSS includes RTI for academics but also considers whether children have problem behavior or need support in the area of social and emotional learning. What follows is a description of our conceptual framework for interventions, which is a prelude to our description of types of interventions (reading and writing).

## Conceptual Framework for Interventions

The primary strand of our conceptual framework in this article will likely be familiar to SLPs—the Simple View of Reading and Writing (Juel, Griffith, & Gough, 1986)—because practitioners can relate it to the development of language and literacy, as well as to individual students' patterns of strengths and weaknesses. The Simple View of Reading and Writing (Gough & Tunmer, 1986; Juel et al., 1986) initially proposed that reading with understanding was the product of two broad sets of skills: code-focused skills such as decoding and spelling and meaning-focused skills such as vocabulary and language comprehension. Thus, a struggling first grader may experience relative strengths in the area of language comprehension and weaknesses, understanding phonemic awareness and decoding within the realm of reading; this pattern could help an SLP collaborate with a team to select an intervention that is generally efficacious to improve the code-focused skill deficit. In the area of writing, the two analogous sets of skills include spelling and ideation, which we have expanded upon (discussed further in the Evidence-Based Writing Interventions section).

Thus, a secondary but related strand within our conceptual framework is the Taxonomy of Intervention Intensity (D. Fuchs, Fuchs, & Malone, 2017). As with the Simple View of Reading and Writing, the Taxonomy of Intervention Intensity is very practitioner friendly, but it addresses the fact that even the most effective interventions will not work for every student; in the vernacular, no one

size fits all. In fact, research suggests that a number of students may not respond to generally effective interventions (Al Otaiba & Fuchs, 2002; Lam & McMaster, 2014; Nelson, Benner, & Gonzalez, 2003). Thus, as we will describe in greater detail, the Taxonomy of Intervention Intensity can guide SLPs in the process of how to intensify interventions by increasing their dosage, aligning to the skill deficits and strengths of the student, attending to transfer to other genres and settings, providing behavioral and motivational support, and following a data-based process to guide individualization.

## Evidence-Based Reading Interventions

In this section, we describe evidence-based reading interventions for elementary students with intensive reading needs, including struggling readers, students with dyslexia, and SWSLD, based on numerous syntheses (e.g., D. Fuchs, Mock, Morgan & Young, 2003; Gersten et al., 2009; Jimerson et al., 2016; Lonigan & Shanahan, 2009; National Reading Panel [NRP], 2000; Wanzek et al., 2013; Wanzek & Vaughn, 2007; Wanzek, Wexler, Vaughn, & Ciullo, 2010). Evidence-based reading interventions are programs that have been tested empirically to demonstrate there is evidence of their efficacy for struggling readers and SWSLD across multiple research studies, students, and settings. A criteria for the strength of evidence proposed by the What Works Clearinghouse is an effect size (*ES*) favoring the treatment over a comparison group that is larger than 0.25: small effects,  $d = 0.2-0.4$ ; medium effects,  $d = 0.5-0.8$ ; and large effects,  $d > 0.8$ . Drawing on the Simple View of Reading and Writing (Gough & Tunmer, 1986; Juel et al., 1986), we include evidence-based interventions within two broad skill areas: code-focused skills (i.e., phonemic awareness, phonics, and fluency) and meaning-focused skills (i.e., vocabulary and comprehension). Some interventions are multicomponent and focus on both sets of skill areas. These skills form the content for interventions; the Taxonomy of Intervention Intensity informs the intensification for delivery of skills.

### Code-Focused Reading Skills

#### Phonemic Awareness and Phonics

Findings from the NRP (2000) emphasized the effectiveness of explicit and systematic phonemic awareness and phonics instruction and intervention, particularly for students in the primary grades (see also Ehri, Nunes, Stahl, & Willows, 2001). In addition, findings from other meta-analyses and research summaries (Foorman & Torgesen, 2001; Gersten et al., 2009; Swanson, 1999; Torgesen, 2004; Wanzek et al., 2010; Wanzek & Vaughn, 2007) confirm the importance of explicit and systematic, or direct instruction of code-focused skills in a sequence or order of easiest to most difficult skills.

Phonemic awareness involves learning how to manipulate sounds in speech, and difficulty in mastering this skill predicts future reading difficulties (e.g., Adams, 1990;

Catts, 1989; Lonigan & Shanahan, 2009; NRP, 2000; Wagner & Torgesen, 1987). It is easiest for children to learn to manipulate larger chunks of language before involving discreet phonemes. Phonics involves understanding how letters represent sounds and how units and morphemes are represented. Both sets of skills are closely related and are challenging for SWSLD.

#### Fluency

Fluency is another code-focused skill identified by the NRP as a necessary skill to address with struggling readers (NRP, 2000). Fluency involves the ability to read connected text smoothly, rapidly, and with minimal errors (Hudson, Lane, & Pullen, 2005; Kuhn & Stahl, 2003). Research has indicated a strong relationship between fluency and reading comprehension with dysfluent readers demonstrating lower comprehension due to spending greater amounts of time sounding out words. (L. S. Fuchs, Fuchs, Hosp, & Jenkins, 2001; Laberge & Samuels, 1974). This skill is challenging for SWSLD and one that should be addressed through explicit and systematic practice.

SLPs need to know that, across the available research and reviews, findings emphasized the importance of building code-focused skills in tandem. First, practitioners provided deliberate scaffolding and modeling of these skills. Then, they supported guided and independent cumulative review and practice. Second, skills were taught along a scope and sequence beginning with manipulating phonemes or sounds in spoken language to learning letters. As students mastered letter-sound correspondence, they began blending and segmenting words to decode and encode. Third, students mapped spellings of parts of words (including morphemes) to read multisyllabic words and began to automatically recognize words with irregular patterns (i.e., sight words). After developing automaticity, they practiced to achieve fluency. Once students read fluently and with prosody, it was easier for them to self-monitor their comprehension.

### Meaning-Focused Reading Skills

The NRP (2000) findings also emphasized the importance of interventions to address meaning-focused skills, which include oral language development, listening, and reading comprehension. These are more traditional targets for SLPs. By oral language development, we mean aspects of language (exclusive of phonology), including (a) semantics or vocabulary, (b) morphology or the study of word formations, (c) syntax or grammar, and (d) pragmatics or language use. As SLPs know, disorders in language development are related to reading and writing difficulties (cf. Soifer, 1999).

#### Vocabulary Development

Vocabulary development is strongly correlated to reading comprehension; for example, Biemiller (2005) found a strong and relatively stable correlation of .81 between vocabulary size and reading comprehension across

the elementary grades. The NRP (2000) emphasized the importance of direct and indirect vocabulary instruction. Beck, McKeown, and Kucan (2002) suggested teachers consider classifying words into three categories or tiers, not to be confused with RTI tiers. Tier 1 words are words within a child's spoken lexicon such as cup, paper, and play. Tier 3 words are very low frequency words or words for specialized content instruction, such as isotope or photosynthesis. Beck and colleagues suggested the more direct instruction focus on Tier 2 words: those high-frequency words that children will encounter in text such as construct, devise, and emerge. They suggested Tier 2 words should be introduced following principles of direct instruction: repeated exposures, modeling of word meanings and word relationships through word webs, direct teaching of synonyms and antonyms, and engaging in discussion to promote word usage.

### Listening Comprehension

Another strategy for developing oral language and listening comprehension is shared book reading. Shared book reading can take many forms, but one of the best researched is dialogic reading, which has been found to improve vocabulary and language skills for young children, including students at risk for SLD (e.g., Lonigan & Whitehurst, 1998; Whitehurst et al., 1994). The What Works Clearinghouse (WWC) evaluated rigorous studies of dialogic reading and reported positive effects on oral language ( $ES = 0.50$ ), but no studies examined effects on listening comprehension. There are several components of dialogic reading practices that should be familiar to SLPs in their work with teachers and parents. First, the adult reader preteaches essential vocabulary. Then, while reading, the adult reader asks questions to engage children, encourage their use of vocabulary, and help them recall information and draw inferences.

