EFFECTS OF A COMPREHENSIVE READING PROGRAM ON K-8 STUDENTS WITH COGNITIVE IMPAIRMENTS

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Abstract

Approximately three decades of research conducted in response to the federal government’s Reading First initiative have identified the foundational, emergent literacy skills necessary to gain competence as a reader. Unfortunately, students with cognitive impairments often have not been exposed to the comprehensive reading programs that develop these emergent literacy skills. Excluding students with cognitive disabilities from the integrated components of reading instruction has limited literacy outcomes for this population. Research is just beginning to be conducted on students with cognitive disabilities in comprehensive reading instruction. The purpose of this paper is to explore how students with cognitive impairments respond to comprehensive reading instruction and how this could improve their literacy outcomes in the future.
Chapter I: Introduction

Literacy research over the last 30 years has focused primarily on developing integrated and comprehensive reading programs to prevent reading failure in students with reading disabilities (Fletcher, Lyon, Fuchs, & Barnes, 2007). However, research dealing with how students with cognitive impairments respond to a comprehensive reading program has been limited. Students with below average intelligence quotients (IQs) have been excluded from recent developments in reading instruction. Behind this exclusion is a history of assumptions by educators that students with cognitive impairments cannot acquire the skills to sound out words from the systematic instruction associated with a comprehensive reading program. Reading instruction for this population has instead focused on the memorization of lists of sight words and the teaching of isolated reading subskills (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006). As more students with cognitive impairments have access to the general curriculum, researchers need to define how comprehensive reading programs might benefit students with cognitive impairments.

Background

Research on effective methods for teaching students who are struggling to read is extensive. The majority of this research has focused on students with reading disabilities and average to above-average IQ scores. Typically, students with below-average IQ scores, including those with cognitive impairments, have been excluded from comprehensive reading programs and interventions (Allor, Mathes, Champlin, & Chetham, 2009). The past century has provided a vast array of methods, materials, and techniques concerning the literary instruction of people with cognitive impairments. Historically, a functional curriculum in regards to reading instruction has been implemented in most programs that serve children with moderate to mild
cognitive impairments (Katims, 2000). Most of this instruction has originated from a reductionist viewpoint on the purpose of teaching literary skills to people with cognitive impairments. This reductionist orientation has focused on teaching isolated reading subskills and specific sight word lists to help this population function in social, personal and vocational environments (Katims, 2000). Authentic outcomes for literacy, such as obtaining information or reading for pleasure, have traditionally not been viewed as plausible outcomes.

Behind this reductionist view of teaching literacy to people with cognitive impairments is the assumption that this population cannot apply phonemic awareness skills to unfamiliar or novel words. As a result, even the majority of current literary instruction for students with cognitive impairments focuses on memorizing specific lists of words (Allor et al., 2009; Katim, 2000). The primary research-based methods of reading instruction for students with cognitive impairments have been various sight word approaches such as time delay, picture integration, and picture fading (Browder & Xin, 1998). Sight word approaches have proven to increase a working and functional vocabulary among students with cognitive impairments. However, these students are not provided with the skills needed to decode unfamiliar words in functional reading contexts (Bradford, Alberto, Houchins, Shippen, & Flores, 2006). The realization that sight word instruction actually limits the number of environments in which students with cognitive impairments may operate has increased interest in providing decoding instruction. The instructional history of students with cognitive deficits has assumed that teaching sound/letter correspondences would not be mastered and generalized to novel words. Studies by Bradford et al. (2006) and Conners, Rosenquist, Sligh, Atwell, & Kiser (2006) have indicated that decoding skills of students with cognitive impairments can be improved upon with systematic, explicit decoding instruction.
Statement of Problem

The summary of research presented by the National Reading Panel (2000) has intensified the search for data and interventions relating to the scientific process of teaching students how to read. The interventions and research for struggling readers have benefited students with reading or learning disabilities and average to above average IQ scores. Reading instruction for students with cognitive impairments remains focused on isolated components of literacy instruction, such as the memorization of sight word vocabulary (Browder et al., 2006). Students with cognitive impairments typically have not been exposed to the benefits of scientific reading instruction now available to students with reading disabilities.

Research is beginning to show that students with cognitive impairments can respond to intensive, scientific reading instruction in the area of transferring phonemic awareness skills to unfamiliar words (Allor, Mathes, Roberts, Cheatham, & Champlin, 2010; Conners et al., 2006). The presence of phonemic awareness skills indicates the foundation necessary to continue to develop as a reader (National Reading Panel, 2000). Students with cognitive impairments need to be exposed to comprehensive reading programs that encompass the components of scientific reading instruction. Educators need to implement comprehensive reading programs with proven effectiveness over a long period of time. Maintaining a high degree of fidelity in implementing comprehensive reading programs to students with cognitive impairments will yield higher levels of reading achievement for these students and provide information on individual learning differences for this population.

Research Question

The National Reading Panel (2000) has produced scientific methods of reading instruction and reading interventions. The instructional techniques and components of a
comprehensive reading program derived from the National Reading Panel’s research have demonstrated that the number of children experiencing reading difficulties can be greatly reduced (Mathes & Denton, 2002; Mathes et al., 2005). The benefits of comprehensive reading programs for students with cognitive impairments are only beginning to be explored. Reading instruction for students with cognitive impairments includes research detailing the success of teaching decoding skills to these students. Students with cognitive impairments have the ability to learn basic decoding and word attack skills as other students with reading disabilities do (Allor, Gansle, & Denny, 2006; Mueller, Olmi, & Saunders, 2000; Saunders, 2007; Saunders, O’Donnell, & Williams, 2003). Theoretical models of the reading process reflect that readers who can fully process text through decoding skills can move on to higher order tasks such as language meaning and reading comprehension (Adams, 1990). Students with cognitive impairments can master these decoding skills. The questions for future research centers on how students with cognitive impairments specifically respond to comprehensive reading programs.

