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Reading Comprehension in Adolescents with LD: What We Know; What We Need to Learn

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The changing job market requires a sophisticated array of literacy skills that adolescents with learning disabilities reading below grade level have not yet acquired. This summary of the research on reading comprehension highlights emerging findings and related instructional conditions necessary to achieve optimal student outcomes with limited instructional time. Limitations in the existing evidence base are addressed via four factors for future research and development agendas: (a) use theory to inform research and practice, (b) study the role that dosage plays as an independent variable, (c) study tiered models of instruction that are applicable for use in middle and high school settings, and (d) study factors that can enhance scaling of reading comprehension interventions.

Job markets throughout the world are undergoing dramatic changes (National Academies, 2006). The growing presence of computerization in all sectors of the economy is impacting the types of positions available and the skill sets required of workers to successfully compete (Partnership for 21st Century Skills, 2004). Specifically, the share of menial jobs has increased modestly, whereas the largest job growth has been in occupations requiring significant education. Thus, it is estimated that between 2000 and 2010 more than two-thirds of all jobs will require some postsecondary education. The jobs requiring the most education and offering the highest pay are the fastest growing (Carnevale & Desrochers, 2003).

In a recent study of shifting employment demographics, Levy and Murnane (2004) concluded that the workers who will be most successful are those who can engage in "expert thinking" (i.e., identifying and solving uncharted problems for which there are no rule-based solutions) and "complex communications" (i.e., interacting with texts and others to acquire or interpret information, to explain it, or to persuade others of its implications for action). To perform effectively in these two domains, workers must demonstrate a command of critical information in an area *along with* an understanding of how the information is linked together and how things work.

Clearly, to successfully navigate this new postsecondary employment scene, students must acquire a sophisticated array of literacy skills. Such skill acquisition has proven particularly challenging for a considerable number of students diagnosed with learning disabilities (LD) because of their difficulties in learning to read. In reading, the ultimate measure of proficiency is being able to comprehend a broad array of text types at a high level. In the last two decades, significant investments from federal agencies (especially the National Institute for Child Health and Human Development [NICHD]) have been made to understand the reading characteristics and instructional practices that yield positive outcomes in younger students (e.g., McCardle & Chhabra, 2004). Most of the attention has been in building phonemic awareness and decoding skills.

Similar research investments have not been made with adolescents in secondary schools (Deshler & Hock, 2007). This is reflected in the most recent National Assessment of Educational Progress data, which underscored the magnitude of the problem presented by older students. Specifically, 26 percent of eighth-grade students cannot read material essential for daily living, and overall, 68 percent of secondary students score below the proficient level (Perie, Grigg, & Donahue, 2005).

While significantly less research has been done with older than with younger students with LD, there is a growing body of research on adolescents, including six comprehensive literature reviews, that can provide an emerging foundation from which to make informed programming and policy decisions for these students (Edmonds et al., in press; Gersten, Fuchs, Williams, & Baker, 2001; Mastropieri, Scruggs, & Graetz, 2003; Swanson, 1999; Swanson & Hoskyn, 2001; Vaughn, Gersten, & Chard, 2000). Even though these reviews of the literature on reading comprehension instruction related to adolescents with LD and students at risk for failure represent significant contributions to the professional literature, they are not sufficient to define what is needed to achieve the kinds of gains to enable struggling adolescents to compete in the new economic and corresponding academic realities described above. That is, knowing that an intervention has large effect sizes is no assurance that the overall progress

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made by struggling adolescents will be sufficient to close the large performance gap that they must overcome to compete with their typically achieving peers.

When designing and subsequently judging the overall effectiveness of literacy programs for adolescent learners, a broad array of factors must be considered that are unique to this group of students. Because of the limited amount of instructional time remaining before an adolescent leaves school (through either graduation or dropping out), it is not only important to determine that an intervention will result in a sufficiently large gain, but also that the gain can be achieved in a relatively short period of time. Therefore, it is important to have a good understanding of the exact instructional conditions and levels of intensity that must be in place to achieve optimal outcomes.

In short, to be of greatest assistance to practitioners, researchers must carefully describe the types of learners for whom an intervention is designed, the context within which it should be taught, the content of the intervention, the pedagogy used to teach it, the fidelity required to achieve the desired outcomes, and the intensity required (i.e., the amount of instruction provided at any one time, the intervals at which it should be provided, and the duration of the instruction). Such specificity is needed to design sound instruction and accompanying staff development that result in optimal student outcomes.

