

USING PICTURES TO STIMULATE DEVELOPMENT THROUGH LEARNING
WORDS: THE EFFECT OF PERSONAL PHOTOGRAPHS AND PICTURE
COMMUNICATION SYMBOLS ON INCREASING SIGHT WORD VOCABULARY
FOR STUDENTS WITH SEVERELY LIMITED READING ABILITY

by

Mary Kathryn Maher
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Committee:

Margaret Mastropieri Chair
Michael M. Ben

Gary R. Galluzzo
C. K. Egg Program Director

[Signature] Dean, College of Education and Human
Development

Date: 9/11/08 Fall Semester 2008
George Mason University
Fairfax, VA

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Doctor of Philosophy at George Mason University

By

Mary Kathryn Maher
Master of Education
George Mason University, 2001
Master of Education
George Mason University, 1996
Bachelor of Arts
Manhattan College, 1981

Director: Margo Mastropieri, Professor
College of Education and Human Development

Fall Semester 2008
George Mason University
Fairfax, VA

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DEDICATION

This is dedicated, in memoriam, to my son Kevie. I made a promise seventeen years ago to Kevie that I would learn everything about special education and how to help kids like him, to be the best they can be. He inspired me to always keep learning.

For my husband, Kevin, who I am indebted to (no, really) he's counting. His love is always and forever. For Kourtney, whose giving and insightful soul makes me smile. Her essence is only one of her most engaging qualities. For Brittie, who makes life better with her ability to love. She never met a challenge she couldn't overcome.

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ABSTRACT

USING PICTURES TO STIMULATE DEVELOPMENT THROUGH LEARNING WORDS: THE EFFECT OF PERSONAL PHOTOGRAPHS AND PICTURE COMMUNICATION SYMBOLS ON INCREASING SIGHT WORD VOCABULARY FOR STUDENTS WITH SEVERELY LIMITED READING ABILITY

Mary Kathryn Maher, Ph.D.

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Dissertation Director: Dr. Margo Mastropieri

The purpose of this study was to examine the effects of a reading intervention on increasing the sight word recognition using language books across three instructional phases for three students with moderate disabilities. Students' attitudes and parents' perceptions of the instructional methods employed were also assessed. A multiple baseline design across participants was implemented to examine the effect of reading strategies on increasing sight word vocabulary for children with moderate disabilities who were an average age of 17.7 years. All the participants were able to understand simple directions and had limited conversational speech. Target words were selected using parent input. Following baseline condition, during which student performance was assessed using flash cards containing words, the three treatment phases included use of: (a) phase I: personal photographs embedded within the new vocabulary words; (b) phase II: picture communication symbols; and (c) phase III: generalization to flash cards

containing only words. Student maintenance of word recognition was also measured. Reading accuracy data were collected during each phase. Participant surveys and parent interviews were analyzed to examine the attitudes and perceptions of their parents. Visual inspection of the data revealed that all the participants increased their sight word vocabulary using both reading strategies, including personal photographs and picture communication symbols. These findings were also supported by exceptionally high levels of percent of nonoverlapping data from baseline to treatment phases and statistical significance on randomization tests. Two of the three participants were able to generalize their knowledge during the flashcard phase. Survey results revealed that two of the three students preferred using personal photographs for learning new vocabulary words. All parents were positive in their assessment of the instructional methods used and reported that their expectations for instruction were met. These findings support previous studies demonstrating that certain reading strategies can be effective for increasing sight word vocabulary for individuals with moderate intellectual disabilities who have severely limited reading ability. Future research can address which of the strategies implemented may be more powerful for similar students.

1. Introduction

Introduction to the Problem

In 1975 the Education for All Handicapped Children Act, PL 94-142 legislation introduced initiatives into education to ensure each child had access to a free appropriate public education. Reauthorized in 1990 and 1997 IDEA, NCLB of 2001, and IDEIA of 2004 acts focused more resources and money toward the disabled population. During this same period more children were being diagnosed as severely disabled and new often undiagnosed conditions continued to challenge the education system. New methodologies have been introduced such as inclusion and self-contained classes, all in an effort to improve the educational experience of the severely disabled student population. The purpose of this investigation was to examine the effects of a reading intervention, specifically language books (word-picture-definition) on students with severe disabilities and their capability to increase sight word vocabulary. Literacy is an integral skill that can ensure future success (Downing, 2005). Specifically with No Child Left Behind Act of 2001 focusing on making sure all children learn and acquire skills to be successful, it becomes imperative that literacy mastery be part of every child's education.

The term severe disability is defined as having a primary disability that severely impairs one of several areas including: cognitive abilities, adaptive skills, and life

functioning (Office of Special Education, 2005). A child with severe disabilities requires additional support as well as different strategies to acquire literacy skills (Kliewer & Biklen, 2001). Research has suggested that many children with severe disabilities have the motivation and potential to learn to read and write. One factor that impedes learning to read and write is, perhaps, traditional teaching methodologies. Children with severe disabilities need systematic intensive training in order to understand or progress in the area of reading and writing (Basil & Reyes, 2003).

Background of the Problem

Research on literacy indicates that there are factors to be considered such as reading readiness, speech before reading, and a child's cognitive level (Spear-Swerling, 2004). These factors are equally important to consider when dealing with children with disabilities. These factors can make literacy success challenging. These children need additional support in building skills to achieve any measure of literacy success. The transition from emergent reader to conventional reader for a child with severe disabilities takes more time and effort and different strategies that meet their individual needs. Literacy is often a low priority for children with severe disabilities and they have less exposure to literacy in the classroom (Basil & Reyes, 2003). This is a critical issue for children's literacy development.

Research has shown that giving a child exposure to early literacy activities is beneficial (Kliewer & Biklen, 2001). To children with severe disabilities this exposure is even more critical. These children need to experience language and know that sounds correspond to speech and that words are made up of the sounds. This is the beginning of

their independence skills by understanding the world around them (Lindfors, 1999). Literacy is more than learning to read. Literacy is about experiencing the world through language development (Basil & Reyes, 2003). Children with severe disabilities acquire language by listening to others and learning about sharing. The more experiences in literacy the more benefits for each child (Basil & Reyes, 2003). Every child can use oral language experiences every day. These experiences are a starting point to increase and improve their ability to express themselves verbally or using pictures in a participatory manner.

Students with disabilities need more experiences in literacy and more training than other children (Basil & Reyes, 2003). This is the key point in understanding how children with severe disabilities need a different strategy or tool in order to understand or progress in the area of reading and writing. One reason for a student not succeeding in acquiring literacy skills is that they don't understand the task that is being asked of them. These students are not engaged in the activity and are difficult to reach. The approach of "scaffolding" might be useful to these students because they are actively learning and are participating in the activity (Basil & Reyes, 2003).

Children who have difficulty with oral language often will have difficulty with learning literacy skills as well (Menyuk & Chesnick, 1997). There are many factors associated with children who struggle with both tasks (Jennings, Caldwell, & Lerner, 2006). Some of the problems that put children at risk for struggling with literacy are their home life, their school life, their culture, and their social life. These factors can prevent children from progressing and acquiring the necessary literacy skills. Research tells us

that early intervention for children at risk for reading difficulties is important and beneficial (Jennings et al., 2006).

Language skills are important for all students so they can effectively communicate with others. This is particularly important in the classroom, where ideas are often shared verbally. The opportunities for children to use language happen all day in the classroom but it is important to have a specific time for skill building for language development (Pinnell, 1985).

Research suggests that acquiring literacy skills is built on a foundation of language skills that are learned in the home environment (Jennings et al., 2006). These preliteracy skills are vital for children who are disabled and need additional support to acquire the necessary skills for literacy success. Children's language skills at the beginning of their lives lay the foundation for the reading and writing later in school and in life. Children with limited language skills have difficulty with learning to read (Jennings et al., 2006).

There are two skills that are needed for a child to learn how to read: code-related skills; and oral language skills (Jennings et al., 2006). The code related skills involve a child learning the alphabet and understanding sound/symbol relationship and those words are comprised of different sounds. Thus the child begins to understand the words in print. Oral language skills involve vocabulary and storytelling skills. The child begins to have comprehension skills. These skills play an important role in comprehension and learning to read (Spear-Swerling, 2004).

Children need to understand the importance of print and the function of print to begin to see the relationship between printed language and oral language. Both are forms of communication and both concepts are needed to become an effective reader. Children need to understand about language and how words are printed and spoken and both are important to learn to read.

Significance of the Problem

Many researchers have told us that we know how to improve reading instruction for children with severe reading disabilities, yet we do not understand all the conditions that are essential for these students to become skilled readers (Torgesen, Wagner, Rashotte, Burgess, & Hecht, 1997). There are significant gaps in understanding how to instruct the 3% to 5% of children with the most profound reading disabilities (Torgesen et al., 1997).

Reading has fundamentally two components: word recognition and reading comprehension (Juel, Griffith, & Gough, 1986). These two components are integral in reading instruction for children with severe reading disabilities. Literacy is defined as being able to read and write as well as being able to generate and receive messages. Students who have multiple disabilities are not able to engage in literacy (Downing, 2005). Many students have difficulty acquiring literacy skills. Students with severe disabilities have great difficulty attaining basic skills in literacy (Kliewer & Biklen, 2001). This area of research is limited and there is great potential for learning more about the importance of effective reading programming for students with severe disabilities.

Students with disabilities need more experiences in literacy and more training than other children (Basil & Reyes, 2003). This is the key point in understanding how children

with severe disabilities need a different strategy, tool and scale in order to understand or progress in the area of reading and writing.

Children acquire important skills beginning at birth that can help them achieve literacy success later in life. Research tells us that children with disabilities require a foundation that includes oral language skills, social skills, and cognitive skills that can enhance a child's ability to acquire literacy skills (Spear-Swerling, 2004). For some children there are other ways of knowing about literacy that enable them to both construct meaning and communicate meaning (Crawford et al., 1995). For children with severe disabilities it is vitally important to acquire literacy skills for their independence. Literacy experiences can enhance their lives in many ways (Yaden, Rowe, & MacGillivray, 2000).

Browder, Wakeman, Spooner, Ahlgrim-Delzell, and Algozzine (2006) examined 128 studies on teaching reading to individuals with significant cognitive disabilities. The review focused on studies that used the National Reading Panel's five components of reading as a standard. This review identified quality studies that highlighted effective reading instruction for this student population. Browder et al., (2006) found that systematic prompting such as time delay was the most effective tool for teaching sight word vocabulary. Researchers found further evidence to indicate that pictures helped teach comprehension skills.

Researchers and practitioners have acknowledged the significance of children's literacy skills to many areas of their lives (Kliewer & Biklen, 2001). It is important to understand what predicts the growth of literacy skills in students with severe disabilities. However, little is known with respect to examining the role of two instructional

strategies, personal photographs and picture communication symbols, on sight word vocabulary. We do know that pictures can be an effective instructional tool for students with significant cognitive disabilities to increase their sight word vocabulary (Lignugaris/Kraft, McCuller, Exum, & Salzberg, 2001). Research suggests that sight word vocabulary can lead to functional use in the lives of students with significant cognitive disabilities (Browder et al., 2006). There is little evidence about the development of broader literacy skills acquisition for students with significant cognitive disabilities and if students can generalize their sight word vocabulary skills to other materials and settings. Sight word instruction can not provide a means to generalize from known to unknown words (Browder & Lalli, 1991; Browder & Xin, 1998). A great need exists for a variety of instructional strategies for teaching literacy skills for students with significant cognitive disabilities (Browder & Xin, 1998).

Statement of the Problem

Students with disabilities often get stalled at the emergent literacy level (Erickson, Musselwhite, & Ziolkowski, 2002). This means that some students may listen to text for various reasons but may not be able to read on their own (Erickson et al., 2002). The climb up the literacy ladder is challenging for students with severe disabilities. A literacy program of intensive explicit instruction helps children make the first step onto the literacy ladder (Basil & Reyes, 2003). An effective program can capture a child's ability to become a reader. But without intervention the child will struggle to climb onto the literacy ladder. Without the first step, effective reading intervention, students will have

difficulty achieving the first rung of the ladder. A student with severe disabilities will be stalled on the climb to literacy attainment.

Researchers and practitioners have acknowledged the significance of children's literacy skills to many areas of their lives (Kliewer & Biklen, 2001). It is important to understand what predicts the growth of literacy skills in students with severe disabilities. Therefore, this study is intended to evaluate the effectiveness of two reading strategies, personal photographs and picture communication symbols, on increasing sight word vocabulary for children with severely limited reading ability.

Research Questions

This study specifically asks the following research questions:

1. Do personal photographs increase sight word vocabulary in children with severely limited reading ability?
2. Do Picture Communication Symbols increase sight word vocabulary in children with severely limited reading ability?
3. Does this sequence of teaching from concrete to abstract facilitate reading?
4. Does increasing sight word vocabulary for children with severe disabilities lead to generalization of new acquired sight words to other materials?
5. What are the perceptions of the parents regarding using instructional strategies for their children to improve and generalize their sight word vocabulary?
6. What are the attitudes of the participants in using these instructional strategies on improving their sight word vocabulary and generalizing those words to other materials?

Definition of Terms

Severe Disability: The term severe disability is defined as having a primary disability that severely impairs one of several areas including: cognitive abilities, adaptive skills, and life functioning (Office of Special Education, 2005). The ADA of 1990 stated that a person with either a physical or mental disability is substantially limited in one or more major life activity. Children with severe disabilities have limitations in one or more main areas of learning. Children with severe disabilities need different tools in order to develop skills, i.e., sight word vocabulary. Children with severe disabilities need educational programs and services that incorporate a variety of strategies that can meet their individual learning needs.

Sight Word Vocabulary: This is a list of functional words that can be student specific to help children build basic skills. Students are able to build their word recognition skills and help them progress in the area of reading. Sight word acquisition is important to the daily living of children with severe disabilities (Fossett & Miranda, 2006). Through the acquisition of sight words, individuals with moderate and severe disabilities can enhance their daily living and job skills (Browder & Xin, 1998). For example, sight words have been used for grocery shopping and household chores, following instructions for cooking and other daily tasks, reading product warning labels, and reading signs during community recreation (Browder & Xin, 1998).

Personal Photographs: These pictures are representative of the child acting out the word. Learning using picture representation is a useful concept when teaching children with severe disabilities to acquire literacy skills. Pictures can circumvent

deficiencies for children with disabilities in the learning process (Randhawa & Coffman, 1978). Using pictures to teach a skill can be an effective instructional approach for children with severe disabilities.

Picture Communication Symbols: These symbols are black and white drawings that symbolize a word. Each symbol is representative of a word. The graphic symbols give a visual cue to the reader to help them decipher the meaning of the word. These symbols are visual communication tools that help teach children the meaning of pictures and help children associate the picture with a word. These symbols help support the individual learning styles of children with severe disabilities.

Severely Limited Reading Ability. This includes three major areas of assessment which are: intellectual disability; eligible for alternative assessment (e.g., VAAP); limited number of known words. The first area of assessment is intellectual disability which refers to a person having below normal intellectual capacity. According to the American Association on Intellectual and Developmental Disabilities (AAIDD) definition on intellectual disability, it is defined as having significant limitations in both intellectual functioning and adaptive behavior (Schalock et al., 2007). The term intellectual disability is being used in place of mental retardation (Schalock et al., 2007). This term covers the same population of individuals who had been diagnosed with mental retardation in terms of kind, level, type and duration of the disability (Schalock et al., 2007). The second area of assessment is eligibility for alternative assessment because standard assessments are not possible for the individual. Alternative assessments are able to demonstrate what a child does understand and can provide detailed descriptions of the child's performance.

One of the main tenets of alternate assessments was that States would know that these individuals were meeting the expectations for learning (Browder et al., 2003). These expectations would ensure educational accountability for these students (Browder et al., 2003). The third area of assessment is a limited number of known words as reported by parents and validated by school records.

Literacy. Literacy is the ability to use and understand words. It also refers to having a set of skills to learn how to read.

Fragile X syndrome. Fragile X syndrome is caused by a genetic mutation (Hall, Lightbody, Reiss, 2008). Fragile X is the most common inherited cause of intellectual disability and boys are more severely affected than girls (Price, Roberts, Hennon, Berni, & Anderson, 2008). This disorder causes moderate to severe mental retardation as well as language delays (Price et al., 2008).

Down Syndrome. Down syndrome causes mental retardation and heart defects (Korenberg et al., 1994). Down syndrome is uniquely identifiable by certain facial and physical features (Korenberg et al., 1994). Down syndrome is caused by having an extra chromosome. It causes various anomalies that include deficiencies in intellectual functioning as well as defects in the immune, endocrine, and gastrointestinal systems. Down syndrome causes an increased risk of leukemia and dementia (Korenberg et al., 1994).

Tetralogy of Fallot. Tetralogy of fallot refers to four defects within the heart and is the most common heart defect found in children (Joransen, Lucas, & Moller, 1979).

Dysphasia. Dysphasia is a severe childhood learning disorder of unknown etiology (Chiron, et al., 1999). Recent findings on dysphasia suggest left hemisphere of patients is affected and may cause language disorders (Chiron, et al., 1999).

Oromotor apraxia. Oromotor apraxia is a communication disorder where oral movements like tongue wagging or sequencing movements like wagging then smiling are difficult for the child (Hodge, 1994).

2. Literature Review

Introduction to Literature Review

This chapter is divided into four sections. The first section presents a theoretical understanding of how children with severe disabilities learn sight word vocabulary and acquire literacy skills. Included in this section is a description of three main areas that address sight word acquisition for children with severe disabilities: 1) oral language development; 2) link between oral language and reading; 3) importance of reinforcement in learning. The second section includes the conceptual framework and presents a rationale for a layered approach to acquiring literacy skills for students with severe disabilities. The third section reviews literature on reading and students with severe disabilities and presents a review of current literature on sight word vocabulary acquisition with students with severe disabilities. The fourth section describes the importance of picture reading skills included is a rationale for using pictures as instructional tools for students with severe disabilities, and a description of picture reading studies for students with disabilities.

We've all said and heard that a picture is worth a thousand words. The term picture refers to any two-dimensional representation. Pictures can be detailed, representational, or spatial (Randhawa & Coffman, 1978). Pictures can enhance our understanding of a concept, illustrate a text, give a graphic description and enable learning to happen.

Learning using picture representation is a useful concept when teaching children with severe disabilities to acquire literacy skills. Pictures can circumvent deficiencies for children with disabilities in the learning process (Randhawa & Coffman, 1978). Using pictures to teach a skill can be an effective instructional approach for children with severe disabilities. The skill of increasing sight word vocabulary for children with severe disabilities can promote independence for job skills and improve their daily lives (Browder & Xin, 1998). Considering the importance of the link between sight word vocabulary and word comprehension and the influence it has on children with severe disabilities' lives in their homes, school, and community environments, it is critical to examine what skills can promote word knowledge to help achieve a beginning of literacy acquisition which can expand their lives.

Researchers have recognized the importance of students' literacy skills to success in many areas of life (Basil & Reyes, 2003). Students need to strive to climb the ladder to literacy in order to progress in any other subject areas in school. The literacy ladder can be described as having rungs with a set of increasingly complex sub skills. According to this viewpoint, every rung contains core competencies that must be mastered before climbing to the next rung on the ladder (Kliewer & Biklen, 2001). Generally children with severe disabilities stall at the readiness level where cognitive mastery is demanded (Kliewer & Biklen, 2001).

One step toward literacy success for children with severe disabilities is to acquire sight words. Sight word acquisition is important to the daily living of children with severe disabilities (Fossett & Mirenda, 2006). Through the acquisition of sight words,

individuals with moderate and severe disabilities can enhance their daily living and job skills (Browder & Xin, 1998). For example, sight words have been used for grocery shopping and other tasks in the house, cooking directions, and other daily activities, reading product labels, and reading signs during community activities (Browder & Xin, 1998).

Oral Language Development

Before children can progress in reading they need to develop oral language skills (Menyuk & Chesnick, 1997). Oral Language is the first language process developed. Once oral language is developed it allows for the development of reading, writing, thinking and learning (Pinnel, 1985; Silliman & Wilkinson, 1994a). Oral Language development allows children to make sense of what they read and write. According to Stallman and Pearson (1990) young children go about the process of learning how to talk as they are immersed in language. They learn by listening to and trying out language through social interactions. By the time they enter school children have already explored many of the forms and functions of language (Morrow & Smith, 1990; Pinnell, 1985). They have used language to express themselves, find out about things, give information, negotiate, interact, and acquire knowledge about the world (Pinnell, 1985).

Oral Language, the complex system that relates sounds to meanings, is made up of three components: the phonological, semantic, and syntactic (Lindfors, 1999). The phonological component is made up of morphemes, the smallest units of meaning that may be combined with each other to make up words. The syntactic component consists of the rules that enable us to combine morphemes into sentences (Lindfors, 1999). Some

language experts would add a fourth component known as pragmatics. This deals with the rules of language use. Pragmatic rules are part of our communicative competence which is our ability to speak appropriately in different situations (Genishi, 1988).

Research has indicated that teachers can help sustain oral language development by providing environments full of language development opportunities (Eeds & Wells, 1989; Guthrie & Anderson, 1999). Children learn very early on how conversations work (taking turns, looking attentively, using facial expressions) as long as they have experiences with others. This can be nurtured in the classroom through promoting activities that enhance language development.

Children learn best through direct experience with actual physical objects and materials (Erickson et al., 2002). According to Erickson et al., (2002) active exploration in a supportive classroom environment is essential to children's learning. The children connect new information to their own prior experiences through carefully designed and meaningful teacher/student interactions. Teachers can foster this construction of knowledge by encouraging and accepting the child's own interests. This can be accomplished in any classroom when children are able to learn and apply what they've learned. Children move through the learning cycle over time in an environment, which promotes positive condition for learning. This is especially applicable for language development (Erickson et al., 2002).

Researchers have indicated that children need to be given the tools to learn and grow (Guthrie & Anderson, 1999). Every child needs the foundations to develop their skills so they can progress and attain literacy success. Alternative approaches to literacy

instruction may support a child's language acquisition process (Basil & Reyes, 2003). The basic difference is in how each population attempts that goal. The non-disabled population achievements come from self-motivation and interactions. Motivation is part of one's personality and can contribute to one's learning (Argyris, 1957). Motivation can help students achieve and perform tasks, such as learn new sight words. One of the factors in understanding motivation is perceived competence (Crow, 2007). The severe student population must also deal with the timing of what may be called, the literacy challenge. For many, it is not easy to achieve proficiency in oral language skills, thereby delaying the normal building blocks to literacy. A child must first develop oral language skills as the fundamental journey to literacy (Menyuk & Chesnick, 1997).

Link between Oral Language Skills and Reading

There is a link between oral language knowledge and reading (Menyuk & Chesnick, 1997). Depending on a child's level of development, children with problems in oral language may not have knowledge of words and sentences in order to read (Menyuk & Chesnick, 1997). Reading demands that children are aware of the various categories and associations in the language (Menyuk & Chesnick, 1997). A child's processing ability can predict both their oral language and reading ability significantly (Menyuk & Chesnick, 1997).

Lanter and Watson (2008) provided a tutorial on improving reading skills of students with autism spectrum disorder (ASD) by encouraging a connection between oral language skills and reading skills. The focus was to ensure that both the literacy needs as well as the oral language needs of children with ASD are met in schools. Lanter and

Watson (2008) state that promoting reading skills can help improve oral language skills for children with ASD. Research suggests that helping children with ASD learn to read does improve their oral language skills (Lanter & Watson, 2008).

The Importance of Reinforcement in Learning

Skinner's operant conditioning research informed us that all behavior is purposeful (O'Donohue & Ferguson, 2001). Skinner's research on operant behavior indicated that behavior that is reinforced in a positive manner will reoccur. Skinner's theories indicated that learning occurred as the outcome of selection by consequences of behavior (O'Donohue & Ferguson, 2001). He extended his theories to include language development as well. He began the discussion on the importance on repetition in learning especially for children learning language or a new task. Skinner believed that the key variable is reinforcement. He believed that practice provided opportunities for additional reinforcement. His work was on behavior modification and that reinforcing good behavior is appropriate to learning a new behavior. Skinner believed that changing behavior through positive reinforcement helps create change in people (Skinner, 1978). Positive reinforcement is strengthening (Skinner, 1978). Skinner influenced the use of reinforcements in learning and how reinforcers can produce generalizability to other materials. The importance of generalizability in this study is critical due to the link between increasing sight word vocabulary and independence skills in the lives of students with severe disabilities.