How do students with cognitive impairments progress on skills of decoding, phonemic awareness and the reading of connected text when exposed to the components of comprehensive reading programs? Can students with cognitive impairments transfer phonemic awareness skills to unfamiliar words? How do the instructional needs of students with cognitive impairments differ from students with reading disabilities?

**Definition of Terms**

An understanding of the following terms is needed to survey literary instruction research for students with cognitive impairments. The difference in definitions between learning disabilities and cognitive impairments must be understood. In this literature review, the terms learning disability and reading disability are used synonymously as the terms apply to reading. A
comprehensive reading program is defined by its components. The definitions for these terms were derived from primary sources examined by this literature review.

**Comprehensive Reading Program.** The National Reading Panel defines a comprehensive reading program as having the following integrated components: oral language, phonological awareness, phonics, word recognition, fluency, and comprehension (Allor et al., 2009, p. 33; National Reading Panel, 2000).

**Phonemic Awareness.** “Instruction that involves teaching children to focus on and manipulate phonemes in spoken syllables and words” (National Reading Panel, 2000, p. 7).

**Cognitive Impairment.** A cognitive impairment consists of an IQ below 70 and 2 or more functional deficits in adaptive skill areas (Allor et al., 2010b, p. 445).

**Sight Words.** Sight words can be defined as a list of words that frequently occur in texts and have atypical phonemic qualities. Sight words are words that are typical memorized by beginning readers (Allor et al., 2010b, p. 445).

**Learning Disability.** A disability that manifests itself by a statistically significant deficit in an academic skill area in a student with average to above average IQ scores (Allor et al., 2010b, p. 446).

**Reading Disability.** A disability that manifests itself by a statistically significant deficit in reading skills in a student with average to above average IQ scores (Allor et al., 2010b, p. 446).

**Theoretical Framework**

The model and learning principles described in this literature review draw largely on the work of Lev Vygotsky. Tenets of Vygotsky’s Sociocultural Perspective form the basis of many of the interventions for students with cognitive impairments described in this literature review.
Students with cognitive impairments draw upon the scaffolding of capable peers and adults in many learning strategies. Additionally, Vygotsky believed that higher-order mental processes were accessed through cultural symbols, signs, and language. Specifically, Vygotsky commented on the need to teach persons with cognitive impairments a method of symbolic thought (Vygotsky, 1978).

**Summary**

Comprehensive reading programs are available to general education students and students with learning disabilities on a large scale. Reading instruction for students with cognitive impairments has focused on isolated skill components such as sight word instruction. Students with cognitive impairments can make significant progress on decoding skills when exposed to an intensive reading program (Allor et al., 2010b; Conners et al., 2006) that is systematic. Students with cognitive impairments should be exposed to comprehensive reading programs on a large scale as well. The next chapter will review the historical trends of reading instruction for students with cognitive impairments, examine research on the acquisition of decoding skills and individual learning differences of cognitively impaired students, and detail the current level of participation in comprehensive reading programs for this population.
Chapter II: Literature Review

Introduction

The development of research-based reading instruction for struggling readers has largely excluded students with cognitive impairments. A focus of on sight word instruction for this population has led to reading instruction deficiencies. A lack of pre-service teacher training and instruction has contributed to limited literary outcomes for students with cognitive impairments. Sight word instruction remains the primary mode of instruction for students with cognitive disabilities.

Fortunately for students with cognitive impairments, research has indicated that this population benefits from explicit instruction in phonemic awareness and decoding. Recent studies have emphasized that these students can attain the sound-letter correspondence needed to progress to the reading of connected text. Longitudinal studies now in progress are exposing students with cognitive impairments to the integrated components of comprehensive reading programs.

Instructional Deficiencies

Research on preventing reading failure has largely excluded students with below average intelligence. Furthermore, instructional strategies for students with cognitive impairments have focused on teaching isolated sight words rather than an integrated program of comprehensive reading instruction. Reading instruction for students with cognitive impairments has focused on functional skills reflected in daily living activities (Browder et al., 2006). The vocabulary and sight words taught in this isolated manner are typically not applied in a meaningful context resulting in low levels of reading comprehension for students with cognitive impairments (Cooper-Duffy, Szedia, & Hyer, 2010).
The effects of focusing on sight word instruction for cognitively impaired students have severely limited literacy outcomes for this population. Sight word instruction has developed and maintained its status as the main avenue of reading instruction for students with cognitive impairments. Previous literature reviews in the area of reading instruction for students with cognitive impairments have proven the effectiveness of sight word instruction using systematic prompting techniques (Browder & Xin, 1998; Connors 1992; Houston & Torgesen, 2004). These reviews have focused meta-analyses on the singular component of sight word instruction and revealed strong evidence as to its effectiveness. The effectiveness of sight word instruction for cognitively impaired students has continued the focus on one component of reading instruction. This focus on one component of reading instruction has limited potential literacy outcomes for students with cognitive impairments.

Factors for Instructional Deficiencies

The instructional focus on the acquisition of sight words and other isolated reading skills for students with cognitive impairments can be contributed to a lack of instructional information. Katims (2000) conducted a survey of the current state of literary instruction for people with cognitive impairments as represented in the leading textbooks in the field of special education and cognitive impairments. Each of these textbooks was used in undergraduate and graduate teacher training programs for teaching students with cognitive impairments. Three of the 24 textbooks surveyed contained information on instructional techniques for teaching reading to students with cognitive impairments. Only one textbook was described as useful in the area of instructional procedures (Katims, 2000).

