1 Understanding Reading Comprehension

Challenges for Older Students with Reading Disabilities

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Content area literacy is a critical component to academic success for adolescent students. For many years, however, significantly more attention has been paid to improving the reading skills of elementary school students, and neglecting the needs of older readers struggling with both basic reading skills and content knowledge acquisition. Not all students at risk for reading deficits receive intervention early in their literacy skill development, despite the fact that early intervention is a key component to remediating reading difficulties, and, in many cases, intervention is ineffective (Flynn, Zheng, & Swanson, 2012). This leaves a significant number of adolescent students with reading disabilities. Unfortunately, the problems associated with reading disabilities will continue to follow individuals beyond the K–12 education system and into adulthood. The impact of such reading deficits can be seen in all facets of adult life, including continued education, employment opportunities, daily living skills, and community involvement.

The demands of content area academics for older students are complex, challenging, and necessitate the integration of multiple skills. Older students are required to use numerous text materials to increase and demonstrate knowledge of varying content. Deficits associated with reading skills, including word identification, fluency, vocabulary, and comprehension, will not only affect an older reader's capacity to gain access to text, but also successfully master and demonstrate core academic skills. The skill set associated with text comprehension is of particular importance. Comprehension is viewed as the ultimate goal of reading. Adolescent readers, however, must do more than simply make meaning from the text they read. They must also connect prior knowledge to new information, identify key components and concepts related to the content area of focus, learn and use new vocabulary in novel situations, and employ strategies enabling them to gain access to and acquire content area knowledge.

Adolescents with reading disabilities must navigate the challenges involved in content knowledge acquisition paired with deficits in reading comprehension skill. The learning demands placed on these students exceed those experienced by their typically developing peers and add an element of difficulty to instruction as teachers must concurrently address content and comprehension within an environment already stretched tight on time. Addressing comprehension skills within content area instruction becomes complex as text structures vary widely across materials, language is often abstract and relies on knowledge of conceptual constructs (De Oliveira, 2010), unfamiliar vocabulary may hinder basic understanding (Hairrell et al., 2011), and older students with reading disabilities frequently have difficulty selecting and using appropriate comprehension strategies (Gersten, Fuchs, Williams, & Baker, 2001).

Some of the data discussed in this chapter are found in greater detail in the following resources: Swanson (2001); Swanson and Deshler (2003); Swanson and Hoskyn (1998, 2001).

Several factors contribute to poor comprehension in adolescent readers. The remainder of this chapter discusses the contributing factors, including problems at the word level, issues associated with fluency, challenges faced with content area vocabulary, the impact of a student's background knowledge, understanding of text structure, and organizational knowledge on comprehension, strategy use, and motivation. This discussion is followed by highlighting the key findings related to a meta-analysis of reading intervention research directed at the instructional practices for improving comprehension in older readers. The chapter concludes with a brief summary and recommendations for the direction educators and researchers should head to effectively address the challenges associated with reading comprehension skills of adolescents.

FACTORS CONTRIBUTING TO POOR COMPREHENSION

Multiple skills working in tandem are required to ensure successful comprehension of a given text. A deficit in any one of these skills may significantly affect a student's understanding of text and subsequent learning. It is important to understand the contribution that each of these skills has to comprehension because it will enable teachers to effectively select instructional methods at improving reading comprehension.

Word Level Problems

Word level reading skills are essential for students to gain access to texts and other materials containing information specific to content area learning. Unfortunately, merely identifying the words within their content text materials presents a major challenge for many struggling readers. Comprehension is an impossible feat without the ability to translate the letters on the page into recognizable words in language. Successful word level reading for older readers includes a wide array of skills associated with having phonological awareness, understanding morphology, and knowing the complexities affiliated with reading multisyllabic words.

Phonological Awareness Phonological awareness encompasses the understanding that words are comprised of separate units of sound and letters or combinations of letters represent these same units of sound. The systematic and predictable relationships between spoken sounds and written letters are not transparent to students demonstrating deficits in phonological awareness. It is critical, however, that students develop a strong sense of phonological awareness given its high correlation to reading achievement (Adams, 1990; Bhat, Griffin, & Sindelar, 2003; Juel, 1988), including performance on tasks of comprehension.