### Reading Comprehension

In terms of reading comprehension, the NRP (2000) suggested instruction should develop background knowledge, focus on strategy instruction (e.g., predicting, clarifying, monitoring, summarizing), and incorporate both story grammar for narrative text as well as text structure for expository genres. SLPs may introduce these strategies orally during language therapy. Such instruction may occur before, after, and during reading and should include modeling, guided practice, and independent practice (Mastropieri, Scruggs, Bakken, & Whedon, 1996; Swanson, 1999). Findings from a more recent review of effective comprehension instruction converge; the Institute for Education Sciences (IES) Practice Guide for Comprehension in K-3 (Shanahan et al., 2010) made five primary recommendations for teachers and SLPs. One practice, which had strong evidence, was to teach students how to use evidence-based reading comprehension strategies, including activating background knowledge, questioning, visualization, monitoring, inferencing, and retelling. Two more practices had moderate evidence: teaching students to identify and

use text structure, which includes story grammar for narrative and text structures for expository text, and creating an engaging and motivating context in which to teach reading comprehension. The remaining two had only weak evidence to date but include providing guided discussion about the meaning of text and carefully selecting texts that support comprehension development. This particular IES practice guide is notable because the Southwestern Regional Lab created a guide for developing and nurturing professional learning communities with this guide (see Kosanovich & Foorman, 2016). Because SLPs may also be involved in leading professional development for teachers, this type of train-the-trainer material is very helpful. A related guide that focuses on developing language and academic content for English language learners could also be a helpful resource to SLPs (Institute of Education Sciences, 2018b). This second resource has links to videos of practices being implemented in schools.

### Specific Intervention Programs

Organizations such as the International Dyslexia Association (IDA, 2018a) currently use the term *structured literacy* to describe an explicit and systematic instructional approach. However, historically, beginning as early as the 1920s, some in the community have argued that some students with dyslexia learn differently and require explicit and systematic phonetic instructional approaches employing multisensory techniques to develop word reading (e.g., Fernald & Keller, 1921; Monroe, 1932; Orton, 1937). Common characteristics of such approaches include not only explicit and systematic instruction but also emphasis on building connections across the visual, auditory, and kinesthetic/tactile domains. However, to date, there have been few methodologically sound studies from which to determine the effectiveness of multisensory approaches, despite theoretical support and wide-spread adoption of these methods. Most are provided in one-to-one tutoring settings within schools and clinics. The professional development and certification standards to deliver these interventions are considerable (see, e.g., IDA, 2018a); this same link allows navigation to the new Knowledge and Practice Standards, which are recommended for all teachers and the higher-level standards for therapists. A helpful link on the IDA website provides up-to-date information about states with dyslexia legislation or guidance International Dyslexia Association (IDA, 2018b).

Some might argue that any intervention that involves reading and spelling is multisensory, but that term is usually used to describe approaches for students with dyslexia. Given the widespread use of multisensory interventions, SLPs should also be aware of the somewhat limited research about their efficacy. Although there is certainly plenty of anecdotal support for these methods, there is a need for more rigorous studies. For example, Ritchey and Goeke (2006) reviewed the available studies on the efficacy of multisensory Orton-Gillingham (OG)-based interventions and reported some mixed effects. In three of the

12 studies, the authors found OG was more effective than the “business as usual” instruction with a large mean effect size of 0.82 for word reading and 0.76 for comprehension (Joshi, Dahlgren, & Boulware-Gooden, 2002; Litcher & Roberge, 1979; Stoner, 1991). However, effect sizes could not be determined in some studies; moreover, two studies found OG was less effective than the comparison condition, and one found no significant differences.

In addition, the IES has conducted systematic reviews of the evidence for some specific structured literacy programs with a multisensory approach, including Lindamood Phoneme Sequencing (LIPS; Institute of Education Sciences What Works Clearinghouse, 2010) and the Wilson Reading System (Institute of Education Sciences What works Clearinghouse, 2007; Wilson, 2002). For LIPS, the WWC considered 48 relevant studies but noted that only eight studies included a group design and only two were randomized control trials (Gunn, 1996; Torgesen, Wagner, Rashotte, Herron, & Lindamood, 2010). Torgesen et al. (2010) reported statistically significant effects of a LIPS small group intervention relative to a basal reading comparison condition on standardized measures of word reading, phonological awareness, and reading comprehension for first graders. However, findings from the Gunn (1996) study indicate negative effects of LIPS on word reading relative to a basal reading comparison condition.

With regard to the Wilson Reading System, the WWC examined nine studies, but only one included a randomized control trial. In that study, Torgesen et al. (2006) examined Wilson relative to a basal reading comparison condition and found statistically significant effects favoring Wilson on word reading but not on fluency or comprehension. In a recent single-case design study, Schlesinger and Gray (2017) directly compared the efficacy of structured language and multisensory approaches. They reported that both approaches showed important treatment effects over baseline; however, there were no significant effects favoring multisensory over a structured literacy approach on letter naming, letter sound production, word reading, or word spelling.

In addition to specific multisensory programs, there are a large number of explicit and systematic interventions that are evidence-based and are commercially available, and many have also been reviewed by IES. All of these programs provide strong phonemic awareness and phonics instruction. None of these programs require the level of training as the IDA-accredited intensive programs, and so they may be feasible for SLPs to recommend in schools as Tier 2 early interventions. For example, some highly scripted programs were designed and field-tested for use by para-professionals or volunteers (e.g., Sound Partners; Vadasy, Sanders, & Peyton, 2006), and the curriculum also involves reading connected texts to promote fluency practice. Others have even been designed for classwide peer tutoring (e.g., Peer-Assisted Learning Strategies; D. Fuchs et al., 2011, 2016). For kindergarten, the emphasis is letter–sound correspondence and building decoding and sight word fluency, but for first grade and beyond, students reading connected text and comprehension is also addressed. Other scripted

programs have been designed for small group delivery by teachers, whereas one focuses predominantly on code-focused skills (Road to the Code, Blachman, Ball, Black, & Tangel, 2000), two additional programs also include meaning-focused skills (e.g., Early Interventions in Reading, Mathes & Torgesen, 2005; Early Reading Intervention, Simmons & Kame’enui, 2003). In a study of Early Reading Intervention, Coyne et al. (2013) reported that when kindergarten teachers monitored student mastery and regrouped students to promote more homogeneous small group instruction, effect sizes were even higher. It is also noteworthy that Early Interventions in Reading for first graders has reduced the percentage of children with word reading scores below a standard score of 90 to less than 5% even in high needs schools (Al Otaiba et al., 2014). Other programs are more intensive, focus predominantly on fluency and meaning-focused skills, and are suggested for one-on-one instruction (e.g., Reading Recovery, Clay, 1993). This was designed for highly trained teachers to deliver in a one-on-one format daily for up to 20 weeks; notably the effects of this program were stronger when teachers also provided explicit code-focused instruction (Iversen & Tunmer, 1993).

### ***Common Instructional Characteristics of Evidence-Based Reading Interventions***

There are several common characteristics of effective reading instruction across the aforementioned research base of which SLPs should be aware. Consistent with emphasis on structured literacy approaches highlighted by the IDA (2018a), the instructional approaches included explicit instruction, which linked phonics and phonemic awareness to target the critical content that SWSLD need to learn. This instruction was most effective with younger students as prevention than it was with older elementary students as remediation (cf. Ehri et al., 2001; Wanzek & Vaughn, 2007). SLPs, teachers, and other interventionists should seek programs that provide structured, mindfully sequenced, well-organized lessons. SWSLD need daily opportunities to read and practice skills at an appropriate instructional level. Relatedly, SWSLD benefit from intensive intervention that is delivered to small groups of students to provide frequent opportunities to respond and to receive corrective feedback. Although specific comparisons of multisensory interventions to other explicit interventions are lacking, SLPs may collaborate with instructors to incorporate instruction that involves multiple modalities to facilitate connections between letters and sounds, as well as between written and oral language that incorporate visual and auditory cues. We provide more information about incorporating writing to support the kinesthetic or motoric cues in the following section.

