

Running Head: Reading Techniques

Research-Based Techniques for Teaching Early Reading Skills
to Students with Intellectual Disabilities

Jill H. Allor

Patricia G. Mathes

Tammi Champlin

Jennifer P. Cheatham

Southern Methodist University

Manuscript submitted to *Education and Training in Developmental Disabilities*

Author Contact Information:

Jill H. Allor

Department of Teaching and Learning

Annette Caldwell Simmons School of Education and Human Development

Southern Methodist University

P.O. Box 750381

Dallas, TX 75275-0381

jallor@smu.edu

Acknowledgments: The work presented in this article was supported by Grant No. H324K040011-05 from the Institute of Education Sciences. This article does not necessarily reflect the positions or policies of this funding agency and no official endorsement should be inferred. We thank the teachers and students who participated in this research.

Abstract

Teaching students with intellectual disabilities (ID) to read is extremely challenging. Fortunately, the outlook for students with ID is improving because we now know much more about how to teach reading to students who struggle, including those with ID. The central theme of this article is that reading instruction for students with ID must be a carefully orchestrated integration of key skills and strategies that are explicitly linked to meaning. Organized according to the major components of reading instruction, including (a) oral language and vocabulary, (b) phonological awareness, (c) phonics and word recognition, (d) fluency, and (e) comprehension, this article describes key techniques used in research examining effective methods for teaching students with ID to read. We provide specific examples from our research study describing how these skills are being taught to students with ID.

Research-Based Techniques for Teaching Early Reading Skills to Students with Intellectual Disabilities

Teaching students with intellectual disabilities (ID) to read is extremely challenging. These students face severe deficits in memory and language that make it very difficult for them to learn to read. Further, behavior issues may interfere with their learning. Although there are many examples of students with ID who successfully learn to read, most students with ID learn very few, if any, basic reading skills. In fact, only 1 in 5 students with ID achieve even minimal literacy skills (Katims, 2001). Fortunately, the outlook for students with ID is improving because we now know much more about how to teach reading to students who struggle, including those with ID (Allor, Mathes, Jones, & Roberts, in press; Browder, Ahlgrim-DeLzell, Courtade, Gibbs, & Flowers, in press; Mathes & Denton, 2002; O'Connor, Bocian, Beebe-Frankenberger, Linklater, in press; Torgesen, 2002). The encouraging news is that we are currently gathering evidence indicating that techniques proven to work with struggling readers who have average to high IQs are also effective for students with ID (Allor et al., in press; Browder et al., in press).

Reading research has advanced tremendously in recent decades as we have learned how good readers read and how to assist struggling readers so that they can become good readers. Theoretical models of the reading process reflect that good readers employ multiple language systems as they fully process text, including phonology, orthography, and the meaning of language (Adams, 1990). Good readers simultaneously process the internal structure (i.e., complete spellings) of words as they effortlessly read with expression and deeply comprehend the meaning of text (Adams, 1990; Ehri, 2005). Research on effective methods for teaching students who struggle to read is extensive. Effective early reading interventions include multiple components that are explicitly integrated, including oral language, phonological awareness,

phonics, word recognition, fluency, and comprehension (see National Reading Panel, 2000; Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001; Snow, Burns, & Griffin, 1998).

Typically students with low IQs, including those with ID, have been excluded from research on effective early reading interventions (O'Connor et al., in press); however, recent studies including these students are demonstrating that the same general techniques are effective for both types of students (see Allor, Mathes, Jones, & Roberts, in press; Browder et al., in press). For some time, we have known that students with ID are capable of learning isolated skills, such as sight word recognition and basic phonics (see Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006; Browder & Xin, 1998; Connors, Rosenquist, Sligh, Atwell, & Kiser, 2006). What is new is that we are now measuring the impact of comprehensive programs that address multiple skills simultaneously and include explicit instruction to teach students to integrate and apply those skills in context. An important finding from our research is that students with ID who received comprehensive reading instruction, on average, outperform their peers on measures of phonological awareness, word recognition, oral language, vocabulary, and basic comprehension. In other words, when taught explicitly and carefully, most students in our study are able to read at least simple connected text with meaning, demonstrating their ability to successfully apply phonemic awareness and phonics skills (Allor, Mathes, Jones, & Roberts).