Another factor associated with the low numbers of students with cognitive impairments who learn to read is that teachers of this population have been provided with little training on
how to teach reading (Katims, 2000). College courses designed for teaching students with
cognitive impairments often contain very little information on teaching reading to students with
cognitive impairments. Teachers in this field have had to rely on their own initiative to seek out
effective reading interventions. These sources of reading interventions tend to be fellow teachers
or recent research articles (Browder et al., 2006). A shortage of training and information has
perpetuated a lack of reading instruction for students with cognitive impairments. The absence of
the application of comprehensive reading programs for students with cognitive impairments has
limited potential literary outcomes.

**Preliminary Studies in Decoding**

Despite the predominance of sight word instruction as the primary method of reading
instruction for students with cognitive disabilities, there is sufficient evidence that this
population responds to explicit decoding instruction (Gersten, Woodward, & Darch, 1986). Early
decoding instruction studies for students with cognitive disabilities feature the use of a direct
instruction program designed to teach phonetic decoding called Distar Reading (Engleman &
Bruner, 1969). Bracey, Maggs, and Morath (1975) studied the effectiveness of Distar on 8
students with cognitive disabilities over the course of a year. Six of the eight students
demonstrated gains in the decoding areas of (a) identifying the sounds of letters and digraphs, (b)
readings by blending sounds, and (c) spelling words by blending sounds. Nietupski et al. (1979)
provided a continuation of this decoding research by utilizing components of Distar. This study
focused on the word analysis subskills of letter-sound correspondence for consonants, letter-
sound correspondence for vowels, and vowel-consonant combinations for six cognitively
impaired students. These subskills were taught through a variety of individual and group formats.
The authors of both of these studies found that students could learn to decode words as a result of
systematic phonics instruction. Both of these studies provided a basis for future studies on decoding for students with cognitive impairments. Unfortunately, a focus on sight word instruction and isolated reading subskills would dominate the teaching methods for this population for the next 17 years.

**Decoding Skills**

Current reading research indicates that phonemic awareness and letter knowledge are the best predictors for how well children will develop reading fluency during the first two years of instruction (National Reading Panel, 2000). Development of these two areas must happen for a beginning reader to attain reading fluency. Additionally, The National Reading Panel (2000) stated that decoding skills, not just sight word recognition, are essential to becoming a fluent reader. Applying these principles to the reading instruction of students with cognitive impairments is the next logical step in increasing their literary outcomes.

Historically, students with cognitive impairments have received a functional curriculum in regards to reading instruction. The design of empirical studies on the benefit of decoding instruction for this population has been a recent phenomenon. A literature review by Joseph and Seery (2002) involved a computer database and manual search of 15 journals published from 1990 to 2002. This search yielded only seven studies that used phonics or decoding instruction with students with cognitive impairments.

Previous studies on the acquisition of phonological awareness skills by children with cognitive impairment have been characterized by two weaknesses. First, these studies have had small treatment groups that have allowed for in-depth analysis of individual characteristics, but have not produced sample trends that can be applied to populations. Secondly, these
phonological acquisition studies required students only to recognize and point out word-like stimuli rather than perform the actual task of decoding (Conners et al., 2006).

The use of systematic instruction to teach decoding skills in a study by Bradford et al. (2006) improved upon previous studies by requiring the three participating students to develop and transfer decoding skills using the Corrective Reading Program (Engelmann, Carnine, & Johnson, 1988). A pretest-posttest design with program specific criterion-referenced measures was used in this study. The participants were three males, ages 12 to 15, who were classified as moderately cognitively impaired with IQ scores ranging from 46-55. The materials for instruction was the Corrective Reading Program, Decoding A. The participants received instructional segments of 35-45 minutes of teacher-directed work and 10-15 minutes of independent student practice 2-3 times per week over a six month period. The lessons were divided into four parts: word attack skills, group reading, individual reading checklists, and workbook exercises. The students were placed into Corrective Reading Program based on a teacher-made test that consisted of identifying letter names, sounds and words that begin with a specific letter. Following completion of the program students were administered a post-test of either the Dolch Sight Words or the Edmark Functional Words. The Corrective Reading Program Placement Test was re-administered at the completion of the program and at the beginning of the next school year.

Bradford et al. (2006) delivered 65 lessons and all three students completed Level A of the Corrective Reading Decoding Program. The posttest assessments measured (a) identifying letter sound correspondence, (b) sounding out words, (c) blending sounds to read words, (d) irregularly spelled words, (e) reading sentences, and (j) reading short passages at approximately the second grade level. Error analysis was conducted to calculate a mean percent correct for each
student in the areas above. All three students performed at 97% correct or above in oral letter sound correspondence, written letter sound correspondence, and word recognition. The students’ fluency performance was measured through a combination of reading rate and reading accuracy. All three students exceeded the first two reading fluency measures on one minute fluency rates. The students could not attain the reading rates necessary to pass the next two fluency measures. As a measure of generalization, a sight word posttest was re-administered to the three subjects. The three students displayed percent gains of 21%, 51%, and 68% respectively.

The results of this study indicate that students with cognitive impairments are capable of learning phonemic awareness and decoding skills. This study also supports the need for explicit phonics instruction for this population to acquire these skills. Most importantly, the students in this study used explicitly taught decoding skills to indentify previously unknown function words. This generalization of decoding skills increases the number of environments that students of cognitive impairments can function in (Bradford et al., 2006). The results of this study demonstrate that the explicit teaching of phonemic awareness and decoding skills can overcome the limitations of sight word instruction.

A landmark, quantitative study by Conners et al. (2006) improved upon the small sample size of the Bradford et al. (2006) study. The purpose of this study was two-fold. One purpose of this empirical study was to demonstrate the effectiveness of phonological reading instruction for children with cognitive impairments. The second purpose was to examine the effect of individual student differences on the acquisition of phonological reading skills. Individual differences were measured in the areas of nonsense word reading, language comprehension, and phonemic awareness.
Forty children with cognitive impairments between the ages of seven and twelve participated in a randomly chosen instructional group or control group. Cognitive impairment was defined for this study as an IQ less than 70 but greater than 40 with deficits in at least two adaptive skill areas. Participants had a developmental range between four and eight years of age.