### **Evidence-Based Writing Interventions**

In this section, we describe evidence-based interventions for elementary students with intensive writing needs, including SWSLD. It is important that SLPs have knowledge of evidence-based writing interventions that include

teaching methods that have been tested and shown to be effective for improving the writing skills and writing quality of struggling writers and SWSLD across multiple research studies, multiple students, and multiple settings. Once again, drawing on the Simple View of Reading and Writing (Juel et al., 1986), we include evidence-based interventions for teaching writing to struggling writers and SWSLD within two broad skill areas: transcription (i.e., handwriting and spelling) and ideation (i.e., sentence construction and composition). Across these skill areas, SLPs will recognize a common theme: Writing instruction should be explicit, systematic, and structured in ways to promote student practice and provide ongoing scaffolding and feedback prior to students practicing writing skills on their own (Graham, 2006; McMaster, Kunkel, Shin, Jung, & Lembke, 2017).

### **Transcription**

We expanded on Juel et al.'s (1986) two basic factors (i.e., spelling and ideation) in the Simple View of Reading and Writing to include handwriting with spelling under the heading "transcription." We felt addressing both spelling and handwriting was important for SLPs to understand, as struggling writers and SWSLD often display difficulties with automatic and fluent letter writing as well as difficulties with spelling (Berninger, Nielsen, Abbott, Wijsman, & Raskind, 2008), both of which can impact writing quality and writing fluency (Graham, Harris, & Hebert, 2011).

### **Handwriting**

Handwriting involves multiple processes and skills a writer must adequately deploy to create legible letters (Datchuk & Kubina, 2013). Furthermore, until handwriting becomes automatic and fluent, it can constrain a writer's ability to focus on other writing processes, including sentence construction, text organization, and the content and meaning conveyed in a text (Graham, 2006; Schlagal, 2013). Because struggling writers and SWSLD frequently struggle with handwriting skills, they often produce texts that are illegible or difficult to read, which can negatively impact how others view and score the quality and content of their writing (Graham et al., 2011).

SLPs should be aware that, across the available research (Datchuk & Kubina, 2013; Graham, 1999; McMaster et al., 2017; Schlesinger & Gray, 2017; Wanzek, Gatlin, Al Otaiba, & Kim, 2017), there were several common features of effective handwriting interventions for struggling writers and SWSLD. First, handwriting interventions included direct instruction in how to form letters, including both instructors modeling how letters were formed and students following verbal (e.g., instructors saying the steps to form each letter or saying the correct positioning of the letter in relation to the lines on the paper) and visual cues (e.g., numbered arrows, dotted lines) to form letters on their own. Introducing students to several letters at a time that shared common features (e.g., h, r, n) but were not easily confused or reversed (i.e., b, d, p) also proved effective.

Second, handwriting interventions involved memory retrieval components, such as cover and copy, during which a student examined a properly formed letter and then covered the letter and wrote it from memory. Third, instructors taught students to evaluate their own handwriting, asking them to identify correctly formed letters and correct illegible or improperly formed letters, often creating visual displays (such as graphs) of students' progress. Fourth, handwriting interventions incorporated fluency-building activities. Frequently, instructors asked students to write newly learned letters in words and sentences for a specific time (e.g., 3 min of copying a sentence that contains many of the newly learned letters) to develop fluency. Then, instructors expected students to apply handwriting skills in their own written texts. Fifth, instructors incorporated multisensory activities into handwriting interventions, such as having students skywrite letters or having students trace letters on tactile surfaces (e.g., sand trays, carpet tiles). Sixth, instructors included orthographic coding activities during handwriting interventions. Such activities included students identifying letters that came before or after different letter strings or writing missing letters in various letter sequences.

Direct instruction and modeling of letter formation, combined with memory retrieval, self-evaluation, fluency, and/or orthographic coding activities, led to improvements in students' legibility and writing fluency in the studies reviewed (Datchuk & Kubina, 2013; Graham, 1999; McMaster et al., 2017) and improvements in correct word sequences in one study (Wanzek et al., 2017). Importantly, with all effective handwriting interventions, instructors included time for students to participate in handwriting practice, and handwriting intervention sessions were relatively short, lasting on average less than 30 min (range 10–45 min) per session.

### **Spelling**

Like handwriting, spelling is a complex process involving multiple components and skills. To become competent spellers, students must not only master letter-to-sound relationships but they must also understand letter and syllable spelling patterns and the meaning layer (e.g., Greek and Latin word roots) of spelling (Bear, Invernizzi, Templeton, & Johnston, 2016; Williams, Walker, Vaughn, & Wanzek, 2017). SLPs should be aware that providing effective spelling instruction to struggling writers and SWSLD is important so that transcription becomes automatic, and thus students free up working memory space to focus on other writing processes. In addition, with accurate spelling skills, students are better able to convey their intent in writing, as even one misspelled word can change the meaning of a composition and affect how a reader views the quality of that composition (Graham, Harris, & Fink Chorzempa, 2002). SLPs should also recognize that different types of spelling interventions will be more or less appropriate given the type of words a student is expected to learn. For example, students need understanding of the patterns within English orthography, but they also need

strategies for memorizing irregular words that do not follow these patterns.

Research and research reviews on spelling instruction for struggling writers and SWSLD (Berninger et al., 2000; McLaughlin, Weber, & Derby, 2013; McMaster et al., 2017; Schlesinger & Gray, 2017; Wanzek et al., 2017; Williams et al., 2017) indicated several effective interventions. First, spelling interventions involved direct and systematic instruction in letter–sound correspondences, the spelling of syllable patterns, the spelling of morphemes, and the spelling of irregular words. Second, spelling interventions involved teaching students to self-correct spelling errors. One common method, cover–copy–compare, involved a student looking at a spelling word, covering the word, copying it from memory, and then comparing his or her written response to the correctly written word. Teaching students to self-correct allowed for immediate corrective feedback on spelling, thus reducing the creation of error patterns. Third, instructors taught students strategies for studying their spelling words and for self-monitoring their learning. Study strategies included word sorts, word hunts, flashcards, and peer practice with spelling words; these strategies allowed students to determine which words they could spell easily and which words required more practice. Fourth, to support fluency as well as the generalization and maintenance of what they had learned, instructors had students apply newly learned spelling skills in sentence writing and in their own written compositions. Typically, these activities began with single word dictation, followed by sentence dictation, and then application of spelling skills in written compositions. Fifth, instructors employed multisensory activities during spelling interventions; such activities included having students trace three-dimensional letters with their fingers while saying the letters aloud to spell a given word or asking students to use mirrors to watch how their mouths moved when producing letters and sounds.

These effective spelling interventions (i.e., direct and systematic instruction, self-correction, self-study strategies, and fluency activities) resulted in improved spelling and, in some studies, improved writing quality, writing fluency, and word reading skills (Berninger et al., 2000; McLaughlin et al., 2013; McMaster et al., 2017; Williams et al., 2017). Importantly, SLPs should note that, across effective spelling interventions, instructors provided distributed spelling practice over time and limited the number of words students were required to learn at one time.

### **Ideation**

We felt it was important for SLPs to know how to address both sentence-level skills and composition skills when considering ideation. This is important because research shows that struggling writers and SWSLD struggle with both the cognitive demands imposed by sentence construction (Datchuk & Kubina, 2013; Saddler, 2013) and with understanding and enacting the skills needed to carry

out the writing (i.e., composition) process (Lienemann & Reid, 2008; MacArthur & Graham, 2016).

### **Sentence Construction**

Writers must consider lexical, syntactical, grammatical, mechanical (e.g., punctuation), and rhetorical choices for each sentence they construct (Fayol, 2016); because this process is so complex and cognitively demanding, researchers contend that composing a sentence is akin to the process required to plan and organize an entire composition (Furey, Marcotte, Wells, & Hintze, 2017; Saddler, 2013). Because struggling writers and SWSLD typically lack the linguistic skills required to produce complete, interesting, and varied sentences, their compositions are often less coherent and less complex, which negatively impacts overall writing quality (Saddler, Behforooz, & Asaro, 2008). Therefore, it is important to improve the sentence construction skills of struggling writers and SWSLD not only to increase their writing fluency but also to improve the quality of their written compositions (Datchuk & Kubina, 2013; Saddler et al., 2008).