The purpose of this article is twofold: first, to provide a brief summary of six literature reviews and research syntheses on reading comprehension *and* their general findings. We will then explicate four factors that should be included as part of future research and development agendas as they address limitations in the existing research on reading comprehension instruction.

SUMMARY OF KEY FINDINGS IN READING COMPREHENSION RESEARCH

During the last decade a converging, yet multifaceted, evidence base has emerged regarding adolescent reading comprehension instruction (see Table 1). Three types of reviews have been included in the present summary: (a) literature reviews, (b) research syntheses, and (c) meta-analyses.

Gersten and colleagues (2001) conducted a comprehensive review of research prior to 1999 on techniques for improving comprehension of narrative and expository texts for students with LD. Using a different approach, both Vaughn et al. (2000) and Mastropieri et al. (2003) developed research syntheses of interventions to improve outcomes in reading for students with LD based on an analysis of several existing literature reviews. Whereas studies of both adolescent and nonadolescent samples were included in the Gersten et al. and the Vaughn et al. reviews, Mastropieri et al. specifically focused on secondary students and reading comprehension. Finally, Swanson et al. (Swanson, 1999; Swanson & Hoskyn, 2001) and Edmonds et al. (in press) calculated effect sizes across the intervention studies included in their meta-analyses. Collectively, these meta-analyses surface the components of effective reading comprehension pedagogy by quantitatively comparing research findings across studies.

Reviews selected for the present summary were chosen because they represent peer-reviewed examinations of literature on reading comprehension in the last decade involving individuals with LD. This section provides an analysis of key findings across these studies, including statements about *what to teach* and *how to teach* reading comprehension to adolescents.

General Findings

Six findings related to reading comprehension strategy instruction were consistently supported across the reviews:

1. Reading comprehension for both students with LD and those at risk for failure was improved with targeted instruction of what good readers do. Specifically, comprehension improved when readers learned to identify narrative and expository text structures, discover word meaning, tap prior knowledge, and use cognitive strategies. Results demonstrated moderate to large effect sizes.
2. The content of reading comprehension instruction focused on teaching students with LD cognitive strategies (e.g., self-monitoring and self-questioning), narrative and expository text structures, cooperative learning to increase task engagement, and blended components of each of these elements to improve reading comprehension.

TABLE 1
Literature Reviews and Meta-Analyses Included in the Research Summary

Edmonds, M., Vaughn, S., Hjelm, J., Reutebuch, C., Cable, A., Tackett, K., et al. (in press). A synthesis of reading interventions and effects on reading outcomes for older struggling readers. *Review of Educational Research.*

Gersten, R., Fuchs, L., Williams, J., & Baker, S. (2001). Teaching reading comprehension strategies to students with learning disabilities: A review of research. *Review of Educational Research, 71,* 279–320.

Mastropieri, M., Scruggs, T., & Graetz, J. (2003). Reading comprehension instruction for secondary students: Challenges for struggling students and teachers. *Learning Disability Quarterly, 26,* 103–116.

Swanson, H. L. (1999). Reading research for students with learning disabilities: A meta-analysis of intervention outcomes. *Journal of Learning Disabilities, 32,* 504–532.

Swanson, H. L., & Hoskyn, M. (2001). Instructing adolescents with learning disabilities: A component and composite analysis. *Learning Disabilities Research & Practice, 16,* 109–119.

Vaughn, S., Gersten, R., & Chard, D. (2000). The underlying message in learning disabilities intervention research: Findings from research syntheses. *Exceptional Children, 67,* 99–114.

3. Cognitive strategies that tended to be remembered best and used most in postinstructional situations included self-monitoring, summarizing, and story grammar self-questioning.
4. Reading comprehension improvement for students with LD was demonstrated for both elementary and secondary learners.
5. Explicit instruction improved the reading comprehension of students with LD, students at risk for failure, and typically achieving students.
6. Strategy instruction that is overt and explicit provides the most accurate prediction of magnitude of treatment outcomes.

These findings indicate the benefit of instruction across ability and grade levels in the components of reading comprehension. Moreover, these findings offer preliminary indication of which practices, when learned to a mastery level of acquisition, will be maintained for fluent long-term application. To further understand these general findings, we will examine the findings of the various reviews for what and how we should teach components of reading comprehension.

Instructional Emphasis

Recently, several reading scholars have recommended components of a framework for reading comprehension instruction that includes: (a) knowledge of text structures (both narrative and expository), (b) vocabulary/depth of word meaning, (c) domain/prior knowledge, (d) cognitive strategies, and (e) increased motivation/engagement (e.g., Biancarosa & Snow, 2004; Gersten et al., 2001; Torgesen et al., 2007). Within the scope of this summary are specific empirical supports for many of the aspects of such a comprehension instruction framework.

