

©Copyright 2012

Talya Kemper

Promoting Listening Reading Comprehension for Nonverbal English Language Learners Who  
Have a Severe Intellectual Delay

Talya Kemper

A dissertation

submitted in partial fulfillment of the  
requirements for the degree of

Doctor of Philosophy

University of Washington

2012

Reading Committee:

Elizabeth West, Chair

Patricia Dowden

Charles Peck

Program Authorized to Offer Degree:

Special Education

College of Education

University of Washington:

**Abstract**

Promoting Listening Reading Comprehension for Nonverbal English Language Learners Who  
Have a Severe Intellectual Delay

Talya Kemper

Chair of the Supervisory Committee  
Assistant Professor Elizabeth West  
Special Education

This study used an alternating treatment design to examine the use of a listening reading comprehension intervention package. This package was implemented in English as well as bilingually (on alternating days). This package was applied to four participants who were English Language Learners, were diagnosed with a severe intellectual delay, and were nonverbal. No studies to date have applied a listening reading comprehension program to participants with such unique challenges. All participants demonstrated an increase in both their total number of responses to comprehension questions and in their communication attempts. Participants demonstrated increases in both the English-only intervention and the bilingual intervention, however, when the bilingual intervention was implemented, a slightly larger increase in initiating communication and answering questions was seen. Future research should continue to explore what language instruction should be provided in for students with severe intellectual delays who are ELL and nonverbal.

## TABLE OF CONTENTS

|   | Page |
|---|------|
| List of Figures .....                                     | ii   |
| List of Tables .....                                      | iii  |
| Chapter One: Introduction and Literature Review.....      | 1    |
| Chapter Two: Methods .....                                | 16   |
| Chapter Three: Results.....                               | 35   |
| Chapter Four: Discussion.....                             | 49   |
| References.....   | 63   |
| Appendix A: Procedure Checklist: English .....            | 68   |
| Appendix B: Procedure Checklist: Bilingual.....           | 69   |
| Appendix C: Teacher Interviews .....                      | 70   |
| Appendix D: Data Collection Comprehension Questions ..... | 71   |
| Appendix E: Data Collection Engagement .....              | 72   |
| Appendix F: Data Collection Communication .....           | 73   |
| Appendix G: Book Questions, Summary, and Vocabulary ..... | 74   |
| Appendix H: Communication Boards (modified).....          | 84   |
| Appendix I: Coding Data .....                             | 89   |

## LIST OF FIGURES

| Figure Number | Page |
|---------------|------|
| 1. ....       | 38   |
| 2. ....       | 41   |
| 3. ....       | 44   |
| 4. ....       | 46   |

## LIST OF TABLES

| Table Number | Page |
|--------------|------|
| 1.....       | 6    |
| 2.....       | 19   |
| 3.....       | 23   |
| 4.....       | 29   |
| 5.....       | 47   |

## ACKNOWLEDGEMENTS

I must begin by acknowledging those that inspire me to continue my work. To all of my students with special needs, especially to Juan, Gabby, Betsabe, Kevin, Lepa, Nina, Wendy, Matthew, Shanti, Dana, Bob, Abby, and Libby: I watched you learn and grow even when it was most difficult. I taught you to take the bus; you taught me perseverance.

I owe my deepest gratitude to Dr. Elizabeth West for her guidance and advice. She has served as a mentor and model for me as an advisor, a scholar, and a teacher.

In addition, I would like to thank my reading committee, Drs. Pat Dowden and Cap Peck, for their encouraging words and thoughtful feedback. I also thank my dissertation committee, Drs. Roxanne Hudson and Manka Varghese, for their suggestions and their time.

This dissertation would not have been possible without the tremendous efforts of Alyssa, Becca, Jennifer, and Caroline. These four dedicated teachers supported my intervention and implemented it in their classrooms, giving their personal time to find the best instructional programs for their students. I also thank my research assistants, Sara Celms and Kelly Gray, who worked tirelessly to code over a hundred hours of video.

I am grateful to my parents, Anne and Morris, for their love and support. Lastly, I would like to thank my wife, Maria del Carmen, for her patience and her nerdy love of grammar.

## **Chapter One: Introduction and Literature Review**

In the United States the education of students who speak a language other than English and students with disabilities are closely connected. Non-English-speaking students can be inappropriately placed in special education, and students who qualify for special education and speak a language other than English often do not receive an education that meets their linguistic needs (Figueroa, Fradd, & Correa, 1989).

Due to a lack of research in this area, best practices for teaching students that have both a severe intellectual delay (ID) and are English as a second language learners have not been determined (Bridges, 2004; Mueller, Singer, & Grace, 2004). Research is available in how to teach literacy to students who are English Language Learners (ELL); however, there is a lack of literature regarding how to teach students who are ELL, have a disability, and use augmentative and alternative communication (AAC) (Bridges, 2004; Mueller, Singer, & Grace, 2004). Research has demonstrated that the use of modified books and embedded vocabulary during shared book reading can increase independent communication, engagement, and reading comprehension for students with significant disabilities (Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2008; Mims, Browder, Baker, Lee, & Spooner, 2009; Browder, Trela, & Jiménez, 2007; & Browder, Lee, & Mims, 2011). No research exists on the outcome of these interventions when applied to participants who have been diagnosed with a severe intellectual delay (ID), are nonverbal, and are ELL.