Relevant Theorists who Promote Cognitive Growth from Nonrepresentational Thought

Vygotsky's social development theory and Piaget's stages of cognitive development tells us how children learn and develop and how to teach children in a developmentally appropriate manner. Both Piaget and Vygotsky are germane in discussing emergent literacy and a child's cognitive level of understanding. Piaget was interested in cognitive development and how children think and how they interact in the world (Pellegrini, Galda, Bartini, & Charak, 1988). Piaget believed that children must be active learners and discover their world through questioning and exploring (Pellegrini et al., 1988). He stated that our curiosity manifests itself from infancy, therefore our cognitive functions are innate as well (Piaget, 1981). Piaget believed that our cognitive activity is related to our hereditary needs (Piaget, 1981). Vygotsky believed that an individual is the direct result of their culture and that their language and reasoning process are interrelated (Rieber & Carton, 1993). A child develops through his or her culture and immersion in the language process. Vygotsky believed that children are so much more than their IQ scores (Rieber & Carton, 1993). Children are a product of their language and language is a tool that provides a means of making sense of their world. Language can help children both socially and cognitively. Consequently, to enhance the social and cognitive development of children with severe disabilities requires interventions that enhance their oral language (Rieber & Carton, 1993).

L. Vygotsky saw handicap as a process not a condition. His forward thinking built the groundwork for distinguishing between a child's actual level of development and his potential ability to learn (Rieber & Carton, 1993). Vygotsky was a learning theorist in

addition to a methodologist of psychology who believed that one of the most important aspects of special education is to focus on strengthening the parts of the brain that function and improve on the defective parts of the brain using both psychological and pedagogical strategies (Rieber & Carton, 1993).

Another theorist who promoted cognitive growth through abstract thought was Jerome Bruner. He stated that beginning to understand concepts involved a process of learning what characteristics of the environment were related (Bruner, Goodnow, & Austin, 1956). Bruner's interest in pictures and how children can learn from pictures about the world around them is explained in his theory of instruction (Presno, 1997). Bruner's beliefs that a picture can help students learn about their experiences are instrumental in my reading intervention. Bruner continued his theory with his three stages of the learning process which are: enactive, iconic, and symbolic (Johnson, Knowlton, Adams, & Swall, 1992). Bruner's enactive stage is similar to experiential learning in that a child learns by being actively involved in learning. The next process is iconic, which is a less structured form of representing the word using universal symbols of the target sight words. The last process is symbolic which is using the word only for understanding and meaning. The next section focuses on studies that examine picture reading and the role of parents of students with disabilities learning literacy skills.

Conceptual Framework

This section describes the rationale used for this study. This study used a layered approach to acquiring literacy skills for children with severe disabilities as seen in Figure

I. The layers include: oral language development; motivation to learn; ample opportunities to learn; self-determination skills; functional reading; and generalization.

Layered Approach to Acquiring Literacy Skills

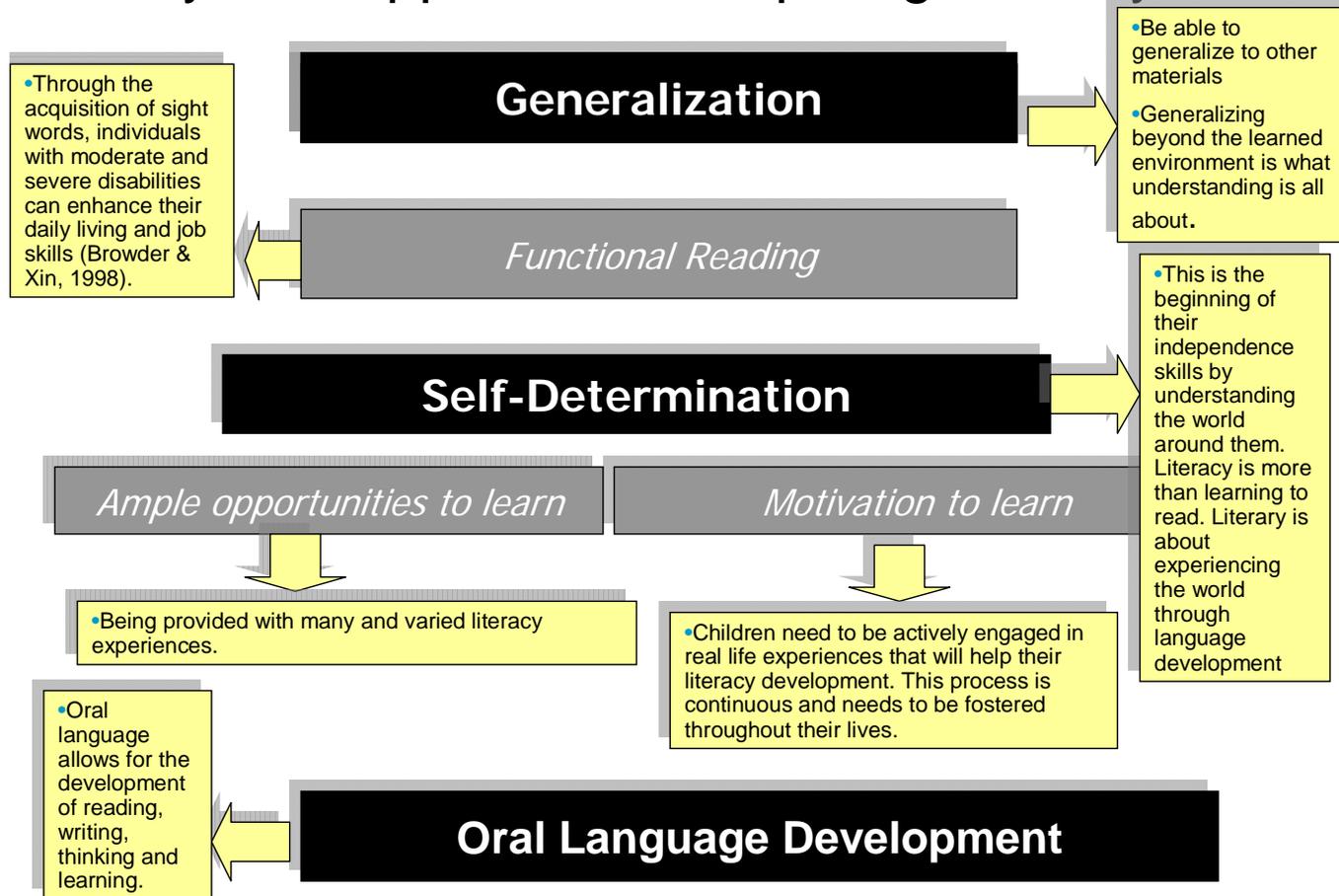


Figure 1. Layered Approach to Acquiring Literacy Skills

Oral Language Development. Figure 1 demonstrates that the first layer, oral language is an important process to develop for children. Oral language is the first language process developed. Once oral language is developed it allows for the development of reading, writing, thinking and learning (Pinell, 1985; Sillman & Wilkinson, 1994a). The key is the assimilation of language and literacy learning (Wilkinson & Sillman, 2000). The relationship between oral language and literacy is ongoing and continuous (Morrow & Smith, 1990).

The next layer is the motivation to learn. Deci and Ryan (2000) examine how an issue such as human learning is not innate. Motivation is central to any student's willingness to learn. Motivation focuses one's energy and direction in two distinct ways. People can be motivated due to internal needs that drive them to achieve or they can be motivated because there is some type of external pressure (Deci & Ryan, 2000). Motivation is part of one's personality and can contribute to one's learning (Argyris, 1957). Motivation can help students achieve and perform tasks, such as learn new sight words. One of the factors in understanding motivation is perceived competence (Crow, 2007). It is important for children to feel they can accomplish a task that is asked of them.

The subsequent layer is having ample opportunities to learn. The instruction process is more difficult for the teacher because of the constant repetition that is needed to ensure progress on very simple skill development. Research has shown that giving a child exposure to early literacy activities is beneficial (Kliewer & Biklen, 2001). To children with severe disabilities this exposure is even more critical. These children need to experience language and know that sounds correspond to speech and that words are

made up of the sounds. Literacy is more than learning to read. Literacy is about experiencing the world through language development (Basil & Reyes, 2003). Children with severe disabilities acquire language by listening to others and learning about sharing. The more experiences in literacy the more benefits for each child (Basil & Reyes, 2003). Every child can use oral language experiences every day. These experiences are a starting point to increase and improve their ability to express themselves verbally or using pictures in a participatory manner.

Self-Determination Skills. The next layer is self-determination skills which come from the self-determination theory. Self Determination Theory is one of the reasons behind motivating individuals (Deci & Ryan, 2000). The two motivational methods are intrinsic and self-regulation of extrinsic and internally motivated individuals have enhanced performance and show more interest than those who are externally motivated (Deci & Ryan, 2000). This area is key in dealing with students with moderate and severe disabilities. Intrinsic motivation is driven by an individual's willingness to be successful, to feel, and understand the meaning of achievement at that particular skill, talent, goal or ambition (Deci & Ryan, 2000). The internal motivation to achieve and be recognized for that achievement by their peers, parents, congregation or family is the human element (Ryan & Deci, 2000). Unlocking the learning key for severely disabled students begins with understanding Self Determination Theory. The concepts implored in developing self determination and specifically intrinsic motivations are challenges for students with disabilities. Some of the innate qualities which define intrinsic motivation are areas of significant gaps for students with severe disabilities. The teaching methods used must be

adaptable to their motivations and desires. The U.S. Office of Special Education Programs identified that there needs to be more research to understand how severely disabled students learn (Agran, Cavin, Wehmeyer, & Palmer, 2006). There is increasing evidence that with the severely disabled population, student-directed learning can achieve positive results. In an environment of regulating expectations, choices and decisions the dependence on external support is reduced and the overall experience takes on a greater role for a severely disabled student (Mithaug, Mithaug, Agran, Martin, & Wehmeyer, 2003). Watson and Tharp (1985) indicate severely disabled student success is based on self-regulation and Mithaug (1993) goes further to indicate the amount of self-regulation will determine the depth of an individual's control of their life. There seems to be some evidence that the lack of self direction has contributed to the gap in learning by the severely disabled population (Agran et al., 2005). This stigma in education can be overcome by incorporating new techniques and processes to educational performance, which is consistent with the other aspect of motivation which is Self-Regulation of Extrinsic Motivation. Educators certainly want to give students every opportunity to succeed however; training is needed to ensure all students learning styles are addressed and each student is able to reach their potential, thus a desired state (Agran et al., 2005; Mithaug, 1996). The optimal gain is the discrepancy between a current state and a desired one and the realization that fuels behavior change (Agran et al., 2005; Mithaug, 1996)

The severely disabled student population can achieve similar results but rather than just relying on intrinsic motivation they require, self-regulation of extrinsic motivation, a combination of self-direction and support. The key difference in the strategy is the

support required to develop and set the actions required to achieve the desired behavioral change. Each severely disabled student has different motivational actions which will trigger his or her willingness to learn. It is unlocking this behavior that is key to increasing the ability to learn. SDT sees these differences in motivation as the student's ability to internalize and integrate; first to understand why it is important to them and then to solve for how it might benefit them (Agran et al., 2005).

Beyond both motivational theories is Cognitive Evaluation Theory (CET) which is an alternative that explores the underlying behavioral issues that either encourage or degrade the intrinsic motivation of an individual (Deci & Ryan, 1985b; Deci & Ryan, 2000). Conceptually, CET identifies positive feedback equals greater confidence and motivation and negative feedback reduces intrinsic motivation (Deci, 1975; Ryan & Deci, 2000). CET revolves around the theory that one needs to evolve into an autonomously confident individual who requires positive feedback in order to continue on a course of self-determination (Reeves 1996; Ryan & Deci, 2000). For students with severe disabilities CET provides some excellent insights on how to motivate and what techniques do not encourage the required behavior.

CET provides keen insights into motivation and in defining feedback as a key contributor to success, but it goes further to identify the sense of autonomy that needs to exist in order for true learning to transpire coupled with the underlying sense that behavior is self determined and not outwardly coerced (Fisher, 1978; Reeve, 1996; Ryan, 1982; Ryan & Deci, 2000). These insights are main contributors in realizing the potential for the severely disabled population; they also provide support and guidance into the

realm of extrinsic motivation and its relationship with the severely disabled population. The core of extrinsic motivation is achieving an outcome, based on nonintrinsic behavior (Deci & Ryan, 2000). This methodology though, has a wide spectrum of possibilities based on the concept of Organismic Integration Theory (OIT) which builds on the theory of self determination (Deci & Ryan, 1985; Ryan & Deci, 2000). It melds integration, CET, and extrinsic aspects into different categories of self awareness. The initial category is an individual who is neither intrinsically motivated nor autonomous to one that is completely self-motivated and autonomous (Deci & Ryan 1985; Ryan & Deci, 2000). It is this spectrum that needs to be utilized in order to understand the developmental aspects of teaching students with severe disabilities. Schools need to evolve their styles from the initial OIT phase which is a rewards system for the severely disabled students to one that allows the severely disabled students to self determine their own behavior. Self determination will not come from intrinsic motivation but needs to be developed through the teacher-student relationship, setting expectations, and developing the individual to aspire to achieve results are the primary steps toward self determination (Agran, Blanchard, Hughes, & Wehmeyer, 2002). Self monitoring and targeting behavior changes are the key contributors for the severely disabled population to achieve some level of self determination (Agran & Wehmeyer, 2002). This is the real area of growth for the severely disabled population, understanding that learning cannot be coerced and it needs to be led by their own inner need to want to learn. Learning can utilize some external themes to instill a level of motivation and it also needs to be developed from within (Ryan & Deci, 2000).

Children need to learn self-determination skills to order to acquire the necessary skills in life and in school. Self- determination is a essential part of any curriculum. Self-determination skills enable each student to achieve and progress in many areas of their lives (Ward, 2005). The skills needed to promote self-determination need to begin early and involve many varied models of teaching to increase student learning (Palmer & Wehmeyer, 2003). The student needs to learn how to develop clear goals and plans to accomplish their goals. The self-determined learning model of instruction allows each student to participate fully in their instruction and become better problem solvers and goal setters (Lalli & Shapiro, 1990; Palmer & Wehmeyer, 2003).

The following layer, Functional Reading moves toward literacy success for children with severe disabilities to begin to acquire functional reading skills, i.e., acquire sight words. Sight word acquisition is important to the daily living of children with severe disabilities (Fossett & Mirenda, 2006). Through the acquisition of sight words, individuals with moderate and severe disabilities can enhance their daily living and job skills (Browder & Xin, 1998).

Generalization. The final layer is generalization. This layer provides the approach which is being able to read across materials and settings. Generalizing beyond the learning environment is what understanding is all about. Research has shown that children with severe disabilities can have success with interventions of increasing sight word vocabulary (Browder & Xin, 1998). Generalizing the words is necessary to a child's development and social acceptance. If a child with severe disabilities can generalize their vocabulary then it opens up new areas for a student to explore. New areas

they can become actively involved in supporting. “Feed Cat” moves from a picture to an activity. “Clean Room” becomes a combination of activities that culminate in independent behaviors. Independent behaviors clearly demonstrate comprehension and an accomplishment of word knowledge.

There is a significant benefit to the generalization layer. If the student can begin to master this layer he/she has more of an opportunity to begin to be part of the community. Without literacy, without comprehension the severely disabled population has limited social capital. The focus can shift from literacy attainment and move toward independence. This may lead to more self-determination goal setting and choice making. Acquiring literacy skills may expand the possibility of extending social capital in the community for students with severe disabilities. This is the beginning of the process of building social capital in the community for students with severe disabilities. The next section is a review of current literature on sight word vocabulary for students with severe disabilities.

Review of Literature on Sight Word Vocabulary and Students with Severe Disabilities

Empirical Literature was reviewed that examined the effectiveness of certain reading strategies for sight word acquisition for students with moderate and severe disabilities. The following procedures were employed to locate the studies used in this dissertation. First, a computer-assisted search of the following databases was conducted: ERIC, Social Sciences Research, Wilson Web, Department of Education, PsychInfo, and EBSCO Host and dissertation abstracts. These databases were searched from the year 1990- present. The descriptors used were: sight word vocabulary, literacy and severe

disabilities, sight word vocabulary and severe disabilities, picture communication symbols and reading.

Next, a manual review of relevant journals from 1997-2006 was conducted. In addition to journals, relevant books on sight word vocabulary and students with severe disabilities were also examined. Finally, an ancestry search of reference lists from identified articles was conducted.

The topic was further delimited. Articles were selected that addressed reading strategies for sight word acquisition and students with severe disabilities. A total of 13 studies met the selection criteria. The majority of these studies involve children in elementary, middle and high schools. The following table (See Table 1) represents the studies that involve reading strategies for sight word acquisition with students with severe disabilities.

The 13 studies included 47 participants and the meta-analysis included 269 participants. The average age was elementary aged children. All studies took place in a school setting. The dependent measures were to increase sight word vocabulary. Findings are listed in Table 1.

Table 1

Sight Word Vocabulary Studies

Authors	Disability	Sample Size and Description	Results: Benefits
Browder & Xin (1998)	Moderate/ Severe	48 studies - 269 participants. Most participants were elementary age (63%). Meta-analysis focused on determining the effectiveness of sight word research on students with significant disabilities	Benefits: Sight word instruction is highly effective and useful for daily living and job skills.
Rohena, Jitendra and Browder (2002)	Students with Mental Retardation	4 Puerto Rican middle school students Examined the effectiveness of a time delay instructional package on increasing English sight words	Benefits: Teaching both English and Spanish time delay strategies were equally effective in increasing sight word vocabulary
Belfiore, Skinner, & Ferkis (1995)	Students with specific learning disabilities in reading	3 elementary students Compared the effect of trial repetition and response repetition on sight word acquisition	Benefits: Both strategies were effective in increasing sight word vocabulary
Barbetta, Heward, Bradley, & Miller (1994)	Students with developmental disabilities	5 students Compared immediate and delayed error correction	Benefits: Immediate error correction proved more useful
Barbetta,, Heard, & Bradley (1993)	Students with developmental disabilities	5 students Compared whole word and phonetic prompt error correction on increasing sight word vocabulary	Benefits: Whole word correction yielded higher percentages
Barbetta, Heron, and	Students with developmental	6 students	Benefits: Active student response correction procedure resulted in more word read correctly.

Heward (1993)	disabilities	Compared active student response correction to no-response error correction during sight word instruction	These results occurred immediately, during maintenance and again in generality tests.
Cuvo & Klatt (1992)	Students with Mental Retardation	6 adolescent students; 3 in group 1 and 3 in group 2 Words were presented in three different instructional settings: flashcards; videotapes; and signs in the community	Benefits: All three conditions yielded positive results for acquisition of sight words and flashcards and videotape condition were more effective during the generalization phase.
Doyle, Wolery, Gast, & Ault (1990)	Preschoolers with developmental delays	3 students Compared constant time delay and least prompts	Benefits: Both strategies were effective and constant time delay resulted in fewer trials, errors and time.
Mosley, Flynt, & Morton (1997)	Students with moderate mental retardation	8 students Compared constant time delay and community based instruction to increase functional sight words	Benefits: Both strategies were equally effective in the number of words learned and in generalizing those words.
Browder & Minarovic (2000)	Students with moderate mental retardation	3 participants in competitive jobs and receiving employment services A training package included time delay to teach sight words; verbalized self instruction technique; and checklist for self-monitoring	Benefits: Functional sight word instruction for individuals in competitive jobs and increase independence skills.
Bijl, Alant, & Lloyd (2006)	Students with mental disability		Benefits
Browder & Shear (1996)	Students with moderate mental retardation and behavior disorders	3 middle school students Evaluated the effectiveness of a treatment package to teach sight words that included and interspersal drill sequence	Benefits: Using the weather report students were able to learn 10 new sight words and enhance their daily living skills.
Fossett & Mirenda (2006)	Students with developmental disabilities	2 students Compared paired associate instruction to picture to text matching to increase sight words	Benefits: Picture to text matching proved more effective for increasing sight word vocabulary

Conley, Derby, Roberts- Gwinn, Weber, & McLaughlin (2004)	Kindergarten students with delays	5 students Compared the copy, cover, compare method to picture matching to increase sight words	Benefits: The copy, cover, and compare method resulted in better maintenance of words.
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A comprehensive meta-analysis of sight word research examined 48 studies (Browder & Xin, 1998). The studies focused mostly on children in elementary school but a wide age range was represented and the research participants were students with moderate and severe disabilities. Many different reading strategies were implemented and resulted in positive outcomes for the participants. This review provided many insights into designing instruction for increasing sight word vocabulary. In this meta-analysis the researchers focused on the overall effectiveness of the sight word research and new methods that facilitate learning sight words for students with moderate and severe disabilities (Browder & Xin, 1998).

Browder and Minarovic (2000) taught student's sight words to complete job tasks in employee settings. This study examined the effects of a training package that included progressive time delay procedure to teach the sight words, self-instruction technique, and a self-monitoring checklist. This package enabled the participants to self-initiate job tasks, acquire job related sight words, increase self-monitoring skills, and increase verbalized self-instruction. This study provided an effective intervention for increasing relevant sight words as well as self-initiation skill building (Browder & Minarovic, 2000).

Fossett and Mirenda (2006) examined how paired associate (PA) instruction and picture-to-text matching (PTM) instruction approaches increased sight word reading on two boys between the ages of 10 and 11 years of age. Both boys were severely disabled with limited reading ability. In this study, picture communication symbols were used for communication. Two sets of five words were used for each boy, one set for the first

approach (PA) and one set for (PTM) approach (Fossett & Mirenda, 2006). The intervention was for the first PA approach one hour daily instruction. Five levels of instruction were used and verbal praise was given after a positive response. In the PTM approach, flash cards and worksheets were used to help participants learn the words. Findings revealed that using pictures to teach sight words produced positive results. Authors also found that using the PTM for children without speech produced positive results and increased sight word vocabulary.

Mosley, Flynt, and Morton (1997) study compared the effectiveness of classroom instruction using constant time delay and community based instruction to teach sight word vocabulary to students with severe disabilities. The different approaches did not yield any significant difference. The participants were asked to match the words to the picture flashcard during probes (Mosley, Flynt, & Morton, 1997). This study suggests that students with moderate to severe disabilities are able to learn words in a classroom as well as in a community based setting.

Conley, Derby, Roberts-Gwinn, Weber and McLaughlin (2004) compared copy, cover and compare method to picture-word matching to teach sight word recognition. The students were presented with 23 words in four stimulus contexts: words in isolation; words in the context of a sentence; words in the context of a sentence with a matching picture; and words in context of a sentence with a matching picture and three distracter pictures (Conley et al., 2004). The authors revealed that the copy, cover and compare method was more effective than the picture matching strategy. The picture matching strategy yielded quick results it did not teach word recognition skills.

Browder and Shear (1996) evaluated the effectiveness of a treatment package to teach functional vocabulary involved in reading the daily weather report. The students were instructed in 10 known words and 10 unknown words from the newspaper weather reports. The words were presented on flashcards and correct or incorrect responses were noted. An interspersal drill sequence was used and if the response was correct the word was then put in a story starter to reinforce the word recognition and give meaning to the word. All the students learned 10 new words in 2 to 6 weeks of school.

Barbetta, Heron, and Heward (1993) study the authors compared the effects of active student response error correction to no response error correction on sight word instruction on eight sets of 20 unknown words. The elementary age students in a self-contained classroom were introduced to a new set of words each week for 8 weeks with both active student response (ASR) error correction and no response (NR) error correction. ASR consisted on the experimenter modeling the word and having the student repeat it and was praised when the response was correct. If the response was incorrect the experimenter corrected the student and repeated the word. NR consisted of the experimenter modeling the word and the student looking at the word. If the student responded incorrectly the experimenter said the word and asked the student to look at it and went on to the next card. The results indicated that ASR was more effective during instruction, maintenance and generalization phases.

Barbetta, Heward, Bradley, and Miller (1994) compared immediate and delayed error correction teaching sight word instruction for students with developmental disabilities. Elementary age students were instructed in 14 unknown words weekly and

the experimenter gave immediate error correction strategy following each error and gave praise for correct responses or gave delayed error correction and told student that the word would be tried later and to move on the next word. The immediate error correction had better performance for all students.

Barbetta, Heward, and Bradley (1993) examined the effects of whole word and phonetic prompts error correction on increasing sight word vocabulary for students with developmental disabilities. Whole word correction showed the students learned more words. The implications of this study for ease of use in the classroom as well as home-based instruction (Barbetta et al., 1993).

Doyle, Wolery, Gast, and Ault (1990) compared constant time delay to a system of least prompts in teaching sight word instruction for preschoolers with developmental disabilities. The students were presented with known and unknown words and asked to verbalize the word, identify the photograph associated with the word, and correctly match the word when presented with three words. For constant time delay a 4 second delay was implemented with a vocal model and a controlling prompt (Doyle et al., 1990). For the system of least prompts the experimenter moved through a series of hierarchy of prompts. The authors found that constant time delay resulted in fewer total trials, errors and time.