Across the available research and research reviews of sentence construction interventions for struggling writers and SWSLD (Datchuk & Kubina, 2013; Furey et al., 2017), there were several common effective practices for SLPs to understand. First, sentence construction interventions included direct instruction (modeling, guided practice, and independent practice) in how to develop and write simple and complex sentences. Often, instructors used picture–word prompts; each of these prompts included an illustration along with several related words that students should include in their sentence to describe the illustration. Using these prompts allowed students to focus on sentence-level skills without having to come up with writing content on their own. Second, instructors used sentence-combining activities during sentence construction interventions. With sentence combining, students learned to combine simple, or kernel, sentences into more complex sentences using sentence cues (e.g., underlined parts of each kernel that should be retained in the combined sentence) and connector words (e.g., conjunctions). Through sentence combining, students learned to consider different syntactical options and to choose to write the combined sentence that best conveyed the meaning they intended. After direct instruction in how to combine sentences, instructors often paired students to complete sentence-combining activities, so that peers could provide feedback on the sentences their partners created. Third, sentence construction interventions included teaching of grammar skills within authentic contexts. During authentic grammar instruction, students applied learned grammar skills to writing (rather than learning them through workbook-type activities that were disconnected from writing connected text). Frequently, instructors incorporated grammar instruction (e.g., subject–verb agreement, parts of speech, capitalization, and punctuation) into their direct instruction in simple and complex sentences or into their sentence-combining instruction. Fourth, instructors used strategy instruction to teach students mnemonics (e.g., F-SPEED: Framed-Subject Predicate

Evaluate Expand Describe; Furey et al., 2017) for remembering steps in creating complete and interesting sentences.

The aforementioned sentence construction interventions (i.e., direct instruction in simple and complex sentences, sentence combining, authentic grammar instruction, and strategy instruction) led to improved sentence construction skills (i.e., production of complete sentences production of complex sentences, correct word sequences in sentences) as well as to improvements in writing fluency and writing quality (in some studies) for struggling writers and SWSLD. Importantly, across interventions, instructors provided opportunities for students to apply sentence construction skills in their own writing and to get feedback on their performance from the instructor and/or peers.

### Composition

With fluent transcription and sentence construction skills, writers can focus on the higher-order processes involved in composing quality compositions. Skilled writers devote time to planning what they will write as well as revising and editing their texts; they have strategies for carrying out each of these writing processes (Graham & Harris, 2000; Lienemann & Reid, 2008). Skilled writers consider not only what they know about a topic but also consider how to convey their message to an intended audience, which elements are important for their chosen writing genre, and which text structures they should use to express their ideas (Flower & Hayes, 1981; Graham, 2006; Scardamalia & Bereiter, 1987). In contrast, as SLPs have likely experienced, many struggling writers and SWSLD lack the skills, strategies, and writing knowledge necessary to produce quality texts (Graham, 2006; MacArthur & Graham, 2016). Thus, they require targeted interventions to address each of these areas of weakness.

Reviews of research on composition interventions for struggling writers and SWSLD (Gersten & Baker, 2001; Gillespie & Graham, 2014; McMaster et al., 2017) indicated several common effective practices of which SLPs should be aware. First, composition interventions involved using a process writing approach. With process writing, instructors taught students to follow the writing process (i.e., plan, draft, edit, revise, publish), asked students to write for authentic audiences and purposes, allowed sustained time for students to write, allowed students opportunities to write collaboratively with peers, and delivered mini-lessons to address students' writing skills as the need arose (Graham & Sandmel, 2011). Second, during composition interventions, instructors provided direct instruction in strategies for carrying out the writing process, such as strategies for planning, writing for different genres, editing, and revising texts. Often, instructors provided students mnemonics (e.g., SPACE: Setting Purpose Action Conclusion Emotions; Harris, Graham, Mason, & Friedlander, 2008) for remembering steps of each writing strategy. Third, composition interventions involved self-regulated strategy development (SRSD; see Harris, 1982; Harris et al., 2008; Harris & Graham, 1992). SRSD involved explicit instruction in writing strategies combined with instruction in the self-regulation strategies needed to carry out those writing

strategies. In addition, with SRSD, instructors provided the background knowledge and writing knowledge (e.g., common vocabulary used to talk about a specific writing genre, elements of specific genres, strong and weak examples of the types of texts students are learning about) students needed to use the writing strategies. SRSD instruction was presented through six flexible stages and driven by student progress in each stage (see Harris et al., 2008, and thinkSRSD, 2018, for further information about SRSD). Fourth, instructors provided frequent writing feedback during composition interventions. Instructors conducted writing conferences with students, providing feedback on overall writing quality and specific elements students included (or neglected) in their writing. Often, instructors set a goal with each student (e.g., add three more descriptive details, take out all uses of passive voice) and followed up on the goal at the next conference. Instructors also taught students how to provide writing feedback to their peers and paired students for peer writing conferences.

After participating in effective composition interventions (i.e., process writing, strategy instruction, SRSD, and writing feedback), struggling writers and SWSLD demonstrated increases in writing quality as well as increases in the number of genre elements present in their texts and in the length of their texts in some studies (Gersten & Baker, 2001; Gillespie & Graham, 2014; McMaster et al., 2017). Like the other writing interventions described in this article, all composition interventions involved explicit instruction, instructor modeling, opportunities for students to receive feedback on their writing during guided practice, and opportunities for students to apply newly learned skills and strategies in their own writing.

### *Common Instructional Characteristics of Evidence-Based Writing Interventions*

Importantly, all of the aforementioned evidence-based writing interventions that address transcription and ideation difficulties for struggling writers and SWSLD shared common characteristics that are important for classroom or small-group, intensive implementation. The interventions also included elements of structured literacy and multisensory instruction, both of which have been emphasized by IDA (2018a).

Regardless of the type of writing intervention used or the type of writing skill of focus, writing instruction for struggling writers and SWSLD should be explicit, direct, and systematic (Berninger et al., 2000; Datchuk & Kubina, 2013; McMaster et al., 2017). SLPs, teachers, and other interventionists should model writing skills and strategies extensively, with the goal of making the writing process and the "hidden" strategies (e.g., generating ideas for writing, planning and brainstorming) that skilled writers use transparent. Struggling writers and SWSLD also need multiple opportunities for guided practice before they are expected to apply newly learned writing skills and strategies independently. Furthermore, writing skills and strategies should be taught within an authentic context, and students



should be expected to learn and apply those skills and strategies in connected text and ultimately be held accountable for using them in their own writing (Berninger et al., 2000; Datchuk & Kubina, 2013; Graham, 2006; Troia, 2013). Instructors should also help students learn writing skills through multiple modalities, making connections between visual, auditory, and kinesthetic cues for written language as well as gross and fine motor movements (Berninger et al., 2000; Wolf, Abbott, & Berninger, 2017).

## Taxonomy of Intensive Intervention

The Taxonomy of Intervention Intensity proposed by D. Fuchs et al. (2017) informs what SLPs, teachers, and other interventionists might consider as they collaborate to adapt standard programs and provide data-based individualization. For illustrative purposes, we provide a case study of a fourth-grade SWSLD, Tommy, who did not respond to a Tier 2 small group multicomponent intervention, showing how this Taxonomy of Intervention Intensity could be used to intensify his intervention, monitor his response, and use data to improve the intervention formatively.

During the fall semester, Tommy received an evidence-based multicomponent intervention 5 days a week for 30 min a day provided by a well-trained reading specialist at his school. The program followed a scope and sequence that included about 15 min of word study, 5 min of vocabulary, and 10 min of comprehension instruction; but after about 20 weeks, the word study was reduced to only 5 min with extra time devoted to comprehension. As a student identified with a speech-language disorder, he also received speech and language services once a week from the school's SLP.

Despite these supports, the interventionist noted that, after 2 months, Tommy could not keep up with his group, his reading was very dysfluent, and he lacked the ability to decode many simple vowel patterns. His progress monitoring data indicated that he read in the bottom quartile of words correct per minute, and he was not able to answer basic or inferential comprehension questions. Tommy was beginning to act out during intervention to avoid his peers realizing he could not read the text; his lack of motivation was obvious when he would say things such as "You can't make me read that!" or "I'm too tired today."