Children who use AAC have complex and diverse literacy needs. Most of these individuals, even those without an intellectual delay, do not attain conventional literacy skills (Light & McNaughton, 1993; Sturm & Clendon, 2004). There is no research to indicate that the cognitive processes of learning to write and read are different for children who use AAC than for

typically developing children; in addition, motor speech fluency is not required in order to learn how to read (Fallon, Light, McNaughton, Drager, & Hammer, 2004; Sturm & Clendon, 2004). There is, however, research which indicates that students who use AAC do not develop functional literacy skills and have limited access to educational and vocational opportunities (Fallon et al., 2004; Light & McNaughton, 1993; Light, McNaughton, Weyer, & Karg, 2008; Swinehart-Jones & Heller, 2009).

It is essential for all learners, even those who are nonverbal, to develop literacy skills, as these skills can promote reading and independent communication (Fallon et al., 2004; Swinehart-Jones & Heller, 2009; Taibo, et al., 2009). Children who use AAC have been shown to have challenges with synthesis of phonemes and word length analysis, and to have decreased articulatory coding abilities. Children who have challenges in these areas may be at risk for delays in phonological awareness and reading comprehension (Sturm & Clendon, 2004; Taibo, Iglesias, Mendez, & Gonzalez Raposo, 2009). People who use AAC need syntactic, semantic, morphologic skills and an understanding of the different genres of text. These skills provide an important foundation for the person, and facilitate the ability to read, comprehend, and write meaningful texts (Light et al., 2008).

Research has been conducted in reading to determine the most effective interventions for ELL students with learning disabilities. In addition research has been conducted for students with severe ID in improving their reading comprehension. However to date there have been no studies that have examined reading comprehension for participants who are ELL have a severe ID and are nonverbal. In this literature review, two specific areas were reviewed. First, strategies for teaching reading comprehension and the research that has been conducted on teaching reading comprehension to students with severe disabilities will be presented. Second, research related to

instruction designed to improve reading comprehension among ELL students without a disability as well as research that has been conducted for students who are ELL and use AAC will be discussed. These areas of research were reviewed to identify effective techniques in improving listening reading comprehension which influenced the intervention package for this study.

### **Reading Comprehension for Students with Severe Disabilities**

According to the National Reading Panel (NRP, 2000), readers use their knowledge of the world to understand text and assign meaning to the information found in the text. Specific comprehension strategies can be taught to individuals to assist them in this process. The NRP conducted an extensive review of the literature on teaching reading comprehension to students without disabilities, and from this review identified 13 effective instructional strategies that influenced the teaching of reading comprehension. Of those strategies, five were specific to teaching vocabulary and eight to increasing reading comprehension skills. The five vocabulary teaching strategies identified were implicit instruction, explicit instruction, association methods, multimedia methods, and capacity methods. The eight comprehension strategies that the NRP found to be effective were comprehension monitoring, cooperative learning, graphic organizers, question answering, question generation, story structure, summarization, and multiple strategy teaching.

Literature reviews conducted to date on severe disabilities and reading comprehension have relied upon NRP's instructional strategies. Specifically, two reviews focused on these instructional recommendations for teaching reading comprehension. These reviews defined reading comprehension as both reading academic text and sight word vocabulary. The first review identified studies that focused on the 13 instructional strategies for reading comprehension in which participants with severe disabilities were involved (Browder, Wakeman,

Spooner, Ahlgrim-Delzell, & Algozzine, 2006). The second review focused on the five suggested strategies for teaching comprehension and examined research that included these strategies when teaching literacy skills to students with Autism Spectrum Disorder (ASD) (Chiang & Lin, 2007).

Researchers conducting the first review identified 128 articles related to reading instruction for students with severe disabilities (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006). Of the articles reviewed, 23 focused on reading comprehension and eleven of these studies focused on participants with severe intellectual delays. The studies were organized by the type of instructional strategy used for teaching reading comprehension: sight word use in a functional activity, matching words to pictures, and massed trial training used to answer systematic questions with systematic prompts and fading. These instructional strategies are not ones that have been recommended by the NRP, this does not mean that they are ineffective strategies but it is important to note that they do not have a strong research base that backs them as effective strategies to use. Of the 11 studies that focused on participants with severe disabilities, only one of the eight instructional strategies recommended by the NRP was used—question answering. Limited research exists which has extended effective instructional strategies for reading comprehension to learners with severe disabilities and that have used the NRP recommendations for teaching reading comprehension.

Little research has been conducted not only in how to teach students functional reading skills, for example sight word vocabulary, but also in how to read and understand academic and pleasure texts, especially for students with severe disabilities.

The second review of literature conducted by Chiang and Lin (2007) focused on teaching reading comprehension to students with ASD. Eleven studies met criteria for article selection

which included a focus on teaching reading comprehension for functional skills or teaching students how to comprehend academic texts. The eleven studies were divided into the following instructional categories: sight word comprehension skills i.e. learning isolated words (seven articles); text comprehension (four articles); interventions to improve students' reading comprehension for functional skills (six articles) and teaching students to comprehend academic texts (five articles). From this review, several strategies were reported to be effective when teaching reading comprehension to students with ASD: progressive time delay, peer tutoring, discrete trial, cooperative learning groups, incidental teaching procedure, procedure facilitation, multimedia instruction, and computer-based instruction. The authors reported that it was difficult to determine the most effective strategy for teaching reading comprehension because the multiple studies did not use the same instructional strategy, making comparisons across the studies difficult.