Cuvo and Klatt (1992) used three different instructional methods to teach sight words to adolescents with mild and moderate disabilities. The three methods included: flashcards, videotapes, and signs in the community. The students all learned the community based words in all of the three instructional techniques. In the generalization phase the flashcard and videotape proved more effective.

Belfiore, Skinner, and Ferkis (1995) examined the effects of trial repetition to response repetition for 3 elementary students with specific learning disabilities in reading. The different strategies included trial repetition which consisted of 5 repeated practice trails given for each word with the experimenter used the antecedent response feedback procedure each of the five trials. In response repetition condition consisted of five trials with only one antecedent cue and only one feedback response for all five trials. The trial repetition condition resulted in higher learning rates for all students (Belfiore et al., 1995).

Rohena, Jitendra, and Browder (2002) investigated the effects of Spanish and English constant time delay on Hispanic students with mental retardation. Four Puerto Rican middle school students with mental retardation were instructed on sight word reading in both Spanish and English constant time delay conditions. Both conditions proved effective for increasing English sight word vocabulary and all students were able to generalize the word to natural settings (Rohena et al., 2002). The authors found that the strategy of constant time delay is effective for sight word reading.

Van de Bijl, Alant, and Lloyd (2006) compared two strategies of sight word instruction for students with mental disabilities. The authors selected 22 words that the participants could recognize when shown the picture of the word but not the written word. The students were instructed in both the modified orthography (MO) and the traditional orthography (MO/TO) and a control group. Each of the strategies produced an increase in sight words for all the students.

Summary. Across these 13 studies all reported overall positive findings in increasing sight word vocabulary for students with severe disabilities. Strategies included: constant time delay, trial repetition, immediate error correction, whole word error correction, active student response error correction, use of flashcards, and picture to text matching. In these studies participants were mostly elementary age. Various reading instructional tools proved noteworthy in these studies.

Studies Involving Parents and Communities

Koppenhave, Erickson, and Skotko (2001) examined the connection between mother and daughters in increasing labeling and symbolic communication through storybook reading. The study focused on the support of early communication functioning between the mother and child and the role of reading in early literacy and communication skills. Storybook reading is a socially and interactive experience (Koppenhave et al., 2001). The study looked at how the parents can provide a means of communication and give meaning to their children's attempts at communication through this shared experience. The children used augmentative devices with picture communication symbols as a form of communication. The results indicate that the girls responded more in the later phases of the intervention than in the initial phases. There was a higher frequency of labeling and commenting in the later phases. The children's ability to communicate using symbols through the reading intervention proved noteworthy.

In Stone (1997) the study examined parent, teacher, and student perceptions in 21 different skill areas for students with disabilities. The study used a student skills survey instrument and a questionnaire to ascertain the perceptions of students, teachers, and

parents on the child's academic and emotional functioning, and the current and future view of the child's learning problems. The findings suggest that the students' perceptions of themselves was the highest and most positive compared to their parents and teachers. The parents were more negative about their child's learning disabilities than their teachers.

Kliewer (1998) focuses on the lives of 10 students with Down Syndrome over a 2 year period to understand their literacy experiences in the classroom and the expectations and opportunities given to them. The study defines literacy as both conformity to identified skills or construction of meaning through connection with others (Kliewer, 1998). Both these definitions help describe how the participants are viewed in this study. When the students were connected to their literate community as full participants their capabilities were realized. However, reconceptualizing literacy from a subskill to a communication tool is important for the students to feel connected to their literate community (Kliewer, 1998).

Kliewer et al. (2004) explored the literacy development of nine preschool and kindergarten classrooms of children with and without disabilities. The teachers created environments in which all children were connected to their literate environment and were the students were all competent meaning makers regardless of disability (Kliewer & Fitzgerald, 2004). The authors suggest that inclusive classrooms help promote a literate environment for all children.

Picture Reading Skills

Empirical literature was reviewed that assessed the effectiveness of pictures as an instructional tool. For purposes of the review, studies included students in any disability group. In this section the studies examined how picture reading can enhance literacy learning. Results of empirical studies on picture reading skills supported the idea that pictures can stimulate learning information for students with significant disabilities (Lignugaris/Kraft et al., 2001). Students were instructed in basic picture reading skills that included matching objects to pictures, orienting objects in the direction shown in the picture, positioning objects and performing illustrated actions and asked to generalize their skills from pictures to actual situations (Lignugaris/Kraft et al., 2001). The results revealed a positive contribution of pictures in teaching factual information. This review paper examined research from 1970-1986 on picture reading skills (Lignugaris/Kraft et al., 2001). The review described studies using pictures as an instructional tool and showed how competent the participants were in generalizing the learned skills to new tasks, objects, or settings after being taught with picture reading. In general, the results were positive for generalization of some picture reading skills.

As can be seen in the above review, using picture reading strategy with a variety of tasks has resulted in the generalization of some picture reading skills to students with disabilities (Lignugaris/Kraft et al., 2001). Picture reading may be used to accelerate learning and promote generalization (Lignugaris/Kraft et al., 2001). Picture reading can facilitate language learning. The reading of a picture can be expressed through language

(Alberto & Fredrick, 2000). The steps to reading a picture involve a student response and thus a language demand.

One study examined the effects of using personal photographs and figure line drawings to increase communication shown positive effects for students with moderate mental retardation (Johnson et al., 1992). The authors taught students to gain information from the pictures to express ideas verbally. The students were motivated by the activity being understandable and doable. The pictures were used to stimulate language and focus on extracting meaning (Johnson et al., 1992). The pictures were personal photographs of each participant performing an action to increase verb usage and language development. The pictures consisted of the participants enacting out ten verb poses. The photographs were taken in the common area of the classroom as well as the students' personal desk area. Four language books were developed. The first three books included the ten personal photographs of each participant. The fourth book contained figure line drawings of each target verb that every participant was able to use. The participants were introduced to the photo language book first and instructed on each target verb. After 100 percent correct verbalizations for three consecutive sessions the graphic line drawings were introduced. After the student achieved 100 percent correct verbalizations on the graphic representations for three consecutive sessions criterion was met. The study examined the effects of each phase and various sequences of stimuli used (Johnson et al., 1992). This sequence of stimuli was based on Bruner's theory of instruction. The language books used in this study corresponded with Bruner's theory of instruction that

address student's learning needs by helping students proceed from concrete to abstract representations using target verbs (Johnson et al., 1992).

Alberto and Fredrick (2000) taught students with disabilities how to read pictures using personal photographs, object photography and interactive games to encourage students to communicate more effectively. The ability to read pictures can enhance a students' learning (Alberto & Fredrick, 2000). Research on picture reading skills has found that student's ability to read pictures helps them engage in relevant social and educational activities (Alberto & Fredrick, 2000). This strategy can be used across the curriculum and in many different settings. Picture reading involves different skills that include identifying, describing and imitating what is happening in the picture (Alberto & Fredrick, 2000). In this study the whole class was instructed in this strategy of reading pictures. The five step instruction included: identify person, identify object, identify person and object, identify action, and identify sequence. In the first step, the teacher took a picture of each student. This was done to involve each student in picture identification and to increase language skills by asking 'Is this you.' The second step involved the teacher taking pictures of objects around the classroom to increase labeling and comprehension by matching the pictured items to the real item. The third step involved the teacher taking pictures of individuals holding objects to increase language expansion questioning (Alberto & Fredrick, 2000). The fourth step involved having the teacher take a picture of the student performing an action which increased task performance by having the students imitate the picture. The fifth step involved the teacher taking pictures of the students performing a sequence of actions, e.g., picking up a paintbrush, dipping it in

paint, and putting paint on the paper. Picture reading helped facilitate the transition to books and introducing sight words. This strategy facilitated a student's reading instruction in sight word instruction (Alberto & Fredrick, 2000). In this study the student could read a picture and the student learned that the pictures have meaning. This method helped students begin to learn sight words through a paired-associate strategy (Browder & Lalli, 1991; Alberto & Fredrick, 2000). Paired-Associate learning introduces sight words with pictures and the student then learns to associate the sight word with the picture. The picture is used to enhance the meaning of the sight word for the student. This has been shown to be an effective instructional strategy that promotes student communication and picture reading comprehension (Alberto & Fredrick, 2000). The picture is then faded out or used less frequently until the student is able to recognize the sight word without the picture cue.

Knowlton (1980) evaluated the effect of picture fading on students' sight word acquisition. Two students with learning disabilities participated in a picture fading intervention to increase their sight word vocabulary. Each student had a word list of 12 target words associated with corresponding pictures. Words were printed in red on an index card with a corresponding picture in green. The picture fading materials were tracing paper and tape and were used after correct responses to the target words. During the initial phase of the intervention students were presented with the word and corresponding pictures. After the students answered correctly on four words then picture fading technique was introduced. Students maintained the sight words after the pictures

were removed. The results indicated that picture fading helped increase sight word vocabulary.

Similarly, Croll, Idol-Maestas, Heal, and Pearson (1986) investigated the effects of using pictures to build reading comprehension skills. Two special education students participated in an intervention where pictures were used to enhance the meaning of a reading passage. The use of these topic related pictures improved the students' comprehension and ability to answer questions with more details. The pictures were colored and illustrated a comprehensive view of the topic of each passage for each lesson (Croll et al., 1986). The pictures were taken from magazines and placed on white tag board. For each picture and passage, eight questions were used to examine prior knowledge and comprehension of details in the picture and passage. In addition, this study supports the idea that instructing students to relate to what they know and to what they read builds reading comprehension skills (Croll et al., 1986). The participants were able to connect their prior knowledge to what was happening in the pictures. This study supported the expectation that students with prior knowledge have better comprehension (Croll et al., 1986).

Baseli and Olle (1995) looked at developing vocabulary by using visuals. The review examined different techniques of visualization to increase the students' vocabulary. For example, having students illustrate words from a story helps facilitate comprehension on the story and helped students personally connect to the story (Baseli & Olle, 1995). Some research has suggested that an improvement in vocabulary can enhance comprehension (Baseli & Olle, 1995). The use of visuals have a great impact on

student's lives and was an effective tool for learning vocabulary as well as increasing comprehension skills (Baseli & Olle, 1995).

Rationale for Sight Word and Picture Vocabulary Studies

This section presented research providing evidence of the increase of sight word vocabulary using various reading and picture strategies for children with severe disabilities. There are many different effective strategies used for sight word acquisition and many successful interventions on increasing sight word vocabulary for functional literacy. Browder, Wakeman, Spooner, Ahlgrim-Delzell and Algozzine (2006) reviewed 128 studies on teaching reading to individuals with significant cognitive disabilities. This review found strong evidence for teaching sight words using systematic prompting and fading. Most of the studies targeted sight word instruction. The review also included studies that taught picture or symbol identification connected to literacy was successful for students with moderate and severe disabilities.

Browder (1997) promotes research-to-practice conversations to enable more fluid idea sharing in order to benefit instruction for students with severe disabilities. The instructional techniques available provide practitioners with different methods for students with severe disabilities to acquire knowledge and skills. Thus, selecting instructional strategies must be based on the specific outcome for instruction (Browder, 1997).

Many of the research studies that examine strategies on sight word instruction for students with severe disabilities focus on the importance of sight words for daily living (Browder, Spooner, Wakeman, Trela, & Baker, 2006). Functional reading includes sight

word instruction that can be generalized to relevant life and job tasks (Browder & Cooper-Duffy, 2003). The importance of teaching reading to children with severe disabilities is critical to their lives in every aspect of living. Skills that promote students' participation in literacy activities through teaching strategies can facilitate their progress.

The skill of increasing sight words can improve children with severe disabilities lives. Children with severe disabilities need additional support in building skills to achieve any measure of literacy success. The transition from emergent reader to conventional reader for a child with severe disabilities takes more time and effort and different strategies that meet their individual needs

These studies also examined the effectiveness of using pictures or photographs to teach sight words to students with disabilities. Teaching picture reading as a skill to build language skills that can help students learn in many other areas (Alberto & Fredrick, 2000). There are many uses and functional applications for picture reading for students with severe disabilities. Creating opportunities to explore different forms of literature helps children progress in their own development in literacy acquisition (Strasser & Seplocha, 2007).

Summary

We know from previous research that pictures are an effective instructional tool for increasing vocabulary for children with disabilities. Johnson et al., (1992) taught students to use pictures to improve their expressive vocabulary. The pictures were personal photographs of students enacting out target verbs to help students recognize the words with picture cues. Alberto and Fredrick (2000) taught students how to read pictures

to increase their communication skills. The students were instructed in identifying people, objects, actions and sequences in classroom activities to increase labelling and and task performance. Croll et al., (1986) helped students improve their comprehension skills using topic related pictures to enhance their understanding of reading passages. Browder and Minarovic (2000) investigated the use of a training package to teach sight words to students with disabilities in a work setting. The importance of teaching functional job related sight words enabled the students to increase their job performance (Browder & Minarovic, 2000). Browder and Shear (1996) focused on teaching students vocabulary used in a daily weather report. These skills promote independence in the lives of students with significant cognitive disabilities. Pictures can be an effective instructional tool for increasing sight word vocabulary and promoting independence for students with significant cognitive disabilities.

However, we do not know whether teaching students using personal photographs containing students acting out vocabulary words with the written word will facilitate the acquisition of a broader range of literacy skills or enable students to generalize the words to other materials or settings. Recent studies have indicated that measuring functional use of sight word instruction would be appropriate for this student population (Browder & Xin, 1998).

We also do not know whether that knowledge can be transferred to a symbolic condition containing less concrete information. Recent studies on teaching pictures and symbol identification has helped promote literacy skills for students with significant cognitive disabilities (Browder et al., 2006).

Finally, it is unknown whether students who have gone through two phases of learning words from concrete to more abstract can generalize to a flash card mode containing only the written word. This study suggests that students with moderate disabilities can learn to identify and comprehend sight words with concrete representations.

The literature reviewed in this chapter has provided a foundation of understanding for sight word acquisition for students with severe disabilities. The present sight word vocabulary interventions provide valuable information, but still do not provide all the answers for effective reading instruction for students with severe disabilities. Additional research on the use of making instruction from concrete to abstract using pictures to symbols to words can provide additional evidence for effective instructional strategies.

3. Methodology

This chapter presents the methods employed including, research design, participants, materials and the procedures for the research study. First, the design is described, followed by an overview of the setting and participants. Following this descriptions are provided of the materials, independent and dependent variables, procedures for baseline, intervention, generalization phase and maintenance, data collection, observer training, fidelity of treatment, and social validation.

Design

A multiple baseline design across participants design was used in this study in order to evaluate the effectiveness of two reading strategies on increasing sight word vocabulary for children with severely limited reading ability. Single-Subject Research Design involves studying a single individual and taking repeated measurements of a dependent variable. SSRD systematically applies an intervention or independent variable.

In SSRD the researcher wants to investigate treatment effectiveness, validate a practice as well as look at individual differences (Neuman & McCormick, 2000). Samples are often small and it attempts to apply principles of design to study the one subject. This design is used in special education so that the effect of certain interventions can be examined and used if appropriate for individuals; it also establishes evidence-based practice.

This research design is a true experimental design that shows functional relationships. Multiple baseline designs can help examine strategies used for teaching reading (Barger-Anderson, Domaracki, Kearney-Vakulick, & Kubina Jr., 2004). The multiple baseline design across participants was used to address the impact of the independent variable (two reading strategies) on the dependent variables for the different participants (Barger-Anderson et al., 2004). The two strategies were: a) personal photographs; and b) PCS symbols. In addition, after the termination of the intervention, the parent's were interviewed to examine their perceptions and attitudes concerning the intervention and the how the instructional strategies helped their children. The participants were surveyed in order to examine their attitudes toward the intervention and their level of satisfaction. This type of research is appropriate for use with this student population (Horner et al., 2005). Students with severe disabilities have very different needs and learning styles and therefore it is important to examine each child and intervene specifically to address each student's individual needs.

Much of SSRD is based on the work of B. F. Skinner's theories on behaviorism. Skinner believed that single subject research provided applicable and replicable results. He also believed that the key variable in any research is reinforcement (O'Donohue &

Kitchener, 1999). He believed that practice provided opportunities for additional reinforcement. His work is on behavior modification and that reinforcing good behavior is appropriate to learning a new behavior. Skinner influenced the use of SSRD because it focuses on the individual and the intervention that can increase appropriate behavior and decrease inappropriate behaviors (O'Donohue & Kitchener, 1999).

SSRD is able to divulge important trends (Alberto & Troutman, 2006; Kazdin, 1982). This is an important feature of this design because it allows us to see the effect of an intervention on an individual and compare those results to other individuals who did not receive the treatment. These patterns provide useful information in the field of study. SSRD along with other designs is able to address many of the issues in literacy research. This type of research design is able to contribute a new tool or strategy that can lead to a new theory or application in literacy research (Neuman & McCormick, 2000).

In SSRD, the percent of nonoverlapping data (PND) is used to validate data plotted to visually represent the important trends (Neuman & McCormick, 2000). The researcher performs tests on the participants and graphs those results. The researchers are able to determine the proportion of data points in a given treatment phase that exceeds the extreme value in the baseline condition (Scruggs & Mastropieri, 2001). They are able to calculate the percent of nonoverlapping data on individual participants, on specific outcomes measures and overall percents as well. These graphs are used to compare the student's performance on the selected strategies used in the study. Percent of nonoverlapping data is obtained by counting the number of data points in the intervention

phase that fell outside the range of data points posted in the baseline phase for each individual and calculating a percentage (Neuman & McCormick, 2000).

There are specific characteristics for SSRD. There is an untreated (baseline) phase and a treatment (intervention) phase. In the baseline phase there is no treatment given to individuals. The accepted practice in single subject experiments is to continue with baseline observations until there is no evidence of a trend predicted in the treatment phase (Todman & Dugard, 2001). When stability of baseline occurs then the next phase can begin. If there is variability in the baseline phase and a trend is emerging then it is difficult to determine if the treatment was effective (Todman & Dugard, 2001). It is important to understand what may be the cause of the differences in phases. One means of establishing the reliability of a treatment effect is replication. Replication is built into the design of single subject research. It is also possible to design the study in such a way as to statistically determine that individual comparisons in a single case design as reliable. For example, a randomization test is a valid and practical test (Todman & Dugard, 2001). Randomization tests give single subject research analytic power which has three advantages: use of a statistic; use of actual distribution of the statistic; and actual forms of distribution affect interpretation of test results (Todman & Dugard, 2001). However, to meet the assumptions of the randomization test, baseline stability may not be visually seen since the number of sessions of baseline must be randomly pre determined.

During the intervention phase there is an interobserver agreement where different observers rate the behaviors to ensure reliability or percent of agreement. This is important because one of the essential standards for experimental research is internal

validity in the study. Internal validity minimizes the possibilities that different variables are influencing the outcome (Kennedy, 2005).

In SSRD the conclusions are based on individual response to an intervention. This information is important because it gives the field understanding of individual subjects as well as makes a contribution to the field of study. SSRD is valuable for behavioral research and can add value to program instruction in determining the most effective program or treatment to use with students who struggle. A major concern with SSRD is the issue of generalizability. This research is done with individuals; therefore it is difficult to imply that it can work for many students. However, SSRD is able to define patterns of behavior and establishes evidence-based practices. This helps the field of special education tremendously. Many of the interventions that are successful are used in the classroom and continue to enhance the lives of many students.

SSRD in this study was a multiple baseline design. This design was used to see the effect of using certain reading strategies on individuals with severely limited reading ability. Multiple Baselines uses the variable time schedule to ensure that each student is working at his/her own pace. Following the intervention both visual analysis and statistical analysis were used to determine the treatment effectiveness. Data were also represented using a randomization test. Randomization tests substitute computational power for statistical power (Todman & Dugard, 2001). These tests are an adjunct to visual analysis for single subject research.

This study had three phases of treatment and a maintenance phase. This study conducted visual analysis that entailed the interpretation of level, variability, slope, and

overlapping data during baseline, all phases of treatment, and maintenance phase (Horner et al., 2005). This study conducted statistical analysis which entailed randomization tests and PND. This study also conducted qualitative analysis that involved structured interviews and participant surveys.

This study implemented randomization principles in order to conduct randomization tests for all phases. One of the principles needed to run randomization tests that was used in this study is randomly assigning the participants to the start of the intervention and randomly assigning the words during baseline, all phases of treatment, and the maintenance phase. The use of randomization tests is important to ensure that visual analysis is not misleading in evaluating evidence of a treatment effect (Todman & Dugard, 2001).

Following observer training, data were collected and analyzed by the researcher. Data reflected the baseline phase, all three phases of the intervention, and the maintenance phase across participants and for each participant. Students were randomly assigned to the order in which they began the intervention, using www.random.org to select the random order for intervention starting day. Since baseline ranged between 3 and 13 days, integers 4 and 13 were entered into random.org and the following random numbers were obtained: 4, 7, and 10, these numbers were assigned at random to one of each of the participants. Baseline sessions ranged from 3 to 9 sessions. After 3 days of the baseline session, Participant 1 entered the intervention. After 6 days of the baseline session, Participant 2 entered the intervention. After 9 days of the baseline session, Participant 3 entered the intervention. Phase I ranged from 20 sessions to 35 sessions;

Phase II ranged from 20 sessions to 26 sessions, Phase III was 5 sessions; and Maintenance was 4 sessions. Treatment, baseline and maintenance data were collected 5 days a week.

Method

Protection of Human Participants and Informed Consent

The Human Subjects and Review Board at George Mason University reviewed and approved all the methods and procedures for this study. Informed consent was obtained from the parent of each participant and the student participating. Each participant and his or her parent met with the researcher to go over the consent form and answer any questions and explain in detail the study and their level of participation in it. The researcher obtained a signed consent form (Appendix A) and gave each participant a copy of the assent form (Appendix B). The researcher described the project to the selected students in the presence of their parents. Since the students were not capable of reading or understanding the active assent form, the researcher explained it to the students and their parents at the same time. The researcher made sure that the participants were aware that their participation was voluntary, and they could withdraw from the study at any time and for any reason.

Setting and Selection of Site

This study was conducted in the mid-Atlantic region with a diverse population. The three students selected for this study were in the same high school in self-contained classrooms. The student's home setting was used for this study. The study was conducted after school hours in the participant's home. It is the belief of this researcher that the one-

on-one structure in a comfortable familiar setting provided a positive learning environment.

Participants

Three participants were selected for this study. The students that participated were selected because they had severely limited reading ability. Severely limited reading ability includes three major areas of assessment which are: intellectual disability; eligible for alternative assessment (e.g., VAAP); and limited number of known words. The first area of assessment is intellectual disability which refers to a person having below normal intellectual capacity. According to the American Association on Intellectual and Developmental Disabilities (AAIDD) definition on intellectual disability, it is defined as having significant limitations in both intellectual functioning and adaptive behavior (Schalock et al., 2007). The term intellectual disability is being used in place of mental retardation (Schalock et al., 2007). This term covers the same population of individuals who had been diagnosed with mental retardation in terms of kind, level, type and duration of the disability (Schalock et al., 2007). The second area of assessment is eligibility for alternative assessment because standard assessments are not possible for the individual. Alternative assessments are able to demonstrate what a child does understand and can provide detailed descriptions of the child's performance. One of the main tenets of alternate assessments was that States would know that these individuals were meeting the expectations for learning (Browder et al., 2003). These expectations would ensure educational accountability for these students (Browder et al., 2003). The third area of

assessment is a limited number of known words as reported by parents and validated by school records.

The students were able to verbalize but had limited understanding of the printed word. The students were in the moderate range of functioning with limited reading ability. This level of functioning manifests itself with deficits in many areas including: cognitive processing, reasoning, communication, attention as well as skill areas. These deficits are pronounced in one or many of these areas. The following table, Table 2, presents the demographics of the participant's major characteristics.

Table 2

Demographic Data on Participants

Participant	Gender	Age	Disability
Participant 1 Larry	Male	17.4	Fragile X, Autism, and ID*
Participant 2 Andy	Male	17.8	Down Syndrome
Participant 3 Emma	Female	18.0	ID

- ID = Intellectual Disability

The following section presents a description of each participant, current level of functioning and current IEP goals. The first participant characteristic described was severity of disability. This characteristic included significant limitations in both intellectual functioning and limitations in all areas of adaptive skills. The characteristic of life skills included limitations in life functioning areas, such as personal hygiene and self-care. Language limitations included differences in communication abilities. Adaptive behavior characteristic included limitations in conceptual, social and practical adaptive skills (Schalock et al., 2007).

Participant's Characteristics

It is important to understand the unique characteristics of students with severe disabilities. Specific information about each student was reviewed. The researcher examined current records of each student and spoke with each parent on current level of functioning in school and at home. An explanation of the various characteristics include: severity of disability; life skills; language; adaptive behavior; and social competence.