In an RTI meeting, the principal asked both the upper elementary SLP Mrs. Garcia and the reading specialist Ms. Evans to collaborate to build a plan to intensify Tommy's intervention using the Taxonomy of Intervention Intensity. In the first or setup phase, Mrs. Garcia and Ms. Evans examined six dimensions of the Taxonomy of Intervention Intensity. First, they considered the "strength" of the program for students like Tommy. They logged on to the Institute of Education Sciences What Works Clearinghouse (2018) website and the National Center for Intensive Intervention (NCII; 2018b) tools chart to learn what effect sizes for the intervention were reported for SWSLD and found both resources suggested effects ranged from 0.40 to 0.60 on comprehension. This suggests the intervention was generally strong for students like Tommy.

In the second step, Mrs. Garcia and Ms. Evans both examined the "dosage," including the group size, number of minutes per day, and sessions per week to evaluate Tommy's opportunities to respond and to receive corrective feedback. Both of the educators were satisfied that Tommy was receiving the recommended dosage.

The third step was to examine the "alignment" or how well the intervention addressed Tommy's reading deficits but also covered fourth-grade standards. Mrs. Garcia and Ms. Evans closely examined Tommy's most recent comprehensive evaluation and decided to readminister a phonics inventory, a test of word fluency, and an oral reading fluency measure. These data confirmed he was reading at only a first-grade level and was unable to consistently decode words with a consonant-vowel-consonant-e or vowel team patterns. His sight word lexicon was also very limited. However, the readability for the intervention materials was at a third-grade reading level, which was not well aligned with his instructional reading level. Furthermore, the amount and type of word study were not adequate to help him catch up to grade level.

Their fourth step was to evaluate "attention to transfer" or the degree to which the intervention supported Tommy in making connections from the skills taught in the lessons with reading other texts, such as informational text. They realized that there was a big divide between the intervention materials and they included little to no explicit instruction for how to use the comprehension strategies when reading social studies and science content texts.

Their fifth step was to examine the "comprehensiveness" of the intervention; in other words, to what extent were the explicit and systematic principles applied? Did the program provide clear and simply worded explanations, model strategies for decoding and comprehending, support Tommy's limited background knowledge, fade supports and increase independent practice, and incorporate specific feedback as well as cumulative review of the skills taught? Mrs. Garcia and Ms. Evans sampled four lessons and noted that the program was very comprehensive.

Their final step of the setup phase was to consider "behavior support." The team had noted Tommy was frequently off task and lacked motivation. So, both the SLP and the reading specialist considered whether the program provided supports for self-regulation, self-monitoring, as well as praise for effort. After collaborating, they judged that Tommy would need more behavior supports in both his speech and reading pullout sessions.

Taken together, these six steps within the setup phase led Mrs. Garcia and Ms. Evans to develop an intensification plan for "individualization." They planned to use data-based individualization (D. Fuchs, Fuchs, & Vaughn, 2014; Lemons, Kearns, & Davidson, 2014; Stecker, Fuchs, & Fuchs, 2005) as their platform. After revisiting the National Center on Intensive Intervention website (NCII 2018a) Mrs. Garcia and Ms. Evans selected the Dynamic Indicators of Basic Literacy (Good & Kaminski, 2002), a second grade-level oral reading fluency measure, to track his RTI every other week. They

set up a shared Excel spreadsheet to evaluate whether his progress was commensurate with the end-of-year goal by checking each month to see if his rate of improvement was as steep as his goal line. For intervention, they decided that the program appeared strong and was comprehensive, but that Tommy should be regrouped in a smaller group of students with similar skills to an earlier stage in the intervention with simpler text. To improve the alignment of the intervention with his skills, after consulting the Center on Instruction's review titled "Why Teach Spelling?" (Reed, 2012), Mrs. Garcia and Ms. Evans added a word study intervention that involved spelling to develop more accurate word reading. They also boosted grade-level comprehension through e-books that allowed Tommy to preview and review with a graphic organizer and listen to social studies and science text. They decided that Tommy would benefit from an additional one-on-one speech session to further support the language deficits affecting his reading and writing. During reading instruction, Ms. Evans increased the behavioral supports by adding a fluency game that provided more practice and motivation for Tommy to beat his own best time with a self-graphing component to help him see his effort paying off. To promote transfer for reading informational text during social studies and science, Mrs. Garcia reviewed the Office of Special Education–funded technical assistance website for Positive Behavior Interventions & Supports (2018) and developed a daily report card/checklist to help Tommy self-monitor his use of word reading and comprehension strategies during intervention and speech.

Next, during the implementation stage, Mrs. Garcia and Ms. Evans executed the plan. They met with Tommy together to discuss the changes that would be occurring in both classes. At the end of the month, they evaluated Tommy's progress monitoring. In their meeting, Tommy proudly showed them his improvements on the fluency game scores on his own progress-monitoring graph. He also told them his plan for the upcoming science fair. Mrs. Garcia and Ms. Evans determined that he had mastered the phonics patterns and so changed the word study elements to include patterns he did not know. In child-friendly terms, they told him it was time to "level up" just as he did when playing computer games. Within 2 months, they conducted a second brief review and saw that his progress was accelerating and he appeared likely to meet his end-of-year goal.

We hope this case study shows how SLPs and other educators can work together to use the Taxonomy of Intervention Intensity in order to increase the intensity of intervention and improve outcomes. In the next section, we provide more resources for evidence-based tools, similar to the IES WWC Practice Guides, and websites like the PBIS and NCII, which we mentioned within this case study.

### ***Resources for Intensification***

There are many evidence-based websites that provide technical assistance resources that may be helpful for SLPs to stay current with the research and that are useful for guiding professional learning communities to help general

educators as well as special educators and dyslexia specialists. We emphasize that the intensification taxonomy is a process of taking one step at a time and involving a team with a common child-focused and problem-solving mindset.

The NCII (2018a), American Institutes for Research, provides resources and tools for providing intensive intervention and for monitoring RTI. Particularly helpful are the reviews describing the reliability and validity of a variety of universal screeners and progress monitoring tools (NCII, 2018b).

The IES (2018a) provides practice guides for implementing educational practices and conducts reviews of programs to determine the research base of effectiveness. IES has tasked 10 regional educational laboratories to disseminate findings and provide technical assistance to improve reading outcomes (e.g., Foorman et al., 2016).

The IRIS Center (2018), funded by the Office of Special Education Programs, offers training modules on RTI, reading, writing, math, behavior, individualization, English language learners, and assessment. For example, IRIS offers case studies on students who struggle with written expression skills (Lienemann, Reid, & the IRIS Center, 2009). Each case study presents a short vignette about a student struggling with a particular writing skill and typically displays a sample of that student's writing.

TeachingLD (2018a), a project of the Division for Learning Disabilities, which is part of the Council for Exceptional Children, features Current Practice Alerts, highlighting evidence-based academic interventions for SWSLD. One example of an alert is Fluency Instruction (2008), which describes the practice and research behind it. Furthermore, educators can access a wealth of online tutorials (TeachingLD, 2018b).

The International Dyslexia Association (IDA, 2018d) has a website that offers resources for families and educational professionals including the fact sheets (IDA, 2018d) that provide foundational understanding about dyslexia. Moreover, the website provides a link to dyslexia laws for each state (IDA, 2018c).

The RTI Action Network (2018a), sponsored by the National Center for Learning Disabilities, is a website that offers a variety of resources about RTI. For example, SLPs can link to pages within the website to initially develop the plan for implementing RTI in their schools (2018b).

Understood: For Learning and Attention Issues (2018) is a website that primarily targets parents and families of children with high-incidence disabilities. In addition, SLPs and educators will find resources to communicate with parents of SWSLD.

### **Conclusion**

Our purpose in writing this narrative review was to describe intensive reading and writing interventions for elementary grade students with dyslexia, SWSLD, and students with intensive reading and writing needs. Across these interventions, SLPs, teachers, and interventionists will notice common characteristics of effective reading and writing

instruction include (a) explicit and systematic instruction, (b) extensive modeling and daily practice opportunities, (c) frequent and timely feedback, and (d) use of multiple modalities for practice and retention of skills. This was not an exhaustive review of the research. Rather, our intention was to inform readers and to empower them with tools and resources to guide them in selecting interventions, but more broadly to guide RTI and MTSS implementation and to inform professional development efforts. These resources may be helpful to SLPs, teachers, and interventionists both for self-study and for use within professional learning communities.