These two reviews provide some guidance for teaching reading comprehension to individuals with disabilities. Several interventions were found to be appropriate for teaching reading comprehension to students with disabilities, but no one instructional technique could be verified as the most effective. The articles reviewed focused exclusively on reading comprehension and not on listening comprehension. In addition, none of the articles reviewed focused specifically on reading comprehension for students who are both nonverbal and ELL.

### **Listening Reading Comprehension Instruction for Students with Severe Disabilities**

A balanced reading program incorporates instruction in the alphabetic principle, reading fluency, vocabulary and text comprehension (Fallon, Light, McNaughton, Drager & Hammer, 2004 & National Reading Panel, 2000). Being able to read and write provides expanded communication skills for people who are AAC users. These skills help to reduce communication

limitations, and provides a vocabulary that is large and diverse to facilitate communicate with a larger group of people and create novel messages (Pufpaff, 2008). For students with more significant disabilities listening reading comprehension skills are an important way in which students can begin to access text and expand their vocabulary (Fallon, et al., 2004 & Pufpaff, 2008).

There is a lack of research on the development of *listening reading comprehension*, which is the ability to be read a text and gain meaning from what is being read to you, for students with severe disabilities. A review of this research generated four articles that incorporated the intervention of modifying books in order to increase the students' comprehension and engagement during the book reading sessions. Books can be modified in a variety of ways and includes altering some aspect of the original book so that participants can access the book more efficiently. Modifications can range from inserting symbols in the books to shortening the length of the text on specific pages. Table 1 provides details on these four studies.

Table 1

*Summary of Four Studies*

| Study  | Number and Diagnosis of Participants                  | Book Modifications   | Results   |
|--|---|--|---|
| Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2008 | $N = 3$<br>Students with profound intellectual delays | Name of participant used for main character, repeated story lines, insertion of physical objects to represent vocabulary | Increased accuracy in answering comprehension questions |
| Mims, Browder, Baker, Lee, &                         | $N = 2$<br>Students with severe                       | Objects to represent vocabulary, abbreviated text,   | Increased accuracy in answering comprehension           |

|                                 |   |  |   |
|---------------------------------|---|--|---|
| Spooner, 2009                   | intellectual delays and visual impairments  | repeated story lines   | questions   |
| Browder, Trela, & Jiménez, 2007 | <i>N</i> = 2<br>Teachers who had students with moderate intellectual delays in their classroom  | Picture symbols to represent vocabulary  | Successful implementation of task analysis, improvement in student accuracy in answering comprehension questions, and early literacy skills |
| Browder, Lee, & Mims, 2011      | <i>N</i> = 3<br>Students with profound intellectual delays and severe physical or sensory disabilities who were nonsymbolic communicators | Summary of book inserted every few pages, objects to represent vocabulary placed in book | Increased engagement and accuracy in comprehension questions  |

Browder, Mims, Spooner, Ahlgrim-Delzell, and Lee (2008) conducted a study with three students who had profound intellectual disabilities and inconsistent participation during shared story book reading. Mims, Browder, Baker, Lee, and Spooner (2009) conducted another study with two students with severe intellectual disabilities; these students also had visual impairments. Browder, Trela, and Jiménez (2007) conducted a study in which the participants were teachers who had in their classrooms students with an IQ below 50 (a moderate intellectual delay). This study differed from the others as the focus was on the teachers instruction of the methods as applied to the students. Another difference between this study and the other three is that the students had a moderate intellectual delay whereas the other studies included students diagnosed with a severe intellectual delay. The participants in the Browder, Lee, and Mims (2011) study were diagnosed with profound intellectual delays, had severe physical or sensory disabilities, and

relied primarily on nonsymbolic communication. The participants of this study differed from the other three in that the students' communication was an important part of the selection criteria and communication was measured as an independent variable. All four studies targeted participants with a moderate to severe intellectual delay; only one specifically targeted participants who were nonverbal (Browder, Lee, & Mims, 2011). None of the studies involved participants who used high technology AAC or were ELL.

The Browder et al. (2008) study used a task analysis intervention in conjunction with modified books. The books were modified by including the name of the individual student as the main character, repeating story lines, and inserting physical objects in the book to represent vocabulary. The Mims et al. (2009) study also relied upon a task analysis and used modified books during book reading sessions. Mims et al. modified books by using objects to represent vocabulary words that were in the story. In addition, each book included abbreviated text and a repeating story line. Comprehension questions were asked throughout the reading of the book, and the participants used the objects that had been inserted in the books to answer the comprehension questions. The books in both of these studies were modified in very similar ways and teachers were trained to use a task analysis. The study by Browder, Trela, and Jiménez (2007) also implemented a task analysis and used modified books. This study relied upon three techniques to help improve participant understanding of the text: important vocabulary was defined in the book, picture symbols were used to support key vocabulary, and the story was retold to the students at a comprehension level that was lower than the actual text in order to enhance their understanding.

Browder, Lee, and Mims (2011) differs from the other studies because in addition to looking at participant comprehension, the researchers were also interested in measuring

participant engagement during shared book reading. The intervention consisted of two books that were modified in several different ways. The research team developed a typed summary sentence of the book and inserted this into the book after every few pages. Objects were also inserted in the book to represent vocabulary and were relied upon to answer comprehension questions. The teachers were provided with a script to use during the shared book reading sessions, which prompted them when to ask comprehension questions and when to ask engagement questions. Each student was provided with a different way to communicate, by an object response, touch response, or eye gaze.