Severity of disability. All three participants were in the moderate range of intellectual functioning. This means that their intellectual functioning is well below the normal range of functioning and their adaptive skills are below normal (Schalock et al., 2007). The diagnosis of mental retardation requires a measured IQ usually below 70 (Whitaker, 2008). The adaptive skills are expressed in conceptual, practical and social limitations (Schalock et al., 2007). In this study all three participants experienced difficulty in all areas of adaptive behavior skill development. The participants in this

study spent most of their day in self-contained classrooms and were included in regular education activities only part of their school day.

Life skills. Life skills include a level of independence in self care and other self help areas such as feeding and hygiene. Limitations in this adaptive skill area of self-care and self-direction manifest itself before age 18 (Luckasson et al., 1992). In this study all three participants had some measure of independence in personal hygiene yet all the participants needed assistance with choosing clothes, preparing easy meals, and visiting shops. Also, included in life skills are self-direction skills, basic academic skills, and work skills. For each of the participants these areas were delayed and the extent of the delays included deficiencies in self-care, health and safety, self-direction, functional academics, communication, leisure and work skills (Luckasson et al., 1992).

Language. Speech and language problems were prevalent among all three participants. Language skills include clear pronunciation of words, understanding of conversational skills, and fluency. According to Stallman and Pearson (1990) young children go about the process of learning how to talk as they are immersed in language. Children learn to use their language skills through social exchanges. Each participant experienced difficulties with pronunciation of words, understanding meaning during conversations, and speaking fluently.

Adaptive Behavior. Adaptive behavior includes many areas such as communication, self-help and interpersonal skills (Luckasson et al., 2002). Each of the participants experienced delays in two or more of those areas of development.

Communication skills included understanding basic literal questions, conversing on one topic at one time, and being understood in answering questions or repeating a word.

Social Competence. Reasoning ability limits social competence which includes social development and personal well-being (Luckasson et al., 2002). In each of the participants the ability to reason was delayed. Lack of understanding concepts like danger, cause and effect as well as socially acceptable behavior was evident across all participants.

Participant 1: Larry

Larry is a seventeen year old male with a diagnosis of Fragile X syndrome, autism, and intellectual disability. He is in his second year at his neighborhood high school. He lives with both parents and three siblings. His home environment is nurturing. He is able to communicate his wants and needs and is able to respond to questions. For example, he was able to respond to conversation with the researcher and answer simple questions about his daily activities.

He was born without complications or any known medical problems. He met language and developmental milestones until fifteen months of age. However, he was not walking by eighteen months and was referred by the pediatrician for tests. At eighteen months of age he was diagnosed with Fragile X syndrome. Fragile X syndrome is caused by a genetic mutation (Hall et al., 2008). Fragile X is the most common inherited cause of intellectual disability and boys are more severely affected than girls (Price et al., 2008). This disorder causes moderate to severe mental retardation as well as language delays (Price et al., 2008). He began physical and speech therapy immediately. He started

walking at twenty two months. He began school at age two at a private school that specializes in speech and language. He then entered in an early intervention program given by the county and continued his schooling through the services provided by the local county.

His school placement history has included placements in non categorical classrooms that are self contained classes but allow some time in regular education activities during the school day. He began reading in kindergarten using the Edmark Reading Program. Edmark is based on sight word vocabulary and teaches beginning reading to students who are not yet readers (Barrier, 1981). Larry continued using Edmark but not consistently through the years. He enjoys books and memorized certain favorite books which he repeatedly reads.

His current Individual Education Program (IEP) goals in school focus on career, self advocacy and independent livings skills. He presently works in the cafeteria in school as well other work experiences in the community such as stacking chairs for a local restaurant. His academic goals include handwriting; time telling and money counting; conversational skills that involve turn taking; and building sight word vocabulary and fluency.

Participant 2: Andy

Andy is a seventeen and a half year old male diagnosed with Down Syndrome. He is in his third year at his neighborhood high school. Andy lives with his mother. He spends limited time with his father. He had great difficulty expressing his wants and

needs due to his severe apraxia of speech and very poor articulation. He does not use sign language but enjoys pictures.

Andy was born four weeks premature at 4 pounds 6 ounces. His immediate diagnosis was Down syndrome, tetralogy of fallot, and an incomplete opening from stomach to large intestine. Tetralogy of fallot refers to four defects within the heart and is the most common heart defect found in children (Joransen et al., 1979). His first surgery was a four days of age to correct the stomach opening. He remained hospitalized in intensive care until five weeks of age and until he reached five pounds. He remains under the care of a cardiologist to continue to monitor any heart related problems.

Down syndrome causes mental retardation and heart defects (Korenberg et al., 1994). Down syndrome is uniquely identifiable by certain facial and physical features (Korenberg et al., 1994). Down syndrome is caused by having an extra chromosome. It causes various anomalies that include deficiencies in intellectual functioning as well as defects in the immune, endocrine, and gastrointestinal systems. Down syndrome causes an increased risk of leukemia and dementia (Korenberg et al., 1994). Andy was immediately enrolled in an intervention program at three months of age. He received speech, occupational and physical therapy. He began a preschool program at two years of age for children with disabilities. He has been in self contained classrooms his entire academic career.

His current IEP goals in school focus on career, self advocacy and independent livings skills. He presently works in the cafeteria in school as well other work

experiences. His academic goals include maintaining a bank account and community mobility (utilizing the metro system). Communication goals continue to be reinforced.

Andy has limited academic skills. His school experience has included various reading programs but without consistency he has been unable to maintain any level of performance. He enjoys using pictures and can name many animals, places, and things by looking at the picture representations.

Participant 3: Emma

Emma is an eighteen year old female diagnosed with intellectual disability. She is in her fourth year at her neighborhood high school. She lives with both parents and one sibling. His home environment is extremely nurturing. She is able to communicate her wants and needs effectively and is able to respond to questions. For example, Emma was able to converse on topics that included fashion and sports with the researcher and would respond appropriately.

She was normal without complications and reached all her milestones until fifteen months old. Three days after the Measles, Mumps, Rubella (MMR) vaccine she had numerous febrile seizures that persisted. Febrile seizures are convulsions that were brought on by a high fever that was reported by Emma's parents. She walked at eleven months of age but had difficulty with balance after the MMR vaccine. Hearing was normal but she had speech delays and receptive language delays. Emma has difficulty with communication with both dysphasia and oromotor apraxia. Dysphasia is a severe childhood learning disorder of unknown etiology (Chiron, et al., 1999). Recent findings on dysphasia suggest left hemisphere of patients is affected and may cause language

disorders (Chiron, et al., 1999). Oromotor apraxia is a communication disorder where oral movements like tongue wagging or sequencing movements like wagging then smiling are difficult for the child (Hodge, 1994).

Emma's school placement has been in non categorical classrooms that are self contained classes. However, she spends some time in regular education activities during the school day. She has focused on both academic and life functioning skills throughout her schooling. Emma enjoys being with people and receiving praise for her accomplishments. Reading is difficult for Emma because of her limited number of sight words and her rate of fluency when reading is very low which had an effect on her comprehension.

Her current IEP goals in school focus on career, self advocacy and independent living skills. She presently works in the cafeteria in school as well other work experiences. Her academic goals include increasing her sight word vocabulary and fluency; money and counting; maintain a savings account; self- initiation tasks for job related skills; and communication skills.

Emma was recently evaluated for vocational skills and was found to need improvement in planning and organization skills; persistence in completing job related tasks; independent problem solving skills; and visual acuity tasks. Emma has a positive attitude and wants to receive praise for her accomplishments. She had difficulty remaining focused on the task at hand and limited ability to understand her assignments. Emma was cooperative and able to listen and follow through on one step directions. Beyond one step directions it was difficult for Emma to complete any assigned task.

Emma enjoys working one-on-one and accomplishing the task given to her. She is able to understand simple directions. She relates well to others and tries hard to do well. Emma however, has a very slow work pace and limited academic skills and requires close supervision for any task completion.

Table 3 is a list of target behaviors across participants that served as a context for discussion during the intervention.

Table 3

Target Behaviors Across Participants

Behavior	Larry	Andy	Emma
# of Known Words	About 300	Under 10	Not given
Self Determination skills			
Self- awareness	X	X	X
Focus on task	X	X	X
Enjoyed positive feedback	X	X	X

Materials

Pre- Test. A group of target words were used and put on flashcards for each participant. The lists of target words were developed through parent consultations and teacher reports on known words. For example, some words included were: three, turn, between, example, and machine. Each participant had separate lists, but some words

overlapped. For example: signature, area, and measure all overlapped. Each participant was given the list of target words as a pre-test to determine whether words were known or not. After the pre-test was administered a revised list of target words was developed for each participant. Each participant's list of individual words is seen in Appendix I.

Language book I – Personal Photographs. In Phase 1, each participant had an individual target word list. These words were chosen because they represented daily living activities that are important to the participants and based on discussions with the parents and reports from the teachers. The book included the word, picture and definition of the word. The picture was of the student's acting out the word. For example, a picture of the student walking and the word **WALK** is highlighted for emphasis and word recognition. The words were placed in a binder with 8 ½ X 11 inch separate pages for each word-picture-definition. The font used was kids 72 point for the word and kids 14 point for the definition. The word was placed on top and highlighted in blue followed by the picture approximately 4X6 and then the definition. Each of the pages was placed in the binder with the title Language Book I on the cover of the binder. Here is an example of one of the word-picture-definition uses in this study.

Walk



To **walk** is to move from one place to another on foot. For example, I am **walking** to get exercise.

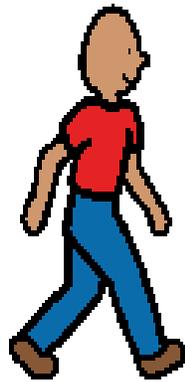
Figure 2. Example of Phase I

Individual word lists. Each participant had an individual word list (Appendix I). For participant 1, the words chosen were school and home related and consisted of words found on a list of common words as reported by his teacher; parent input on feeling type words like angry and anxious; math words like example, measure, between, thousand, pattern, and correct; and directions words like bring, serve and lay. For participant 2 many of word choices were work related; for example, bank, money, signature, area, wait, enter, schedule and set. These words were chosen to help the participant with work related skills at his current job placement. For participant 3, the word choices were work related as well for example; signature, area, salary, transportation, several, numeral, and correct. These words were chosen to help with her current job placement.

Language book II - PCS symbols. In Phase 2, the target word list remained the same for each participant. Picture Communication Symbols were used as the pictorial representation of the word. The words were placed in a binder with 8 ½ X 11 inch separate pages for each word-picture-definition. The font used was kids 72 point for the word and kids 14 point for the definition. The word was placed on top and highlighted in blue followed by the picture approximately 4X6 and then the definition. Each of the pages were placed in the binder with the title Language Book II on the cover of the binder. Here is an example of Language Book II.

Walk

walk



To **walk** is to move from one place to another on foot. For example, I am **walking** to get exercise.

Figure 3. Example of Phase II

Flashcards. For the baseline phase, flashcards were used to see if students were able to identify any of the target words. The flashcards were on 3X5 index cards with the word written in black marker and initial capital letters. Here is an example of a flashcard.

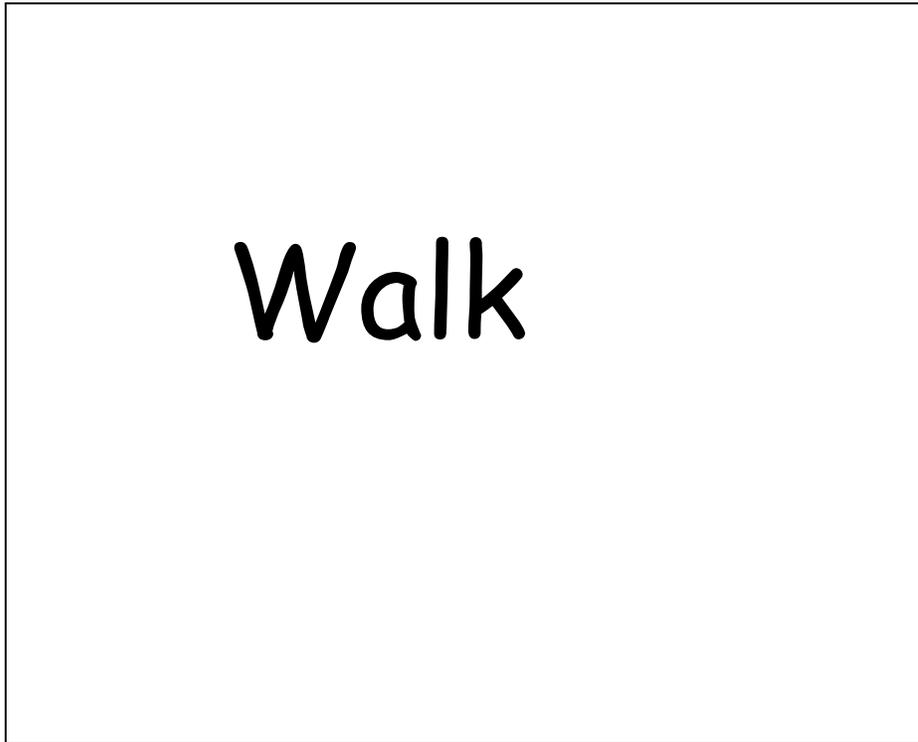


Figure 4. Example of Phase III

In phase III, flashcards were reintroduced using the sight words from the language books and put on flashcards. This was done to see if the students could recognize the words without a picture cue.

Independent Variable

The reading strategies, personal photographs and picture communication symbols, were the independent variables in this study and were introduced subsequent to baseline. Each of these reading strategies consists of the word-picture-definition. For the purpose of this study phase 1, personal photographs (Appendix C), was introduced first. Personal Photographs was introduced first because of the importance of the sequence of learning involved. Personal photographs involved enactive representation which helps the learner obtain knowledge through actions (Johnson et al., 1992). The students read from their books with pictures of themselves doing some activity and a caption under the picture explaining what they are doing to give meaning to the word. After mastery using this instructional strategy, picture communication symbols, phase II (Appendix D), of the intervention was introduced. Picture communication symbols were introduced second because it involved iconic learning which involves obtaining the knowledge through pictures or symbols (Johnson et al., 1992). During phase II the second reading strategy was introduced. During phase II a symbol replaced the personal photograph. This strategy was implemented until mastery was achieved. During phase III flashcards were introduced (Appendix E). This involved a symbolic level of learning which required the learner to read the words without any picture cues.

The words used in each reading strategy were selected in consultation with the parents of the participants. Each group of words was student specific and tailored to their individual level of functioning. These words were chosen because they represent daily living activities that were important to the participants and based on discussions with the

parents. There was a common group of words that consisted of three words (measure, area, and signature) across all participants, as well as their individualized list of words.

Dependent Variables

Baseline. In the baseline condition, student accuracy was used as the dependent measure. During baseline flashcards were used to measure student accuracy. Individual word lists were used and each participant's responses to each word were measured.

Intervention. During the intervention, in order to evaluate the effectiveness of the language books, the following dependent variables were measured: student accuracy while responding to the picture prompts; student satisfaction; and parent perceptions (see Table 4 & 4a).

Student accuracy. Student accuracy was measured using a checklist during the baseline, intervention and generalization phases, and maintenance. Random assignment of the words was used during treatment. Student accuracy was determined using an active response system which is operationally defined as follows. Students were asked to recognize the word and respond by verbally stating the word. An active response was needed (see rubric for active student response – Appendix J). If the student responded correctly the score was 1.0; if the student responded incorrectly the score was 0; if the student gave a partial response (either the beginning sound of the word or the ending sound of the word) the student was given a .5; if the student did not respond the score was 0. The instructional sessions were audio-recorded to ensure consistency of treatment. Three graduate students were asked to listen to audio recording in order to record any inconsistency between the researcher and the observer to establish inter-rater agreement.

Inter-rater agreement is the degree of agreement among the different raters. This is important for scoring reliability during the sessions. It allows for a consistent and precise implementation of the intervention across all the participants. The fidelity of treatment observers were trained accordingly so that the intervention is implemented exactly the same way for each participant.

Student Satisfaction. Students were asked to participate in a survey. The survey had questions about the study and the different strategies that were used (see Appendix F). The students were asked to make decisions on which strategy was more useful.

Parent Perceptions. Parents were asked to be interviewed after the completion of the study (see Appendix G). Parents were asked if they have seen progress and improvement in their child's sight word vocabulary. Parents were asked if their children were using the words in their daily lives and if they can recognize the word in other materials. Prior to beginning each parent interview, the parents were asked to share any relevant school records that might add insight into their children's background, current IEP goals, motivation to learn, and willingness to perform during the study.

Definitions of Dependent Variables

Words read correctly. The number of words read correctly was defined as the number of words a student recognized and then pronounced verbally. The words used were taken from conversations with the participant's parents focusing on daily chores and daily living routines.

Correct answers to flashcards. Comprehension was measured as the number of correct responses to the flashcards.

Intervention characteristics. This intervention included direct instruction and positive feedback. A combination of strategies was implemented to ensure that the participants' unique learning needs were met. In this study the researcher used a demonstration and drill instructional strategy to build word knowledge of each participant. Redirection and positive reinforcement was used to aid each participant to fully engage in the learning process. This study relied on pictures and print to support the teacher driven instruction.

Content area of the study. One major area of study was examined – reading. There are stages of reading development that occur during the process of acquiring the skills to read. Each child goes through these different stages. Children with severe reading difficulties and functioning at the moderate level need more time and more instruction to progress up this literacy ladder. Each participant had an individual list of words during treatment that involve functional words that are chosen by both the parent and researcher. There was also be a common group of words amongst all participants in this study that was used.

Procedures

HSRB

HSRB proposal was reviewed and accepted. Following approval, a flyer was given out looking for volunteers for this study. Three participants met the selection criteria and an initial consultation with parents took place. Parents of the three participants were informed of the study and how their child would be involved. They were provided consent forms granting permission for their child to participate in the

study (Appendix A). Each of the three students was also informed of the study and an assent form was provided (Appendix B) granting their own permission to participate in the study.

Initial consultation with parents

Prior to beginning each parent meeting, the parents were asked to share any relevant school records that might add insight into their children's background, motivation to learn, and willingness to perform in the study. With the consultation of parents, word lists were developed for each participant. These word lists were developed to increase the participant's sight word vocabulary for functional use at home, in school, and in the community.

Random assignments of participants and words

Participants were randomly assigned to intervention initiation days using the following procedures. Each participant was randomly assigned a number from 1-3. The participant's number determined the order in which they started the intervention. There were at least three data points separating each participant's start of the intervention. This is important in order to evaluate the treatment effect using a randomization test (Todman & Dugard, 2001). In addition, www.random.org was used to select the random order for intervention starting day. Since baseline ranged between 3 and 13 days, integers 4 and 13 were entered into [random.org](http://www.random.org) and the following random numbers were obtained: 4, 7, and 10. These numbers were assigned at random to one of each of the participants.

Each participant had an individualized group of words. Those words were randomly ordered for each session during baseline, treatment phases and maintenance

phase. Each word list was put in the list randomizer using www.random.org for each session.

Observer Training

Three graduate interns were assigned to listen to the audio recording of each participant during baseline, treatment phases and maintenance phase. The researcher met with the observers and explained the use of the data collection procedures (Appendix K). The researcher asked the observers to listen to sessions that were audio-recorded and complete the data collection sheets for those sessions. There were four training sessions between the researcher and the observers to ensure that the data collection methods were being followed. During the first training session, the researcher and the observers simultaneously went over the data collection sheets while listening to the audio tape of the participants during the pre-test and discussed any questions. The following three training sessions included listening to the audio tapes and completing the data sheets simultaneously to answer any questions about the data collection methods or any other forms.

Baseline Procedures

Each participant met individually in their home with the researcher in the basement using a table and chairs to work. First the pretest was administered. Participants were shown words on flashcards and asked to verbally state the word within 10 seconds. Known words were eliminated from the pool of targeted words to be used in subsequent phases of the study. After three data points under baseline, Participant 1 was provided instruction on Language Book I – personal photographs. After six data points under

baseline, Participant 2 was provided instruction on Language Book I – personal photographs. After nine data points under baseline, Participant 3 was provided instruction on Language Book I – personal photographs.

Phase I

All participants were introduced to the language books following the completion of baseline. The following four steps were completed for each participant:

Step 1: The researcher presented the Language Book I for each participant with the individual list of words, which included the photograph. The photograph was a picture of the participant acting out the word. This was a one-on-one session between the researcher and the participant. These sessions occurred after school hours at the home of each of the participants. These sessions occurred at approximately the same time daily, Monday through Friday. The researcher provided the prompt when starting the session to each participant, “It’s time to work in your language book.” Time allotted for each session was about 15 minutes and there were two sessions daily for each participant.

For the Personal Photograph strategy, Phase I, the researcher modeled and read the word and pointed to the picture from Language Book I which contained the personal photographs during the first session. Student was prompted to verbally repeat the word. After session 1 the teacher prompted the student to read the word before the teacher modeled it. Teacher did not read the word if the student recognized and said the word correctly. If the student did not respond, responded incorrectly, or said the word partially correct the teacher modeled the word.

Sample Dialogue from Phase I session 1 included the researcher, acted as the teacher participant saying: This is a language book of your photographs. You may open the book and look at the first photograph. When the student made eye contact with the picture, the teacher said “Tell me what is happening in the photograph. A wait time of 30s was given.

Student response was incorrect, the teacher said, this is measure and pointed to the photograph (as seen in the Figure 5). Teacher said, now you say it. A 10s wait time was given. Student responded correctly. The student was directed to turn to the next picture. The student responded correctly, the teacher said that’s right. Turn to the next photograph please. When the student made eye contact with the picture the same procedures were followed. After session 1 the teacher says it’s time to work in your language book. Turn to the first picture, please. The entire sequence was repeated during the 2nd daily session.

Measure



To measure is to find out how much there is of something and determine the size and amount. I am measuring the amount of water in this cup.

Figure5. Personal Photograph Phase

Step 2: The researcher read aloud from Language Book I including the word and the definition. The participant made eye contact with the word and repeated the word as clearly as possible. After session 1, the teacher prompted the participant by pointing to the word and waited for a response. A 30 s wait time was given before the teacher modeled the word. When the student verbalized all the words correctly mastery was obtained. A minimum of 20 sessions was established for criterion to be met by all the participants. If mastery was not achieved after 20 sessions, then phase I was continued until each participant achieved mastery. An active student response criteria was established (Appendix J) and followed.

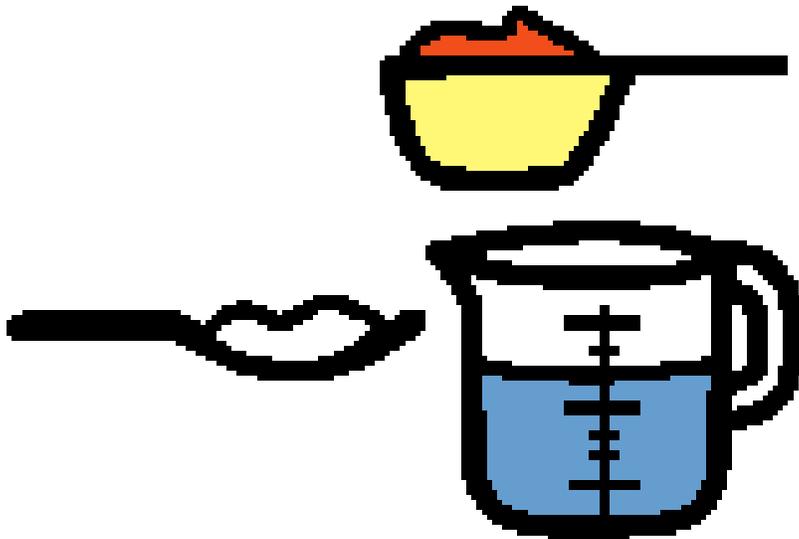
Phase II

Step 3: After mastery was achieved for Language Book I, then Language Book II was introduced. Language Book II included picture communication symbols and the same word and definition used in Language Book I. For the Picture Communication Symbols strategy, Phase II, the researcher modeled and read the word and pointed to the picture symbol from Language Book II which contained the picture communication symbols. Student was prompted to verbally repeat the word.

Sample Dialogue from Phase II session 1 included the researcher, acted as the teacher participant saying: This is a language book of symbols. You may open the book and look at the first symbol. When the student made eye contact with the symbol, the teacher said “Tell me what is happening in the symbol. A wait time of 30s was given.