## Acknowledgments

The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R324A160132 to Stephanie Al Otaiba at Southern Methodist University. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

## References

- Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.
- Al Otaiba, S., Connor, C. M., Folsom, J. S., Wanzek, J., Greulich, L., Schatschneider, C., & Wagner, R. K. (2014). To wait in Tier 1 or intervene immediately: A randomized experiment examining first-grade response to intervention in reading. *Exceptional Children, 81*(1), 11–27.
- Al Otaiba, S., & Fuchs, D. (2002). Characteristics of children who are unresponsive to early literacy intervention: A review of the literature. *Remedial and Special Education, 23*(5), 300–316.
- American Speech-Language-Hearing Association. (2001). *Roles and responsibilities of speech-language pathologists with respect to reading and writing in children and adolescents* [Position statement]. Retrieved from <http://www.asha.org/policy>
- American Speech-Language-Hearing Association. (2010). *Roles and responsibilities of speech-language pathologists in schools* [Professional issues statement]. Retrieved from <http://www.asha.org/policy>
- Bear, D. R., Invernizzi, M., Templeton, S., & Johnston, F. (2016). *Words their way* (6th ed.). Upper Saddle River, NJ: Pearson.
- Beck, I., McKeown, M. G., & Kucan, L. (2002). *Bringing words to life: Robust vocabulary development*. New York, NY: Guilford.
- Berninger, V. W., Nielsen, K. H., Abbott, R. D., Wijsman, E., & Raskind, W. (2008). Writing problems in developmental dyslexia: Under-recognized and under-treated. *Journal of School Psychology, 46*(1), 1–21.
- Berninger, V. W., Vaughan, K., Abbott, R. D., Brooks, A., Begayis, K., Curtin, G., . . . Graham, S. (2000). Language-based spelling instruction: Teaching children to make multiple connections between spoken and written words. *Learning Disability Quarterly, 23*(2), 117–135.
- Biemiller, A. (2005). Size and sequence in vocabulary development: Implications for choosing words for primary grade vocabulary instruction. In E. H. Hiebert & M. L. Kamil (Eds.), *Teaching and learning vocabulary: Bringing research to practice* (pp. 223–242). Mahwah, NJ: Erlbaum.
- Blachman, B. A., Ball, E. W., Black, R., & Tangel, D. M. (2000). *Road to the code: A phonological awareness program for young children*. Baltimore, MD: Brookes.
- Blachman, B. A., Schatschneider, C., Fletcher, J. M., Francis, D. J., Clonan, S. M., Shaywitz, B. A., & Shaywitz, S. E. (2004). Effects of intensive reading remediation for second and third graders and a 1-year follow-up. *Journal of Educational Psychology, 96*(3), 444–461.
- Catts, H. W. (1989). Defining dyslexia as a developmental language disorder. *Annals of Dyslexia, 39*, 50–64.
- Clay, M. M. (1993). *Reading recovery: A guidebook for teachers in teaching*. Portsmouth, NH: Heinemann.
- 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), 1–23.
- Criminal Justice Initiative. (1997). *Education as crime prevention: Providing education to prisoners*. The Center on Crime, Communities and Culture. Retrieved from [https://www.prisonpolicy.org/scans/research\\_brief\\_2.pdf](https://www.prisonpolicy.org/scans/research_brief_2.pdf)
- Datchuk, S. M., & Kubina, R. M. (2013). A review of teaching sentence-level writing skills to students with writing difficulties and learning disabilities. *Remedial and Special Education, 34*(3), 180–192.
- Elhri, L. C., Nunes, S. R., Stahl, S. A., & Willows, D. M. (2001). Systematic phonics instruction helps students learn to read: Evidence from the National Reading Panel's meta-analysis. *Review of Educational Research, 71*(3), 393–447.
- Fayol, M. (2016). From language to text: The development and learning of translation. In C. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (2nd ed., pp. 130–143). New York, NY: Guilford.
- Fernald, G. M., & Keller, H. (1921). The effect of kinesthetic factors in the development of word recognition in the case of non-readers. *Journal of Educational Research, 4*(5), 355–377.
- Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication, 32*(4), 365–387.
- 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* (NCEE 2016-4008). Washington, DC: National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://whatworks.ed.gov>
- Foorman, B. R., & Torgesen, J. (2001). Critical elements of classroom and small-group instruction promote reading success in all children. *Learning Disabilities Research & Practice, 16*(4), 203–212.
- Fuchs, D., Fuchs, L. S., & Malone, A. S. (2017). The taxonomy of intervention intensity. *TEACHING Exceptional Children, 50*(1), 35–43. <https://doi.org/10.1177/0040059917703962>
- Fuchs, D., Fuchs, L. S., McMaster, K., Thompson, A., Al Otaiba, S., & Yen, L. (2016). *Kindergarten peer-assisted learning strategies: Teacher manual* (Rev. ed.) [Unpublished training manual]. Nashville, TN: Vanderbilt University.
- Fuchs, D., Fuchs, L. S., Svenson, E., Yen, L., Thompson, A., McMaster, K. N., . . . Kearns, D. (2011). *Peer-assisted learning strategies: First grade reading PALS* (Rev. ed.) [Unpublished training manual]. Nashville, TN: Vanderbilt University.
- Fuchs, D., Fuchs, L. S., & Vaughn, S. R. (2014). What is intensive instruction and why is it important? *TEACHING Exceptional Children, 46*(4), 13–18. <https://doi.org/10.1177/0040059914522966>
- Fuchs, D., Mock, D., Morgan, P. L., & Young, C. L. (2003). Responsiveness-to-intervention: Definitions, evidence, and