Comprehension relies on accurately identifying the words within a given text. Students struggling at the word level expend significant cognitive resources decoding the text, which leaves limited capacity available to make meaning of the reading (LaBerge & Samuels, 1974). The fact that there are 44 sounds in the English language with only 26 letters available to represent the sounds increases the challenges faced by students struggling to make sense of reading individual words. Errors in word identification or inordinate amounts of time spent distinguishing letter–sound correspondences increase the likelihood that a struggling reader will experience comprehension deficits and low levels of achievement in core academic content areas.

Morphology Despite the highly alphabetic nature of the English language, there are aspects of the writing system that require knowledge of more than letter–sound correspondences (Nagy, Berninger, & Abbott, 2006). Morphology involves studying the smallest units of meaning in words (morphemes) and breaking those units apart to decipher the meanings of new or unknown words (Ebbers & Denton, 2008). Understanding the meanings of word parts such as prefixes and suffixes can improve performance on tasks of reading comprehension (Nagy et al., 2006). This is important because morphemic knowledge is useful to determine word meanings as the words found in core academic content area texts become increasingly morphologically complex (Nagy & Anderson, 1984).

Understanding the morphology of complex words found in various texts is related to reading comprehension for adolescent students (Nagy et al., 2006). Students with lower levels of morphological understanding will be less adept at tapping this knowledge source and using morpheme meanings to aid in defining unknown words, which may leave significant deficits in understanding content area and informational texts. This not only affects comprehension of content text, but also impedes core academic learning and achievement. The impact of such learning and achievement gaps is far reaching and may inhibit future learning opportunities and successful transition to adult life.

Multisyllabic Word Reading

In addition to understanding the role morphology plays in identifying words, knowing syllable types and how to segment words into syllables increases word reading accuracy, which, in turn, is connected to reading comprehension. Although teaching the rules of syllabication to students seems to be an intuitive solution, research demonstrates that this has limited effects on improving word reading accuracy (O'Connor & Goodwin, 2011), and students often do not generalize this knowledge to reading tasks outside of syllabication instruction due to the complexity of the rules (Cunningham, 1998). When students are able to segment words into syllables using features of the word (e.g., vowels, prefixes, suffixes), however, they are able to more accurately blend the segments together to correctly identify the word (Bhattacharya & Ehri, 2004). In addition, reading multisyllabic words by dividing them into familiar word parts provides struggling older readers with a reasonable strategy for managing the reading of unknown, complex words (McCormick, 2007).

Fluency Problems

As noted with problems at the word level, slow, labored reading decreases a student's capacity to engage in the higher-order processes required for comprehending text (LaBerge & Samuels, 1974; Samuels, 1997). Reading fluency refers to the speed and accuracy with which an individual reads. It is typically measured in words read correct per minute, and research has demonstrated a clear connection between fluency and comprehension (Fuchs, Fuchs, Hosp, & Jenkins, 2001). It is important to note that this relationship is much better evidenced for younger readers than older readers. Regardless, it is essential for students to be both accurate and swift at the word reading level for fluency to be evident (Nathan & Stanovich, 1991).

The difficulty associated with increasing their reading rate is one significant issue older struggling readers face. Fluency growth rates decrease as students' grade levels increase, even with intensive intervention (Deno, Fuchs, Marston, & Shin, 2001; Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993). Despite the decreased rate of fluency growth for older readers, studies implementing interventions designed to increase fluency have met some measure of success and increased the fluency scores of their participants (O'Connor & Goodwin, 2011). In addition, research shows gains in comprehension even when fluency growth was minimal (Fuchs, Fuchs, & Kazdan, 1999). Furthermore, there may be a decreased correlation between fluency and comprehension for older readers, which extends the possibility that addressing word level and vocabulary deficits may be more effective for improving the comprehension skills of older struggling readers.