Knowledge of discourse structures (text structures) within each discipline provides adolescents with an understanding of how to view the language features and conventions of specific content areas (Heller & Greenleaf, 2007). To date, the most commonly researched text structure involves teaching the elements of story grammar found in many narrative texts. Narrative text structure interventions have demonstrated large effect sizes for students with LD (Edmonds et al., in press; Gersten et al., 2001).

A second text structure, and one more commonly encountered by adolescents, is expository texts. Unlike narrative texts, which often require single-strategy instruction in story grammar elements to improve reading comprehension, expository texts require multiple-strategy instruction to produce significant results, including improved transfer effects to novel texts (Gersten et al., 2001). Frequency of research on the text structures has been variable with secondary (i.e., sixth grade or above) students. Gersten et al. (2001) included 7 studies of narrative text compared to 17 studies using expository texts prior to 1999. The more recent review by Edmonds et al. (in press) reports 12 studies, including narrative text and 7 studies including expository text between 1994 and 2004. Collectively, research on text structure has received considerable attention and provides justification for claims that such instruction positively impacts student comprehension.

Vocabulary instruction was not present in any of the reviews examined, but should not be dismissed as a critical component of improving reading comprehension. For example, Jitendra, Edwards, Sacks, and Jacobsen (2004) reviewed the research on vocabulary instruction across K-12 students with LD from 1978 to 2002. Jitendra et al. reported generally enhanced vocabulary development for students with LD when mnemonic, cognitive strategy, direct instruction, activity-based, constant time delay, and computer-assisted methods of instruction were used. Specifically, the effectiveness of vocabulary instruction yielded effect sizes of 1.48 for junior high students ($SD = .87$) and 1.79 for high school students ($SD = .37$; Jitendra et al., 2004). The authors note that, while this research is promising, the relationship between vocabulary instruction and comprehension outcomes requires further study.

Domain or prior knowledge instruction has been found to activate student background knowledge prior to and during reading. Activation of prior knowledge helps students to integrate new information into their existing understanding of content. Intervention research has used self-questioning strategies to access relevant background knowledge prior to reading (Vaughn et al., 2000).

Cognitive strategies include how one thinks and acts when planning, executing, and evaluating performance on a task and its outcomes (Deshler & Schumaker, 2006). The largest effect sizes across reviews were found for interventions teaching cognitive strategies (e.g., self-questioning, summarizing, or self-monitoring; Vaughn et al., 2000). Specifically, teaching students to ask and answer questions related to text while reading has a significant impact on the comprehension for students who have not previously used reading strategies (Mastropieri et al., 2003; Vaughn et al., 2000). The body of work surrounding cognitive strategy instruction is substantial and has led to several meta-analyses discussed later in the article (e.g., Swanson, 1999).

Increased motivation/engagement was addressed in two separate analyses (Gersten et al., 2001; Vaughn et al., 2000), which mentioned the importance of task persistence in improving reading comprehension. One belief is that student engagement increases when students take an active role in learning through peer mediation. Both analyses cited the work of Fuchs, Fuchs, Mathes, and Simmons (1997), in which students with LD (and their low- and average-achieving peers) in a peer-assisted learning strategies condition demonstrated greater reading progress on several measures (including reading comprehension) than a control group during 15 weeks of instruction. Because only one study was reported, it is impossible to comment on general effect size beyond the promise of individual study findings.

Finally, a large number of studies combined the teaching of text structure and self-questioning by providing students with questions to structure their reading (Vaughn et al., 2000). In essence, this research showed that the combined effect of questioning and understanding the components of text structure resulted in significant comprehension improvement when reading narrative texts. However, the variance accounted for by individual components (i.e., questioning and text structure) is difficult to determine.

The suggested framework highlights important instructional content that must be taught to improve reading

comprehension in adolescents. Some of these components have been studied more than others; however, some support exists for teaching each of these components. To date, no definitive information is available on such issues as (a) in what sequence should these components be taught? (b) which component(s) is more heavily weighted? and (c) how should these components be configured given that most adolescents who struggle to read have missed, or have not benefited from, much of the instruction provided on these elements in elementary school?

Instructional Pedagogy

Each literature review highlighted components of instruction that appear to be effective across reading comprehension interventions. However, the most complete analysis of instructional components that improve outcomes for students with LD are found in a series of meta-analyses conducted by Lee Swanson and his colleagues (e.g., Swanson, 1999; Swanson & Hoskyn, 2001; Swanson, Hoskyn, & Lee, 1999). A common core of instructional practices has emerged from this work as well as two priority pedagogical components for supporting adolescent reading described below.