Student response was incorrect, the teacher said, this is measure and pointed to the symbol (as seen in Figure 6). Teacher said, now you say it. A 10s wait time was given. Student responded correctly. The student was directed to turn to the next symbol. The student responded correctly, the teacher said that's right. Turn to the next symbol please. When the student made eye contact with the symbol the same procedures were followed. After session 1 the teacher says it's time to work in your language book. Turn to the first symbol, please. The entire sequence was repeated during the 2nd daily session.

Measure



To **measure** is to find out how much there is of something and determine the size and amount. I need to **measure** the amount of water in this cup.

Figure 6. Picture Communication Symbol Phase

The researcher read aloud from Language Book II including the word and the definition. The participant made eye contact with the word and repeated the word as clearly as possible. After session 1, the teacher prompted the participant by pointing to the word and waited for a response. A 30 s wait time was given before the teacher modeled the word. When the student verbalized all the words correctly mastery was obtained. A minimum of 20 sessions was established for criterion to be met by all the participants. If mastery was not achieved after 20 sessions, then phase II was continued until each participant achieved mastery. An active student response criterion was established (Appendix J) and followed. After mastery was achieved with Language Book II, then flashcards were introduced.

Phase III

Step 4: Flashcards were introduced using the same words from the participant's target word lists on flashcards. Flashcards with the word and no picture cue were used. The researcher did not model the word, only looked to see if participant recognized the word. After 5 sessions with the flashcards the treatment phases were completed. Steps 1 through 4 were completed for every participant in the Intervention Phases.

After mastery was achieved for Language Book II, flashcards were introduced. Sample Dialogue from Phase III included, this is a group of flashcards of words that we have been reading. I want you to look at the words. When the student made eye contact with the flashcard the teacher said "Tell me what the word is, a wait time of 30s was given.

Student response was incorrect, the teacher said, this is measure and pointed to the word (as seen in Figure 7). Teacher said, now you say it. A 10s wait time was given. Student responded correctly. The student was directed to turn to the next card. The student responded correctly, the teacher said that's right. Turn to the next flashcard please. When the student made eye contact with the flashcard the same procedures were followed. After session 1 the teacher says it's time to work on your words. Turn to the first flashcard, please. The entire sequence was repeated during the 2nd daily session.



Figure 7. Flashcard Phase

Data Collection Procedures

Data were collected daily for 7 to 10 weeks, Monday through Friday. The audio recording of each reading session was used for review. The three graduate interns individually listened to the recordings for the accuracy data on the accuracy recording form. Data collection checklists for baseline, all phases of treatment and maintenance phase for Participant 1 (see Appendix L); for Participant 2 (see Appendix M); for Participant 3 (see Appendix N).

During baseline data were collected five days a week using flashcards with preselected target words. The target words were defined as unknown words after the pretest given to each of the participants. These word lists were individualized for each participant. Participant 1 had 17 words; Participant 2 had 10 words; and Participant 3 had 13 words. During baseline each participant was prompted to read the words on the flashcards and the active student response criteria was followed for scoring.

During each treatment phase data were collected five days a week. The target words were individualized for each participant. A response criterion was followed for scoring and reliability.

Maintenance

Two weeks following the termination of the intervention, data were collected again for four days using flashcards to look for accuracy on sight word vocabulary. Accuracy data were collected across all three participants. Data were recorded in the same manner as used during baseline and intervention phases. This phase determined if the intervention maintained its effect over time.

Fidelity of Treatment

The checklists sheets included a list of criteria for the design and implementation during baseline, all phases of treatment, and maintenance phase to establish whether instructional procedures were followed: Rubrics for active student response criteria (Appendix J), baseline script, phases I, II, and III scripts, and maintenance script, accuracy data collection checklist. For example, after listening to each recording the observer completed the observer checklist indicating the phase, the session number, the participant number, and any anecdotal notes concerning response criteria and script procedure. Each observer also completed an accuracy data checklist after listening to each session which indicated how the participant responded to each word that was presented to them. These checklists were completed by three trained doctoral interns assisting with the research project. Each trained observer attended four training sessions. During training session 1, the researcher discussed the project in detail with a description of data collection methods including the use of the recording system as well as scoring and reliability procedures. During this training session the researcher and the observers listened to the audio recording of the participants taking the pre-test. During this session the response criteria was discussed and any questions were answered. This was done to achieve a consistent level of interobserver agreement (Kennedy, 2005). During the following three training sessions the observers listened to the recording of the individual participants and response criteria was practiced.

For reliability of data collection, all lessons were audio recorded to check for consistency of treatment implementation. Baseline, intervention conditions, and

maintenance used scripted lessons. Approximately 67% of all observations during baseline, all phases of treatments and maintenance phase were assessed for interobserver agreement by three graduate students to record any inconsistency in delivery of treatment. A checklist was used to ensure that the researcher was following the script and using the correct response criteria.

Reliability of Scoring

Reliability checks were administered by having the researcher and three observers compare the accuracy recording checklist for 93% of observations under baseline and 70% of observations under all treatment phases. Three graduate students were asked to listen to the audio recorded sessions in order to record any inconsistency between the researcher and the observer. Inter-rater agreement is the degree of agreement among the different raters. This is important for scoring reliability during the sessions. It allows for a consistent and precise implementation of the intervention across all the participants. The observers were trained accordingly so that the intervention was implemented exactly the same way for each participant.

Table 4

Research Questions, Data Sources, Collection Procedures, Scoring and Data Analyses

Research Question	Data Source	Data Collection	Scoring	Data Analysis
# 1 – Do personal photographs increase sight word vocabulary for children with severely limited reading ability?	Accuracy recording: An active response was recorded; Anecdotal notes	5 days a week; 3 participants; Audio-recording	Over a 30 minute instructional session, a Correct response = 1.0; No response = 0; Partial response = .5; Incorrect response = 0. Audio-recorded to ensure consistency and 3 observers to take average score if inconsistent between observers	Visual inspection of data points plotted under baseline, intervention, and maintenance phases.
# 2 - Do picture communication symbols increase sight word vocabulary for children with severely limited reading ability?	Accuracy recording: An active response is recorded; Anecdotal notes.	5 days a week; 3 participants; Audio-recording	Over a 30 minute instructional session, a Correct response = 1.0; No response = 0; Partial response = .5; Incorrect response = 0 Audio-recorded to ensure consistency and 1 observer to take average score if inconsistent between observers.	Visual inspection of data points plotted under baseline, intervention, and maintenance phases. Randomization Tests
# 3 – Does this sequence of teaching from concrete to abstract facilitate reading?	Accuracy recording: An active response is recorded; Anecdotal records	5 days a week; 3 participants; Audio-recording	Looking for an increase trend in performance with each phase; looking to see if there is a drop in performance across phases; looking to see if they stay at the same level.	Visual inspection of the word identification data examining degree of overlap across all phases

Table 4a

Research Questions, Data Sources, Collection Procedures, Scoring and Data Analyses

Research Question	Data Source	Data Collection	Scoring	Data Analysis
# 4 - Does increasing sight word vocabulary for children with severe disabilities lead to generalization of new acquired sight words to other materials?	Parent Interview Protocol; Participant survey	Triangulation of data determined effectiveness of language books on sight word vocabulary	Student satisfaction survey; Parent protocol- Generating coding categories and themes	Looked for patterns and triangulation of data sources Student survey and parent interview presented student progress and perceptions.
# 5 – What are the perceptions of the parents regarding using instructional strategies for their children to improve and generalize their sight word vocabulary?	Parent Interview Protocol	Triangulation of data determine d effectiveness of language books on sight word vocabulary	Generated coding categories and themes Parent protocol	Looked for patterns and triangulation of data sources
# 6 - What are the attitudes of the participants in using these instructional strategies on improving their sight word vocabulary and generalizing those words to other materials?	Participant survey	Triangulation of data determined effectiveness of language books on sight word vocabulary	Student satisfaction survey	Student survey presented student progress and perceptions

Social Validation

Upon completion of this study there were two additional attitudinal outcomes measured which were a parent interview and a participant survey. The parent interview (Appendix G) was given to the parents of the participants to examine their perceptions of the progress their children made during the intervention. The interview provided additional qualitative information that helped determine the impact of the study. A participant survey was given. The student survey was given (Appendix F). The survey was intended to provide information on the preferences of the participants in this study in both reading strategies. An interview was conducted with the participant's parents in order to understand and document the progress and the perceptions of this study from the participant's and parent viewpoint (Appendix D).

Summary

This chapter has provided a basis for understanding the project design used in this study, the participant characteristics, and procedures for all phases of the intervention, data collection methods, and the importance of all three dependent measures: including the instructional dependent measure – accuracy; and the two attitudinal dependent measures - parent interview and participant survey. These measures are analyzed in the next chapter as well as data was provided regarding each participant in this study.

4. Results

Introduction

This chapter presents a description of the project design, reliability and scoring, and data results for each participant and across participants. As described in chapter three, a multiple baseline design across participants was used to assess the effectiveness of the reading intervention for increasing sight word vocabulary for children with severe disabilities. The multiple baseline design consisted of baseline, three phases of treatment, and maintenance phase. In baseline condition data were collected using flashcards. In Phase I, accuracy reading data were collected during the implementation of the first reading strategy, personal photographs. In Phase II, accuracy reading data were collected during the implementation of the second reading strategy, picture communication symbols. In Phase III, reading data were collected using flashcards in a generalization setting. During Maintenance Phase, reading data were collected using flashcards; and a participant survey and parent interviews, collected after all reading data were collected, were analyzed to examine the effectiveness of the reading intervention and look at the attitudes and perceptions of the participants and parents.

Reliability and Scoring

This section presents information on reliability during data collection as well as reliability of scoring procedures on the dependent measure. Accuracy of student response was assessed. An active student response was measured and recorded using an audio recording of each reading session. Accuracy of student response was defined as correct, incorrect, partial correct, and no response (See Appendix J). Participants were asked to verbalize the word, make eye contact with the trainer, and provide a verbal response. After 10 seconds with no response the participant was shown another word. Each instructional session lasted approximately 10 to 15 minutes and two sessions were held daily. Interobserver reliability in interval recording is based on the number of agreements divided by the total number of agreements and disagreements multiplied by 100. Any additional information listening to the recordings were written as anecdotal notes on the recording checklist (See Appendix K).

Three doctoral interns were trained as observers to help in this project. Training included four sessions. Observers were trained in the use of the recording system; understanding of the operationalized definition of the independent variable including quantitative characteristics; and specific details of the intervention (Kennedy, 2005). For example, training sessions included listening to participant's responses on audiotape and completing data collection checklists. After each recording, the checklists were completed and the active student response rubric was discussed and followed. Any additional information was recorded as anecdotal notes on the checklists.

Interobserver agreement was assessed for approximately 67% of all observations during baseline, all phases of treatment, and maintenance phase. If 75% or greater reliability was not achieved further training on observational techniques was conducted. Doctoral interns conducted reliability checks across all participants. A coefficient of agreement was calculated for each participant and then averaged to yield a mean interobserver coefficient.

The mean interobserver coefficient of agreement was calculated at least 90% for all participants for the dependent variable of number of words correct. Participant 1 (Larry): 93 %; (assessed on 88% of observations); Participant 2 (Andy): 86 %; (assessed on 46% of observations); Participant 3 (Emma): 92% (assessed on 68% of observations).

The number of words correct. The number of words correct verbalized by each participant was calculated after each session. The number was recorded on a checklist. Three observers independently scored the participant's responses across baseline, all phases of treatment, and maintenance phase. For all scores that were not exact matches, an average score was provided. There were two scores for each participant. Reliability of scoring was computed by averaging the two scores and the resulting reliability was 90 percent agreement.

In addition to the instructional dependent measure this study assessed two attitudinal dependent measures which were the parent interview and the student survey.

Parent interview. Parent perceptions were noted during the interview after the intervention. Each interview took place in the interviewee's home to provide comfort. Each parent was asked about their children's use of the sight words learned and if they

believed the methodology used was successful. The researcher compared each interview to look for main themes that emerged. The main themes were a) pictures; b) reading; and c) expectations.

Upon completion of all the interviews the digital audio that used to record each session was sent to a professional transcription service. Field notes were created immediately following each interview. These transcripts and the field notes were analyzed using a qualitative approach. All data sources were read and re-read and examined for emergent themes and confirmation or disconfirmation (Creswell, 2005).

Student Survey. Participants were asked to complete a brief survey designed by the researcher. The survey asked the students to determine what methodology worked best for them to learn new sight words. Students were asked whether pictures, symbols, or flashcards helped them learn and remember the words. The survey consisted of 5 questions: 3 general questions with choices given; and 2 questions were tailored made for the participant's individual word list. Forced choice items were: which method do you like best; which is your favorite word; which is your favorite book. Open-ended items were: do you like to read; and what is your favorite picture. Items were then scored by grouping forced choice items responses together and open-ended choice item responses together across all participants.

The researcher examined each survey to look for general responses to each question. This survey served two purposes: 1) it helped add relevant information on the participant's preferred method of learning words and 2) provided another source for triangulating data.

Fidelity of Treatment

In order to assure the fidelity of the intervention, checklists for fidelity was completed for 93% of the reading sessions under baseline and 70% of the reading sessions under treatment conditions and 33% of the reading sessions for maintenance sessions across all three participants. Fidelity scoring was assessed for accuracy of student response under baseline, all phases of treatment, and maintenance phase. Each observer listened to the audio recording of two of the three participants during baseline and their responses were averaged to obtain a mean interobserver agreement coefficient. Each observer listened to two of the three participants during treatment phases and their responses were averaged to obtain a mean interobserver agreement coefficient. Two observers listened to one of the participants during maintenance phase and their responses were averaged to obtain a mean interobserver agreement coefficient. Fidelity of treatment implementation was 100% for baseline and 100% for intervention phases.

Data Analyses

A visual analysis and randomization test were conducted for the data collected for the dependent measure. Visual analysis entailed the interpretation of level, variability, slope, and overlapping data during baseline, all phases of treatments, and maintenance phase (Horner et al., 2005). An alternative to visual analysis is randomization tests which are nonparametric tests and were conducted in order to provide versatility in the statistical analyses (Todman & Dugard, 2001). Randomization tests are a valid test that has no assumptions about the data (Todman & Dugard, 2001). Randomization tests are not vulnerable to weaknesses of other statistics applied to single subject data.

Visual analysis. This type of analysis is useful for single-participant research and allows us to inspect the data and is the traditional means of evaluating single subject research. The level refers to the mean performance during a phase, variability refers to the amount of fluctuation around a mean or slope during a phase; slope is the incline of a straight line, and overlapping data refers to the number of data points that overlap between phases (Horner et al., 2005). Visual analysis allows us to examine these changes in the data and evaluate the effectiveness of the treatment.

Statistical Analysis and Randomization Tests

The assumptions for randomization tests are the nature of the distribution; random sampling from the distribution; independence of observations, and exchangeability (Todman & Dugard, 2001). Randomization tests are based on certain principles: randomization procedures, a test statistic is selected and computed for alternative arrangements of the data (Todman & Dugard, 2001). In this study we randomized the words and we also randomly assigned the participants to the start of the intervention.

Randomization tests can verify visual analysis procedures where treatment effects are not obvious. A randomization test is a procedure for determining significance. The test is done to draw valid statistical inferences about the effectiveness of the treatment. The effects of the treatment was evaluated using Todmand and Dugard's (2001) randomization designs where intervention points were randomly determined within a preset range for each participant. Specifically, Design 3 (AB – Multiple Baseline) in Todman and Dugard (2001) was used with SPSS.

PND. This evaluative metric determines the proportion of data points in a given phase that exceed the extreme value in the baseline condition (Scruggs & Mastropieri, 2001). PND is sensitive to variability and slope but allows us to focus on a meaningful outcome and can be easily calculated (Scruggs & Mastropieri, 2001).

Number of Words Correct

During the baseline, intervention, and maintenance phases, the number of correct words was measured. Number of words correct was determined based on an operationally defined behavior once the word was shown to the participant. A correct response was given 1.0 points, an incorrect or no response was given 0 points, and a partial response was given .5 points. This variable was measured after each response and points were totaled after each session. First, results for all phases of treatment are presented. Figure 8 presents data for all three participants across all phases.

Visual inspection of the data indicate that all the participants increased their sight word vocabulary once the intervention was introduced as seen in the graphic display across participants where percentages of words correct is represented as seen in Figure 9, across all participants and noted in the descriptive data in Table 6.

This study measured performance data on one instructional dependent variable: accuracy data on sight word vocabulary. A minimum of 20 sessions was implemented for Phase I. The phase ended when the criterion was met and mastery was achieved. The total number of sessions required to reach criterion on each instructional level were determined by the number of data points (1 point per session) for each level. Two of the three participants showed immediate effects of phase 1 intervention while the other

participant required 35 sessions. The data showed that the intervention was effective across both phases with all three participants as seen in Figure 8. Number of words correct by three participants was measured. Baseline used flashcards, Phase I used personal photograph strategy to teach sight word reading; Phase II used picture communication symbols; Phase III used flashcards. Total number of words correct for Participant 1 is 17, Participant 2 is 10, and Participant 3 is 13.

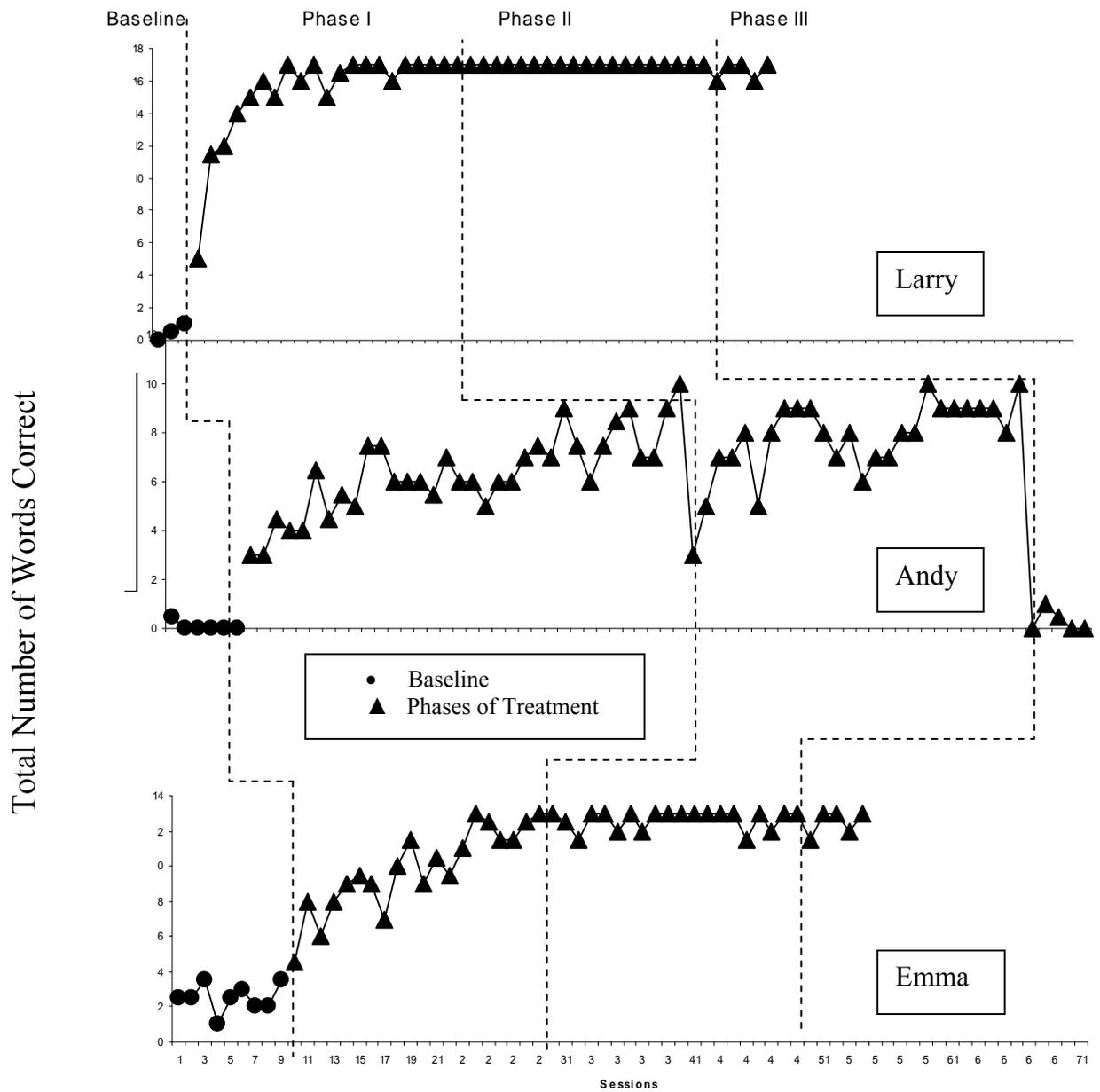


Figure 8. Reading data across all phases and all three participants. Total number of words correct for Participant 1 is 17, Participant 2 is 10, and Participant 3 is 13.

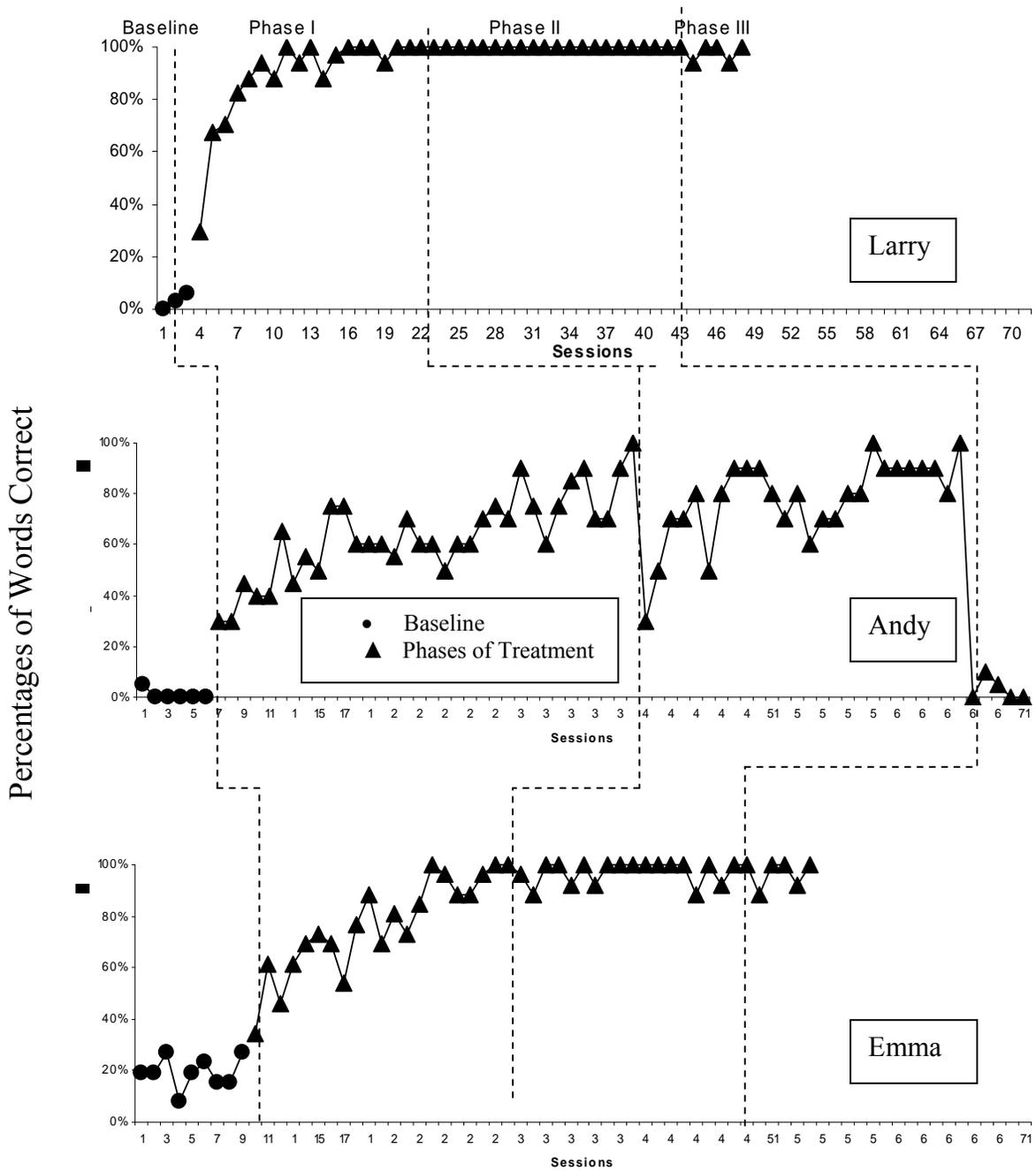


Figure 9. Percentages of words correct across all phases and all three participants. Total number of words correct for Participant 1 is 17, Participant 2 is 10, and Participant 3 is 13.