Vocabulary Problems

Word level reading and fluency problems are just two aspects that affect reading comprehension for struggling older readers. Vocabulary knowledge is crucial for students to extract meaning from texts and other materials containing information specific to content area learning. Vocabulary is not merely important to reading comprehension but fundamental (Jitendra, Edwards, Sacks, & Jacobson, 2004). Comprehending text is incomplete without knowing word meanings. Successful

vocabulary acquisition and comprehension of text for older readers is influenced by exposure to content-specific words, short- and long-term memory, and delivery of instruction.

Vocabulary Exposure Exposure to word meanings through either direct or indirect experiences is strongly related to vocabulary knowledge (Rupley, 2005). It is theorized that the more experience students have reading text, the more developed their vocabularies (Stanovich, 1986). Research identified a correlation between vocabulary knowledge and comprehension skill. Students who struggle, however, tend to avoid reading (Baker, Simmons, & Kame'enui, 1998) and, thus, suffer the consequences of limited exposure to content-specific vocabulary, which inhibits further reading skill development, including skills associated with reading comprehension. In addition, struggling readers often select texts composed with lower vocabulary and comprehension demands, which further limits their opportunities to increase vocabulary knowledge and refine word level reading and comprehension skills (Cain & Oakhill, 2011).

It is critically important to note the disparity in vocabulary exposure between typical and struggling readers. Anderson, Wilson, and Fielding (1988) reported that typical readers read about 600,000 words per year, in stark contrast to the approximate 50,000 words per year for struggling readers. Typical readers are not exposed to just merely a greater volume of words, but the depth and quality of the vocabulary is vastly different (Cunningham & Stanovich, 1998). This leads to a domino effect of sorts. Struggling readers read fewer words of lesser complexity but still face the demands required in their content area text. With less developed vocabulary, however, the knowledge struggling readers bring to the task of making meaning from the materials they read reduces their level of understanding and further affects overall academic achievement.

Memory Deficits In addition to lower levels of exposure to essential vocabulary, struggling older readers often deal with deficits in short- and long-term memory (Swanson & Sáez, 2003). A definite relation exists between memory and gaining vocabulary knowledge from print (Cain, Oakhill, & Lemmon, 2004; Daneman & Green, 1986). Maintaining new knowledge of word meanings in short-term memory as vocabulary is introduced is essential for comprehending text as it is read. Successful transfer of word meanings from short- to long-term memory and then eventual retrieval of that knowledge from long-term memory is critical to understanding text that repeatedly uses content-specific vocabulary as well as high-frequency vocabulary found across a variety of written materials. Increasing short- and long-term memory capacity is not a reasonable undertaking for a teacher working with students exhibiting limited vocabulary knowledge and impaired comprehension. Utilizing vocabulary instruction techniques that explicitly teach strategies addressing memory deficits, however, is a practical enhancement to instruction that may have a positive impact on vocabulary learning.

Vocabulary Instruction Variations on mnemonic devices, which provide some measure of scaffolded support for students exhibiting memory deficits, have proven successful for struggling readers during vocabulary instruction (see O'Connor & Goodwin, 2011). Mnemonic devices are memory aids that typically link easily remembered verbal or auditory cues with information tied to specific words and concepts. Several studies that used keywords or word clues demonstrated positive outcomes for students exhibiting difficulty learning and remembering new vocabulary (e.g., Burns, Hodgson, Parker, & Fremont, 2011; Mastropieri, Scruggs, Levin, Gaffney, & McLoone, 1985; Veit, Scruggs, & Mastropieri, 1986). In addition to vocabulary learning, keyword word instruction can significantly affect the comprehension of text for older struggling readers (Burns et al., 2011; Mastropieri, Scruggs & Fulk, 1990).

Background, Text Structure, and Organizational Knowledge Problems

Vocabulary and background knowledge play significant roles in reading comprehension for older readers. In fact, background knowledge contributes more to comprehension than word reading and strategy use (Cromley & Azevedo, 2007). Unfortunately, readers struggling with comprehen-

sion often cannot understand the texts they read due to limited background knowledge (Gersten et al., 2001). Students need a framework within which to add new information and reformat existing knowledge. As the spiral of reading problems decreases the amount of text a student consumes, it is likely that struggling older readers are lacking prior experience with and exposure to the information presented in content area material as well as recreational text. This lack of exposure negatively affects comprehension because students have no foundation on which to build new learning and attach novel concepts to existing schema. This not only inhibits comprehension of reading material, but also affects overall academic achievement within the content areas.