Consistent with the work of Rosenshine (1995), Swanson (1999) identified six core components present in the teaching methodologies used in both strategy instruction and direct instruction: (a) daily reviews of previously covered material, (b) teacher statement of lesson objectives for instruction, (c) teacher presentation of new material, (d) teacher-guided student practice, (e) independent student practice, and (f) formative evaluation of student progress (Swanson, 1999).

Because secondary teachers have such limited time to teach struggling adolescent learners, they must use the most robust pedagogical components. Swanson and colleagues identified priority instructional components that contribute significant variance beyond the core instructional model toward improving reading comprehension. The two priority components found in reading instruction were (a) small-group instruction and (b) strategy cueing, or prompting strategy use by the teacher (Swanson, 1999).

In a separate meta-analysis of instructional components related to strategy instruction for adolescent learners, Swanson and Hoskyn (2001) identified two priority instructional components, advance organizers and explicit practice, which contributed significant variance toward treatment outcomes. The advance organizer component includes (a) guiding students to look over material before instruction, (b) providing direction to focus on particular information, (c) providing prior information about a task to be completed, and (d) stating the objectives of instruction. Explicit practice is composed of (a) distributed review and practice, (b) repeated practice, (c) sequenced reviews, (d) daily feedback, and (e) weekly reviews. While these were separate analyses and cannot be simply added together, it is helpful for practitioners to know that such priority and core components can coexist as a part of a teacher's explicit teaching routines for improving outcomes for academically diverse students.

Mastropieri et al. (2003) suggest the following instructional framework, which encapsulates many of the core components related to strategy instruction discussed above: (a) use clear objectives, (b) follow a specific sequence for teaching, (c) inform students of the importance of strategy use, (d) monitor student performance, (e) encourage questions that require students to think about strategies and text, (f) encourage appropriate attributions, and (g) teach for generalized use of the strategy. Further, the specific suggested sequence for teaching is as follows: (a) state the purpose of the lesson, (b) provide instruction, (c) model using a think-aloud, (d) provide guided practice, (e) provide corrective feedback, (f) provide independent practice, and (g) provide generalization practice (Mastropieri et al., 2003).

Finally, several research studies have demonstrated the benefits of cooperative learning, including groupings of students with and without disabilities, as well as disability-only groupings, for mediating student learning (Gersten et al., 2001; Mastropieri et al., 2003). Cooperative learning, typically referring to dyads (though occasionally larger groupings of three or four students) makes use of peer coaching, modeling, and problem solving to scaffold learning of targeted strategies.

Qualifiers and Cautions

The findings discussed above enhance our understanding of how to most effectively improve comprehension outcomes for students with LD. However, these summary statements must be interpreted with caution and qualification. First, the amount of time in instruction was noticeably absent in the study descriptions provided in the reviews. Specifically, there were conflicting results around the necessary amount of time in instruction across the reviews. In general, as instructional time increases, maintenance scores tend to go up; however, there appears to be a threshold point at which continued instruction no longer explains student gains. In fact, two analyses found that time in instruction was not a contributing factor for student outcomes (Mastropieri et al., 2003; Swanson, 1999). This may be explained by the considerable variance in instructional explicitness during prolonged periods of instruction or by student mastery of strategies prior to discontinuation of instruction (e.g., unnecessary prolonged practice).

Second, transfer of skills to novel texts has proven problematic, especially for students with LD (Vaughn et al., 2000). Limited evidence indicated that transfer of reading strategies when focusing on novel narrative texts is more successful than similar transfer of strategies when reading novel expository texts (Gersten et al., 2001).

Third, care must be exercised in separating out the effects of teaching students to use a specific reading strategy (i.e., the content of the instruction) from the effects of the actual instructional methodology on student outcomes (e.g., Ellis, Deshler, Lenz, Schumaker, & Clark, 1991). Fourth, strong maintenance and transfer (i.e., generalization) effects are generally observed when the nature of the task and the instructional conditions are similar to those used during the acquisition phase of the instructional process. Specifically, gains have been demonstrated on measures that are directly related to specific interventions; however, improved

performance has not always been observed on more general measures (e.g., a global reading comprehension tests; Gersten et al., 2001; Edmonds et al., in press).