The 40 children were matched as closely as possible with a partner in the areas of age, IQ, phonemic awareness, and language comprehension. One partner was randomly assigned to the instructional group and the other to the control group. All subjects were exposed to a pre-instruction assessment that was used to match subjects, assess improvement, and predict posttest outcomes. Twenty of the 40 subjects were then exposed to 22 instructional sessions on phonological skills. The control group received their regular classroom instruction. All subjects participated in a post-instruction assessment that repeated the tests from the pre-instruction assessment.

The children who received the 22 lessons were better at sounding out familiar and unfamiliar words than the control group. On the sounding out portion of the posttest, there was a significant main effect for Group, F (1.19) = 7.20, M.S.E. = 1809.00, with the treatment group scoring higher than the control group. Readers in the treatment group improved their nonsense word fluency from a mean pretest score of 8.93 to 23.10 on the posttest with p = .001.

Smaller sample sizes of previous studies were enlarged to 40 subjects in this study. In addition to the larger sample size, this study required the participants to decode words instead of merely pointing them out. Both of these standards represent improvements in research quality in the area of phonological awareness in students with cognitive impairments. More importantly, this study establishes that students with cognitive impairments can acquire decoding and phonemic awareness skills through explicit instruction.
Comprehensive Reading Programs

Moving beyond sight word instruction for students with cognitive disabilities is a new opportunity and venture. The literature in the field of reading instruction for students with cognitive impairments suggests these students possess the entry-level skills needed to participate in a comprehensive reading program. Teachers of the cognitively impaired must now build upon the science of reading principles available to general education students (Browder et al., 2008).

In response to the United States Congress’s inquiry of the status of research-based practices used to teach children to read, the National Reading Panel indentified five essential components of a reading program. These five components of reading instruction are: (a) phonemic awareness, (b) phonics, (c) fluency, (d) vocabulary and (e) comprehension (National Reading Panel, 2000). According to the National Reading Panel, a comprehensive reading program consists of an integration of these five components into a program of reading instruction. These concepts have advanced reading research tremendously as the National Reading Panel has brought to light how good readers function. Struggling readers have also benefitted from this research (Allor et al., 2009). Students with cognitive impairments are capable of learning isolated skills (Allor et al., 2010b; Browder et al., 2006; Conners et al., 2006). The new course of research for reading instruction for students with cognitive impairments is measuring the outcomes of these students involved in comprehensive reading programs that are integrated with all components of reading instruction.

Students with cognitive impairments exposed to comprehensive reading programs have experienced better literary outcomes (Allor et al., 2010b; Cooper-Duffy et al., 2010). Students with cognitive impairments involved in small case studies have made progress in reading achievement when exposed to comprehensive reading programs. The three students in an Allor et
al. (2010a) case study showed gains in three DIBLES measures: oral reading fluency, nonsense word fluency, and phoneme segmentation. Early Interventions in Reading Level 1 and Early Interventions in Reading Level 2 (Mathes & Torgesen, 2005a, 2005b) were the curriculums used for these students). All three of these students progressed from emergent literacy to reading at the first grade level in the course of three academic years. Comprehensive thematic units for six middle school students with cognitive impairments were implemented in a study devised by Cooper-Duffy et al. (2010). These students were exposed to daily explicit instruction in a comprehensive reading program. Over the course of the academic year, these students were given a vocabulary pretest in which the average score was 23%. All six students demonstrated 90% to 100% accuracy on vocabulary words at the end of the unit. Additionally, all six students displayed 80% to 100% accuracy on comprehension questions asked at the end of the thematic unit.

Teachers of the cognitively impaired can expect significant gains in indicators of reading achievement if their students are exposed to comprehensive reading instruction of a daily basis. The potential for reading ability in all students are demonstrated by these studies (Allor et al., 2010). By maintaining high expectations and utilizing research-based instructional techniques, teachers can notice marked improvement in reading skills within an academic year.

**Individual Needs in Comprehensive Instruction**

Comprehensive reading instruction for students with cognitive impairments is promising based on current research. Reading intervention techniques that are effective with struggling readers with average to above average IQs are applicable to students with cognitive impairments as well (Allor et al., 2010; Cooper-Duffy et al., 2010; Browder et al., 2008). However, to apply these methods of instruction, individual needs for instruction must be considered. Students with
cognitive impairments require instructional modifications in the areas of extensive practice and high-quality individualized instruction (Allor et al., 2010a).

Students with cognitive impairments who are exposed to comprehensive reading programs exhibit learning characteristics that require extra forms of instructional support. These students also require extra time to learn. These individualized needs should be embedded within a comprehensive reading program for students with cognitive impairments to be successful.

Individual learning differences in this population are addressed by Allor et al. (2010a). The use of orchestrated time delays has been well-documented in the research of reading instruction for students with cognitive impairments (Allor et al., 2010a; Browder & Xin, 1998; Connors, 1992; Houston & Torgesen, 2004). Time delays between stimulus presentation and student responses were included in the Allor et al (2010b) case study. These time delays were gradually reduced as students mastered content questions. Time delays in instruction were also utilized by Cooper-Duffy et al. (2010). Time delays were necessary and effective in introducing and maintaining concepts in reading lessons according to both sets of authors.

Students with cognitive impairments also require intensive instructional supports in the form of repeated lessons and additional practice activities. Daily reading activities were repeated until students achieved mastery of prerequisite skills in the Allor et al. (2010b) case study. Cooper-Duffy et al. (2010) followed the same procedure, as well as creating additional practice activities for skill mastery. The defining difference between students with reading disabilities and cognitive disabilities is the extra instructional time needed for students with cognitive impairments to make reading progress (Allor et al., 2010c).