In addition to background knowledge of content presented in text, knowledge of text structure is also a contributor to comprehension. Students with reading disabilities often have limited knowledge of both expository and narrative text structure (Gersten et al., 2001). This leads them to approach a variety of texts without purpose and retrieve information using less systematic organizational techniques (Gersten et al., 2001; Meyer, Brandt, & Bluth, 1980). Understanding the common formats under which texts are designed is an important reading skill because it enables the student to recall and organize information in a way that parallels the delivery of the content. This provides the reader with a template within which to construct an organized summary of the most important details and a framework for understanding. Incomplete understanding of material and misunderstanding the most important facts and details of a text are the result of limited knowledge of text structure.

How struggling students choose to organize the information they retrieve from text further affects comprehension. Arbitrary details often are deemed as some of the most important by older struggling readers because they lack not only knowledge of how the text is constructed, but also have limited skills in discriminating between key points and supporting information. Inappropriately selecting critical information is often characterized by recalling tangentially connected details and an inability to convey the overall message of a reading. In addition, even when taught to use various methods of organizing information from text, struggling readers often do not generalize these skills or strategies across content, text materials, and assessment measures (Kim, Vaughn, Wanzek, & Wei, 2009). Use of these tools may be incorrectly applied to various texts or students are unaware that organizational methods are applicable in multiple situations. Regardless, skill deficits in organizing information lead to decreased levels of understanding and lower levels of achievement.

Strategy Use Problems

Struggling older readers often are inconsistent with their use of a variety of comprehension strategies, as demonstrated by the use of organizational strategies. Gersten et al. (2001) noted that students with reading disabilities may not have a repertoire of strategies to employ in the event of a comprehension breakdown. In addition, they are often unaware of when to use a strategy they previously may have learned. Furthermore, struggling readers may ineffectively implement a given strategy with limited benefit to their comprehension of text. Finally, in some instances, struggling students are oblivious to the fact that they do not have a complete understanding of the content addressed in their reading materials and texts and, therefore, fail to employ a necessary strategy to aid in comprehension. Each of these potential roadblocks associated with strategy use compounds the problems struggling older readers face in making meaning from and connecting learning to the texts they need to comprehend.

Motivation Problems

Reading comprehension achievement is positively affected when, over time, students are actively engaged in text reading and motivated to understand (Guthrie & Wigfield, 2000). Unfortunately, older struggling readers are often less motivated to engage with and understand text. The impact of decreased motivation on comprehension is far reaching. Unmotivated students read less (Baker et al., 1998; Stanovich, 1986), which decreases their exposure to critical vocabulary and varied text

genres and structure, as well as limits the amount of background knowledge they bring to the task of reading new content. Students lacking motivation often exhibit frustration and a potentially paralyzing expectation of failure (Gersten et al., 2001), which affects the way they approach reading activities and instruction tied to reading. This may, in turn, decrease the effectiveness of interventions designed to improve reading skills (Guthrie & Humenick, 2004) because students are not as engaged or easily give up as learning becomes more challenging. Finally, after having struggled with reading skills for an extended number of years, it is difficult to reverse the associated negative effects for older students. Despite the negative effects that lack of motivation has on comprehension for older struggling readers, research has demonstrated success with interventions designed to increase motivation in adolescent readers (see Guthrie & Humenick, 2004; O'Connor & Goodwin, 2011).

SYNTHESIS OF INTERVENTION RESEARCH TARGETING READING PROBLEMS

As indicated, reading comprehension difficulties are one of the most significant problems experienced by adolescents identified as struggling readers, especially those with learning disabilities. This is because reading comprehension underlies performance in the majority of academic content areas, as well as adjustments to most school activities. Several comprehensive descriptive and quantitative reviews of reading comprehension interventions for students with learning disabilities have been published (e.g., Berkeley, Scruggs & Mastropieri, 2010; Flynn et al., 2012; Gertsen et al., 2001; Kamil, 2003; Savage & Pompey, 2008; Scammacca et al., 2007; Wanzek, Wexler, Vaughn, & Ciullo, 2010). For example, Gersten et al. comprehensively reviewed several reading comprehension intervention studies for students with learning disabilities and concluded that systematic strategy instruction improves reading comprehension performance. Specific intervention suggestions were given related to the type of text used (e.g., narrative, expository) as well as some of the instructional issues to be considered in establishing generalization to content beyond where the instruction took place. This chapter complements some of their findings. In contrast to describing the individual interventions within studies, however, we primarily focus on findings from a meta-analysis of the literature.