Four data characteristics were examined in the visual analysis method: level, trend, stability changes, and slope. Level of performance was defined by the shift of performance from the end of one phase to the beginning on the next phase (Kazdin, 1982). Trend was defined by the data showing an increase or decrease over time (Kazdin, 1982). Stability change is across all data points in a phase and stability was established by all of the participants. Two of the three participants appeared to have stable data. However, the data of 1 of the participants, Participant 2, was highly variable, thus stability was not useful information. Criterion was established prior to the implementation of the intervention and mastery for each phase was required. Participant 2 required 15 additional sessions of phase 1 to meet the criterion and 6 additional sessions of phase 2 to meet the criterion. Level change is an indicator of the strength of each phase. In this study, where sequential learning is required, this measurement is not valid. It is logical to expect that the first data point of phase 2 will be lower than the last data point in phase 1. Level of performance with changes in trend across phases is seen in Figure 10 across all participants. Baseline shows a relatively stable trend or possibly increasing trend. When the intervention was introduced an accelerating trend is evident in Phase I and Phase II. For participant 2, in phase III there is a decreasing trend.

Use of Pictures in phase I is assumed to create a behavior change from baseline condition. The last data point in baseline phase was also compared to the first data point in phase I as seen in Figure 11.

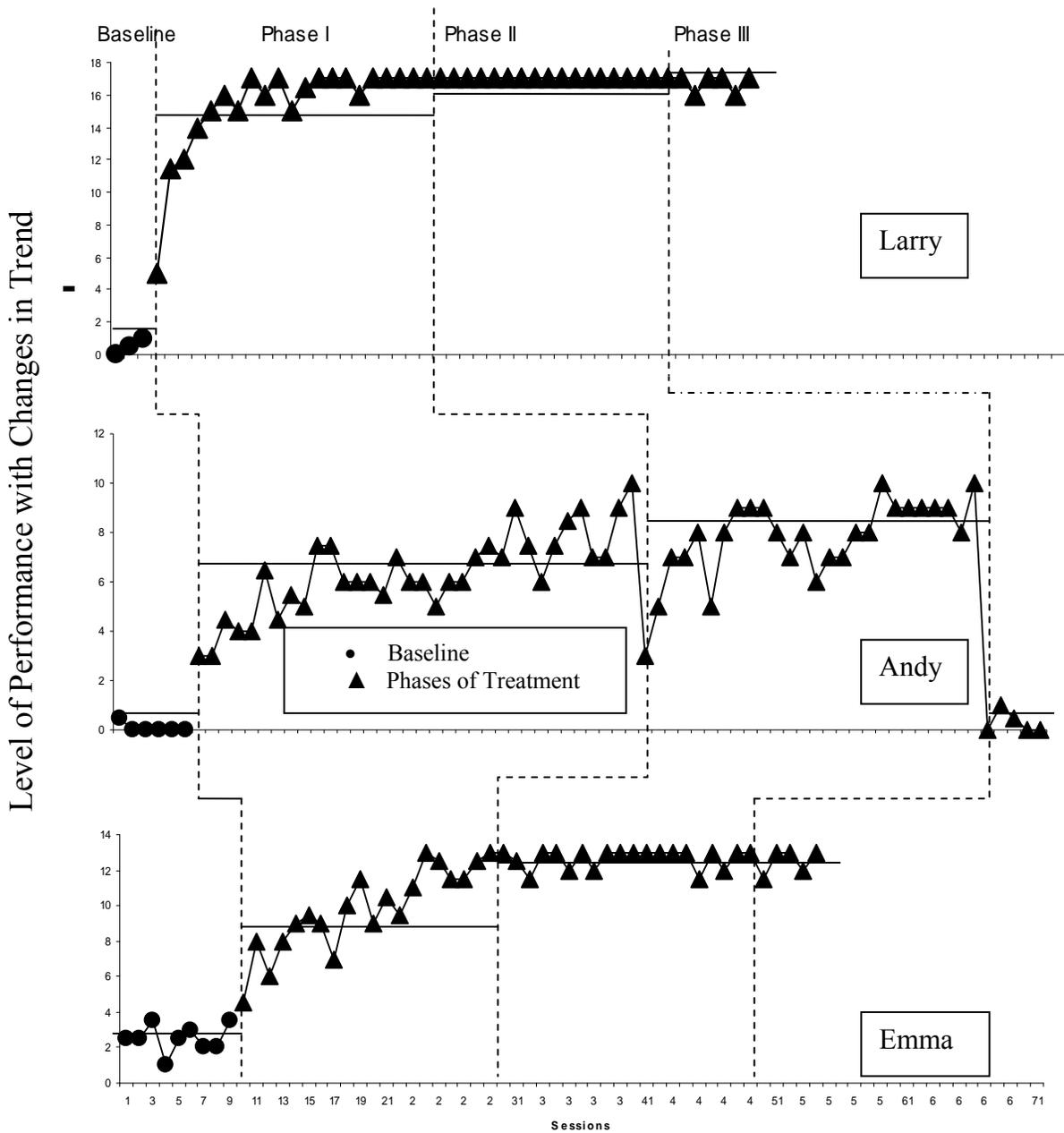


Figure 10. Level of performance with changes in trend across phases represented with straight lines. Total number of words correct for Participant 1 is 17, Participant 2 is 10, and Participant 3 is 13.

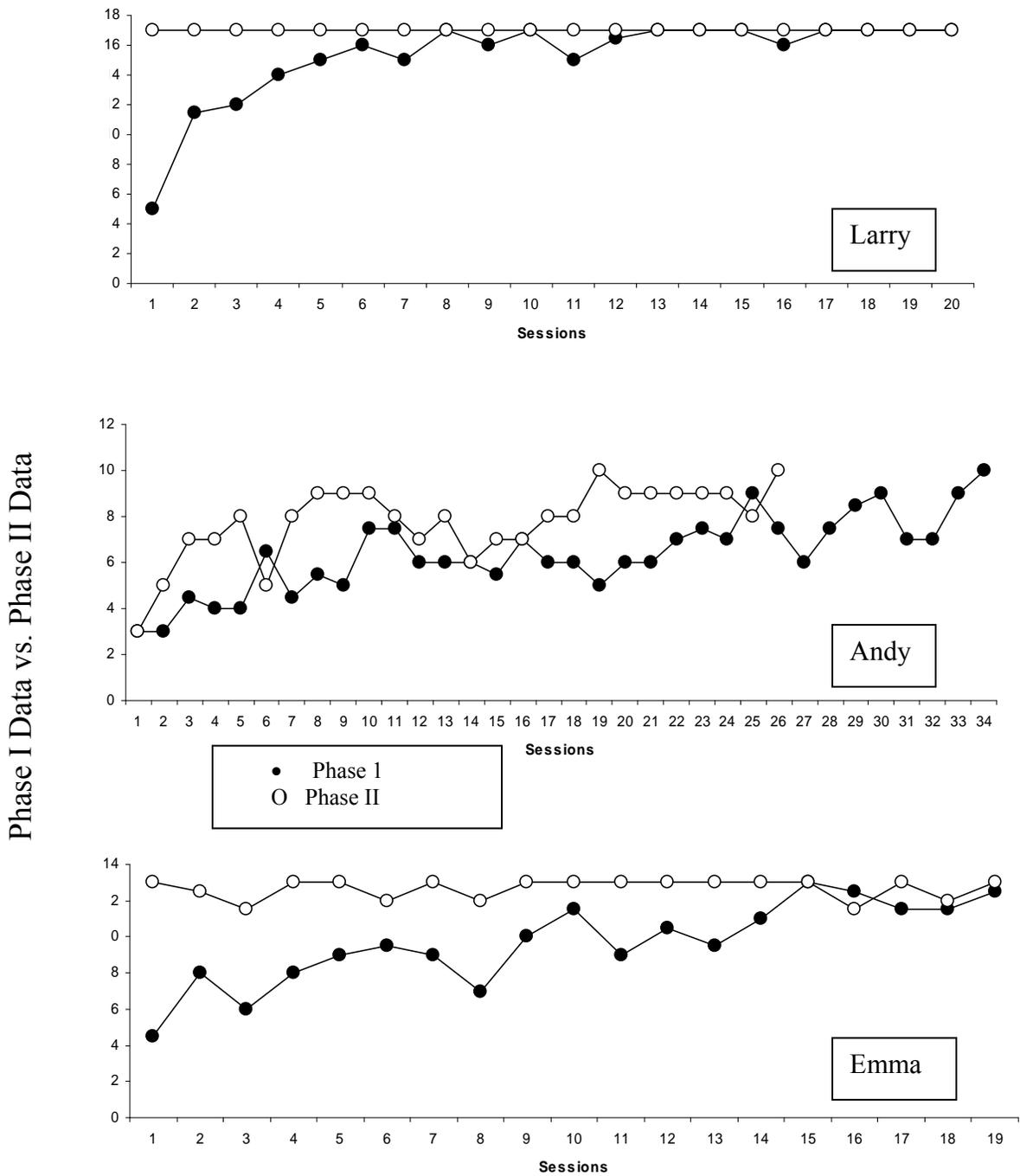


Figure 11. Comparative analysis of phase I data to phase II data across all participants. Total number of words correct for Participant 1 is 17, Participant 2 is 10, and Participant 3 is 13.

Use of symbols in phase II is assumed to create a behavior change from the previous phase. Within phase data was analyzed to determine the participant performance during the specific phase. That was then compared to the previous phase which serves as its baseline. This between phase analysis provides information about the effects of the intervention over the baseline condition. The amount of change in level and trend between and within phases is used to evaluate a functional relationship. Within each phase the direction was noted by the positive direction of the trend line. Between phases, it was the positive difference of the mean level of the two adjacent phases.

For Participant 1, trend and level stabilities were established over three days. During these three days, Larry was asked to identify 17 words. During baseline phase, mean level of performance of 2.9% (see Table 6). On the fourth day, the intervention was introduced. Language Book I with personal photographs was read to Larry and he was prompted to respond and repeat the words. This intervention phase lasted 20 sessions for Larry. The level of performance during Phase I was 89.7%. Phase II lasted 20 sessions for Larry. The level of performance during Phase II was 100%. Phase III was the generalization phase and lasted for 5 sessions. During the generalization phase the words were not read to Larry and he was shown flashcards with no picture cues. There were no prompts during this phase and only the words were shown for Larry to respond. During the maintenance phase which lasted for four sessions, flashcards were used. The level of performance during the maintenance phase was 100%.

For participant 2, trend and level stabilities were established over six days. During these six days, Andy was asked to identify 10 words. During baseline phase, mean level of performance of .8 % (see Table 6). On the seventh day, the intervention was introduced. Language Book I with personal photographs was read to Andy and he was prompted to respond and repeat the words. This intervention phase lasted 35 sessions for Andy. The level of performance during Phase I was 64 %. Phase II lasted 26 sessions for Andy. The level of performance during Phase II was 78 %. Phase III was the generalization phase and lasted for 5 sessions. During the generalization phase the words were not read to Andy and he was shown flashcards with no picture cues. There were no prompts during this phase and only the words were shown for Andy to respond. During the maintenance phase which lasted for four sessions, flashcards were used. The level of performance during the maintenance phase was .03 %. Andy had difficulty meeting the criterion for phase I and phase II. Andy's developmental disability is borderline moderate range of functioning, i.e., close to severe range of functioning. Andy's number of known words was less than 10. His functional academic skills were minimal. These characteristics could be the reason for his low performance in phase III. Andy's developmental level was perhaps not high enough to perform the tasks. Future research might control for developmental age across participants.

Participant 3 trend and level stabilities were established over nine days. During these nine days, Emma was asked to identify 13 words. During baseline phase, mean level of performance of 13 % (see Table 6). On the tenth day, the intervention was introduced. Language Book I with personal photographs was read to Emma and she was

prompted to respond and repeat the words. This intervention phase lasted 20 sessions for Emma. The level of performance during Phase I was 75.4 %. Phase II lasted 20 sessions for Emma. The level of performance during Phase II was 97 %. Phase III was the generalization phase and lasted for 5 sessions. During the generalization phase the words were not read to Emma and she was shown flashcards with no picture cues. There were no prompts during this phase and only the words were shown for Emma to respond. During the maintenance phase which lasted for four sessions, flashcards were used. The level of performance during the maintenance phase was 100%.

The use of each reading strategy, personal photographs and picture communication symbols when introduced to each of the participants increased their sight word vocabulary. Their sight word vocabulary list was developed by the researcher in consultation with the parents as well as school reports and records that indicated known word lists. An individualized list of target words was developed for each participant; a common group of words across all participants included three words; and a total group of words for each participant was examined. Each participant has a total number of words as seen in Figure 2. There are a group of three common words that each participant had on their list of target words as seen in Figure 12. Figure 13 is a repeated acquisition graph. The figure shows the study of sight word acquisition with three students with severely limited reading ability. The dependent variable was the number of sight words read correctly. Two different interventions were compared in terms of number of words correct: 1) personal photographs, 2) picture communication symbols. This graph analyzed

skill acquisition under all three phases. This represented how the participants learned words using different conditions.

During the maintenance phase of the study flashcards were used to determine if the participants' sight word recognition was evident after the intervention was removed for two weeks. For Participant 1 the level of performance during maintenance phase was 100%. For Participant 2 the level of performance during maintenance phase was 25 %. For Participant 3 the level of performance during maintenance phase was 100 %.

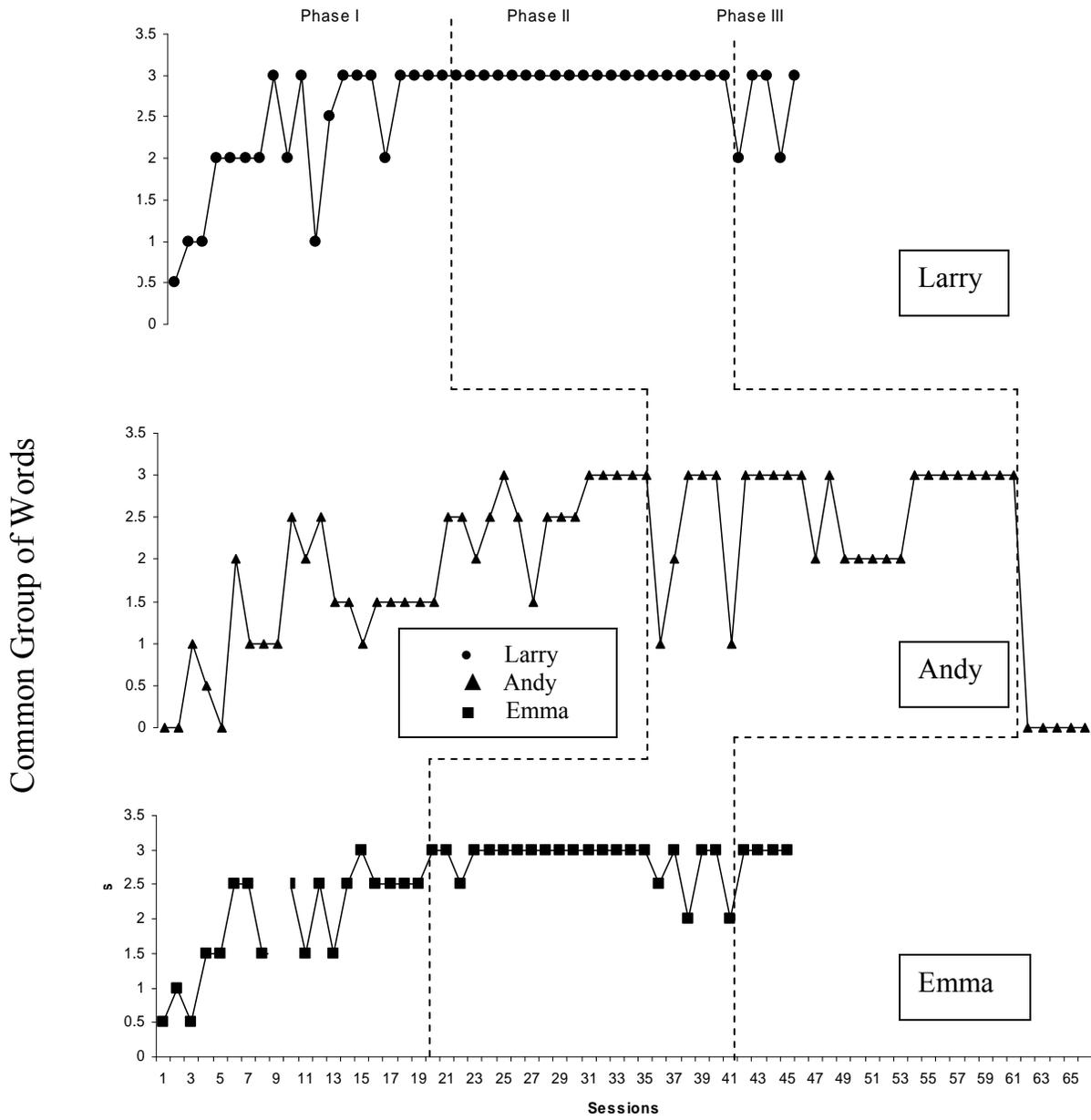


Figure 12. Common group of words across all participants. All three participants had three words in common that were measured for accuracy data. Total number of words correct for Participant 1 is 17, Participant 2 is 10, and Participant 3 is 13.

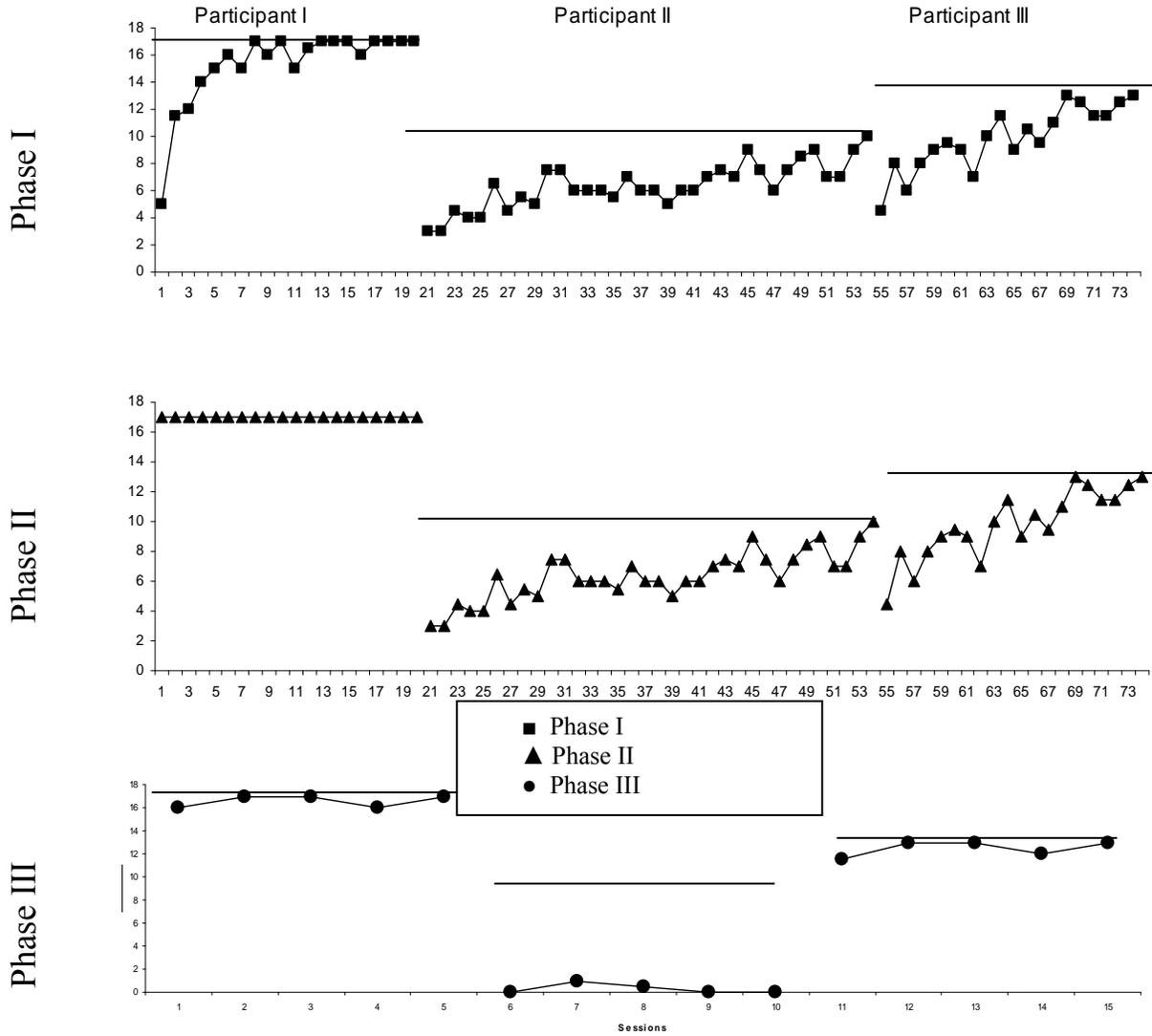


Figure 13. Repeated Acquisition across all participants. Total number of words correct for Participant 1 is 17, Participant 2 is 10, and Participant 3 is 13 as shown by straight line. The straight line represents a criterion line for each participant for their individual number of words.

Randomization Test Results

A randomization test confirms the results of the visual analysis. The test is done to draw valid statistical inferences about the effectiveness of the intervention. In a randomization test of the prediction that a child would increase sight word vocabulary when a reading strategy was introduced the proportion of data divisions giving a time difference in the predicted direction at least as large as the experimentally obtained difference was 0.007631. Therefore, the obtained difference in sight word vocabulary before and after introduction of a reading strategy was statistically significant ($p < 0.05$; one-tailed). This indicates that these findings were not chance findings. However, the number of treatment sessions varied across participants and therefore the randomization test is an approximation.

The assumptions for randomization tests are the nature of the distribution; random sampling from the distribution; independence of observations, and exchangeability. When repeated observations are made on the same participant there is a likelihood that errors will occur. Because the sessions of this study were close in occurrence there was a chance that there were highly correlated scores. Thus, autocorrelation violates the assumption of independence of observations.

Percent of Nonoverlapping Data

The Percentage of Nonoverlapping Data was 100% across all participants as shown in Table 5 except for Andy as noted from baseline to phase III was 10%. Visual inspection shows a positive trend between baseline and intervention phases. The use of

the reading intervention appeared to positively impact sight word acquisition as data indicted an upward trend.

For participant1, the change in trend direction between baseline and intervention phase was positive. The percent of Non Overlapping Data (PND) was 100% between baseline and phase I. The PND was 100% between baseline and phase II. For participant 2, the change in trend direction between baseline and intervention phase was positive. The percent of Non Overlapping Data (PND) was 100% between baseline and phase I. The PND was 100% between baseline and phase II. For participant 3, the change in trend direction between baseline and intervention phase was positive. The percent of Non Overlapping Data (PND) was 100% between baseline and phase I. The PND was 100% between baseline and phase II. In Table 5, PND is represented across all participants.

Table 5

PND

Participant	Baseline to Phase I	Baseline to Phase II	Baseline to Phase III
Larry	100%	100%	100%
Andy	100%	100%	10 %
Emma	100%	100%	100%

Table 6

Summary of Statistical Data During Baseline, Treatment and Maintenance

	Baseline	Phase I	Phase II	Phase III	Maintenance
Participant 1	$M = .03\%$	$M = 90\%$	$M = 100\%$	$M = 98\%$	$M = 100\%$
Larry	$SD = 1$	$SD = 2.92$	$SD = 0$	$SD = .28$	$SD = 0$

Participant 2	$M = .008\%$	$M = 64\%$	$M = 78\%$	$M = .03\%$	$M = 25\%$
Andy	$SD = .53$	$SD = 1.71$	$SD = 1.66$	$SD = .45$	$SD = 1.63$
Participant 3	$M = 13\%$	$M = 75\%$	$M = 97\%$	$M = 96\%$	$M = 100\%$
Emma	$SD = 1.16$	$SD = 2.43$	$SD = .55$	$SD = .71$	$SD = 0$
Combined					
All	$M = 4.3\%$	$M = 88.3\%$	$M = 92\%$	$M = 64.7\%$	$M = 75\%$
Participants	$SD = .59$	$SD = 4.47$	$SD = 4.6$	$SD = 8.48$	$SD = 6.2$

Note. M = Mean; SD = Standard Deviation.