All of these four studies modified the books used during the intervention in a similar way, by inserting pictures or objects that represented vocabulary. They also all had the teachers, who were implementing the intervention, use a task analysis or a script to ensure that the procedures were followed with fidelity. In addition, students were asked questions while the book was being read, usually right after the answer to the question had appeared in the text.

Results for all four of the studies demonstrated improvement in students' listening reading comprehension. Specifically, participants in Browder et al., (2008) increased their independent responses to questions during the shared book reading. All students across the reviewed studies demonstrated an increase in the accuracy in which they answered comprehension questions. One study demonstrated an increase in comprehension and student engagement (Browder, Lee, & Mims, 2011), and another reported positive results for the teacher and student participants (Browder, Trela, & Jiménez, 2007). Specifically, the teachers demonstrated successful implementation of the intervention through the use of a task analysis, and the students increased their book awareness, listening comprehension, and early literacy skills.

Studies have examined reading for ELL students with severe disabilities who are verbal, and reading for nonverbal non-ELL students. To date no research has combined these two areas of instruction. The research that has been conducted with students who are ELL highlights strategies that are successful at improving reading comprehension. The following section will review the research on improving reading comprehension for ELLs without a disability and ELLs who have been diagnosed with a disability.

### **Literacy instruction for English Language Learners students with disabilities.**

Students who are ELL are not necessarily poor readers. However, ELL students may not reach the same proficiency in reading comprehension and writing as non-ELL students (August, Shanahan, & Escamilla, 2009). Development of English literacy is affected by a number of different factors, including similarities and differences between the students' first and second languages, age, English oral proficiency, and cognitive ability (August, Shanahan, & Escamilla, 2009). Other factors that influence literacy include age at time of immigration, socioeconomic status, and educational history (August & Shanahan, 2006). Reading comprehension is affected not only by a person's language proficiency but also by his or her prior knowledge of the topic that is being read. To assist ELL students with the comprehension of text, the material should be on a topic that is familiar to them and teachers should build on the students' background knowledge before the text is read (Peregoy & Boyle, 2001). An overview of literacy instruction and reading comprehension for ELL students with disabilities is provided below.

ELL students who also have a learning disability have been shown to not utilize their background knowledge and to have limited vocabulary. During reading, these learners may not rely upon the comprehension skills that they have already acquired (Hoover, Klingner, Baca, & Patton, 2008). In addition, these learners may not independently monitor their understanding of

text as they are reading and may not take the initiative to improve their comprehension.

However, it has been demonstrated that these students can transfer reading strategies they have in their home languages and use these strategies when reading in English (Hoover et al., 2008). Students who have limited English vocabulary may have challenges in comprehending English text.

Hoover et al., (2008) developed a list of key principles for effective instruction for culturally and linguistically diverse students with learning disabilities. The following is the list of techniques that they recommended: connect with the students' culture, involve the parents/caregivers, involve the community, strategically incorporate the students' home language, assist students to access their prior knowledge, help them make new connections, assist in building new knowledge, create opportunities for students to use language both conversationally and academically, promote vocabulary, pre-teach, reinforce important vocabulary, use visuals to support concepts, and teach vocabulary.

Many of the recommendations for ELL students with learning disabilities could also be useful for ELL students who are nonverbal and have intellectual delays, because the recommended instructional techniques (i.e., pre-teaching, previewing vocabulary, and using visuals to represent vocabulary) have been shown to be beneficial to students who have an intellectual delay.

The education of students with severe ID who are also ELL is a recent avenue of research in the field of special education (Bridges, 2004; Mueller, Singer, & Grace, 2004). Research estimates that ELL students who have not been identified to have a disability are able to use their second language socially in approximately two to three years, and academically in five to seven years (Duran, 1993). Students with severe disabilities can take even longer to gain confidence

and fluency in a second language (Duran, 1993). The problem can become more complicated for ELL students who do not speak and have an intellectual delay, because they have no way of conveying what they do and do not understand in the dominant language. These students are not able to tell their teachers when they do not understand (Duran, 1993).

**Literacy instruction for nonverbal ELL students with severe disabilities.** Few research articles have examined literacy for students who are ELL and use AAC. An extensive search was done in the following search engines: ERIC, PsychInfo, CINHALL, Academic Search Complete, Family Study Abstracts, and Teacher Reference Center. The search terms that were entered included AAC, moderate-severe disabilities, non verbal, literacy, emergent literacy, reading, English Language Learners, bilingual education, English as a Second Language, immigrant, and multicultural. The search results yielded three articles that examined literacy for students with moderate to severe disabilities and one article included participants who were ELL (Spooner, Rivera, Browder, Baker, & Salas, 2009; Rohena, Jitendra, & Browder, 2002; Rosa-Lugo & Kent-Walsh, 2008). Each study examined a different area of literacy development for these participants.

The results of these three studies were mixed. Spooner et al. (2009) demonstrated positive results in using a bilingual reading intervention in a case study in which one student had culturally sensitive books read to her in her home language. The student demonstrated improvement in her emergent reading skills and was able to generalize these skills with peers who were typically developing. Positive results were also reported by Rosa-Lugo and Kent-Walsh (2008), as parents increased their participation and communication with their child who used AAC during reading by asking the child questions and waiting for the child to respond using communication boards. Rohena, Jitendra, and Browder (2002) reported that using Spanish

or English was as effective for three of the four participants and that using Spanish alone was effective for one of the four participants in learning new sight word vocabulary. The researchers had hypothesized that instruction in Spanish (first language) would be more effective than instruction in English (second language). They reported, however, that the students learned just as effectively in English, even though they had less proficiency in English, because the language that was used in instruction was at the students' English proficiency level.