One factor contributing to the low numbers of students with ID who learn to read is that typically teachers of students with ID have been provided very little training about how to teach reading. College courses focused on teaching students with ID most often include very limited information about how to teach reading or no information at all (Katims, 2000). In this article, we take some preliminary steps in remedying this problem by describing effective techniques for teaching early reading in the context of students with ID who are in the primary grades. The

central theme of this article is that reading instruction for students with ID must be a carefully orchestrated integration of key skills and strategies that are explicitly linked to meaning. This article is organized according to the major components of reading instruction, including (a) oral language and vocabulary, (b) phonological awareness, (c) phonics and word recognition, (d) fluency, and (e) comprehension. These are the 5 components identified by the National Reading Panel with the addition of oral language, which is particularly important for students with ID who typically experience severe deficits in oral language (National Reading Panel, 2000). We provide specific examples from our research study describing how these skills are being taught to students with ID, including how we explicitly integrate skills to one another and link skills to meaning. We provide a brief discussion of how these multiple strands overlap and are integrated in effective reading programs, such as the one used in our research, *Early Interventions in Reading* (Allor, Mathes, & Jones, in press; Mathes & Torgesen, 2005; Mathes, 2005). We chose this curriculum because Levels 1 and 2 already had a proven track record of efficacy with other populations (Mathes, et al., 2005; Tong, Irby, Lara-Alecio, & Mathes, 2008; Vaughn, Cirino, et al., 2006; Vaughn, Linan-Thompson, et al., 2006; Vaughn, Linan-Thompson, Mathes, Duradola, & Cardenas-Hagan, 2007).

Instructional Strands within Comprehensive Early Reading Programs

Effective early reading instruction is comprehensive, including multiple strands that are carefully and explicitly taught so that students will apply multiple skills and strategies as they fluently read with comprehension (see Coyne, Zipoli, & Ruby, 2006; Carnine, Silbert, Kame'enui, & Tarver, 2004; O'Connor, 2007). Before describing techniques for teaching each of these strands individually, we emphasize the importance of conspicuously teaching students to integrate and apply skills by teaching students how skills relate to one another and specifically

how to use those skills as they read connected text. Any one lesson includes instruction and practice in multiple strands. As skill in one strand increases, that skill is applied to other strands. To illustrate, here are two brief examples. In the first example, students combine phonemic awareness blending skill and letter-sound correspondence as they sound out words. First, students practice a basic phonemic awareness skill, blending spoken phonemes into words. When the teacher says individual sounds, /s/ /a/ /t/, the students blend those sounds to form the word, *sat*. Then students practice the sounds of printed letters, including the sounds represented by *s*, *a*, and *t*. In early lessons, students practice both of these skills daily. Once students begin to develop these skills, blending individual phonemes orally and saying the sounds of a few letter-sound correspondences, then the teacher integrates these skills into a new activity in which they sound out printed words, such as *sat*. The teacher uses language in the new activity that is consistent with the language in the two separate activities, clearing linking activities. Teaching students to transfer skills from one activity to another is extremely important for students with low IQs, who rarely spontaneously apply learned skills to new activities. A second example of skill integration is connecting the recognition of individual words to the comprehension of sentences. As students gain skill in recognizing sight words and decodable words, they practice reading these words from word cards and use the cards to build logical, meaningful sentences. Although these examples may seem simple, designing instruction that follows a sequence within and across strands that fosters successful integration of skills is challenging, particularly when teaching students with ID who often experience extreme difficulty retaining skills and applying them. In each of the sections below, we discuss developing skills in isolation and then provide brief examples of how these skills are connected to other strands.

Three Students

As we describe the teaching techniques, we will refer to three specific students who participated in our research study, Jacob, Carl, and Rachel. Jacob, a student with Williams' Syndrome and an IQ in the moderate range of ID (44), began the project when he was 8 years old. Carl, whose IQ is also in the moderate range of ID (55), began the project when he was 9 years old. Rachel, whose IQ is in the mild range of ID (63) began the project when she was 6 years old. All three students have participated in the research project for approximately three years. We chose to highlight these three students because they reflect a range of performance within our study. It is important to mention that it is difficult to identify truly representative cases as students with ID are highly variable and must be considered individually. However, all three of these students faced significant challenges in learning to read due to memory and language deficits, but all three have made important progress. Although each student is friendly and generally eager to please, when they began the project they all experienced significant difficulty staying on task and required consistent reinforcement to participate fully in lessons. Early in the study each of these students was taught in a small group of 2 to 3 students; however, by the end of the study Jacob and Rachel were both being taught individually. Jacob is being taught individually because the students with whom he was originally grouped made much faster progress than he did. Rachel is being taught individually because of scheduling conflicts.