Meta-analysis is a statistical reviewing technique that provides a quantitative summary of findings across an entire body of research. The results of individual studies are converted to a standardized metric or effect size (ES). The scores are then aggregated across the sample of studies to yield an overall estimate of ES. Particular attention is given to the magnitude of the ES. According to Cohen (1988), .80 is considered a large ES, .50 moderate, and .20 small.

Strategy Instruction Defined

In general, the majority of the literature on reading comprehension argues that students with learning disabilities underutilize access to information and knowledge unless they are explicitly prompted to use certain strategies. Students with learning disabilities, who have reading comprehension difficulties, are primarily seen as inefficient processors of information. Strategy instruction is viewed as providing a means to help students efficiently and accurately process text information. Strategy instruction within this context is broadly defined as a teaching method organized in such a manner as to solve a problem. The teaching method generally includes two or more goal-oriented tactics. A *tactic* reflects a single processing technique (e.g., elaboration) or a means of monitoring information (e.g., reducing information processing demands with prompts or cues). These tactics are usually mediated by the teacher, text, peers, and/or generated by the student. Several excellent examples of strategy models exist in the literature that focus on struggling readers (e.g., Berkeley, Mastropieri, & Scruggs, 2011; Block, Parris, Reed, Whitely, & Cleveland, 2009; Borkowski, Weyhing, & Carr, 1988; Bulgren, Deshler, Schumaker, & Lenz, 2000; Palincsar & Brown, 1984; Spencer & Manis, 2010). Earlier syntheses of the literature also outlined principles related to strategy instruction models (e.g., Levin, 1986; Swanson, 1993).

Determining Effective Instructional Components

The remainder of the chapter reviews some general instructional models, plus instructional components, found in the meta-analysis of intervention studies that positively influence reading comprehension outcomes. As a point of contrast, instructional models and components that improve word level reading are compared. We draw mainly on comprehensive meta-analyses of experimental interventions for adolescent students with learning disabilities (Swanson, 1999b, 2001; Swanson & Deshler, 2003; Swanson & Hoskyn, 1998). These studies using meta-analysis are the only ones to date that focus on outcomes in reading at the instructional component level (Suggate, 2010; see Flynn et al., 2012, for an update).

Uncovering key components of effective instruction was not an easy task because a distinction must be made between "what was taught" and "how it was taught." Our analyses did not focus on what was taught (e.g., content vocabulary words, teaching vowel sounds) but on how information was taught and sustained. Our rationale, quite simply, was that one cannot adequately assess what should be taught unless one can clearly identify how information should be taught, sustained, and retrieved. Testing what should or should not be taught (or, more appropriately, what information should or should not be emphasized) becomes a moot point unless these instructional components are identified and their influence on the effectiveness of reading instruction clearly delineated. Good information processing relies on the interplay between the knowledge base of the student, the nature of the content, and the context that constrains or activates learning (e.g., Pressley, 1991). Even when analyzing direct instruction models with explicit content variations (e.g., Necheochea & Swanson, 2004), how instructional activities (e.g., modeling, explicit practice) were delivered accounted for the majority of differences in the effectiveness of instruction and, therefore, serve as an important focus of analysis for designing effective reading comprehension instruction.