More studies are needed to examine bilingual reading interventions conducted with students who have severe disabilities. Results reported in Spooner et al. (2009) suggest that using a student's home language can increase emergent literacy skills. This is similar to what has been identified for ELL students without disabilities: using the home language in instruction through a paired bilingual program is an effective strategy for student learning (Cheung & Slavin, 2005; Stritikus & Garcia, 2003).

Results from the literacy acquisition research that has been conducted with ELL students identified in most cases that successful interventions are those where instruction includes a student's home language. Of the three studies reviewed two found that students demonstrated more success in their home language and one had mixed results. More research needs to be conducted in this area in order to help determine if using a student's home language can promote literacy and communication gains. Therefore a listening reading comprehension intervention for students who are ELL should incorporate the individuals' home language in some capacity.

The present study will incorporate the students' home language in the book reading. In addition the books will be modified using some of the same techniques that have been found to be effective in increasing listening reading comprehension, communication and engagement for students with severe disabilities. The review of the research influenced the creation of the

intervention package for this study as effective elements were incorporated. Specifically, five elements were incorporated: (1) previewing key vocabulary; (2) embedding the key vocabulary in the book (3) reading a summary to the participant at the end of the book; (4) reading the book to the participant twice; and (5) during the second read through of the book asking comprehension questions of the participant (Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2008; Mims, Browder, Baker, Lee, & Spooner, 2009; Browder, Trela, & Jiménez, 2007; & Browder, Lee, & Mims, 2011). Instruction was provided in both English and the participants' home language, Spanish. We know from research that students with severe disabilities are able to learn reading skills beyond sight words. Research needs to continue to be conducted to ascertain what language is best to use during instruction with students who have severe disabilities and are ELLs.

The purpose of this study was to examine the effects of a listening reading comprehension package for students who are ELL, nonverbal and have been diagnosed with an ID. Several dimensions were examined including participant response rate, communication and engagement.

This study addressed the following research questions:

1. What effect does the English-only intervention package have on the participants' accuracy in answering reading comprehension questions?
2. What effect does the bilingual intervention package have on the participants' accuracy in answering reading comprehension questions?
3. What effect does the English-only intervention package have on the total number of responses for the participants?
4. What effect does the bilingual intervention package have on the total number of responses for the participants?

5. What effect does the English-only intervention package have on the total communication attempts during the book reading for the participants?
6. What effect does the bilingual intervention package have on the total communication attempts during the book reading for the participants?
7. What effect does using the intervention have on participants' level of engagement?

## Chapter Two: Methods

### Participants

Four participants were recruited for this study. The participants were drawn from two different public school districts in the Puget Sound area of Washington State. Three of the participants were enrolled in a large urban school district, and one was enrolled in a large suburban school district. The following descriptions were obtained during interviews with the participants' teachers.

Diego is a 7-year-old second grader who has a diagnosis of Autism, speech delay, and a severe intellectual delay. He received the diagnosis of severe ID by a school psychologist, no formal assessments were used by the school psychologist the basis of the diagnosis was through the use of observations and interviews with his classroom teacher. Diego has approximately 20 spoken words and follows a picture schedule. He does not have any other type of communication system. Reportedly, Diego's prior exposure to reading activities was very minimal. He was not read to during the school day and his reading instruction was limited to completing folder tasks such as matching or identifying the letters in his name. His parents speak only Spanish at home and at school he is spoken to in English. The classroom teacher reported her belief that Diego understands English better than he understands Spanish, and also indicated that he calms when he is spoken to in Spanish. Diego has been in the class for approximately one month before the study began.

Alonso is a 5-year-old kindergartner who has a diagnosis of Autism, speech delay, and a severe intellectual delay. This diagnosis of severe ID came from the school psychologist who reported that Alonso was unable to attend to individual testing but through clinical observation as

well as parent and teacher report it is estimated that cognitive processing skills are in the moderate low range. Alonso has no spoken communication and uses approximately 15 signs in order to communicate. He also understands 10 symbols and uses these to request items. His teacher reported that he does not appear to understand the symbols unless they are actual photographs of the object. At present, the speech therapist is creating a communication book for him to use. Alonso's family speaks only Spanish at home and at school his teachers speak to him using a combination of English and Spanish. A common practice, as reported by the teacher, is to provide him with directions in English and if he does not comply, the directions are repeated again in Spanish. The teacher indicated that when Alonso is provided with directions in Spanish he responds more quickly and with more accuracy than when he is spoken to in English. Alonso is working on early literacy skills such as identifying the title of a book and sitting through an entire reading of a book. During book reading he is usually very passive, he does not engage and at times tries to escape the activity.