Techniques for Teaching Oral Language and Vocabulary

Oral language and vocabulary underlie all other strands of reading instruction. The meaning of our spoken language should be explicitly connected to all reading activities, including phonemic awareness and phonics; however, during the early stages of reading development when students are able to read very little, if any, text, it is critically important to focus on the development of oral language through books read aloud to them. In our research, we

selected narrative and expository books to read to the students. We targeted specific vocabulary words and provided students with structured opportunities to talk about the books read to them.

Using Read Alouds to Foster Vocabulary Development

In teaching vocabulary, we employed one or more of several techniques, depending on which technique best fit the vocabulary word. When appropriate, we used kid-friendly definitions, such as *Protect means to keep from being hurt*. We also used pictures, videos, and gestures to demonstrate the meanings of words. Words were practiced with a simple game of thumbs up or down during which students applied the vocabulary word to a given situation. For example, Jacob successfully participated in this activity as he learned the meaning of the words *disturb* and *delight*. Jacob correctly responded as his teacher asked him, “Give me a thumbs up if what I say might disturb someone who is sleeping.” She then listed specific situations one at a time as Jason responded with a thumbs up or down: turning on a bright light, playing loud music, whispering, etc. As stories were read, students listened for and discussed the target words. Teachers encouraged students to use these words appropriately in complete, spoken sentences. Teachers provided scaffolding by using target words in appropriate sentences and extended student language by modeling sentences that built on student sentences or phrases.

Using Read Alouds to Foster Oral Language Development

Most often books were read aloud to students on three separate occasions. Prior to a story being read for the first time, teachers guided the students to predict story events and describe what was happening in the pictures. The first story reading was followed by brief discussion. The second time a story was read the teacher stopped occasionally and encouraged discussion of events and vocabulary within the story. After the third reading of a story, the teacher guided discussion through questions designed to assess student comprehension and provide

opportunities to develop oral language. During all discussion, teachers supported student language by restating student responses, extending student language, and using targeted vocabulary words in sentences. The primary goal was to improve expressive language skills, specifically focusing on increasing sentence length and using targeted vocabulary words in context. For example, if a student pointed to the cat and the girl in a book saying, “Cat, girl,” the teacher would say, “The cat lived with the little girl.” Then the teacher would encourage the student to repeat the new sentence. Jacob, Carl, and Rachel all participated in these activities.

Integrating Skills

One technique we used to relate oral language to print was through an activity we called “Point and Read.” Simple sentences related to the storybook read aloud were printed in large text with picture support. During this activity the teacher would first read the sentence to the students, pointing to each word as it was read. Then the students repeated the sentence as they pointed. In this manner, students were building oral language, relating oral language to print, and being exposed to concepts of print such as text being read from left to right. Initially, Carl was unable to repeat sentences with more than two words, but as he practiced, he was able to “point and read” the sentences in the curriculum, including those with four to seven words. Jacob and Rachel experienced more success with this activity. The purpose of the activity was not to identify specific printed words, but to recognize that print is meaningful and related to spoken language.

Techniques for Teaching Phonological Awareness

Focusing on Key Skills

In teaching phonological awareness to the students in our research study, we employed several techniques. First, we chose to focus specifically on blending and segmenting at the

phoneme level. For younger students, teachers should work with larger units of spoken language (syllables within words or words within sentences), but currently research has not proven that these levels of phonological awareness must be mastered prior to developing phonemic awareness (i.e. phonological awareness at the phoneme level). Therefore, in our research with students with ID who were in the primary grades we chose to focus instructional time on the two most important phonemic awareness (PA) skills to develop, blending and segmenting. Although we used a variety of activities to keep student engagement high while they practiced blending and segmenting, our routines and teacher language were consistent. When blending, the teacher said the individual phonemes one sound at a time and the child blended those sounds into the correct word. The script in our intervention used the following terminology:

Teacher: Now we are going to play Say the Word. Remember, Maxwell (puppet) can say words only in a funny way. Whenever he says a word, it is stretched. You have to tell me what word he said the fast way. Listen. /mmm/aaa/t/. What word? (cue students)

Students: mat

When segmenting, the teacher said the whole word and the child segmented the word, saying each phoneme one at a time. The script for segmenting was as follows:

Teacher: Now we are going to play Stretch the Word. Remember, I will say a word, and you will tell me the sounds you hear in the word. Sit. (pause) Stretch *sit*.

Students: /sss/ /iii/ /t/

Focusing instruction on these two critical skills and keeping teacher language consistent was successful with the students in our study, although they required extensive practice.