Fifth, because research studies have not focused exclusively on inclusive educational settings, it is unclear how palatable the previously mentioned practices are to general educators. This is an important qualification as general education teachers' attitudes generally impact the adoption and implementation (fidelity) of evidence-based teaching practices, including cognitive strategies (Mastropieri et al., 2003). Sixth, comprehension outcomes were higher when researchers, rather than classroom teachers, implemented interventions (Edmonds et al., in press). Finally, measurement of both independent and dependent variables is a significant problem for reading comprehension studies. In particular, experimenter-developed measures demonstrate higher effect sizes than standardized measures of reading comprehension (Edmonds et al., in press; Swanson, 1999).

In summary, the current research base, as reflected in the literature reviews presented here, has furthered the field's understanding of instructional practices that improve reading comprehension for academically diverse adolescent learners, including students with LD. However, it is also instructive to understand what issues have *not* been adequately addressed and what steps should be taken to further advance our understanding of how to improve reading comprehension outcomes in shorter periods of time (given the limited time available to work with adolescents before they exit school) and across settings (given the importance of engaging multiple teachers in the instructional process in light of the magnitude and complexity of reading problems manifested by adolescents).

We propose four components to be included in future research and development agendas aimed at improving reading comprehension instruction for adolescents: (a) use theory to inform research and instruction, (b) study the role of dosage as an independent variable, (c) study tiered models of instruction that are applicable for use in middle and high school settings, and (d) study factors that can enhance broad-scale adoption of reading comprehension interventions. These four factors do not represent an exhaustive list but may result in important theoretical, conceptual, and empirical advancements.

FOUR COMPONENTS OF FUTURE RESEARCH

Use Theory to Inform Research and Practice

For the most part, neither practice nor the research conducted with struggling adolescent readers directly mentions a theoretical foundation of reading comprehension. For example, the authors of the reviews and meta-analyses summarized in the first part of this article made no mention of the theoretical underpinnings of the research that they reviewed, though such research likely drew from some theoretical tradition (e.g., behavioral or cognitive learning theories). Similarly, how research agendas were informed by reading theory is seldom included. Such omissions limit the impact of research findings to inform existing theories of reading and/or learning in adolescents. Thus, while reading theories may have been considered by both researchers and practitioners to guide their work, this was not made clear to the reader. Consequently, theories of reading comprehension, specifically focusing on adolescent learners, appear to have played a minimal role in informing either practice or research with struggling adolescent readers.

We believe that accelerated progress in the development and validation of powerful interventions may result if researchers and practitioners grounded their work in theory. Deshler and Hock (2007) argued that two reading theories have potential utility in guiding intervention research on struggling adolescent learners: the simple view of reading described by Hoover and Gough (e.g., Gough & Tunmer, 1986; Hoover & Gough, 1990) and the construction integration theory outlined by Kintsch (e.g., 1994).

A Theory-Based Adolescent Reading Model

The reading interventions developed as part of the strategic instruction model by researchers at the University of Kansas Center for Research on Learning target the key reading components specified in the theories discussed above. The adolescent reading model developed by Hock and Deshler depicted in Figure 1 provides the conceptual framework that may serve to guide the design and implementation of reading interventions. This model recognizes and builds upon, in part, the significant body of reading research conducted on younger populations under the auspices of NICHD (e.g., McCardle & Chhabara, 2004).

As a result of this work, a growing convergence of research findings has been outlined with regard to how to improve reading instruction for younger children, including those with disabilities (NICHD, 2000; Swanson & Hoskyn, 1998; Vaughn et al., 2000). The adolescent reading model is a framework for testing the generalizability of the findings for younger readers with an adolescent population and seeks to determine the unique power of specific components of reading for older learners.

An initial assumption underlying the model is that, although most adolescents have acquired the foundational word recognition and decoding skills associated with early reading instruction depicted in the left portion of the figure (i.e., phonemic awareness, decoding, sight word reading, and fluency) in materials written at the third-grade level, some struggling readers still need intervention in this area. Thus, instruction for adolescents should include a bridging strategy (Brasseur, Hock, & Deshler, 2005) that provides explicit instruction and scaffolded support to help struggling readers with word-level interventions that improve word recognition and fluency. At the same time, and in conjunction with word-level interventions, explicit instruction in language comprehension and reasoning (background knowledge, syntax, vocabulary) should be provided. This is depicted in the middle portion of the figure.