Santiago is an 8-year-old fourth grader who has a diagnosis of Fragile X syndrome, a speech delay, a seizure disorder and a severe ID. He received the diagnosis of severe ID by a school psychologist, no formal assessments were used by the school psychologist, the basis of the diagnosis was through the use of observations and interviews with his classroom teacher, parents and other school personnel (speech therapist, occupational therapist). Santiago uses a Vantage Lite in order to communicate. The Vantage is only available to him at school, at home he must rely upon his limited verbal ability, pointing and facial expressions in order to communicate. According to teacher report in his IEP Santiago is becoming more adapt at finding vocabulary and using it in a functional manner. However he often has to be reminded to use it. He is able to combine words when he is requesting, i.e. "I want water" but needs help in making

any other types of combinations. At this time he only makes one word utterances through the assistance of his vantage. He also has some verbal communication (approximately 20 words) in both Spanish and English. His family speaks only Spanish at home. He hears English, and at times Spanish, at school. One of the aides in his classroom is bilingual and provides Santiago with directions as well as some instructional support in Spanish. Santiago's reading instruction focuses on helping him to identify his name, and learning new sight word vocabulary. Teacher reports that he is able to identify titles of books, he knows the correct way in which to hold books and that books are read from left to right. Book reading is not part of his daily academic schedule.

Marco is an 8-year-old third grader with a diagnosis of a severe intellectual delay and a speech delay. He receives services in the Intellectual Disability category and has a medical diagnosis of chromosome deletion 7 including congenital defects, recurrent ear infections and global developmental delay. During his three year reevaluation in 2011 the school psychologist implemented a developmental profile, Marco scored at the less than 0.1 percentile in the preacademic skill area. The school psychologist reported that he is equivalent to a typically developing one year ten month old child. This profile though was administered in English, no assessment has been conducted with Marco in Spanish. Marco has no spoken communication and his family speaks only Spanish at home. Marco is exposed to English during the school day. Marco has no formal communication system and relies on facial expressions and gestures as his primary mode of communication. Marco is exposed to books during circle time when the teacher reads the class a story. His other reading activities are to identify the letters in his name. At the conclusion of the study he began participating in small group phonics lesson.

### School Demographics and Intervention Setting

Four different schools from two different school districts were involved in the study (see Table 2). School 1 was a K–8 elementary school with a total population of 338 students. Of these students 13% were Latino, 1% qualified for ELL services, and 19% received special education services. This school was located in a large urban school district in the Pacific Northwest. School 2 was a K–6 elementary school with a total population of 449 students. Of these students 6% were Latino, 0% qualified for ELL services, and 9% received special education services. This school was located in the same school district as school one. School 3 reopened this year after being closed. At the time of this study no current information was available. The classroom teacher reported that it was one of the most diverse schools in the school district with a large ELL population. This was the school that Alonso attended. School 4 was a K–6 elementary school with a total population of 504 students. Of these students, 7% were Latino, 3.57% qualified for ELL services, and 11.71% received special education services. This school was located in a large suburban school district in the Pacific Northwest.

Table 2

#### *Demographic Description of the Schools that the Participants Attended*

| School                 | Total Enrollment | % Latino | % ELL | % Special Education |
|------------------------|------------------|----------|-------|---------------------|
| School 1<br>(Santiago) | 338              | 13       | 1     | 19                  |
| School 2 (Marco)       | 449              | 6        | 0     | 9                   |
| School 4 (Diego)       | 504              | 7        | 3.57  | 11.71               |

The intervention was implemented across four self-contained classrooms designed for students with low-incidence disabilities. Two of the students received the intervention at a table in their classroom that was either their designated work area or was a quiet place that they were familiar with. They received the intervention at a time when their classmates were doing activities outside of the classroom, for example having PE in the gym. The two other students received the intervention in a private room in their school building. Each participant received the intervention in the same spot across all sessions. During the sessions, the person delivering the intervention sat at the table next to the participant in order to be able to read the book and show the participant the story as well as the symbol vocabulary that had been embedded in the book. The intervention occurred at a time identified by the participant's teacher as being appropriate given the student's schedule.

**Personnel and training.** The primary researcher and special educator identified school personnel who would be trained to implement the intervention. Aspects of the training and intervention were discussed with these individuals and consent to be videotaped was obtained. Anyone who did not wish to participate could decline. The primary researcher trained those who were willing in the instructional procedures and the data collection methods. Interventionists were provided with a study protocol for each participant prior to the initial training session, during which the protocol was reviewed and questions were answered. The interventionists then engaged in role-playing and modeling of instructional procedures.

The intervention began when personnel obtained 100% accuracy in the protocol procedures, measured by the investigator's observations and data collection from the training role-plays. All phases of the study were videotaped and coded, and instructional and data collection feedback was provided to interventionists throughout all phases of the study.

A total of four interventionists, one at each school site, participated in this study. The person delivering the intervention was a school staff member in each of the participants classroom, either a classroom teacher or paraprofessional. Three interventionists were classroom teachers, and one was a long-term paraeducator substitute who had just received a special education teaching certificate in low-incidence disabilities. Each participant attended a different school, therefore none saw the intervention being done with another participant.

Interventionist A conducted the intervention with Diego. Interventionist A had begun teaching in January 2012. She had completed a credential program in special education in 2011; the program did not have a focus on a particular disability type. Interventionist A had one year of experience as an intern in a resource room. She also had worked before that for two years as a paraeducator and had provided home care for a child with severe physical disabilities for three years. She had taken two years of Spanish in high school.

Interventionist J conducted the intervention with Alonso. Interventionist J is a first-year classroom teacher who had received a teaching certificate in special education with a focus in low-incidence disabilities in 2011. She had two years of experience as an intern in different classroom settings, had worked as a paraeducator for two years, and had volunteered with individuals with disabilities since high school. She spoke some Spanish but did not consider herself to be bilingual.