Behavioral considerations are a pervasive area of modifications as they relate to reading instruction for students with cognitive impairments. Students with cognitive impairments display
difficulties in the areas of attention, positive peer relationships and compliance (Allor et al., 2010b). Both Allor et al. (2010a) and Cooper-Duffy et al. (2010) incorporated existing behavior plans into their respective reading instructional programs. The same reinforcement systems used in other classroom activities beneficial according to these researchers.

**Curriculum Development**

Bradford et al. (2010b) and Conners et al. (2006) concluded that students with cognitive impairments can improve their decoding and phonemic awareness skills with explicit instruction. The students in these studies were exposed to research-proven decoding activities, but not integrated components of a comprehensive reading program. Researchers in the area of teaching reading to students with cognitive impairments have had to design their own comprehensive reading programs based on interventions that have been validated for learning disabled readers and English Language Learners. Allor et al. (2010b) and Browder et al. (2008) have designed studies that provide longitudinal research on how students with cognitive impairments respond to the integrated components of a comprehensive reading program. Both of these studies represent attempts to create a comprehensive reading program and a corresponding system of assessment for students with cognitive impairments.

Browder et al. (2008) are currently developing and evaluating an early literacy program for students with cognitive impairments that is adapted from strategies found to be effective for struggling readers who are nondisabled. The authors of this five-year longitudinal study have developed a program based on the National Reading Panel’s (2000) components of reading and identified the early literacy skills that build each of these components. After reviewing research on early literacy, the authors created a list of instructional objectives that were submitted to a panel of national experts on early literacy to determine the validity of proposed and missing
objectives. The resulting curriculum is called the Early Literacy Skills Builder (ELSB). The Early Language Skills Assessment (ELSA) was developed by Browder et al. to provide a specific assessment tool for the ELSB curriculum. The ELSB consist of five levels of instruction and 13 measurable literacy objectives. Seven self-nominated special education teachers volunteered to administer control and treatment conditions in an urban school district in a southeastern school district in the United States. These seven teachers nominated 35 students for the study. Twenty-three of these students met the criteria of cognitively impaired, reading below a first grade level, and currently enrolled in grades K-4. This study consisted of a randomized control group design in which half the students from each special education class were randomly selected as the treatment group. This sampling procedure resulted in 12 treatment group students and 11 students in the control group. The dependent variable in this study was student performance on the ELSA measures given as a pretest and posttest. The independent variable was the type of reading instruction administered to both groups.

This study began with all students participating in a series of classroom read-alouds with their classroom teachers. The authors deemed this shared literary experience a foundational level of literary knowledge. These story-based lessons (SBL) were also conducted throughout the school year for both groups of students. The experimental group received a scripted ELSB curriculum from October to May. Teachers implemented the ELSB curriculum either in a 1:1 situation or in a small group of two to four students. Teachers were allowed to determine if a 2-, 4- or 10-day cycle was needed to teach each lesson. Students did not move to the next level of ESLB until they had reached a 75% criterion on the current level. Students also received individualized instruction for skill deficits. Students in the control group received sight word and
picture instruction in accordance with their individualized education programs. These lessons were also conducted in either 1:1 or small group format.

A series of mixed analyses of variances (ANOVAs) were conducted for one between– and one within-subjects factor to determine differences between the treatment and control groups. Following the ESLA posttest, all 11 students in the treatment group progresses through at least one level of curriculum by May; 6 students progressed to Level 2, 3 students progressed to Level 3, 1 student reached Level 4, and 1 student completed Level 5. The mean score on the ESLA by the treatment group improved from 42.64 on the pretest to 79.00 on the posttest with a Cohen’s $d$ of 1.15. Students in the control group mean scores improved from 40.33 to 54.08 with a Cohen’s $d$ of .39. These results indicate that students who received the curriculum learned more of the ESLA objectives than students who did not.

A comprehensive reading program administered to a sample of 59 students with cognitive impairments was designed by Allor et al. (2010b). This experimental longitudinal study improved upon the Conners et al. (2006) study by increasing the sample size and by increasing the instructional treatment time to 110 weeks over the course of multiple school years. Allor et al. identify two purposes for this study. The first objective was to determine whether students in the 40-69 IQ range make progress on standardized reading measures when exposed to comprehensive reading instruction. The second purpose was to investigate whether the sample participating in the 110-week reading program would outperform a control group of similar peers participating in typical special education instruction.

The 110-week instructional sequence was performed at 11-13 different schools over the course of two years. The treatment group consisted of 34 randomly selected students and the control group was composed of 25 randomly selected students. These students had IQ scores...
ranging from 40-69 and were in grades 1-4. Six teachers were specifically hired to teach the interventions to the treatment group.

A comprehensive battery of assessments was administered as a pretest and again at the end of each academic year. Progress-monitoring reading assessments were administered once per month. Students receiving the intervention instruction received between 40-50 minutes of daily instruction. Students in the control group received the normal special education curriculum.

Dynamic Indicators of Basic Early Literacy Skills (DIBELS) were used for progress monitoring every month. Hierarchical linear modeling was used to examine gains on the DIBELS measures. These results indicated that students in the instructional group made gains over the control group in all three DIBELS measures after 2-3 years of instruction. Students participating in the comprehensive intervention outperformed students in the control group who received typical reading instruction. The mean scores on phoneme segmentation fluency, nonsense word fluency, and oral reading fluency for the treatment group after 110 weeks of instruction were 34.531, 55.485, and 44.296 respectively with p< .001 on all measures. The corresponding scores for the control group were 17.833, 32.734, and 26.668 with p< .001 on all measures.