Stretch and Connect

A second technique we found to be successful in teaching phonemic awareness was stretching and connecting phonemes during the activities. We found our students much more readily blended words when we stretched continuous sounds (such as /fff/ /mmm/ /sss/) for 1-2 seconds and connected continuous sounds to the sound following the continuous sound. For example, it was easier for students to blend /s/ /a/ /t/ into *sat* when the teacher stretched the continuous sounds and did not stop between sounds (i.e. /sssaaat/). It was important not to pause after continuous sounds. We also used stretching sounds as a method for providing scaffolding. For example, if a student was unable to say the first sound in *sun*, the teacher asked again, “What is the first sound in /sssun/, stretching the /sss/ for emphasis. A word of caution worth noting is that it is important to carefully pronounce sounds in isolation just as they are pronounced in words. A speech therapist, reading coach, or other reading specialists are excellent resources for assistance. For example, students will find it difficult to blend /suh/ /a/ /tuh/ into *sat*. In other words, it is important not to distort sounds by adding /uh/ to the end of the consonant as many people do without realizing it.

Careful Sequencing

A third technique was carefully increasing the difficulty of the blending and segmenting tasks. Initially, students blended and segmented words at the onset-rime level. At this level, students segmented by identifying the first sound in a spoken word (teacher: What’s the first sound in *sun*? student: /sss/). When blending, the teacher provides the onset and rime before the child says the word (teacher: /sss/ /un/, What word? student: sun). Gradually, students blended and segmented one phoneme at a time (*Say the Word* and *Stretch and Blend*, as above). A carefully designed curriculum should also gradually increase the phonological difficulty of the words being blended and segmented. For example, words with continuous sounds in the initial

position (e.g., sat, man) are easier to blend and segment than words beginning with stop sounds (e.g., tag, bat).

Making Phonemic Awareness Activities Meaningful

PA was linked to oral language by linking meaning to the words practiced during the activities. We did this in several ways. Early on, we used a set of picture cards that were carefully developed to represent words that gradually increased in phonological difficulty, but were also clearly recognizable from the picture. For example, the teacher asked, “Which word begins with /ssun/? and the students responded by pointing to the sun. For some students we supplemented the intervention with poster scenes and practiced blending and segmenting words related to the scene. As needed, teachers referred to the scene to support the meaning of the words being practiced (i.e., after blending *run*, the teacher would point to the boy running and say a sentence, such as “The boy likes to run in the park.”). As students progressed, words were practiced in the PA activities prior to being read in connected text.

Jacob, Carl, and Rachel Develop Phonemic Awareness

Jacob, Carl, and Rachel each responded well to PA instruction, though their progress was very slow. Jacob began the study with some PA skills, scoring approximately 25 segments per minute on the phoneme segmentation fluency (PSF) measure of Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2002), while Carl and Rachel began the study scoring 0 on this measure. Even though Jacob began the study with some PA, he struggled to increase his skills in this area because of severe deficits in short-term memory. However, within about 5 months he reached the benchmark and within approximately 10 months, his scores never dipped below benchmark again, indicating he had clearly mastered the skill. Carl and Rachel responded more slowly to instruction in PA, requiring extensive practice and

scaffolding at the earliest levels of PA. With Carl and Rachel, we used picture support and extensive practice and scaffolding at the onset-rime level of PA. Carl began to show progress after approximately 5 months of instruction and now performs very near the benchmark of 35. Rachel began to show progress on PSF after approximately one year of the intervention and reached mastery a few months later.

Techniques for Teaching Phonics and Word Recognition

Focusing on Key Skills

Like PA instruction, phonics and word recognition activities focused on several key skills that were integrated over time and gradually increased in difficulty. The first skill was basic letter-sound correspondence which began with students identifying the most common sound of individual letters and gradually students learned the sounds for various letter patterns. Second, students were taught to read words sound by sound. These words were made up of the letters and patterns that had been taught, with students initially reading words in which each letter represented its most common sound (ran, last, milk, sun, etc.) and gradually increasing in difficulty as students learned long vowel patterns (like, rain, light) and variant vowel patterns (sound, claw, clown). Finally, students learned high frequency words by sight if the words were irregularly spelled (ex. was, have) or if the sounds in the word had not been taught yet (ex. the word *on* is taught before the sound for short *o* is taught).