Participant 1: Larry. Over a baseline period of 3 sessions, Larry was answering (.5) an average number of words correct. Comparing the last data point during baseline to the first data point in Phase I Larry increased to 5 words read correctly. Over the course of 20 sessions, his average number of words correct was 15.25 (out of 17) in Phase I. Over the course of 20 sessions, his average number of words correct was 16.6 in Phase II. Over the course of 5 sessions, his average number of words correct in Phase III was all 17 words correct. The Maintenance phase of the study was implemented two weeks after the intervention phase. Participant 1 (Larry) was able to maintain all 17 target words and read them correctly over the 4 sessions in the maintenance phase.

Participant 2: Andy Over a baseline period of 6 sessions, Andy was answering (.08) an average number of words correct. Comparing the last data point during baseline to the first data point in Phase I Andy increased to 3 words read correctly. Over the course of 35 sessions, his average numbers of words correct 6.4 (out of 10) in Phase I. Over the course of 26 sessions, his average numbers of words correct 7.8 in Phase II.

Over the course of 5 sessions, his average number of words correct in Phase III was .3. The Maintenance phase of the study was implemented two weeks after the intervention phase. Participant 2 (Andy) was able to maintain 2.5 target words over the 4 sessions in the maintenance phase.

Participant 3: Emma Over a baseline period of 9 sessions, Emma was answering (1.7) an average number of words correct. Comparing the last data point during baseline to the first data point in Phase I Emma 4 words read correctly. Over the course of 20 sessions, her average number of words correct 9.8 (out of 13) in Phase I. Over the course of 20 sessions, her average numbers of words correct 12.6 in Phase II. Over the course of 5 sessions, her average number of words correct in Phase III was 12.5. The Maintenance phase of the study was implemented two weeks after the intervention phase. Participant 3 (Emma) was able to maintain all 13 target words and read them correctly over the 4 sessions in the maintenance phase. Table 3 represents the average number of words read correctly across all participants.

Overall effectiveness. Overall effectiveness is based on the visual results of slope and level of performance as well as PND and randomization test results. The overall effectiveness for this study was positive across all participants as noted in Table 7. When looking at each phase, Andy did not meet the mean level of performance and had a decreasing trend line. Larry, however, had performed at the ceiling level and therefore did not show an increase for phase II and phase III.

Table 7

Summary of Overall Effectiveness and the Effectiveness of Each Phase of the Intervention to Increase Sight Word Vocabulary

Participant	Overall Effectiveness	Phase I	Phase II	Phase III
Larry	Y	Y	-	-
Andy	Y	Y	Y	N
Emma	Y	Y	Y	-

Y = criterion met for increased mean level and positive trend line

N = did not meet the mean level and trend criterion

- = an increase was not possible because the participant performed at the ceiling level

Parent Interviews

The parent interview was done in order to gain understanding of how the participants generalized their word list in either the home or school setting. The parents were asked to give examples of how their children utilized the target words in natural settings. The interview was done to give additional information on how the learned words were being incorporated into the participant's lives and if the learned words were beneficial to their school and home lives.

This was done by initially reading the transcripts and coming up with 5 themes (pictures, background, goals, reading, and expectations). Each of the 5 themes was coded using a different highlighted color. After reading the transcripts a second time, the researcher looked for quotes or words when one of the themes was supported in the documentation. The transcripts were then divided into themes and the information that

supported each theme. Three remaining themes emerged and were re-examined and then identified as the main themes. The themes were uncovered after the parent interviews. The following section identifies the themes in detail with supporting words or quotes as seen in Table 8.

Table 8

Definition of the Themes

Theme	Description
Pictures	The theme of using pictures as an effective instructional tool emerged from all the interviews. As noted by Participant 1 parent: “Larry is very visual. I don’t think it would have been nearly as successful without the pictures.
Reading	Reading emerged as a theme because all the families discussed how increasing sight word vocabulary could help their children in different and practical areas of their lives. For example, Participant 2 parent response to how she is going to continue to reinforce the words: “Find out what he’s doing, find actual circumstances where he sees the words in real life and um, help him recognize and be able to apply it to more than just his singular situation but maybe in a broad spectrum.

Expectations The theme of expectations was discussed and found to be positively addressed by all parents. Each parents' expectations included their child increasing their sight word vocabulary and generalizing that skill. As Participant 1 parent states: "I was intrigued by whether or not Larry could learn words that were a little more abstract and maybe and could he memorize the definition along with it. Participant 2 parent continues: "I think Andy and I benefitted. Participant 3 parent: ..." I really believe she can continue to learn.

Parents were interviewed and line by line coding was employed. After picking out key words and looking for patterns, heading codes, and group subjects were generated. Three major categories and themes emerged: Pictures, Reading and Expectations. I aggregated my data by each category. These final categories and codes enabled me to examine my data closely and look for any general themes. The focus of the parent interview was to determine if the words were being generalized in their home setting. I asked each parent ten questions (Appendix G) to examine their perceptions on the progress their children made during the project. I asked Participant's 1 (Larry's) mom what were her expectations of this study?

Response:

Well, I didn't really know what to expect but I was intrigued by whether or not Larry could learn words that were a little more abstract and maybe and could he memorize the definition along with it. I thought that he would probably do pretty well uh, but I also was excited about what he would do, how he would progress.

Researcher: I asked Andy's mom, were your expectations met?

Response: I think Andy and I both benefitted. So success plus! (laughing)

Researcher: (laughing) How do you think the study could have been improved?

Response: Uh, I would think you know, I'm, I'm gearing towards the words that he was successful at and I was thinking maybe the words that he's less successful at are words that are not in his regular vocabulary. So they were probably new words to him to begin with. So I'm thinking words that he may have already known and was comfortable with, he might have been able to pick up more.

Another theme that emerged from the interviews was the value of pictures in learning new words.

Researcher: How would you define success for this study?

Larry is very visual. I don't think it would have been nearly as successful without the pictures.

Researcher: How do you feel your child performed during the study?

Response: There's definitely the progression, you know the pictures Andy's more successful at. The you know, the symbols he's got because um, he knew the pictures immediately. The symbols occasionally he says the wrong word um, like a wait and enter.

Reading was a central theme for all the parents.

The parents of participant 1 and participant 3 expressed similar views on the benefits to continued learning of new tasks. The following is the parent of participant 3.

Researcher: Do you plan to continue to reinforce learned words?

I really believe she can continue to learn.... It's kind of been demonstrated by this study.

Researcher: How would you define success in this study?

Well, in a couple ways. Number one, um, increasing her vocabulary, incorporating it into her daily life, in terms of speech production, but also knowing that there are other people she can work with outside of school to accomplish new goals.

And um, my gut instinct has always been that there's still additional things she can learn.

She continued the discussions on the benefits of small groups and structure that can help her daughter learn.

It's a smaller group but um, you had targeted um, definite goals. And when you have that and you have a child like Emma, she knows when she's attaining that goal. And for them it makes them feel self confident, it makes them feel capable and that's different! and so then it's not a frustrating situation. You know she wasn't trying to learn a hundred words and she was also not working on it for an hour. Her attentions just not that long.

The parent of participant 2 had different insights into the practicality of the abstract words in her son's target sight word vocabulary.

Researcher: Do you plan to continue to use the learned words?

Response: Well, for next year when he's in his new school environment, you know, depending on what kind of work program he's in, I might find words that are applicable to that. So, that would be, that's where I'm heading anyway for him, you know, more practical applications. And wanting him to be able to be safe in his environment and that sort of thing. So that, that's where I would use it primarily.

She continues: find out what he's doing, find actual circumstances where he sees the words in real life and um, help him recognize and be able to apply it to more than just his singular situation but maybe more in a broad spectrum?

Researcher: How do you think the study could have been improved?

So I'm thinking words that he may have already known and was comfortable with, he might have been able to pick up more.

So I'm thinking that because he doesn't use those words they, they were new vocabulary words for him in addition to new reading words. So, I'm thinking he um, when I tried to have him for example just list all his words, just think of all of them, he was, he came up with eight. I was really surprised.

Summary

Parents often have a wide variety of hopes and expectations for their children with significant disabilities. These interviews revealed how important continued hope for their children's learning is in their lives. The major themes revealed from these interviews were pictures, reading, and expectations. All parents reported success at using pictures to learn new words and that their children can continue to learn new things and progress in areas like reading. Expectations were found to be similar in that parents want their children to learn and progress in areas that will benefit their lives in school and home.

Participant Surveys

The survey responses from the three participants are indicated in Table 9. Four of the five survey questions addressed Research Question 6 which is: What are the attitudes

of the participants in using these instructional strategies on improving their sight word vocabulary and generalizing those words to other materials? The first survey question asked participants “Which do you like best?” The responses are indicated in Table 9.

Table 9

Responses to Survey Questions

Question	Response
Which do you like best? Pictures, symbols or words?	Two of the three participants indicated that using pictures was their preferred method of learning words. Both participants circled the picture option. Participant 3 chose words as the preferred method of learning words. She circled the word option.
Do you like to read?	Each participant circled the symbol ‘yes’ in response to this question. They responded positively to whether they enjoy reading.
What is your favorite book – Language Book I (personal photographs) or Language Book II (picture	Each participant chose Language Book I – the personal photographs as their favorite book.

communication

symbols)?

Participant Survey

The student survey was done to gain participant perspective on their preferred methodology while learning new sight words. The participants were asked which strategy helped them learn the sight words and which strategy they enjoyed more when learning something new. The participants were asked which Language Book was their favorite. Language Book I was the personal photographs and Language Book II was the picture communication symbols. The participants chose Language Book I 100%. All the students preferred learning new sight word using the book with personal photographs as seen in Table 10.

Table 10

Results of Student survey

Participant	Preferred Methodology (Pictures, symbols, or flashcards)	Enjoys Reading (Yes, no, I don't know)	Favorite Language Book (Language Book I or Language Book II)
Larry	Pictures	Yes	Book I
Andy	Pictures	Yes	Book I
Emma	Flashcards	Yes	Book I

Comparison of students' preferences. First, Larry and Andy indicated a preference for pictures as seen in Table 11. One possible explanation for this commonality is that pictures can enhance a students' learning (Alberto & Fredrick,

2000). Research on picture reading skills has found that student's ability to read pictures helps them engage in appropriate activities (Alberto & Fredrick, 2000). Perhaps Larry developmental disability is connected with this preference since his performance was significantly high in all three phases. Andy had difficulty across phases however, enjoyed the pictures and was more involved during phase I. Second, Emma indicated a preference for flashcards. Emma's goal during the study was to progress through each step quickly to reach the end. Emma understood that the pictures made it easy for her and she likes challenges and therefore chose the flashcards. Third, results indicate that no student expressed an interest in their most successfully methodology where their individual performance was the highest. Future research is needed with a wider group of participants of various developmental ages.

Table 11

Preference vs. Performance

Participant	Preferred Methodology (Pictures, symbols, or flashcards)	Phase I	Phase II	Phase III
Larry	Pictures	90%	100%	98%
Andy	Pictures	64%	78%	.03%
Emma	Flashcards	75%	97%	96%

5. Discussion

The primary goal of this study was to examine the effectiveness of two reading strategies on increasing sight word vocabulary for children with severe disabilities. This study also examined the importance of the learned unknown sight words to the daily lives of its participants and explored the perceptions of the parents of the study participants on generalizing the target words to other materials and settings. Finally, students were asked about their preferences for the instructional methods employed in this study.

Overall findings for this study were: (a) the first reading strategy introduced, personal photographs, increased sight word vocabulary across all participants; (b) the second reading strategy, introduced after the personal photographs, picture communication symbols, increased sight word vocabulary across all participants; (c) the third strategy following pictures and symbols, flashcards, were effective for maintenance and generalizing the words for two of the three participants; (d) participant's survey indicated that using the first reading strategy, personal photographs was the preferred

method for two of the three participants; and (e) parents reported success with using the strategies to teach sight words.

Effects of Personal Photographs on Word Recognition

In discussing picture reading the current literature suggests that it is a skill that enables students to begin to understand and give meaning to what they are reading (Lignugaris/Kraft et al., 2001). All three participants increased their sight word vocabulary using the personal photographs strategy by immediate and significant amounts. The current findings were also found to be significant using visual analysis, yielded strong PND (100%), and statistically significant using a randomization tests. This strategy was implemented to enable them to use the pictures to add meaning to the words. In the current study, personal words were selected with parental assistance and then materials were constructed using the individual students in photographs acting out the words. For example, Participant 1 had the word lay and acted it out by laying on the floor. Students were then shown the pictures and for the personal photograph strategy, Phase I, the researcher modeled and read the word and pointed to the picture during the first session. Student was prompted to verbally repeat the word. After session 1 the teacher prompted the student to read the word before the teacher modeled it. Teacher did not read the word if the student recognized and said the word correctly. If the student did not respond, responded incorrectly, or said the word partially correct the teacher modeled the word.

Findings revealed that each student experienced success and improved in word recognition over two 15 minute daily sessions over a range of 20 to 35 sessions to reach

criterion learning of 10 to 17 words. In the current study all students were adolescents who were functioning at the moderate level of intellectual ability and who had deficiencies in their adaptive skills were able to increase their vocabulary.

These current findings extend those of other researchers who have worked with individuals with significant disabilities and employed the use of pictures. Several studies have used pictures to help facilitate learning of individuals with significant disabilities. Some have used pictures to represent words. In other words, pictures of actual objects have been used by (Alberto & Fredrick, 2000; Dixon, 1981; Fossett & Mirenda, 2006; Johnson et al., Joyce, 1978; 1992; Lazarus, 1998; Pierce & Schreibman, 1994; Wacker & Berg, 1983). Alberto and Fredrick used pictures to identify things found in the classroom and to encourage labeling of objects as well as to increase language. Pictures in this study consisted of objects found in the classroom or assembled by the teacher. The three students with moderate to severe disabilities were able to identify, describe and imitate what was seen in the pictures (Alberto & Fredrick, 2000). The current study extended these findings by working with older students using action words containing pictures that represented home and community based activities during phase I training.

Wacker and Berg (1983) used picture prompts with five moderately and severely disabled high school students to facilitate learning vocational tasks. Pictures in this study consisted of pictures bound into separate books for each vocational task and each picture was a part of a piece of equipment to be assembled. Each book contained the pictures necessary to put a piece of equipment together in a step by step sequence. For example, the picture book for the circuit board had 15 pages of pictures (Wacker & Berg, 1983).

Each of these books contained behavior descriptions e.g., pick up screw along with the corresponding picture. Results found that picture prompts was an effective means of teaching students to assemble objects. The current study extended these findings by employing personal photos within the training.

Other researchers employed the use of pictures containing actual personalized photographs of students to help teach reading. For example, Johnson et al., (1992) taught three middle school students with moderate disabilities using both personal photographs and figure line drawings to understand the meaning of ten verbs and be able to verbalize the words. The students in this study had demonstrated verb usage at the enactive representation level and therefore progressed easily to the iconic representation level using figure line drawings. The current study extended these findings by using older students and employing a third step using symbolic representation in the use of flashcards to demonstrate understanding of the target words. The current study also used picture communication symbols in place of figure line drawings. The students in the current study had prior knowledge of picture communication symbols in learning words.

Knowlton (1980) evaluated the effect of picture fading on two students with learning disabilities sight word acquisition. The students were elementary school age and 12 words were targeted for each student. The words were grouped in category of four words each. Each picture was sketched in green on the upper portion of the stimulus cards (Knowlton, 1980). Picture fading was started after correct responses to all four words. The results found that picture fading facilitated both students' sight word acquisition (Knowlton, 1980). The current study extended these findings by using older

students with more significant disabilities and employing personal photos in the training. The current study used a sequence of photos to symbols in place of the strategy Knowlton employed with picture fading immediately after a correct response. Fading makes use of stimulus generalization rules which the current study employed as well with the use of flashcards (Knowlton, 1980).

Croll, Idol-Maestas, Heal, and Pearson (1986) investigated the effects of using pictures to build reading comprehension skills with two students with disabilities in middle school. One student had moderate disabilities and the second student was learning disabled. The students, however, performed at the third and fourth grade level in reading. The passages were used with corresponding colored pictures that depicted a complex view of the topic of each of the passages (Croll et al., 1986). The students were asked questions following the reading of each passage to determine comprehension. The findings indicated that the students improved their ability to answer questions about the details of the pictures and the stories. The current study extends these findings by using older students with more significant disabilities and employing personal photos to increase recognition and improve comprehension.

Effects of Symbols With Written Words When Followed By Personal Photographs

Instruction

Phase II of the current study found that immediately following mastery instruction of words using personal photographs, students were able to generalize learning to symbols. Phase II included picture communication symbols and used the same word and definition found in Phase I. For the Picture Communication Symbols strategy, Phase II,

the researcher modeled and read the word and pointed to the picture symbol from Language Book II. Student was prompted to verbally repeat the word.

All three participants increased their sight word vocabulary using the picture communication symbol strategy by immediate and significant amounts. The current findings were also found to be significant using visual analysis, yielded strong PND (100%), and statistically significant using a randomization tests. This strategy was implemented to enable them to use the symbols to add meaning to the words. In phase II, Students were then shown the symbols and the researcher modeled and read the word and pointed to the symbol. Student was prompted to verbally repeat the word. After session 1 the teacher prompted the student to read the word before the teacher modeled it. Teacher did not read the word if the student recognized and said the word correctly. If the student did not respond, responded incorrectly, or said the word partially correct the teacher modeled the word. Findings revealed that each student experienced success and improved in word recognition over two 15 minute daily sessions over a range of 20 to 26 sessions to reach criterion learning of 10 to 17 words.

Fossett and Mirenda (2006) examined how paired associate (PA) instruction and picture-to-text matching (PTM) instruction approaches increased sight word reading on two students with developmental disabilities between the ages of 10 and 12. Picture communication symbols were used in the study and two sets of five words each were selected that corresponded to age appropriate toys. The words were presented in binders with one PCS represented for each word. The researchers measured the number of words matched correctly in both the PA and the PTM condition. The study employed

counterbalancing to control for an order effect. In the PTM approach, flash cards and worksheets were used to help participants learn the words. Findings revealed that using pictures to teach sight words produced positive results. Authors also found that using the PTM for children without speech produced positive results and increased sight word vocabulary. In the current study counterbalancing was not possible because of the sequential learning from concrete to less concrete to abstract. The current study extended these findings by using older students with more significant disabilities and employing personal photos prior to using picture communication symbols.

Koppenhave, Erickson, and Skotko (2001) examined the connection between mother and daughters in increasing labeling and symbolic communication through storybook reading. Four girls with Rett syndrome between the ages of 3.6 and 7 years and their mothers participated in this study. The study focused on the support of early communication functioning between the mother and child and the role of reading in early literacy and communication skills. The children used augmentative devices such as resting hand splints and voice-output devices and symbols, i.e., picture communication symbols as a form of communication. The findings indicate that the children's ability to communicate using symbols through the reading intervention proved significant. The current study employed symbols with words immediately following a more concrete stage of instruction using personal photographs. In addition, an older sample was trained in the current study.

Effects of Flashcards and Maintenance Following the Sequence of Personal Photographs and Symbol Instruction

The final phase of the current study examined the effect of student performance after receiving an instructional sequence of concrete pictures using persons, to more abstract using symbols, to finally the written symbol on a more traditional flash card.

Phase III of the current study found that immediately following mastery instruction of symbols using picture communication symbols, two of the three students were able to generalize learning flashcards. Phase III included flashcards and used the same words found in Phase I and Phase II. For the flashcard strategy, Phase III, the researcher showed the word to the participant with no prompts.

Two of the three participants generalized their sight word vocabulary using the flashcard strategy. The current findings were also found to be significant using visual analysis, yielded strong PND (100%), and statistically significant using a randomization tests. The third participant was not able to generalize the words. Reading instruction is very complex and therefore can be difficult for someone with moderate disabilities (Browder & Shear, 1996). Participant 2, Andy was not able to associate the word and the picture and relied only on the picture cues. In paired associate learning the learner is taught to read the picture with the text and picture (Browder & Lalli, 1991; Fossett & Miranda, 2006). However, Andy was not able to understand the paired associate strategy that was used in this study.

This strategy was implemented to see if the participants could generalize the target words to other materials. In phase III, Students were shown the flashcards without

any prompts to measure word recognition. Findings revealed that two students experienced success and maintained word recognition over five 15 minute sessions to reach criterion learning of 10 to 17 words. Participant three also had five sessions and was unable to maintain criteria.

Browder & Minarovic (2000) taught student's sight words to complete job tasks in employee settings. Two of the three participants were moderately intellectually disabled and one participant had a mild intellectual disability. All three participants were qualified for supported employment services. Flashcards were used with the participants' sight words. The study also measured the participants' comprehension of the sight words by performing the task. The participants were given a self-initiation checklist to perform the tasks without any prompts. The study provided an effective intervention for increasing relevant sight words as well as self-initiation skill building (Browder & Minarovic, 2000). The current study replicated and extended by using the same age participants with similar significant disabilities and employing flashcards to increase sight word recognition.

Cuvo and Klatt (1992) used three different instructional methods to teach sight words to seven adolescents with mild and moderate intellectual disabilities. The three methods included: flashcards, videotapes, and signs in the community. The students were instructed in all three techniques using community based words. During each training session the words were divided into 3 groups for each condition. In the flash card condition, nine words were printed on 8.5 X 11 in cards, computer generated, and laminated and placed in sites in and around the school where they most likely could occur

(Civo & Klatt, 1992). The nine signs that were trained and tested using flash cards also were tested in the community settings. The findings were significant in both the training sessions with the flashcards and in the community settings where the cards were placed. The results showed acquisition of all the words for all the participants in all three methods. The results indicate that flash cards can be used to instruct adolescents with moderate intellectual disabilities to increase community based sight words (Cuvo & Klatt, 1992). The current study extended these findings by employing first personal photos and then picture communication symbols in place of using videotapes to learn sight words.

Browder and Shear (1996) evaluated the effectiveness of a treatment package to teach functional vocabulary involved in reading the daily weather report to three middle school students with moderate intellectual disability and severe behavior disorders. The students were instructed in 10 known words and 10 unknown words from the newspaper weather reports. These words were selected to address life skill needs and to increase participation in the students' inclusion classes (Browder & Shear, 1996). The goal of this study was for the students to recognize the words and be able to generalize the words by reading the weather report. Incidental information on using the information in the weather report to determine the appropriate clothes needed was taught but no data was obtained. The words were presented on flashcards and correct or incorrect responses were noted. All the students learned 10 new words in 2 to 6 weeks of school. The current study extended these findings by using flashcards to assess generalization of the target words.

In the current study, two of the three participants were able to generalize the words using flashcards.

Mosley, Flynt, and Morton (1997) compared the effectiveness of classroom instruction using classroom training and community training to teach sight word vocabulary to eight students with moderate intellectual disabilities whose age ranged from thirteen to seventeen. A group of picture cards with common grocery items along with corresponding flashcards with words and word phrases were used for training. Twenty grocery words or word phrases were selected for training and divided into two groups of ten and taught under the two different conditions. The different approaches did not yield any significant difference. The participants were asked to match the words to the picture flashcard during probes (Mosley, Flynt, & Morton, 1997). This study suggests that students with moderate disabilities are able to learn words in a classroom as well as in a community based setting. The current study extends these findings by employing personal photos instead of pictures of grocery items. However, the current study also faded out the pictures and only used the flashcards as the generalization measure as did Mosley et al., 1997.

Student Opinions Toward Instruction

The current study asked student preferences concerning instructional methods. Findings revealed that all three participants preferred using the personal photograph strategy to learn the target words. Very few previous studies have attempted this further analysis by survey. However, McCray, Vaughn, and Neal (2001) investigated twenty middle school students with reading learning disabilities attitudes toward their instruction

they received in reading. Findings revealed that the students' attitudes were positive about learning to read and were aware of the importance of reading in their lives. The students understood that basic reading skills were necessary for them but did show concern if their peers knew about their struggles in reading. In the current study the participants were asked if they enjoyed reading and all three participants agreed that they like to read.

Parental Attitudes Toward Instruction

The current study asked parents their perceptions concerning instructional methods. Findings revealed that the parents' expectations were met and information was unclear on generalization of the words to other materials or settings. Very few previous studies have attempted this further analysis by interview. McNinch and Gruber (1996) examined the perceptions of parents as well as teachers and principals on their children's literacy instruction. Thirty five parents of elementary school age children responded to their survey. The results indicate that all three groups of responders agreed on how literacy is best developed including the use of flashcards, repetitive listening, and shared story telling in teaching reading (McNinch & Gruber, 1996).

In Stone (1997) examined a group of 26 adolescents in grades 9 through 12 with learning disabilities, their parents and teachers to rate the students skills in 21 different skill areas. The role of parent perceptions of their children's skill level is important and does influence their children's self perception (Stone, 1997). The author found that the parents had lower expectations for their children's skill level then the children had of their own skill level. There were many explanations but no data that specifically

addressed this issue. In the current study the parents of the three participants believed in their child's ability to continue to learn new things.