Students with cognitive disabilities often respond favorably to a comprehensive reading program. The decoding ability of students with cognitive impairments demonstrates the effectiveness of explicit reading instruction for students with cognitive disabilities. Students with cognitive disabilities can acquire decoding skills and transfer these skills to unfamiliar words based on the evidence in these studies. These students possess the ability to acquire these skills and benefit from the comprehensive reading programs available in the general curriculum.
Summary

Research has been limited in helping teachers identify methods for teaching students with cognitive impairments to read. Historically, systematic instruction has been effective for teaching students with cognitive impairments sight words (Browder et al., 2006). This systematic approach to instruction with cognitive impairments can be applied to comprehensive reading programs. Students with cognitive impairments can master decoding skills that lead to participation in a comprehensive reading program (Allor et al., 2010b). Effective methods for teaching struggling readers are also effective for teaching students with cognitive impairments, if the pace of instruction is appropriate. These students need extensive opportunities for practice and behavioral modifications (Allor et al., 2010a). Although students with cognitive disabilities learn to read at a much slower pace than students with reading disabilities, the evidence suggests that cognitively impaired students make significant progress in comprehensive reading programs.
Chapter III: Analysis Relative to the Problem

Introduction

Typically students with cognitive impairments have been excluded from the research-based reading interventions and comprehensive reading programs other struggling learners have been exposed to. Recent studies are demonstrating that the same instructional techniques are effective for both groups of students. Teachers of the cognitively impaired have focused on teaching isolated skills such as sight word instruction with success. Studies by Bradford et al. (2006) and Conners et al. (2006) have suggested that students with cognitive impairments are able to learn basic decoding skills with explicit instruction. New research on reading instruction for this population is measuring the effects of comprehensive reading programs that simultaneously provide integrated instruction on multiple skills. Longitudinal studies by Allor et al. (2010b) and Browder et al. (2008) have exposed students with cognitive impairments to comprehensive reading programs. Their results indicate that students with cognitive impairments, on average, outperform their peers on measures of phonological awareness, word recognition, oral language, vocabulary, and basic comprehension when exposed to explicit reading instruction. Currently, there is a paucity of research base on teaching students with cognitive impairments to read. There are no studies that have examined the effectiveness of a comprehensive reading program delivered over a sustained period of time (Allor et al., 2010c).

Research Trends

The primary research–based methods of reading instruction used with students with cognitive impairments have been sight word approaches (Barudin & Hourcade, 1990; Bradford et al., 2006; Browder & Xin, 1998). Sight word instruction has been successful in building specific, functional vocabularies for students with cognitive impairments (Bradford et al., 2006).
Research has indicated that sight word instruction has its limitations. Barudin and Hourcade (1990) and Browder and Xin (1998) have documented that sight word instruction does not provide the word analysis skills needed for students to decode unfamiliar words in functional reading contexts. A reliance upon sight word instruction may limit the size of a student’s potential reading vocabulary, limit their range of functional reading skills, and limit the number of environments in which they may function (Bradford, et al., 2006; Conners et al., 1992).

The realization that sight word instruction limits literary outcomes for students with cognitive impairments have initiated research in the area of comprehensive reading programs for this population. The National Reading Panel (2000) has indicated that decoding and phonemic awareness skills are the best predictors of the ability to read connected text with comprehension. Studies by Bradford et al. (2006); Browder et al. (2008), Conners et al., (2006), and Allor et al. (2010b) have exposed students to systematic instruction in decoding and phonemic awareness in conjunction with progress monitoring. All treatment groups in these studies have progressed to reach higher levels of phonemic awareness and decoding.

This recognition that students with cognitive impairments can progress in phonemic awareness and decoding instruction has led to small case studies in which students with cognitive impairments are exposed to elements of comprehensive reading programs. Both Allor et al. (2010a) and Cooper-Duffy et al. (2010) worked with small groups of students. Both groups of students experienced academic gains when exposed to integrated elements of comprehensive reading programs.

The current trend in reading instruction research for students with cognitive impairments is now focused on exposing this population to comprehensive reading programs over a significant period of time (Allor et al., 2010b; Allor et al., 2010c; Browder et al, 2008). Studies
by Allor et al., (2010) and Browder et al. (2008) are currently exposing students to five years of comprehensive reading programs. Progress-monitoring from the first two years of these studies show academic gains in phonemic awareness and decoding for students with cognitive impairments.

**Evidence of Emergent Literacy Skills**

A synthesis of the research on reading instruction for students with cognitive impairments indicates that these students are responsive to decoding and phonemic awareness instruction. With sustained, explicit instruction, students with cognitive impairments can acquire the emergent literacy skills that produce further literacy development. Students with cognitive disabilities have participated in studies of explicit reading instruction in phonics and decoding in studies by Bradford et al. (2006), Bracey et al. (1975), and Nietupski et al. (1979). In all three studies, small samples of students with cognitive disabilities could decode words when receiving explicit instruction in decoding. Bracey et al. (1975), Bradford et al. (2006), and Nietupski et al. (1979) found that students with cognitive impairments could successfully decode words when participating in a program of systematic phonics instruction. Conners et al. (2006) improved upon previous decoding studies by increasing the sample size of the treatment group. The twenty students in the treatment group who received the 22 decoding lessons were better at sounding out familiar and unfamiliar words than the control group. The results of these studies indicate that students with cognitive disabilities can develop emergent literacy skills through systematic decoding instruction.

**Participation in Comprehensive Reading Programs**

Studies by Bradford et al. (2006) and Conners et al. (2006) have reemphasized that decoding instruction is effective for students with cognitive deficits. With the developing
emergent literacy skills of phonemic awareness and decoding, students with cognitive impairments are capable of participating in the comprehensive reading programs that other struggling readers participate in. Research trends in which students with cognitive disabilities are being exposed to the integrated elements of comprehensive reading programs are just beginning to develop.