Determining effective instructional components across intervention studies is a difficult task because the instructional components identified in each study would be limited by the way they are described. Although the instructional components evaluated by Swanson and colleagues (Swanson & Deshler, 2003; Swanson & Hoskyn, 1998, 2001; Swanson, Hoskyn, & Lee, 1999) reflected components described from several comprehensive reviews of the instructional literature, the components coded for analysis may not have matched the components emphasized by the primary authors. In addition, descriptions of the same teaching practice may vary considerably by authors of different theoretical orientations, thereby introducing additional complexity in the coding procedure. This issue has been addressed in previous studies (e.g., Swanson, 1999b; Swanson & Hoskyn, 1998, 2001) by using multiple examples for each component category, using several terms that share key concepts, creating hierarchical (categories within categories) and overlapping (allowing various degrees of overlap) categories and coding by representation rather than the absolute quantity of statements within a category (see Swanson, 1999b). Nevertheless, there are studies in the synthesis in which it was difficult to match the authors' general instructional model and/or the label of the instructional components to what actually was reported (see Swanson & Hoskyn, 1998).

Characterizing Instructional Approaches

Despite the difficulties encountered in determining the instructional components characterizing effective reading comprehension programs, we found that higher ESs emerge for a combined strategy instruction and direct instruction approach when compared with the other instructional approaches (e.g., Swanson, 1999b; Swanson & Hoskyn, 1998). Distinctions between strategy instructional approaches and direct instruction are sometimes subtle, creating difficulties in clearly analyzing the two approaches. Lovett et al. (1994), however, provided a clear comparison in their study of both approaches. For example, both strategy intervention models and direct instruction included a graduated sequence of steps with multiple opportunities for overlearning the content

and reading skills. In addition, both instructional models included cumulative review routines, mass practice, and teaching of all component skills to mastery criterion.

Students learned sound units with the strategy model, with additional discussion given to metacognitive issues such as strategy implementation, strategy choice, and self-monitoring. Clear discussions were given to students about: 1) why a strategy facilitates word recognition, 2) how to apply the strategy, and 3) how to check to see if the strategy is working.

The direct instruction condition followed the same procedures as strategy instruction except for two variations: 1) direct instruction focused on subskills (sound units, such as letter sounds, or linguistic units, e.g. *mat-cat-hat*) and 2) discussion of processes and use of general rules was minimized. Thus, focus is what appears to separate the two instructional models. The strategy program focused on processes or global skills for a general approach to reading, whereas a direct instruction model focused on word level reading.

Strategy instructional models and direct instruction treatments may be distinguished by the unit of information (i.e., direct instruction focuses primarily on isolated skills, whereas strategy instruction focuses primarily on rules) and processing perspective (i.e., direct instruction is characterized as a bottom-up processing approach, whereas strategy instruction as a top-down processing approach). Of course, other distinctions are less subtle. For example, strategy instruction programs focus on instructional components that emphasize advanced organizers (providing students with a type of mental scaffolding on which to build new understanding); organization (directing students to stop from time to time to assess their understanding); elaboration (thinking about the material to be learned in a way that connects the material to information or ideas already in their mind); generative learning (making sense of what they are learning by summarizing the information); general study strategies (underlining, notetaking, summarizing, having students generate questions, outlining, and working in pairs to summarize sections of materials); thinking about and controlling one's thinking process (metacognition); and attributions (evaluating the effectiveness of a strategy). In contrast, direct instruction emphasizes fast-paced, well-sequenced, and highly focused lessons. The lessons usually occur in small groups of students who are given several opportunities to respond and receive feedback about accuracy and responses. There is overlap in the two approaches. This is important because it may account for some confusion in differentiating between the two models. Strategy instruction and direct instruction models overlap in at least two ways. First, both models (in one form or another) assume that effective methods of instruction include 1) a daily review, 2) a statement of an instructional objective, 3) teacher presentation of new material, 4) guided practice, 5) independent practice, and 6) a formative evaluation. Second, both strategy instruction and direct instruction follow a sequence of events, such as the following:

1. State the learning objectives and orient the students to the content they will be learning and the performance expectations.
2. Review the skills necessary to understand the concept.
3. Present the information, give examples, and demonstrate the concepts/materials.
4. Pose questions (probes) to students, assess their level of understanding, and correct misconceptions.
5. Provide group instruction and independent practice. Give students an opportunity to demonstrate new skills and learn the new information on their own.
6. Assess performance and provide feedback. Review the independent work and give a quiz. Give feedback for correct answers and reteach skills if answers are incorrect.
7. Provide distributed practice and review.