Teaching Letter-Sound Correspondence

Although teaching letter-sound correspondence is fairly straightforward, we do wish to highlight a few teaching techniques that are important. As with most early reading interventions, we used meaningful mnemonic clues when introducing new letter sounds to link the abstract sound to something concrete (ex. *nose* associated with *n*). We also provided extensive,

cumulative review through a quick activity during which students simply pronounced the sound for the letter on the chart when the teacher touched under the letter. To facilitate memory and the transfer of letter-sound correspondence to the sounding out strategy, teachers held a finger under the letter for two seconds when the letter was a continuous sound. In this way, students became accustomed to stretching sounds when they saw letters that represented continuous sounds and more easily stretched those sounds during sounding out activities. Our curriculum also sequenced letter-sound introduction carefully, introducing the most common sounds early, introducing easier sounds prior to more difficult sounds, and separating confusing letters and sounds.

Jacob, Carl, and Rachel Develop Letter-Sound Correspondence

At the beginning of the study, Jacob, Carl, and Rachel knew very few, if any, letter sounds. We measured their progress on this skill using DIBELS Nonsense Word Fluency (NWF) and all three consistently scored 0 on this measure early in our study. Jacob's scores began to improve somewhat after only one month of instruction, but he did not reach the benchmark of 50 letter sounds per minute until he had participated in the intervention for approximately two and a half years. Carl struggled with letter-sound correspondence because of severe speech problems preventing him from articulating sounds correctly. Carl's speech therapist and teacher used gestures to help Carl remember sounds and pronounce them correctly. Within about 5 months of instruction, Carl's NWF score began to increase, and he is currently very near mastery on this measure. Rachel's NWF scores began to improve somewhat after a few months of the intervention, but she did not reach the benchmark of 50 until she had participated in the intervention for almost two years.

Teaching Students to Read Words Sound by Sound

In our curriculum, students are taught the strategy of reading words sound by sound (i.e., sounding out). As described earlier, this strategy requires students to apply their knowledge of letter sounds and PA. As letter sounds are taught, students quickly apply letter sound knowledge to words made up of those letters. The sequence is also carefully organized to gradually increase in difficulty. Initially, the teacher leads the pacing of sounding out, requiring students to slowly say each sound before saying the entire word. As student skill with sounding out increases, the amount of time the teacher allows for sounding out decreases. Eventually the students no longer say the sounds aloud, but are taught to say the sounds only when they do not know the word immediately. Later in the curriculum, students learn to become flexible decoders. In other words, they are taught that many words do not sound out quite right, but that sounding out usually produces a pronunciation that is close enough to figure out the word.

Integrating Phonemic Awareness and Word Recognition Skills

A technique we used to assist students in transferring PA skills to print was *Stretch and Spell*. Using the same terminology used during PA activities, students stretched each word and wrote the correct spelling of the word. After participating in the intervention for approximately one year, Jacob was stretching and spelling words such as *sack*, *star*, and *help*. As Jacob wrote each word, he repeated the sounds one at a time, writing the letters that represented each sound. This technique linked PA, letter-sound correspondence, and sounding out words.

Jacob, Carl, and Rachel Develop Sounding Out Skills

Jacob, Carl, and Rachel have all made progress with sounding out, but to varying degrees. Early in the intervention, sounding out was a challenge for both Jacob and Carl, as they struggled with severe deficits in short-term memory. While sounding out a word, they would frequently forget the first sound, so *mat* became *at* and *ran* became *an*. Currently, Jacob

is able to read many words without sounding them out first, though Carl continues to struggle in this area. Rachel has made excellent progress with this strategy and is now learning to decode words more flexibly, including multisyllabic words.

Teaching High Frequency Sight Words

The last skill in the word recognition strand was high frequency sight words. These words were presented as tricky words that should be recognized quickly. Once students recognized letters, a few sight words were introduced, but the pace of the introduction of sight words increased as phonics skills developed. Jacob struggled to keep up with the other students in his group. His teacher provided him with extra time to practice these words so he could stay with his instructional group. Carl and Rachel also needed extensive practice with these words, but progressed at least as quickly as the other students in their instructional group. Teachers assisted students in applying this skill during text reading. They provided scaffolding by reminding students that a word was a “tricky word” and asking them to read it fast.