The role of self-regulating or executive processes, considered a key component of language comprehension in Kintsch's situational learning model, is reflected in the third

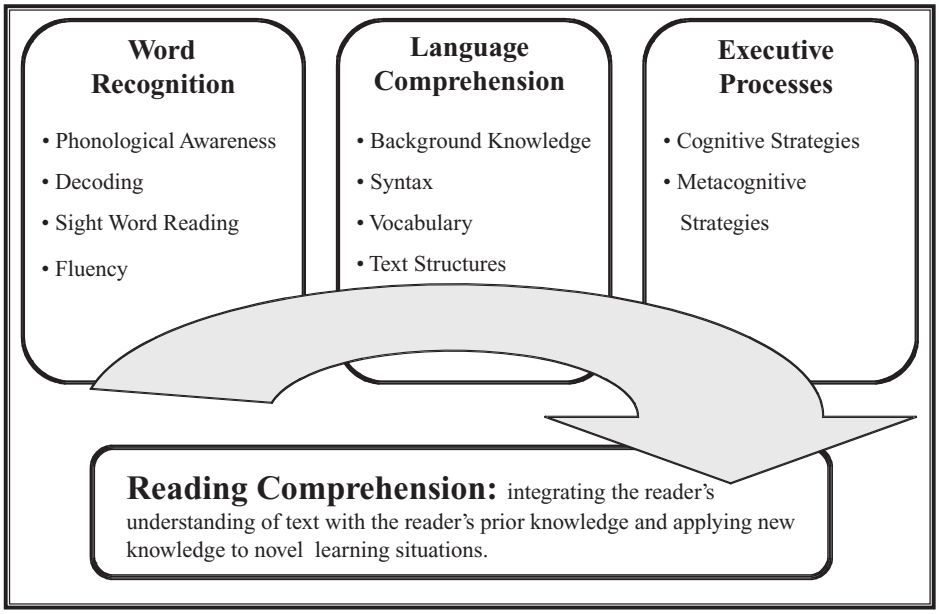

FIGURE 1 Adolescent reading theoretical model.

component in our reading theory (see the right side of the figure). To integrate cognitive and meta-cognitive strategies, the reader must take strategic action and put forth effort to make meaning of the integration of text material and prior knowledge. Thus, reading is an active process requiring word-level, language comprehension and the conscious use of executive processes associated with reading for meaning and learning. The intended outcome of this balanced, interactive model is a significant increase in the reader's ability to integrate his or her understanding of text with prior knowledge and apply that new knowledge to novel learning situations (see the bottom portion of the figure).

Study the Role of Dosage as an Independent Variable

Dosage is defined as the amount of something to be administered at one time and the intervals at which it should be administered for a specified period of time. Focus on instructional intensity is not new to education research. As early as 1980, Meyen and Lehr (1980) challenged the research community to measure the broad array of factors required for effectively educating students with disabilities. One of those factors, they argued, was instructional intensity.

A great deal of attention has been given to the instructional construct of fidelity (e.g., Fuchs, Fuchs, & Compton, 2004; Gersten, 2005; Gresham, MacMillan, Beebe-Frankenberger, & Bocian, 2000) to determine if an intervention is taught with integrity. Dosage, in many respects, however, has been ignored or at least not carefully measured in a majority of reading comprehension studies. This is evidenced in the literature reviews summarized above by the considerable variability in the application of reading comprehension intervention components for students with LD (see Vaughn et al., 2000). Consequently, an intervention may be delivered correctly every time that it is taught (i.e., the intervention has high rates of fidelity), but if it is only taught 2 days per week when it should be taught every day of the week, outcomes may be compromised.

Instructional dosage is composed of at least four interconnected variables: (a) group size, (b) instructional period, (c) frequency, and (d) duration. Group size is concerned with the student-to-teacher ratio during instruction and the corresponding levels of explicit instruction that can occur. Increased group size (i.e., above four students per teacher) can lead to diminished student outcomes due to fewer opportunities to receive corrective feedback (e.g., Torgesen et al., 2001).

The instructional period, or length of each session, can range from a few minutes to 120 minutes per meeting. In general, student attention and cognitive load may wane under prolonged periods of intervention exposure, whereas periods of instruction that are too brief may not provide time for sufficient strategy acquisition or independent practice.

The third variable, frequency, refers to the number of times students are instructed per week. Akin to the challenges of instructional period, instruction that occurs too often or not enough will impact outcomes.

Duration, the final variable, is concerned with two factors: (a) what is the optimal total number of sessions? and (b) what is the optimal length of each session? Each of these factors can support and/or inform decisions about the others, and a failure to take any of these factors into account may adversely affect an intervention.

The instructional dosage framework is relevant to improving best practice in three ways. First, to draw practitioners' attention to those instructional components under their control

that have an impact on educational outcomes. Second, to create a structure for the theoretical relationship between group size, instructional period, frequency, and duration that will broaden our understanding about what interventions work with what students under what conditions. Finally, this framework may have utility for researchers in their design of intervention studies and for funding agencies and policy makers in specifying criteria that programs must meet to qualify for financial support.