Interventionist G conducted the intervention with Santiago. Interventionist G was a long-term substitute paraeducator in the classroom. She had completed her student teaching in this classroom in the fall of 2011 and had worked as a substitute after that, so she was familiar with all of the students. Interventionist G had received a teaching certificate in special education with a focus on low-incidence disabilities in the fall of 2011. She had two years experience working

as an intern in different classrooms for students with severe disabilities. Prior to that she had worked as a paraeducator in classrooms for students with severe disabilities. Interventionist G had taken some Spanish classes in high school.

Interventionist C conducted the intervention with Marco. Interventionist C is a first-year classroom teacher who had received a teaching certificate in special education in 2011. She had one year of experience as an intern and student teacher in a classroom for students with severe disabilities and had also worked for a year as a paraeducator. The credential program she attended did not focus on a particular disability type. She spoke some Spanish but did not consider herself to be bilingual.

### **Experimental Design**

An Alternating Treatment Design was used to assess the effectiveness of the English-only and bilingual intervention packages on four participants' listening reading comprehension. The package is referred to as bilingual because the books were always read to the student in English but during the bilingual days the supports (vocabulary, questions communication board) were implemented in Spanish. Alternating Treatment Designs compare the effectiveness of multiple treatments on a dependent variable (Alberto & Troutman, 2009). Each of the four participants received alternating interventions. For example, Participant 1 received the English-only intervention during session one and the bilingual intervention during session two. Participant 2 received the bilingual intervention during session one and the English-only intervention during session two. Participant 3 received the English-only intervention during session one and the bilingual intervention during session two. Participant 4 received the bilingual intervention during session one and the English-only intervention during session two. These two alternating sessions are referred to as a "block" (Alberto & Troutman, 2009). The interventionist read a new book for

each block. Counterbalancing was used across participants as another form of internal validity. This was done to ensure that positive results were not being received based upon what language the participants had the intervention package in first. This was important to do in order to show that the order in which the participants were exposed to the books was accounted for. Participant 1 was randomly assigned to either the English or bilingual version of the intervention. Subsequently, Participants 2-4 were assigned alternating versions. This pattern of alternating treatment interventions continued for each of the participants until they demonstrated a consistent trend of 80% accuracy when answering comprehension questions for either the English intervention or the bilingual intervention across three sessions. For example, achieving 80% accuracy for three consecutive bilingual intervention sessions.

Table 3 illustrates how sessions alternated for each participant. Sessions (S) are numbered (1-6), and are identified by, the English-only (A) or bilingual (B) version of the interventions.

Table 3

*Visual Example of How the Intervention was Counterbalanced Across Each Session for the Type of Intervention Package They Received*

|          |          |              |               |               |               |               |               |               |
|----------|----------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Diego    | Baseline | Intervention | S1B<br>Book 1 | S2A<br>Book 1 | S3B<br>Book 2 | S4A<br>Book 2 | S5B<br>Book 3 | S6A<br>Book 3 |
| Alonso   | Baseline | Intervention | S1A<br>Book 1 | S2B<br>Book 1 | S3A<br>Book 2 | S4B<br>Book 2 | S5A<br>Book 3 | S6B<br>Book 3 |
| Santiago | Baseline | Intervention | S1B<br>Book 1 | S2A<br>Book 1 | S3B<br>Book 2 | S4A<br>Book 2 | S5B<br>Book 3 | S6A<br>Book 3 |
| Marco    | Baseline | Intervention | S1A<br>Book 1 | S2B<br>Book 1 | S3A<br>Book 2 | S4B<br>Book 2 | S5A<br>Book 3 | S6B<br>Book 3 |

## **Procedures**

**Recruitment.** To participate in this study, potential participants were required to complete a screening exercise and meet inclusion criteria. Potential participants completed a screening exercise which consisted of looking at a favorite book with their classroom teacher and identifying characters in the book. To be eligible for the study, participants needed to be able to point to pictures when asked. In addition to completing the screening exercise, potential participants met the following inclusion criteria: (a) have limited verbal ability, as reported by the teacher or speech language pathologist, or contained in the student's file; (b) be between the ages of 5 and 21; (c) receive special education services, either in a self-contained classroom, resource room, or in a general education classroom; (d) have a medical or educational diagnosis of ID from the school district or by an outside educational agency, (e) have passed vision and hearing screenings; (f) have Spanish as the primary language at home as reflected in their IEP or reported by their classroom teacher; and (g) have no prior exposure to the books used in the intervention as reported by the classroom teachers. Participants were excluded if they were at grade level for reading comprehension. Inclusion and exclusion criteria were reviewed with special educators who then identified potential participants that met the criteria.

Prior to study implementation, letters detailing the nature and purpose of the research were distributed to secure informed consent from each child's parent or guardian. Once participants were selected and parental consent obtained, the study began.

**Materials.** Ten age-appropriate books were selected for this study according to criteria identified by Hargrave and Senechal (2000): books had color illustrations, were of an appropriate length, and included content relating to an age-appropriate topic. In addition, books were chosen that the participants had no prior exposure to. The books were modified with visual symbols

representing important vocabulary words; these symbols were inserted throughout the book on the same pages as the selected vocabulary words. The vocabulary words that were chosen were all words that would be needed by the participants in order to answer the ten comprehension questions. The selected symbols were one inch by one inch, were in color and were either produced by Boardmaker software or were pictures selected from the children's book. At the end of each book, a one- to two-line text summary was included. The summary was typed and inserted on the back cover of the book that was being read. A communication board was made for each book. The communication board contained the same vocabulary words that were in the book. The symbols that were used to represent the vocabulary in the book were the same symbols that were found on the communication board. The communication board was laminated and the symbols were in color. Each symbol was two and a half inches by two and a half inches. In addition to the ten vocabulary symbols the communication board also had a symbol that represented "I like that" and "I don't like that" this was done in order to allow the participants to make comments about what was being read to them if they wanted to (Appendix H). The interventionists were also provided with a chart that had ten blank squares and was laminated. The interventionists used this chart and gave the participants a sticker whenever they answered a question correctly.