Making Word Recognition Activities Meaningful

One technique we used to link meaning to word recognition activities was building sentences with word cards. Although not specifically found in our intervention, our teachers adapted sentences from the decodable text, writing the words on sentence strips and cutting them apart. Jacob responded particularly well to this activity as he would frequently be able to read words in lists or from cards, but continued to struggle with those same words in connected text. By building his own sentences, he practiced reading words in a meaningful context. His teacher provided scaffolding during this activity, but this scaffolding was gradually decreased as his ability to make meaningful sentences improved. In one lesson, his teacher gave him four words (Zip, a, rabbit, is) to use to build a sentence, asking him to read them all and build a sentence that

made sense. His teacher prompted him to read all four words aloud before making the sentence. He first made and read, “A rabbit is Zip,” but immediately recognized that this did not make sense. The teacher provided further scaffolding by asking him, “How could you make it make sense?” and “If you want to tell about Zip, what should come first?” Then he made and read, “Is a Zip rabbit?” He immediately realized it did not make sense. His teacher asked again, “What should come first if you want to tell about Zip?” “Where is first position?” He then moved Zip to the beginning of the sentence and made “Zip is a rabbit.” He then made the next sentence without assistance, “A truck is in the mud.”

Techniques for Teaching Fluency

Teaching Word Level Fluency

Several techniques were used in our study to improve fluency. First, the word level activities just described included techniques to gradually increase student fluency with individual words. During these activities, teachers prompted students to gradually increase the speed with which they were able to recognize whole words. For example, students were instructed to read the words “the fast way” when they did not need to sound out the word. This specific prompt was very important as many of the students in our study continued to read words sound by sound even when they were able to identify the word without sounding out. Many of the students in our research project, including Jacob, Carl, and Rachel needed to be taught when to use the sounding out technique and when it was no longer necessary (i.e., when you knew the word).

Teaching Passage Fluency

Other techniques used to build fluency were reading decodable text, unison reading, and repeating decodable storybooks until fluency goals were reached. Early in the curriculum, reading connected, decodable text was a part of every lesson, with the text gradually increasing

in complexity as students learned new skills. Over time, the text became increasingly more engaging and challenging. Teachers modeled good pacing and guided students to gradually increase their pace during teacher-led unison reading. Students also read decodable storybooks two to three times until predetermined fluency criterion were met. Across time, the criteria required increasingly faster reading, even as the text difficulty became more complex. Both Jacob and Carl struggled to meet these goals and required extensive practice with stories. Rachel consistently met fluency goals during lessons.

Jacob, Carl, and Rachel Develop Fluency

All three students have made important progress toward becoming fluent readers, though their rates of growth are quite different. Carl has made the least amount of progress in this area. After participating in the intervention for approximately one year, he began to show slight improvement on DIBELS oral reading fluency (ORF) passages on ending first-grade level. However, he is currently far from the ending first-grade level benchmark of 40, as his recent scores are approximately 10 words per minute. Jacob has made more progress, though he showed no improvement on first-grade ORF passages until he had participated in the intervention for about two years. Currently he is reading approximately 36 words per minute, which is near the first-grade end of the year benchmark of 40 words per minute.

Rachel has made excellent progress in fluency. Although she did not show any improvement in ORF until after two years of intervention, since then her rate of improvement has been remarkable. Currently, she is in 4th grade and working toward grade-level goals. She met ending first-grade level goals in just over two years of intervention. After three years of intervention, she met ending second-grade level goals with scores higher than 90 words per minute. Recently, she scored 142 words per minute on an ending third-grade level passage, well

above the third-grade benchmark of 110 words per minute. Currently, she is being tested on fourth-grade level passages, with recent scores of 86 and 93.

Techniques for Teaching Reading Comprehension

Early Comprehension Development

As soon as students read connected text, simple strategies are taught to facilitate comprehension of sentences and then passages; however, until basic word recognition skills are mastered, comprehension is primarily taught through storybooks read aloud. We have already discussed how we use these storybooks to develop oral language and vocabulary, but we also use these read alouds to build background knowledge essential for comprehension. The storybooks were selected according to themes (e.g., animal homes, sea animals, getting along with others, etc.) and include both narrative and expository text. Comprehension strategies taught early in the curriculum are applied through the books read orally to the students and the decodable texts read by the students. Early strategies include basic story grammar, sequencing, and the use of simple graphic organizers.

Later Comprehension Development

As word recognition skill increases, the focus of comprehension is on text students read themselves. Like the read alouds used early in the curriculum, text in the later portion of the curriculum is grouped by themes to build background knowledge. Novels and expository text provide students with general knowledge related to content areas, such as social studies. Through these themes students build knowledge and apply comprehension strategies. Strategies taught early in the curriculum continue and new strategies are added. These include making and checking predictions, sequencing, making inferences, story grammar for narrative text, content webbing for informational text, and writing summaries. In one lesson on inferencing, students

review what they have learned about mountains in a previous lesson and then read text about animals to infer where different animals live. For example, the text about mountain goats includes clues that helps students figure out that mountain goats live on the rocky slopes of mountains (i.e., mountain goats use their hooves to climb rocks and steep slopes).