Study Tiered Models of Instruction Applicable for Use in Secondary Settings

Another factor that should be included in future research and development agendas is the application that tiered models of instruction have for middle and high school settings. Multitiered models of service delivery dominate the early literacy intervention research, and recent educational policy has led to a provision in IDEA 2004 for schools to use such methods to make LD identification decisions (Graner, Faggella-Luby, & Fritschmann, 2005). As a result, a significant number of schools have started to use a tiered model of instruction called responsiveness to intervention (RTI).

RTI embodies the following features: (a) multiple tiers of increasingly intense evidence-based interventions, (b) universal screening, (c) progress monitoring, and (d) fidelity of implementation (see Graner et al., 2005). To date, comparable models of instruction have not been articulated for middle and high school settings. As a result, secondary school reading instruction continues to lack a continuum of service delivery, in which reading instruction is integrated schoolwide rather than provided in isolated silos, in which instructional programs and emphases are not related.

A framework for conceptualizing literacy instruction in secondary schools, the content literacy continuum (CLC) (Lenz, Ehren, & Deshler, 2005), describes a service delivery model in which students receive more intensive, systematic, explicit instruction of content, strategies, and skills. Moreover, the model illustrates that there are unique but very important roles for each member of a secondary staff relative to literacy instruction. Figure 2 provides a summary of the five levels of this continuum.

Level One ensures mastery of critical content in the core curriculum, regardless of individual student literacy levels. This can occur when teachers link students' prior knowledge to new content or prompt the use of learning strategies to acquire new knowledge. Level Two instruction is characterized by teachers directly teaching and embedding learning strategy instruction throughout their curriculum. For example, a teacher may start the year by teaching students how to use a summarization strategy that will be cued throughout the year. Level Three provides additional, and more intense, instruction in specific learning strategies. Such instruction may take the form of additional time for strategy practice with ability or grade-level materials, reviewing the steps of a cognitive strategy or providing more explicit feedback. In Level Four, teams develop intensive and coordinated literacy-based instruction for students with severe deficits. For example, students may require additional practice or instruction in decoding skills. Level Five, the final level of the CLC, uses therapeutic interventions to support learners with significant language deficits to learn the foundations of language necessary to learn core content and learning strategies. Finally, strategic tutoring takes advantage of time outside the school schedule to extend instructional time for those students who require additional instruction.

Level 1: **Enhance content instruction** (mastery of critical content for ***all*** regardless of literacy levels)

Level 2: **Embedded strategy instruction** (routinely weave strategies within *and* across classes using large-group instructional methods)

Level 3: **Intensive strategy instruction** (mastery of specific strategies using intensive-explicit instructional sequences)

Level 4: **Intensive basic skill instruction** (mastery of entry level literacy skills at the fourth-grade level)

Level 5: **Therapeutic intervention** (mastery of language underpinnings of curriculum content and learning strategies)

Tutoring: **Strategic Tutoring** (extending instructional time through before- or after- school tutoring)

FIGURE 2 A continuum of literacy instruction.

Generally, different teachers assume more responsibility for instruction at various levels along the continuum. For example, subject-matter teachers generally play a greater instructional role in the first two levels (focusing on the acquisition of critical knowledge, vocabulary, text structures, and strategies), whereas special educators, remedial specialists, and speech–language therapists tend to assume more of the instructional load in Levels Three through Five (focusing on alphabetics, word recognition, sight vocabulary, fluency, and strategies). However, the CLC only becomes a powerful instructional organizing mechanism for literacy instruction when there is deliberate coordination by teachers across the various levels on the continuum. This is especially critical for effective learning strategy instruction. That is, if the specific strategies taught to students in Level Three are not prompted and used when students are in their subject-matter classes, the probability of these students changing as learners is greatly reduced. In other words, the overriding goal of the CLC is to create an instructional synergy across the levels within the continuum in which *all* teachers recognize that they have a responsibility and important role to play in enhancing the literacy skills of students.

The CLC is relevant to improving best practice in three ways. First, it provides a model for service delivery of increasingly intense schoolwide instructional supports that meet the diverse literacy needs of adolescent students. Second, the model counters the fragmented nature of the learning experience by creating a continuum of service delivery in which all educators have clearly defined and coordinated roles. Finally, as opposed to other paradigms, the CLC deliberately considers issues of instructional dosage or intensity on an ongoing basis in making decisions about and teaching students.