The first step in initiating students with cognitive impairments into comprehensive reading programs has been longitudinal case studies with small samples. Students with cognitive impairments exposed to comprehensive reading programs have experienced better literary outcomes (Allor et al., 2010b; Cooper-Duffy et al., 2010). The students with cognitive impairments involved in these studies all made progress in reading achievement when exposed to comprehensive reading programs. The three students in the Allor et al. (2010a) case study showed gains in three DIBLES measures: oral reading fluency, nonsense word fluency, and phoneme segmentation. All three of these students progressed from emergent literacy to reading at the first grade level in the course of three academic years. Cooper-Duffy et al. (2010) devised and implemented a study utilizing comprehensive thematic units for six middle school students with cognitive impairments. These students were exposed to daily explicit instruction in a comprehensive reading program. These six students demonstrated gains in vocabulary and reading comprehension.

The success of these smaller case studies has generated longitudinal studies with greater sample sizes. Longitudinal studies by Allor et al. (2010b) and Browder et al. (2008) are currently exposing students with cognitive impairments to the elements of comprehensive reading programs. After 2-3 years of instruction, students in these studies made progress on phonemic awareness, oral language and vocabulary, phonemic decoding, word identification, and reading
Comprehension. In both of these studies, students with cognitive impairments exposed to comprehensive reading programs outperform peers receiving typical special education reading instruction on standardized reading measures.

**Summary**

Students with cognitive impairments are now just beginning to be exposed to the comprehensive reading programs other struggling readers have benefitted from. This exposure represents a shift from the traditional methods of sight word instruction for this population. Studies by Bracey et al. (2006) and Conners et al. (2006) demonstrated that students with cognitive disabilities can acquire the emergent literacy skills necessary to progress in a comprehensive reading program. Longitudinal studies by Allor et al. (2010) and Browder et al. (2008) are currently exposing students with cognitive deficits to the integrated components of comprehensive reading programs. The results of these studies after 2-3 years of instruction indicate that students with cognitive impairments learn basic reading skills when given explicit and comprehensive reading instruction over an extended period of time. Further longitudinal research is needed to determine if comprehensive reading programs can help students with cognitive disabilities process and comprehend connected text.
Chapter IV: Recommendations and Conclusion

Introduction

Opportunities and exposure for students with cognitive impairments in the general curriculum is increasing. The Individuals with Disabilities Act (IDEA, 1997; IDEA 2004) mandates that students with cognitive impairments be included in the general curriculum to the largest extent possible. Only one in five children with mild or moderate cognitive impairments achieves minimal literacy skills (Katims, 2001). The benefits of an increased exposure to the general curriculum should improve the literary outcomes for students with cognitive impairments.

Research is limited in comparing the reading instruction needs of students with cognitive impairments and students with learning disabilities. More longitudinal research is needed on how students with cognitive impairments progress when exposed to proven reading interventions (Allor et al., 2010b). Reading instruction that is effective for students with learning disabilities and students with cognitive impairments is being examined by current studies (Browder et al., 2008). Limited research on the effects of comprehensive reading programs for students with cognitive impairments has yielded recommendations for practice.

Practical Implications

Instruction focusing on the comprehensive integration of The National Reading Panel’s (2000) components of reading for students with cognitive impairments is a relatively new research trend. The most important practical implication of this research is convincing educators of the cognitively impaired to implement comprehensive reading programs for their students (Allor et al., 2010c). Recent studies on reading instruction for students with cognitive deficits
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(Allor et al., 2010b; 2010c; Browder et al., 2008; Conners et al., 2006) support educators who choose reading instruction that is comprehensive and not limited to sight word instruction.

Another practical implication for instituting comprehensive reading programs for students with cognitive impairments is mirroring the process of implementing reading programs and interventions for other struggling readers. Educators of the cognitively impaired must seek out reading interventions and programs with proven rates of effectiveness and implement these programs with high rates of fidelity. However, interventions used in the past such as Early Interventions in Reading Level 1 and Early Interventions in Reading Level 2 (Mathes & Torgesen, 2005a; 2005b) and Corrective Reading Program (Engelmann, Carnine, & Johnson, 1988) will only take students with cognitive impairments so far. These interventions target specific skill deficits, but do not systematically expose students to the integrated components of reading. Students with cognitive deficits need to be immersed in comprehensive reading programs of the same quality as other students. Local and state education agencies need to allocate funds to provide teachers of the cognitively impaired with these instructional materials. Students with cognitive deficits should be exposed to the elements of the basil series now prevalent in elementary schools. Additionally, teachers of the cognitively impaired need to be dedicated to the use of progress monitoring in driving instruction in comprehensive reading programs. In the process of mirroring the programs for other struggling learners, teachers of the cognitively impaired should expect their programs to include all the same components and the same quality.

Experimental research that focuses on the National Reading Panel’s (2000) components for this population is new and leaves many questions for literacy planning. Presently, the best option for teachers of the cognitively impaired is to adapt and utilize interventions and strategies
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that have been proven effective with other struggling readers (Browder et al., 2008). Professional development and consultation opportunities must be present for teachers of the cognitively impaired. These opportunities help to ensure higher rates of fidelity to research-based curriculums and teaching techniques. Teachers of the cognitively impaired should seek out the expertise of reading coaches as teachers of other struggling learners often do (Allor et al., 2010b; Browder et al., 2008). In Browder et al. (2008) teachers attended training workshops prior to providing reading instruction. These teachers also received ongoing classroom consultations and observations in an effort to maintain ongoing procedural fidelity.

**Teaching Implications**

A lack of focus on comprehensive reading instruction for students with cognitive impairments leaves many questions regarding literacy planning. Longitudinal studies by Allor et al. (2010b) and Browder et al. (2008) have exposed students to comprehensive reading programs and have provided recommendations for teaching practice. A primary recommendation is that students with cognitive impairments need explicit reading instruction over a longer period of time than other students. Students with cognitive impairments should progress through the same literary conventions of concepts of print, letter knowledge, and phonemic awareness as other learners even though their timeline will look different. Allor et al. (2010b) found that students with cognitive impairments need more time to attain basic literacy skills. The students in this study needed three years of intensive instruction to reach an ending first grade level in phonemic awareness and decoding. Allor et al. suggested that there was little or no progress on DIBELS progress monitoring measures for the first year of the intervention.