Jacob, Carl, and Rachel Develop Comprehension

Jacob, Carl, and Rachel are able to read text with comprehension at levels at least commensurate with their oral language ability. They consistently demonstrate their understanding of stories and expository text, answering literal comprehension questions and discussing the details from text. As would be expected, their comprehension is better when text is more concrete and familiar, rather than abstract and unfamiliar. It is also not surprising that these students struggle with inferential comprehension; however, their ability to apply basic strategies is gradually improving. In spite of their significant challenges with oral language, all three students are reading with basic levels of comprehension.

Conclusion

The purpose of this article is to provide teachers of students with ID specific information about practical, research-based techniques for teaching their students to read. As Jacob, Carl, and Rachel illustrate, students with ID who face significant challenges can make important progress in early reading skills. The curriculum and techniques that are effective for students with much higher IQs are also effective for students like Jacob, Carl, and Rachel, but they must be implemented with high degrees of fidelity by skilled teachers. Curriculum and techniques should provide for explicit, systematic instruction that is comprehensive and includes extensive cumulative review. Further, students should be explicitly taught how to integrate and apply strategies in the context of reading connected text. Unfortunately, most teachers of students with

ID receive very little training about effective techniques for teaching reading. This article is only one step toward providing these teachers with specific guidance. Obviously, teachers cannot provide this type of instruction without adequate support. We encourage teachers to seek out additional resources (Coyne et al., 2006; Carnine et al., 2004; Kame'enui et al., 2002), including those that focus on oral language and vocabulary (e.g., Arnold & Whitehurst, 1994; Coyne, Simmons, Kame'enui, & Stoolmiller, 2004), word recognition (e.g., O'Connor, 2007) and comprehension (e.g., Klingner, Vaughn, & Boardman, 2007). In addition to effective curricular materials and training, teachers need access to educators with expertise in reading and behavior who can assist them in tailoring instruction to meet the needs of their students and providing the positive behavioral support necessary for students to participate fully in lessons. We also wish to emphasize the importance of persistence on the part of the students and teachers. The journeys of Jacob, Carl, Rachel, and their teachers have been ones of patience, dedication and perseverance. Finally, we urge teachers to make all aspects of their reading instruction as meaningful as possible. Letter sounds should be taught for the purpose of applying those sounds to words that mean something to students. If students with ID are to understand what they read, it is imperative that reading instruction be linked to meaning that is relevant and meaningful to them.

References

- Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: Massachusetts Institute of Technology.
- Allor, J. H., Mathes, P. G., & Jones, F. G. (in press). *Early interventions in reading: Foundation level*. Columbus, OH: SRA/McGraw-Hill.
- Allor, J. H., Mathes, P. G., Jones, F. G., & Roberts, J. K. (in press). Teaching students with moderate intellectual disabilities to read: An experimental examination of a comprehensive reading intervention. *Education and Treatment in Developmental Disabilities*.
- Arnold, D. S., & Whitehurst, G. J. (1994). Accelerating language development through picture reading: A summary of dialogic reading and its effects. In D. K. Dickinson (Ed.), *Bridges to literacy: Children, families, and school* (pp. 102-128). Cambridge, MA: Blackwell.
- Browder, D. M., Ahlgrim-Dezell, L., Courtade, G., Gibbs, S. L., & Flowers, C. (2008). Evaluation of the effectiveness of an early literacy program for students with significant developmental disabilities. *Exceptional Children, 75*, 33-52.
- Browder, D. M., Wakeman, S. Y., Spooner, F., Ahlgrim-Dezell, L., & Algozzine, B. (2006). Research on reading instruction for individuals with significant cognitive disabilities. *Exceptional Children, 72*, 392-408.
- Browder, D. M., & Xin, Y. P. (1998). A meta-analysis and review of sight word research and its implications for teaching functional reading to individuals with moderate and severe disabilities. *The Journal of Special Education, 32*, 130-153.
- Carnine, D. W., Silbert, J., Kame'enui, E. J., & Tarver, S. G. (2004). *Direct instruction reading* (4th ed.). Upper Saddle River, NJ: Pearson Merrill Prentice Hall.