The specific foci of this study were the participants' experience and the meanings they attributed to the study experience. A principle goal of the study was to explore how parents can help their children reinforce new words and generalize into their daily lives. It is a belief of this researcher that the parent perspective and participant willingness to continue to learn is as important as the experience of learning new sight words.

Limitations

The current findings should be considered in light of several limitations. Repeated measures and small sample size were the main characteristics of this study. These characteristics could lead to challenges with data collection. However, the design used for this study, multiple baseline design across participants, is able to personalize the data collection process because the data is collected on each of the participants (Barger-Anderson et al., 2004). Also, this study implemented one dependent measure, sight word acquisition. With only one dependent measure this study lacked different ways to measure sight word acquisition.

However, the goal of the study was to increase sight word vocabulary for children with severe disabilities and further examine through the parent interview and participant survey how the learned words were generalized into their daily lives. Thus, these two attitudinal measures allowed for further information on the overall findings in this study.

In consideration of these findings, the small sample sizes inhibit generalizability to a larger group of participants. The findings although positive for its participants can not, however, be extended to a greater sample size.

Educational Implications

The implications for this study extend to both practice in the classroom and further research studies on sight word acquisition for children with severe disabilities. Current research emphasizes the importance of different strategies for children with severe disabilities to acquire the necessary literacy skills to be successful in school and in their daily lives (Kliewer & Biklen, 2003). Browder and Cooper-Duffy (2003) support the idea that several approaches have been successful and examined several research based practices that help support the unique learning needs of students with severe disabilities.

Lignugaris/Kraft et al., (1988) promoted the effectiveness of pictures as instructional tools for developing reading skills. Pictures have used to be an important skill for different learning opportunities. Pictures can circumvent deficiencies for children with disabilities in the learning process (Randhawa & Coffman, 1978). Using pictures to teach a skill can be an effective instructional approach for children with severe disabilities. The skill of increasing sight word vocabulary for children with severe disabilities can promote independence for job skills and improve their daily lives (Browder & Xin, 1998).

This study highlights the importance of intervention programs designed to increase sight word vocabulary for students with severe disabilities. This study

underscores the importance of systematic, explicit reading related instruction for students with severe disabilities.

Theoretical Implications

Bruner's instructional theory, Skinner's operant conditioning research, and self-determination theory provided the framework for this study. Results of this research provide support for the basic precepts of those three theories. Bruner's theory of instruction promoted the idea that learning is sequential and needs to involve the participant actively in the process. Bruner's interest in pictures and how children can learn from pictures about the world around them is explained in his theory of instruction (Presno, 1997). Bruner saw the three ways of learning as connected to one another and believed that the logical way to teach was using the same order. This study was based on sequential learning from pictures to symbols to flashcards in order to enable active learning to take place.

Skinner's operant conditioning research informed us that all behavior is purposeful (O'Donohue & Ferguson, 2001). Skinner believed that the importance of repetition in learning is critical and practice provided opportunities for additional reinforcement (O'Donohue & Ferguson, 2001). Skinner believed that behavior that is reinforced in a positive manner will reoccur. This study was based on repetition of the words and providing opportunities to practice.

The Self-Determination Theory is based on children learning self-determination skills in order to acquire the necessary skills in life and in school (Ward, 2005). Self Determination Theory is one of the reasons behind motivating individuals (Deci & Ryan,

2000). Motivating individuals is key in dealing with students with severe disabilities. Intrinsic motivation is driven by an individual's willingness to be successful and to understand the meaning of achievement at that particular skill (Deci & Ryan, 2000). The internal motivation to achieve and be recognized for that achievement by their peers or family is the human element (Ryan & Deci, 2000). Unlocking the learning key for students with severe disabilities begins with understanding Self Determination Theory.

The results of this study further support the basic tenets of those three theories. The learning that occurred across all the participants was based on the principles found in those theories.

Summary

This current study and the related research emphasize the need for different strategies to increase sight word vocabulary for student with severe disabilities. There are many studies investigating the literacy skills of children with severe disabilities. This study begins to tell us more about the different strategies that are successful in increasing sight word vocabulary, their parent's beliefs about reading, and their own ideas and interests in reading. This study provides evidence that different strategies can improve these children's sight word vocabulary. The present study highlights the importance of further examination of literacy skill acquisition for students with severe disabilities.

Browder et al., (2006) examined 128 studies on teaching reading to individuals with significant cognitive disabilities. The authors found strong evidence that sight word teaching is an effective instructional tool for students with severe disabilities. Browder (2001) supports the idea that sight word learning promotes functional use in the lives of

students with severe disabilities. Browder and Xin (1998) meta-analysis found that many studies lacked a measurement for functional use in the lives of students with severe disabilities. There is a need for additional research in the area of skill development for functional use for students with severe disabilities.

In this study there was evidence of a functional relationship as seen in the visual analysis of graphed data by determining that the instruction of the two reading strategies had a positive effect in increasing sight word vocabulary across the participants. In this study, the changes in the mean value and the trend of individual performance between baseline and the intervention conditions were examined and a functional relationship was evident and validated by the statistical results obtained with the randomization test.

Picture Data. Results of the dependent measure, sight word vocabulary, suggest a positive effect across all participants and evidence of a functional relationship does exist.

Symbol Data. Results of the dependent measure, sight word vocabulary, suggest a positive effect across all participants and evidence of a functional relationship does exist.

Flashcard Data. Results of the dependent measure, sight word vocabulary, suggest a positive effect across two out of three participants and evidence of a functional relationship does exist.

Social Validation

This study included two attitudinal outcome measures, parent interview and the participant survey. These measures focused on the perceptions of the parents and their responses on the interview reflected their willingness to participate in the study. The parents reported their children's positive experience and their success at learning new

words. The participants expressed their willingness to engage in the study and their preferences in reading strategies.

Parent Interview. The parent's responses to open ended questions confirmed that the participants were successful in increasing their sight word vocabulary and that the visual methodology implemented produced positive results.

Participant Survey. The participant's responses to questions confirmed that they enjoyed the reading related activities and preferred learning the sight words using the personal photographs strategy.

The qualitative data collected in this study revealed positive attitudes toward reading and learning from both the parents and the participants. Participant surveys also revealed positive attitudes toward reading and learning new words using pictures.

Future Studies

There are numerous studies that indicate positive results using several different approaches for increasing sight word vocabulary for students with severe disabilities. Picture reading research and sight word vocabulary research provide a clear foundation on which to consider further examination of the development of literacy skill acquisition for students with severe disabilities.

Future studies may merge picture reading and sight word acquisition to yield positive outcomes for students with severe disabilities. Is this skill of picture reading promoting an increase in sight words and can these students generalize these words to other materials and settings? Perhaps these strategies can begin to help students with

severe disabilities climb their individual literacy ladder to attain some measure of literacy skills to enable their self determination to prevail.

Future research on sight words needs to examine alternating the phases used in this study. For example, start phase I with picture communication symbols and then provide instruction on personal photographs. Or start with personal photograph strategy and eliminate the picture communication symbol strategy and immediately begin instruction with flashcards. There are many possibilities with these strategies to improve sight word vocabulary for students with moderate intellectual disabilities.

There is much research that could be done to build upon the work presented in this study and that of Browder and Xin (1998). The studies focused mostly on children in elementary school but a wide age range was represented and the research participants were students with moderate and severe disabilities. Many different reading strategies were implemented and resulted in positive outcomes for the participants. This review provided many insights into designing instruction for increasing sight word vocabulary. In this meta-analysis the researchers focused on the overall effectiveness of the sight word research and new methods that facilitate learning sight words for students with moderate and severe disabilities (Browder & Xin, 1998).

Significance of the Research

This study provided evidence into the abilities of children with moderate intellectual disabilities to increase sight word vocabulary and begin their journey as life long readers. These findings in this study provide educators with more and varied teaching methodologies. These methodologies can be the catalyst for students to become

more confident in their abilities and for teachers to embrace the fundamentals required to teach children with moderate intellectual disabilities. This study emphasized the need for older students to continue to learn new words as indicated the average age of 17.7 for this study's participants.

Using repetition to enhance learning. An important factor in this study was the repetition of the vocabulary words. The participants appeared to have benefitted from repeatedly reading the words as demonstrated by their increase recognition of the target words.

Ease of intervention implementation. Use of this intervention in any classroom would be easy to replicate. The use of pictures, symbols, and flashcards are easy to reproduce and the timeframe for each daily session is easy to incorporate into a daily schedule for students with severe disabilities.

Use of pictures in the classroom. In any classroom the use of individual pictures to promote reading can be time consuming, however, every teacher can incorporate the use of pictures to various reading related activities as well any language based curriculum ideas. It is important that teachers understand the use of pictures as an effective means to increase sight word vocabulary which can promote generalization skills that lead to self determination goals for each individual.

Generalization of words to other materials and settings. The target words used for each participant can be developed using a current list of known words and a current list of target unknown words. The list can be developed through teacher narratives, parent input, and the participant's daily activities.

Assessment. In this study each participant was able to be assessed easily through accuracy data collection method. This method can be easily implemented in the classroom. A checklist was used to determine the number of words correct.

Additional research is needed in the area of literacy acquisition for students with severe disabilities that promote broader skills. Skills that include functional use and daily living needs should be addressed. In order to better control for the Hawthorne Effect, replication of this study should occur with different age students in a similar setting and structure.

**George Mason University
Graduate School of Education**

MSN 4B3

Fairfax, Virginia 220230-4444

(703) 993-4136

Email: mmastrop@gmu.edu, mmaher3@gmu.edu

How do personal photographs and Picture Communication Symbols increase sight word vocabulary for children with limited reading ability?

PARENT INFORMED CONSENT FORM

RESEARCH PROCEDURES

This research is being conducted to design and implement the use of personal photographs and Picture Communication Symbols for improving word recognition and increasing sight word vocabulary for students with severely limited reading ability.

The researcher will meet with you to identify relevant words to be used during this study. If you agree for your child to take part in the study, your child will be instructed for daily sessions of about 30 minutes for 40 to 55 sessions after school hours. You will be asked to provide me the information such as your child's age, functioning levels such as reading test scores from existing home documents. We will test your child at the beginning and end to measure vocabulary knowledge and to find out what methods worked best for your child.

RISKS

There are no foreseeable risks for participating in this research.

BENEFITS

The direct benefit to your child is unknown. However, this research may improve word recognition and sight word vocabulary.

CONFIDENTIALITY

All information that could identify your child (including consent forms, test scores, and student information) will be kept strictly confidential and in a locked office. Your child will be assigned a study ID number that will replace his or her name. No individuals, parents, or children will ever be identified in reporting the findings.

PARTICIPATION

Your child's participation is voluntary, and you may withdraw your child from the study

at any time and for any reason. If you or your child decide not to participate or if your child withdraws from the study, there is no penalty or loss of benefits to which you or your child are otherwise entitled. There are no costs to you, your child, or any other party.

CONTACT

This research is being conducted by Kathryn Maher through the Graduate School of Education at George Mason University. She may be reached at 703-759-5805 for questions or to report a research-related problem. Her research is being supervised by Dr. Margo Mastropieri who can be reached at 703-993-4136. You may also contact the George Mason University Office of Research Subject Protections at 703-993-4121 if you have questions or comments regarding your rights as a participant in the research.

This research has been reviewed according to George Mason University procedures governing your participation in this research.

CONSENT

I have read this form and agree to participate in this study.

Name (print)

Signature

Date of Signature

I consent to the audio-taping of the instruction that my child will receive. I understand that any audio tapes will be kept confidential.

_____ Agree

_____ Disagree

Appendix B

How do personal photographs and Picture Communication Symbols increase sight word vocabulary for children with limited reading ability?

STUDENT ASSENT FORM (Will be read to student)

WHAT YOU HAVE TO DO

I am doing this study to find out if the strategies that I teach you will help you to understand more of what you read. If you would like to help, your scores will be used by me. They will help me understand if your vocabulary has improved, if you know more strategies to use while reading. The lessons will take place after school. You will be taught by me.

I will need some other information from your parents such as your age and reading test scores.

Nothing bad will happen to you if you help me with this study. There are no rewards or money paid for being in this study. What I find out may help you read better. It also may help your teachers to know how to teach you better.

I WON'T TELL

Your name will not be used. Your own scores will not be used when I write my report. I will not tell anyone about your grades or who you are.

IF YOU HELP

Your help with this study is up to you. You can stop at any time and for any reason. If you choose not to do the study or if you want to stop after you started, nothing will happen to you or your grades.

IF YOU DON'T HELP

If you choose not to help with the study, you will still be taught the strategies that may help you with your reading.

IF YOU HAVE MORE QUESTIONS

This study is being done by Kathryn Maher. You may call her at 703-759-5805 if you have questions about the study. Dr. Margo Mastropieri, is the supervisor for my project at George Mason University. She may be reached at 703-993-3850 if you have questions about the study.

I WANT TO HELP

I have read this form and agree to help with this study.

Name (print)

Signature

Date

I agree to the audio-taping of the instruction that I will receive. I understand that any audio tapes will be kept confidential.

_____ Agree

_____ Disagree

Version date: 2/5/08

Appendix C

Phase I – Personal Photograph

Sing

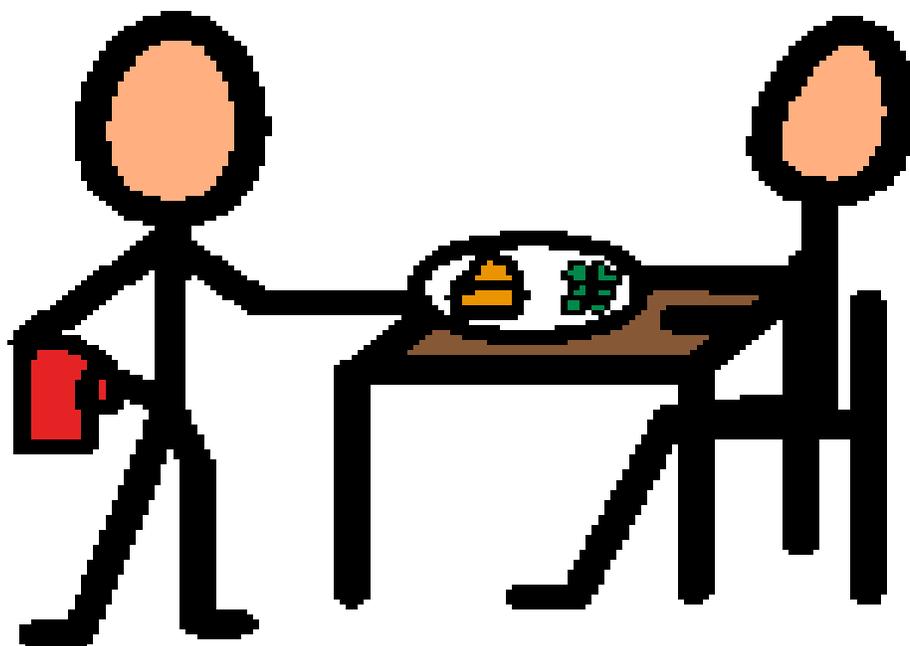


To **sing** is to make music with sounds. For example, I am **singing** along with my iPod.

Appendix D

Phase II – Picture Communication Symbol

Serve



To **serve** means to provide someone with goods or services. For example, my mom **serves** me a cookie.

Appendix E
Phase III – Flashcard

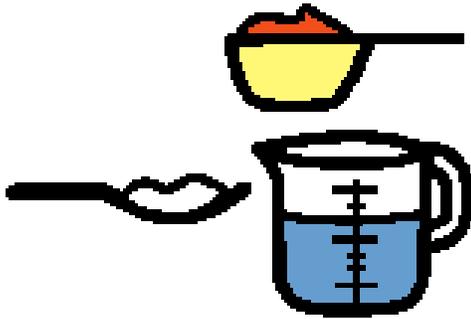
Bank

Appendix F
Participant 3 Survey

1. Which do you like best?



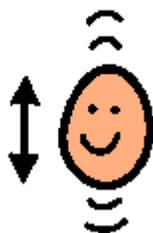
measure



Measure

2. Do you like to read?

yes



no



I don't know about that



3. What is your favorite **WORD?**

Measure
Signature
Area
Children
Correct
Several
Slowly
Numeral
Sing
Transportation
Education
Competition
Salary

4. What is your favorite picture – Let's look at the pictures first together?

5. What is your favorite book? BOOK I or Book II?

Appendix G

Parent Interview Protocol

1. What were your expectations for this study?
2. Have you noticed your child generalizing the words? If so, please give an example.
3. Do you plan to continue to reinforce the learned words for your child?
4. How do you plan to continue to reinforce the learned words?
5. How do you feel your child performed during the study?
6. Did you think the study was successful?
7. How would you define success for this study?
8. Were your expectations met?
9. How do you think the study could have been improved?
10. Would you recommend having your child participate again in another research study?

Appendix H

Scripts for baseline, all phases of treatment, and maintenance

Baseline Script:

This is a group of flashcards of words. I want you to look at the words. When the student made eye contact with the flashcard the teacher said “Tell me what the word is, a wait time of 10s was given. Use the following response criteria:

Correct response: Says the word clearly. When the response is correct the teacher says that’s right- let’s turn to the next flashcard.

Incorrect response – wrong word is stated.

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word

No response – student does not respond.

Phase I

Intervention Script for Personal Photographs:

This is a language book of your photographs. You may open the book and look at the first photograph. When the student made eye contact with the picture, the teacher said “Tell me what is happening in the photograph. A wait time of 30s was given. Use the following response criteria:

Correct response: Repeats the word clearly. When the response is correct the teacher says that’s right- turn to the next photograph please.

Incorrect response – wrong word is stated. This is (Insert word) and point to photograph. Now you say it. Give 10s wait time.

Partial response – student either states beginning or end of correct word

No response – student does not respond.

After the response the student is directed to turn to the next picture. When the student made eye contact with the picture the same procedures were followed.

After session 1 the teacher says it’s time to work in your language book. Turn to the first picture, please.

Phase II
Intervention Script for Picture Communication Symbols:

This is a language book of Picture Communication Symbols. You may open the book and look at the first symbol. When the student made eye contact with the picture, the teacher said “Tell me what is happening in the picture symbol. A wait time of 30s was given. Use the following response criteria:

Correct response: Repeats the word clearly. When the response is correct the teacher says that’s right- turn to the next symbol please.

Incorrect response – wrong word is stated. This is (Insert word) and point to symbol. Now you say it. Give 10s wait time.

Partial response – student either states beginning or end of correct word

No response – student does not respond.

After the response the student is directed to turn to the next symbol. When the student made eye contact with the symbol the same procedures were followed.

After session 1 the teacher says it’s time to work in your language book. Turn to the first symbol, please.

Phase III
Flashcard Script:

This is a group of flashcards of words that we have been reading. I want you to look at the words. When the student made eye contact with the flashcard the teacher said “Tell me what the words are, a wait time of 10s was given. Use the following response criteria:

Correct response: Says the words clearly. When the response is correct the teacher says that’s right- let’s turn to the next flashcard.

Incorrect response – wrong words are stated.

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states the first word or the second word

No response – student does not respond.

Maintenance Script:

This is a group of flashcards of words. I want you to look at the words. When the student made eye contact with the flashcard the teacher said “Tell me what the word is, a wait time of 10s was given. Use the following response criteria:

Correct response: Says the word clearly. When the response is correct the teacher says that’s right- let’s turn to the next flashcard.

Incorrect response – wrong word is stated.

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states the beginning or end of the word.

No response – student does not respond.

Appendix I

Participant's Word Lists

Participant 1

Between
Example
Measure
Thousand
Correct
Machine
Stood
Signature
Vowel
Lay
Pattern
Serve
Area
Angry
Anxious
Bring
Seen

Participant 2

Measure
Signature
Area
Cut
Set
Wait
Enter
Schedule
Money
Bank

Participant 3

Numeral
Children
Slowly
Measure

Signature

Area

Transportation

Competition

Education

Salary

Sing

Correct

Several

The words that are in **bold** are common words across participants.

Appendix J
Active Response Study Rubric
Sight Word Vocabulary

	No Response 0 pts	Incorrect Response 0 pts	Partial Response .5 pts	Correct Response 1 pts
Definition	Student does not respond	Wrong word is stated	Incomplete, only part of the word is stated, not the whole word.	Repeats the word
Examples	Response is nonexistent	Response is unclear or different word is stated	For the word signature; student responds with 'sig' or 'ture' or sign; For the word example; student responds with 'x', 'am', 'ple'; For the word area; student responds 'air' 'ea'.	Student states the word identified. For example, the word example is stated without errors however, the participant's articulation is acknowledged
Word Lists	No sound is heard or distinctive	Response is unclear or different sounds are heard	For the word signature; the sound s would be given partial credit if only 1 word in student's word list begins with the letter s. If student's word list contains more than 1 word beginning with the s sound no partial credit will be given.	Student states the entire word. For example, the word signature is stated without errors however, the participant's articulation is acknowledged

Appendix K

Data collection sheet for Observer:

Session # _____

Circle one: Baseline Phase 1 Phase 2 Phase 3 Maintenance

Participant # _____

Teacher followed script:

Response criteria were followed:

Additional Comments:

Appendix L
Phase 1
Data Collection Sheet (Language Book I – Personal Photographs)

Student : Participant 1 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
	between		
	example		
	measure		
	thousand		
	correct		
	machine		
	stood		
	signature		
	vowel		
	lay		
	pattern		
	serve		
	area		
	angry		
	anxious		
	bring		
	seen		

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix L cont.
Phase II
Data Collection Sheet (Language Book II – Picture Communication Symbols)

Student : Participant 1 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
between			
example			
measure			
thousand			
correct			
machine			
stood			
signature			
vowel			
lay			
pattern			
serve			
area			
angry			
anxious			
bring			
seen			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix L Cont.
Phase III
Data Collection Sheet (Flashcards)

Student : Participant 1 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
between			
example			
measure			
thousand			
correct			
machine			
stood			
signature			
vowel			
lay			
pattern			
serve			
area			
angry			
anxious			
bring			
seen			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix L cont.
Maintenance Phase
Data Collection Sheet (Flashcards)

Student : Participant 1 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
between			
example			
measure			
thousand			
correct			
machine			
stood			
signature			
vowel			
lay			
pattern			
serve			
area			
angry			
anxious			
bring			
seen			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix M
Phase 1
Data Collection Sheet (Language Book I – Personal Photographs)

Student : Participant 2 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
measure			
signature			
area			
cut			
set			
wait			
enter			
schedule			
money			
bank			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix M cont.
Phase II
Data Collection Sheet (Language Book II – Picture Communication Symbols)

Student : Participant 2 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
measure			
signature			
area			
cut			
set			
wait			
enter			
schedule			
money			
bank			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix M cont.
Phase III
Data Collection Sheet (Flashcards)

Student : Participant 2 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
measure			
signature			
area			
cut			
set			
wait			
enter			
schedule			
money			
bank			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix M cont.
Maintenance Phase
Data Collection Sheet (Flashcards)

Student : Participant 2 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
measure			
signature			
area			
cut			
set			
wait			
enter			
schedule			
money			
bank			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix N
Phase 1
Data Collection Sheet (Language Book I – Personal Photographs)

Student : Participant 3 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
children			
area			
measure			
correct			
several			
slowly			
numeral			
sing			
signature			
transportation			
salary			
education			
competition			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix N cont.
Phase II
Data Collection Sheet (Language Book II – Picture Communication Symbols)

Student : Participant 3 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
children			
area			
measure			
correct			
several			
slowly			
numeral			
sing			
signature			
transportation			
salary			
education			
competition			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix N cont.
Phase III
Data Collection Sheet (Flashcards)

Student : Participant 3 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
children			
area			
measure			
correct			
several			
slowly			
numeral			
sing			
signature			
transportation			
salary			
education			
competition			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

Appendix N cont.
Maintenance Phase
Data Collection Sheet (Flashcards)

Student : Participant 3 Session # Behavior: Sight word reading	Response	Summary (Total number of responses)	Summary (Total number of correct responses)
children			
area			
measure			
correct			
several			
slowly			
numeral			
sing			
signature			
transportation			
salary			
education			
competition			

An active response from the student will include:

Correct response: Repeats the word clearly = 1.0

Incorrect response – wrong word is stated = 0

Partial response – Incomplete, only part of the word is stated, not the whole word. The student either states beginning or end of correct word = .5

No response – student does not respond = 0

Anecdotal Notes:

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CURRICULUM VITAE

M. Kathryn Maher graduated from The Mary Louis Academy in Flushing, New York in 1977. She received her Bachelor of Arts from Manhattan College in 1981. She received two Masters from George Mason University; M. Ed. in Severe Disabilities in 1996 and a M. Ed., in Education Leadership in 2001. She taught children with special needs in both public and private schools.