We consider this overlap as reflecting a "common instruction core." This was important in our earlier meta-analysis (Swanson, 1999b) because it allowed us to check on the unique contribution

of specific instructional components to enhance performance outcomes after this common instruction core has been considered.

Three Important Findings

The following important findings are based on the previous discussion. First, the majority of studies in the domain of reading comprehension that used experimental measures met Cohen's (1988) criterion of .80 as a substantial finding. The magnitudes of ESs in reading comprehension were significantly higher on experimental (researcher-developed) measures (ES = .81) when compared with norm-referenced measures (ES = .45). Although the magnitude of ESs related to word level reading were smaller in magnitude, they were more stable across experimental and standardized measures (ES = .53 versus .62). More important, we found that a combined strategy instruction and direct instruction model was the most effective procedure for remediating reading comprehension deficits. The combined model yielded high ES instructional effects (ES = 1.15) that exceeded Cohen's .80 criteria for a substantive finding in the domain of reading comprehension. The model included small-group instruction and emphasized attributions and teacher modeling of processing steps to perform a task. The instructional components that the combined model shared with a direct instructional model were activities related to explicit practice, sequencing, segmentation of information, and one-to-one instruction.

Second, only a few instructional components uniquely increased the intervention effectiveness, regardless of the instruction model (e.g., strategy, direct, a combination). The key instructional components (as stated in the treatment conditions) for reading comprehension that contributed unique differences to the effectiveness of instruction were as follows:

- *Directed response/questioning:* Instruction included dialectic or Socratic teaching, the teacher directing students to ask questions, and the teacher and student or students engaging in reciprocal dialogue.
- *Control difficulty or processing demands of task:* Instruction included short activities, level of difficulty controlled, the teacher providing necessary assistance, the teacher providing simplified demonstration, tasks sequenced from easy to difficult, and/or task analysis.
- *Elaboration:* Instruction included additional information or explanation about concepts, procedures, or steps and/or redundant text or repetition within text.
- *Modeling by the teacher of steps:* Instruction included the teacher demonstrating processes and/or steps the students are to follow to solve the problem.
- *Small-group instruction:* Instruction was provided in a small group and/or verbal interaction occurring in a small group with students and/or the teacher.
- *Strategy cues:* Instruction included reminders to use strategies or multisteps, the use of think-aloud models, and/or the teacher presenting the benefits of strategy use or procedures.

The important instructional components for word level reading that emerged from our analyses were as follows:

- *Sequencing:* Instruction included breaking down the task, fading of prompts or cues, sequencing short activities, and/or using step-by-step prompts.
- *Segmentation:* Instruction included breaking down the targeted skill into smaller units, breaking into component parts, and segmenting and/or synthesizing components parts.
- *Advanced organizers:* Instruction included directing students to look over material prior to instruction, directing students to focus on particular information, providing prior information about task, and/or the teacher stating objectives of instruction prior to commencing.

The importance of these findings is that only a few components from a broad array of instructional activities enhance treatment outcomes.

Finally, only two components contributed to reading comprehension beyond the common instructional core. In our analyses, all those components related to the common core were entered into our regression model. We then determined if any additional instructional component added significantly to differences in the effectiveness of the model beyond the instructional core. We found no component entered significantly contributed to the instructional core in the area of word level reading. That was not the case for reading comprehension, however. Strategy cuing and small-group interactive instruction contributed significantly to differences to the effects on reading comprehension beyond the instructional core model.

CONCLUSION

We have described the factors contributing to poor comprehension for older readers and briefly highlighted some important findings across studies that have included reading comprehension as an outcome measure. We conclude that there are instructional models that can improve comprehension skills, despite the devastating effect comprehension difficulties have on adolescent achievement. Specifically, combined strategy and direct instruction models for adolescents who struggle in reading do make a significant contribution to treatment outcomes in reading comprehension. In contrast, direct instruction is the preferred means of enhancing word level reading. We also find, however, that some instructional components are more important than others in making reading comprehension instructional practices more effective, and those components differ from those that improve word level reading skills.

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