Study Factors That Can Enhance Broad-Scale Adoption of Reading Comprehension Interventions

Given the extensive nature of the adolescent literacy problems in this country (e.g., Kamil, 2003), it is important for curriculum developers and researchers to carefully consider issues surrounding the broad-scale adoption, diffusion, and implementation of the curricula and/or instructional procedures during the development phase. Clear specification of the defining features of interventions that will lead to the highest likelihood of an intervention being embraced and integrated within ongoing practice should be understood and addressed during the design and development phases of the new intervention. Waiting until an intervention is developed to begin considering issues of scalability may be too late (Knight, 2007). The most enduring innovations are those that are *both* powerful and easy to use (Csikszentmihalyi, 1994). Hence, new curricular materials or instructional procedures should be developed with the goal of meeting both of these criteria.

Generally, however, educational researchers tend to focus on designing interventions that are powerful (i.e., that have large effect sizes). Only secondarily do they consider issues surrounding the ease-of-use factor. A failure to do so often leads to powerful interventions being cast aside for less powerful, but more user-friendly ones.

If investments in educational research for struggling adolescent readers are to yield better returns, as measured by broad-scale adoptions and scaled practices, curriculum designers and researchers should ask themselves the following questions about their interventions.

1. To what degree is the intervention considered reasonable, appropriate, and unobtrusive to teachers? (general acceptability)
2. To what degree do teachers have the necessary background knowledge and skills needed to use the intervention? (understanding)
3. To what degree do teachers believe it is practical or reasonable to use the intervention? (feasibility)
4. To what degree do teachers believe that the intervention can be implemented as prescribed? (integrity)
5. To what degree do teachers feel positively about implementing the intervention? (personal enthusiasm)
6. To what degree are the necessary instructional conditions and supports in place (administrative, school culture, etc.) that enhance the chances of success in implementation? (supports)

Even more foundational than the issues embodied within these questions is the fact that teachers need time to consider what is involved in adopting the new innovation—this includes determining the cost (time, energy, etc.) in learning and adopting the new practice as well as the loss that often accompanies giving up what is familiar (Deshler, Deshler, & Biancarosa, 2007). Spillane, Reiser, and Reimer (2002) maintain that successful implementation of a new practice necessitates substantial changes in the teachers' ways of seeing their instructional world. Spillane et al. argue that most theories of change fail to take into account the complexity of "human sense making." Sense making is not simply understanding the new intervention; it is an active process of interpretation that draws on the individual's rich knowledge base of understandings, beliefs, and attitudes. All of these factors can influence the speed and success of adopting the new practice. Similarly, Marris (1975) believes that many changes represent a "crisis of reintegration," and that individuals expected to make the change need an opportunity to make sense of the new innovation and to go through a process of reformulation.

Given that most reading comprehension interventions are complex and demanding to teach, it is important that these realities be carefully considered in designing professional development and subsequent supports to optimize the chances of successful implementation. Additionally, because all interventions are implemented within an instructional context, it is important to carefully consider what pressures, cultural norms, and prevailing practices in secondary schools may hinder adoption and successful implementation of new interventions. Merely turning the task of figuring out ways to overcome potential implementation barriers to those on the front lines decreases the chances of innovations being successfully adopted.

CONCLUSION

To achieve independent living and economic self-sufficiency in the 21st-century job market, all adolescents, but especially those with LD reading below grade level, must acquire a sophisticated set of literacy skills. Of chief concern is the need for a paradigmatic and developmental shift from early literacy instruction to adolescent literacy instruction by researchers and practitioners. Put simply, adolescent readers require different instructional emphases and pedagogies to improve reading comprehension.

The emerging evidence base around reading comprehension instruction is promising. Findings indicate that targeted strategy instruction of what good readers do, when taught in an explicit manner, improve outcomes for adolescent readers. Encouragingly, findings further indicate that outcomes from strategy instruction can benefit students with LD as well as their nondisabled peers. Such evidence necessitates a shift in best practice and compels practitioners to consider adopting these methods to meet the needs of their academically diverse student population.

However, more research on adolescent literacy is necessary. The field must use theory to inform research and practice so that outcome variability can be more thoroughly explained. Moreover, considerable depth of understanding about the role of instructional dosage and how a continuum of service delivery can be operationalized is necessary to make student-specific instructional decisions. Finally, researchers must study the factors that can enhance broad-scale adoption of evidence-based interventions. Collectively, research and practice in these areas related to reading comprehension instruction will significantly improve student outcomes and opportunity beyond the school walls.

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