- implications for the learning disabilities construct. *Learning Disabilities Research & Practice*, 18(3), 157–171.
- Fuchs, L. S., & Fuchs, D.** (1998). Treatment validity: A unifying concept for reconceptualizing the identification of learning disabilities. *Learning Disabilities Research and Practice*, 13(4), 204–219.
- Fuchs, L. S., Fuchs, D., Hosp, M., & Jenkins, J. R.** (2001). Oral reading fluency as an indicator of reading competence: A theoretical, empirical, and historical analysis. *Scientific Studies of Reading*, 5, 239–256.
- Furey, W. M., Marcotte, A. M., Wells, C. S., & Hintze, J. M.** (2017). The effects of supplemental sentence-level instruction for fourth-grade students identified as struggling writers. *Reading & Writing Quarterly*, 1–16.
- Gersten, R., & Baker, S.** (2001). Teaching expressive writing to students with learning disabilities: A meta-analysis. *Elementary School Journal*, 101(3), 251–272.
- 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 for reading in the primary grades. A practice guide* (NCEE 2009-4045). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://ies.ed.gov/ncee/wwc/publications/practiceguides/>
- Gillespie, A., & Graham, S.** (2014). A meta-analysis of writing interventions for students with learning disabilities. *Exceptional Children*, 80(4), 454–473.
- Good, R. H., & Kaminski, R. A. (Eds.)** (2002). *Dynamic indicators of basic early literacy skills*. Eugene, OR: Institute for the Development of Educational Achievement.
- Gough, P. B., & Tunmer, W. E.** (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7(1), 6–10.
- Graham, S.** (1999). Handwriting and spelling instruction for students with learning disabilities: A review. *Learning Disability Quarterly*, 22(2), 78–98.
- Graham, S.** (2006). Writing. In E. Anderman, P. H. Winne, P. A. Alexander, & L. Corno (Eds.), *Handbook of educational psychology* (pp. 457–478). New York, NY: Routledge.
- Graham, S., & Harris, K. R.** (2000). The role of self-regulation and transcription skills in writing and writing development. *Educational Psychologist*, 35(1), 3–12.
- Graham, S., Harris, K. R., & Fink Chorzempa, B.** (2002). Contribution of spelling instruction to the spelling, writing, and reading of poor spellers. *Journal of Educational Psychology*, 94(4), 669–686.
- Graham, S., Harris, K. R., & Hebert, M. A.** (2011). *Informing writing: The benefits of formative assessment. A Carnegie Corporation Time to Act report*. Washington, DC: Alliance for Excellent Education.
- Graham, S., & Sandmel, K.** (2011). The process writing approach: A meta-analysis. *Journal of Educational Research*, 104(6), 396–407.
- Gunn, B. K.** (1996). An investigation of three approaches to teaching phonological awareness to first-grade students and the effects on word recognition (Doctoral dissertation, University of Oregon, 1996). *Dissertation Abstracts International*, 57(09A), 205-3889.
- Harris, K. R.** (1982). Cognitive-behavior modification: Application with exceptional students. *Focus on Exceptional Children*, 15, 1–16.
- Harris, K. R., & Graham, S.** (1992). Self-regulated strategy development: A part of the writing process. In M. Pressley, K. R. Harris, & J. T. Guthrie (Eds.), *Promoting academic competence and literacy in school* (pp. 277–309). New York, NY: Academic Press.
- Harris, K. R., Graham, S., Mason, L. H., & Friedlander, B.** (2008). *Powerful writing strategies for all students*. Baltimore, MD: Brookes.
- Hudson, R. F., Lane, H. B., & Pullen, P. C.** (2005). Reading fluency assessment and instruction: What, why, and how? *The Reading Teacher*, 58, 702–714.
- Individuals With Disabilities Education Act, 20 U.S.C. § 1400 (2004).
- Institute of Education Sciences.** (2018a). [Homepage]. Retrieved from <https://ies.ed.gov/>
- Institute of Education Sciences.** (2018b). *Regional educational laboratory program: Southwest*. Retrieved from <https://ies.ed.gov/ncee/edlabs/regions/southwest/default.aspx>
- Institute of Education Sciences What Works Clearing House.** (2007). *WWC Intervention Report: Wilson Reading System*. Retrieved from [https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/WWC\\_Wilson\\_Reading\\_070207.pdf](https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/WWC_Wilson_Reading_070207.pdf)
- Institute of Education Sciences What Works Clearinghouse.** (2010). *WWC Intervention Report: Lindamood Phoneme Sequencing (LIPS)*. Retrieved from [https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc\\_lindamood\\_031610.pdf](https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_lindamood_031610.pdf)
- Institute of Education Sciences What Works Clearinghouse.** (2018). [Homepage]. Retrieved from <https://ies.ed.gov/ncee/wwc/>
- International Dyslexia Association.** (2018a). [Homepage]. Retrieved from <https://dyslexiaida.org/>
- International Dyslexia Association.** (2018b). *Dyslexia legislation*. Retrieved from <https://dyslexiaida.org/category/legislation/>
- International Dyslexia Association.** (2018c). *Dyslexia laws in the USA: A 2018 update*. Retrieved from <https://dyslexiaida.org/dyslexia-laws-in-the-usa-an-update/>
- International Dyslexia Association.** (2018d). *Fact sheets*. Retrieved from <https://dyslexiaida.org/fact-sheets/>
- The IRIS Center.** (2018). [Homepage]. Retrieved from <https://iris.peabody.vanderbilt.edu/>
- Iverson, S., & Tunmer, W. E.** (1993). Phonological processing skills and the Reading Recovery Program. *Journal of Educational Psychology*, 85(1), 112–126.
- Jimerson, S. R., Burns, M. K., & VanDerHeyden, A. M.** (2016). *Handbook of response to intervention*. New York, NY: Springer.
- Joshi, R. M., Dahlgren, M., & Boulware-Gooden, R.** (2002). Teaching reading in an inner city school through a multisensory teaching approach. *Annals of Dyslexia*, 52(1), 229–242.
- Juel, C., Griffith, P. L., & Gough, P. B.** (1986). Acquisition of literacy: A longitudinal study of children in first and second grade. *Journal of Educational Psychology*, 78(4), 243–255.
- Kosanovich, M., & Foorman, B.** (2016). *Professional learning communities facilitator's guide for the What Works Clearinghouse practice guide: Foundational skills to support reading for understanding in kindergarten through 3rd grade* (REL 2016-227). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southeast. Retrieved from <https://ies.ed.gov/ncee/edlabs/projects/project.asp?projectID=4541>
- Kuhn, M. R., & Stahl, S. A.** (2003). Fluency: A review of developmental and remedial practices. *Journal of Educational Psychology*, 95, 3–21.
- LaBerge, D., & Samuels, S. J.** (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology*, 6, 293–323.
- Lam, E. A., & McMaster, K. L.** (2014). Predictors of responsiveness to early literacy intervention: A 10-year update. *Learning Disability Quarterly*, 37(3), 134–147.

- Lemons, C. J., Kearns, D. M., & Davidson, K. A. (2014). Data-based individualization in reading: Intensifying interventions for students with significant reading disabilities. *Teaching Exceptional Children, 46*(4), 20–29.
- Lienemann, T. O., & Reid, R. (2008). Using self-regulated strategy development to improve expository writing with students with attention deficit hyperactivity disorder. *Exceptional Children, 74*(4), 471–486.
- Lienemann, T., Reid, R., & the IRIS Center. (2009). *Written expression: Grades 2–5*. Retrieved from [http://iris.peabody.vanderbilt.edu/wp-content/uploads/pdf\\_case\\_studies/ics\\_writex.pdf](http://iris.peabody.vanderbilt.edu/wp-content/uploads/pdf_case_studies/ics_writex.pdf)
- Litcher, J. H., & Roberge, L. P. (1979). First grade intervention for reading achievement of high risk children. *Annals of Dyslexia, 29*(1), 238–244.
- Lonigan, C. J., & Shanahan, T. (2009). *Developing early literacy: Report of the National Early Literacy Panel. Executive summary. A Scientific synthesis of early literacy development and implications for intervention*. Washington, DC: National Institute for Literacy.
- Lonigan, C. J., & Whitehurst, G. J. (1998). Relative efficacy of parent and teacher involvement in a shared-reading intervention for preschool children from low-income backgrounds. *Early Childhood Research Quarterly, 13*(2), 263–290.
- MacArthur, C. A., & Graham, S. (2016). Writing research from a cognitive perspective. In C. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (2nd ed., pp. 24–40). New York NY: Guilford.
- Mastropieri, M. A., Scuggs, T. E., Bakken, J. P., & Whedon, C. (1996). Reading comprehension: A synthesis of research in learning disabilities. In T. E. Scuggs & M. A. Mastropieri (Eds.), *Advances in learning and behavioral disabilities: Intervention research* (Vol. 10, pp. 201–227). Greenwich, CT: JAI.
- Mathes, P., & Torgesen, J. (2005). *Early interventions in reading: Challenge stories*. New York, NY: McGraw-Hill Education.
- McLaughlin, T. F., Weber, K. P., & Derby, M. (2013). Classroom spelling interventions for students with learning disabilities. In H. L. Swanson, K. R. Harris, & S. Graham (Eds.), *Handbook of learning disabilities* (2nd ed., pp. 439–447). New York, NY: Guilford.
- McMaster, K. L., Kunkel, A., Shin, J., Jung, P. G., & Lembke, E. (2017). Early writing intervention: A meta-evidence synthesis. *Journal of Learning Disabilities, 51*(4), 363–380.
- Miciak, J., Fletcher, J. M., & Stuebing, K. K. (2016). Accuracy and validity of methods for identifying learning disabilities in a response-to-intervention service delivery framework. In S. Jimerson, M. Burns, & A. VanDerHeyden (Eds.), *Handbook of response to intervention* (pp. 421–440). Boston, MA: Springer.
- Monroe, M. (1932). *Children who cannot read; the analysis of reading disabilities and the use of diagnostic tests in the instruction of retarded readers*. Oxford, England: University of Chicago Press.
- National Assessment of Educational Progress. (2015). *NAEP nations report card*. Retrieved from <https://nces.ed.gov/nationsreportcard/>
- National Center for Education Statistics. (2012). *The nation's report card: Writing 2011* (NCES 2012-470). Washington, DC: Institute of Education Sciences, U.S. Department of Education.
- National Center on Intensive Intervention. (2018a). [Homepage]. Retrieved from <https://intensiveintervention.org>
- National Center on Intensive Intervention. (2018b). *About the charts—Tools chart resources*. Retrieved from <https://intensiveintervention.org/about-charts-resources>
- National Reading Panel. (2000). *Report of the National Reading Panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. Washington, DC: National Institute of Child Health and Human Development, National Institutes of Health.
- Nelson, J., Benner, G. J., & Gonzalez, J. (2003). Learner characteristics that influence the treatment effectiveness of early literacy interventions: A meta-analytic review. *Learning Disabilities Research & Practice, 18*(4), 255–267.
- Orton, S. T. (1937). *Reading, writing and speech problems in children*. New York, NY: Norton.
- Persky, H. R., Daane, M. C., & Jin, Y. (2003). *The nation's report card: Writing 2002* (NCES 2003-529). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.
- Positive Behavioral Interventions & Supports. (2018). [Homepage]. Retrieved from <https://www.pbis.org/>
- Reed, D. K. (2012). *Why teach spelling?* Portsmouth, NH: RMC Research Corporation, Center on Instruction.
- Ritche, K. D., & Goeke, J. L. (2006). Orton-Gillingham and Orton-Gillingham-based reading instruction: A review of the literature. *Journal of Special Education, 40*(3), 171–183.
- RTI Action Network. (2018a). [Homepage]. Retrieved from <http://www.rtinetwork.org/>
- RTI Action Network. (2018b). *Develop a plan*. Retrieved from <http://www.rtinetwork.org/getstarted/develop>
- Saddler, B. (2013). Best practices in sentence construction skills. In S. Graham, C. A. MacArthur, & J. Fitzgerald (Eds.), *Best practices in writing instruction* (2nd ed., pp. 238–256). New York, NY: Guilford.
- Saddler, B., Behforooz, B., & Asaro, K. (2008). The effects of sentence-combining instruction on the writing of fourth-grade students with writing difficulties. *Journal of Special Education, 42*(2), 79–90.
- Scardamalia, M., & Bereiter, C. (1987). Knowledge telling and knowledge transforming in written composition. *Advances in Applied Psycholinguistics, 2*, 142–175.
- Schlalag, B. (2013). Best practices in spelling and handwriting. In S. Graham, C. A. MacArthur, & J. Fitzgerald (Eds.), *Best practices in writing instruction* (2nd ed., pp. 257–283). New York, NY: Guilford.
- Schlesinger, N. W., & Gray, S. (2017). The impact of multisensory instruction on learning letter names and sounds, word reading, and spelling. *Annals of Dyslexia, 67*, 219–258.
- 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: IES practice guide* (NCEE 2010-4038). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from [whatworks.ed.gov/publications/practiceguides](http://whatworks.ed.gov/publications/practiceguides)
- Simmons, D. C., & Kame'enui, E. J. (2003). *Scott Foresman early reading intervention*. Glenview, IL: Foresman.
- Soifer, L. H. (1999). Development of oral language and its relationship to literacy. In J. R. Birsh (Ed.), *Multisensory teaching of basic language skills* (pp. 19–62). Baltimore, MD: Brookes.
- Stecker, P. M., Fuchs, L. S., & Fuchs, D. (2005). Using curriculum-based measurement to improve student achievement: Review of research. *Psychology in the Schools, 42*(8), 795–819.
- Stoner, J. C. (1991). Teaching at-risk students to read using specialized techniques in the regular classroom. *Reading and Writing, 3*(1), 19–30.