To accommodate the extended timelines needed to teach reading to this population, comprehensive reading programs should contain these key features. The instructional techniques
should be consistent with interventions that have been proven effective with other struggling readers. The basis of these interventions needs to be systematic, explicit instruction in all components of reading. These interventions should contain repetitive routine activities that are implemented with consistent instructional language. In addition to routines, students with cognitive impairments respond to fast-paced, short activities that are motivating (Allor et al., 2010c).

To evaluate the effectiveness of these components, a system of progress monitoring should be present to make data-based decisions (Allor et al. 2010b; Allor et. al.; & Browder et al., 2008). DIBELS was utilized as the progress monitoring tool for studies by Allor et al. (2010b), Browder et al. (2008), and Connors et al (2006). Assessments such as DIBLES provide frequent data in which to plan instruction for students with cognitive disabilities. Using assessment to drive instruction is consistent with comprehensive reading instruction for other struggling learners. DIBLES should be used as a system of progress monitoring for students with cognitive impairments. The three DIBLES measures of phoneme segmentation fluency, nonsense word fluency, and oral reading fluency are relevant to measuring the skills needed by students with cognitive impairments to participate in comprehensive reading programs.

**Areas for Further Research**

Prior research in the area of reading instruction for students with cognitive impairments has established that these individuals can learn to read sight words through systematic instruction. The next step for these students is to involve them in comprehensive, longitudinal literacy instruction that focuses on the integrated components of reading (Browder et al., 2006; 2008). More studies are needed that examine the effectiveness of comprehensive reading programs over a sustained period of time. Phonics and phonemic awareness studies such as the
ones by Bradford et al. (2008) and Conners et al. (2006) have established the ability of students with cognitive impairments to acquire foundational reading skills. Presently, only two longitudinal studies by Allor et al. (2010b) and Browder et al. (2008) are being conducted to explore the effects of comprehensive reading instruction on students with cognitive impairments.

Studies exposing this population to longitudinal, comprehensive reading programs are needed to measure progress over a longer period of time. This progress would inform researchers and teachers of factors that predict and influence success for students with cognitive impairments. This research would help to identify specific modes of instruction for teaching reading to students with cognitive impairments. Additional research would also generate assessments specific to this population.

Proposed Study

Designing longitudinal studies for a low incidence population such as students with cognitive impairments produces inherent difficulties. It is difficult to create a sample size large enough for a group design study. Allor et al. (2010b) noted that although their treatment group of 59 elementary students is relatively large for a low incidence population, it was not large enough to justify the statistical methods employed. To counteract the effects of the low incidence of students with cognitive impairments, a study could be designed utilizing the self-contained cognitively impaired classrooms in the Intermediate School Districts in Michigan. Sample sizes for the treatment group of approximately 10 students per classroom would produce a treatment group much larger than those included in previous studies.

A group vs. group design could be implemented by randomly selecting control and treatment groups from these self-contained cognitively impaired classrooms. The Comprehensive Test of Phonological Processing (Wagner, Torgesen, & Rashotte, 1999) would be administered
to students in the control and treatment groups as a pretest battery. All students would be tested on three subtests: Blending Words, Blending Nonwords, and Segmenting Words. After establishing a pretest baseline, the treatment group would be exposed to a comprehensive reading program that begins with a foundation of phonemic awareness and decoding instruction. The control group would receive the typical mode of reading instruction used in that classroom. Students in both groups would receive progress monitoring in the form of DIBELS. Students would be tested on the DIBELS measures of Phoneme Segmentation Fluency, Nonsense Word Fluency and First-Grade Oral Reading Fluency three times during the academic year. Students in the treatment group would receive 40-50 minutes daily in comprehensive reading instruction. This longitudinal study would span five academic years. At the end of the first academic year, The Comprehensive Test of Phonological Processing would be re-administered as a posttest. Hierarchical linear modeling would be used to examine student gains on the three DIBELS measures.

The DIBELS data would be collected over the five years of the study. By exposing students with cognitive impairments to comprehensive reading programs for this length of time data could be collected on oral retell fluency and oral retell skills. These are areas that previous longitudinal studies have not been able to address.

Summary and Conclusion

Approximately three decades of research conducted in response to the federal government’s Reading First initiative have identified the foundational, emergent literacy skills necessary to gain competence as a reader (Browder et al., 2008). The National Reading Panel (2000) and National Institute for Literacy (2001) have identified a foundation of phonemic awareness and decoding skills as predictors of success in emerging literacy. This focus on
identifying the scientific components of reading has largely ignored students with intellectual and developmental disabilities (Browder et al., 2008). The ability of students with cognitive impairments to acquire these emergent literacy skills is well documented in studies by Bradford et al. (2006) and Conners et al. (2006). These studies indicate that students with cognitive deficits respond to explicit instruction in phonemic awareness and decoding.

The knowledge that students with cognitive impairments can attain basic reading skills with scientific reading instruction has introduced research exposing this population to comprehensive reading instruction. Studies by Allor et al. (2010b) and Browder et al. (2008) are currently conducting longitudinal studies in which students with cognitive disabilities are participating in comprehensive reading programs. Preliminary results from these studies indicate that students with cognitive impairments can learn basic reading skills with comprehensive reading instruction over a significant period of time (Allor et al., 2010c). Further research is needed to address a multitude of questions related to reading instruction for students with cognitive impairments. More longitudinal research exposing students with cognitive disabilities is needed to explore what outcomes are possible for this population.
References

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