- Conners, F. A., Rosenquist, C. J., Sligh, A. C., Atwell, J. A., & Kiser, T. (2006). Phonological reading skills acquisition by children with mental retardation. *Research in Developmental Disabilities, 27*, 121-137.
- Coyne, M. D., Simmons, D. C., Kame'enui, E. J., & Stoolmiller, M. (2004). Teaching vocabulary during shared storybook readings: An examination of differential effects. *Exceptionality, 12*, 145-162.
- Coyne, M. D., Zipoli Jr, R. P., & Ruby, M. F. (2006). Beginning reading instruction for students at risk for reading disabilities: What, how, and when. *Intervention in School & Clinic, 41*, 161-168.
- Ehri, L. C. (2005). Learning to read words: Theory, findings, and issues. *Scientific Studies of Reading, 9*, 167-188.
- Good, R. H., & Kaminski, R. A. (2002). *Dynamic indicators of basic early literacy skills* (6th ed.). Eugene, OR: Institute for the Development of Educational Achievement.
- Kame'enui, E. J., Carnine, D. W., Dixon, R. C., Simmons, D. C., & Coyne, M. D. (2002). *Effective teaching strategies that accommodate diverse learners* (2nd ed.). Upper Saddle River, NJ: Merrill Prentice Hall.
- Katims, D. S. (2000). Literacy instruction for people with mental retardation: Historical highlights and contemporary analysis. *Education and Training in Mental Retardation and Developmental Disabilities, 35*, 3-15
- Katims, D. S. (2001). Literacy assessment of students with mental retardation: An exploratory investigation. *Education and Training in Mental Retardation and Developmental Disabilities 36*, 363-371.

- Klingner, J. K., Vaughn, S., & Boardman, A. (2007). *Teaching reading comprehension to students with learning difficulties*. New York: Guilford Press.
- Mathes, P. G. (2005). *Early Interventions in Reading, Level 2*. Columbus OH: SRA/McGraw-Hill.
- Mathes, P. G., Denton, C. A., Fletcher, J. M., Anthony, J. L., Francis, D. J., & Schatschneider, C. (2005). The effects of theoretically different instruction and student characteristics on the skills of struggling readers. *Reading Research Quarterly*, 40, 148-182.
- Mathes, P. G., & Denton, C. A. (2002). The prevention and identification of reading disability. *Seminars in Pediatric Neurology*, 9, 185-191.
- Mathes, P. G., Denton, C. A., Fletcher, J. M., Anthony, J. L., Francis, D. J., & Schatschneider, C. (2005). The effects of theoretically different instruction and student characteristics on the skills of struggling readers. *Reading Research Quarterly*, 40, 148-182.
- Mathes, P. G., & Torgesen, J. K. (2005). *Early Interventions in Reading, Level 1*. Columbus OH: SRA/McGraw-Hill.
- National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Washington, D.C.: National Institute of Child Health and Human Development.
- O'Connor, R. E. (2007). *Teaching word recognition: Effective strategies for students with learning difficulties*. New York: Guilford Press.
- O'Connor, R. E., Bocian, K., Beebe-Frankenberger, M., & Linklater, D. L. (in press). Responsiveness of students with language difficulties to early intervention in reading. *The Journal of Special Education*.

- Rayner, K., Foorman, B. R., Perfetti, A., Pesetsky, D., & Seidenberg, M. S. (2001). How psychological science informs the teaching of reading [Monograph]. *Psychological Science, 2*, 31-74.
- Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.
- Tong, F., Irby, B., Lara-Alecio, R., & Mathes, P. (2008). English and Spanish acquisition by second graders in developmental bilingual programs: A 3-year longitudinal randomized study. *Hispanic Journal of Behavioral Sciences, 30*, 500-529.
- Torgesen, J. K. (2002). The prevention of reading difficulties. *Journal of School Psychology, 40*(1), 7-26.
- Vaughn, S., Cirino, P. T., Linan-Thompson, S., Mathes, P. G., Carlson, C. D., Cardenas-Hagan, E., et al. (2006). Effectiveness of a Spanish intervention and an English intervention for English-Language Learners at risk for reading problems. *American Educational Research Journal, 43*, 449-479.
- Vaughn, S., Linan-Thompson, S., Mathes, P. G., Cirino, P. T., Carlson, C. D., & Pollard-Durodola, S. D. (2006). Effectiveness of Spanish intervention for first-grade English language learners at risk for reading difficulties. *Journal of Learning Disabilities, 39*, 56-73.
- Vaughn, S., Linan-Thompson, Mathes, P. G., Duradola, S., & Cárdenas-Hagan, E. (2007). First-grade English language learners at-risk for reading problems: Effectiveness of an English intervention. *Elementary School Journal, 107*, 153-180.