- Swanson, H. L. (1999). Reading research for students with LD: A meta-analysis of intervention outcomes. *Journal of Learning Disabilities, 32*(6), 504–532.
- TeachingLD. (2008). *Fluency instruction—Go for it*. Retrieved from <http://teachingld.org/alerts#fluency-instruction>
- TeachingLD. (2018a). [Homepage]. Retrieved from <http://www.teachingld.org/>
- TeachingLD. (2018b). *Teaching tutorials*. Retrieved from <http://teachingld.org/tutorials>
- thinkSRSD. (2018). [Homepage]. Retrieved from <http://www.thinkrsrd.com/>
- Tolson, R., & Krnac, V. (2015). Legislative issues for the early identification of dyslexia. *Perspectives on Language and Literacy, 41*(4), 19.
- Torgesen, J. K. (2004). Avoiding the devastating downward spiral: The evidence that early intervention prevents reading failure. *American Educator, 28*(3), 6–19.
- Torgesen, J. K., Alexander, A. W., Wagner, R. K., Rashotte, C. A., Voeller, K. S., & Conway, T. (2001). Intensive remedial instruction for children with severe reading disabilities: Immediate and long-term outcomes from two instructional approaches. *Journal of Learning Disabilities, 34*(1), 33–58, 78.
- Torgesen, J., Myers, D., Schirm, A., Stuart, E., Vartivarian, S., Mansfield, W., . . . Stancavage, F. (2006). *National assessment of Title I: Interim report—Volume II: Closing the reading gap: First year findings from a randomized trial of four reading interventions for striving readers*. Retrieved from Institute of Education Sciences, U.S. Department of Education Web site: <https://www2.ed.gov/rschstat/eval/disadv/title1interimreport/index.html>
- Torgesen, J. K., Wagner, R. K., Rashotte, C. A., Herron, J., & Lindamood, P. (2010). Computer-assisted instruction to prevent early reading difficulties in students at risk for dyslexia: Outcomes from two instructional approaches. *Annals of Dyslexia, 60*(1), 40–56.
- Troia, G. A. (2013). Writing instruction within a response-to-intervention framework. In S. Graham, C. A. MacArthur, & J. Fitzgerald (Eds.), *Best practices in writing instruction* (2nd ed., pp. 403–427). New York, NY: Guilford.
- Understood: For Learning and Attention Issues. (2018). [Homepage]. <https://www.understood.org/en>
- Vadasy, P. F., Sanders, E. A., & Peyton, J. A. (2006). Code-oriented instruction for kindergarten students at risk for reading difficulties: A randomized field trial with paraeducator implementers. *Journal of Educational Psychology, 98*(3), 508–528.
- 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.
- Wagner, R. K., & Torgesen, J. K. (1987). The nature of phonological processing and its causal role in the acquisition of reading skills. *Psychological Bulletin, 101*(2), 192–212.
- Wanzek, J., Gatlin, B., Al Otaiba, S., & Kim, Y. S. G. (2017). The impact of transcription writing interventions for first-grade students. *Reading & Writing Quarterly, 33*(5), 484–499.
- Wanzek, J., & Vaughn, S. (2007). Research-based implications from extensive early reading interventions. *School Psychology Review, 36*(4), 541–561.
- Wanzek, J., Vaughn, S., Scammacca, N. K., Metz, K., Murray, C. S., Roberts, G., & Danielson, L. (2013). Extensive reading interventions for students with reading difficulties after grade 3. *Review of Educational Research, 83*(2), 163–195.
- Wanzek, J., Wexler, J., Vaughn, S., & Ciullo, S. (2010). Reading interventions for struggling readers in the upper elementary grades: A synthesis of 20 years of research. *Reading and Writing, 23*(8), 889–912.
- Whitehurst, G. J., Arnold, D. S., Epstein, J. N., Angell, A. L., Smith, M., & Fischel, J. E. (1994). A picture book reading intervention in day care and home for children from low-income families. *Developmental Psychology, 30*(5), 679–689.
- Williams, K. J., Walker, M. A., Vaughn, S., & Wanzek, J. (2017). A synthesis of reading and spelling interventions and their effects on spelling outcomes for students with learning disabilities. *Journal of Learning Disabilities, 50*(3), 286–297.
- Wilson, B. (2002). *The Wilson Reading System—Third Edition*. Millbury, MA: Wilson Language Training Corp.
- Wolf, B., Abbott, R. D., & Berninger, V. W. (2017). Effective beginning handwriting instruction: Multi-modal, consistent format for 2 years, and linked to spelling and composing. *Reading and Writing, 30*(2), 299–317.
- Youman, M., & Mather, N. (2015). Dyslexia laws in the USA: An update. *Perspectives on Language and Literacy, 41*(4), 10.
- Zirkel, P. A., & Thomas, L. B. (2010). State laws and guidelines for implementing RTI. *Teaching Exceptional Children, 43*(1), 60–73.