**Baseline.** After participants were selected but before the baseline reading sessions began, the participants' teachers were asked how they typically read to their students at school. From these answers the baseline procedures were determined for all participants in the study. Each teacher indicated that when they read books to the participant, they did not ask the participant reading comprehension questions or modify the books in any way. The teachers were also asked what was reinforcing for their student who would be a participant in the study. These reinforcers

were then used during the intervention whenever the participant answered a comprehension question correctly. The types of reinforcers that were used were food (skittles, gold fish) or stickers. The same interventionist implemented both baseline phase and intervention phase with the same participant.

During the baseline reading sessions, a book was read once to the participant by the interventionist. The interventionist did not ask the participant any questions and the books that were read were not modified with symbols. One of the participants had their communication device available to them (Santiago) the other three participants did not have a formal communication system set up they used signs or pointing to pictures in the book in order to communicate. Data were collected to measure participants' (a) total number of correct answers to questions, (b) total number of responses, (c) total number of communication attempts, and (d) level of engagement. All baseline reading sessions were videotaped and one session was completed per day. After four days of baseline reading sessions, a flat, stable, low baseline was observed for each individual participant. The intervention was started immediately for each participant after this fourth data point.

During baseline, the participants' teachers were interviewed and they were asked questions about their training, experience, background and how they taught academics to their students with intellectual disabilities.

**Intervention.** All of the participants began intervention at the same time. Starting the intervention at the same time for all four participants helped to control for maturation effects, and is a common component of alternating treatment design. Maturation is the internal growth that can occur in an individual. All of the participants began intervention on the same date which

controls for the maturation that may occur across the participants when they receive the intervention over a staggered period (Kazdin, 1982; Kennedy, 2005).

The intervention modified the baseline reading activity by adding symbols representing key vocabulary words to the book being read. The vocabulary that was chosen was all words that appeared in the book and would be needed in order to answer the comprehension questions. The vocabulary represented important places, objects or concepts that occurred in the book. The interventionists reviewed the key vocabulary with the participant prior to reading the book by using the participants' communication board. The interventionist read aloud the key vocabulary words, in English or Spanish depending on the session, and showed the participant the corresponding symbols which represented those words on the communication board. After reviewing the key vocabulary, the interventionist read the book aloud to the participant. Each time a key vocabulary word was said in the story, the symbol representing that vocabulary word was placed on the same page and shown to the participant. Once the story was complete, a one-to two-sentence summary of the story was read to the participant, in English or Spanish, while the participant had visual access to the summary. After reading the short summary, the interventionist read the book to the participant a second time. During this second reading, the participant was asked comprehension questions in either English or Spanish depending on whether it was the English or Spanish intervention day for that book. After each question, the interventionist waited up to 10 seconds for a response. A correct response was defined as the participant answering the question the first time he was asked within ten seconds. An incorrect response was defined as the participant answering the question after the first time he was asked within ten seconds but choosing a symbol/picture that was not the answer to the question. A no

response was defined as the participant making no movements towards a symbol or picture within the first ten seconds of being asked the comprehension question for the first time.

The participants were asked 10 comprehension questions for each book during the second reading of the book for all of the sessions. All of the participants were asked the same comprehension questions, which included recall questions, sequencing questions, and main idea questions.

Participants were able to answer the comprehension questions in one of the following ways: (a) by pointing to a picture in the book, (b) by pointing to a symbol in the book, (c) by using their own communication system (the only participant who had a system to use was Santiago) or, a communication board developed for them by the researcher for each of the books that were read. The communication board as well as Santiago's communication system was placed on the table in easy reach for the participant to use. The communication board had all of the vocabulary that participants would need to answer the comprehension questions. When participants gave a correct response within five to ten seconds, they were provided with verbal praise and a mark on their chart, such as a sticker or a star. The mark used for each participant was one that the participant's teacher had reported to be reinforcing to the participant. The participants received a mark every time they answered a comprehension question correctly. If participants had ten marks at the end of the intervention session, they were provided with positive reinforcement that had been identified to be reinforcing by a teacher who was familiar with them. If participants gave an incorrect response, the interventionist provided them with the question again and waited up to 10 seconds for a response. If the participants did not respond, meaning they showed no movement within 10 seconds or they started to make an incorrect response, the interventionist guided their hand to the correct answer while telling the participant

the correct answer to the question. If participants responded correctly after being asked the question a second time, they received verbal praise and a marker on their chart. For data collection purposes, the question was recorded as being answered correctly only if a participant answered the question correctly within 10 seconds of the first time they were asked the question.

**Data Collection.** Each participant participated in four 20-minute videotaped intervention sessions per week, one session per day, for the duration of the study. During that time there were two week long breaks from school (mid-winter break and spring break) and each of the participants missed an additional week of school due to illness. Multiple sources of data were collected to align to the research questions. The dependent variables include the effects of the intervention on participants' (a) total number of correct answers to questions, (b) total number of responses, (both correct and incorrect) when asked a comprehension question (c) total number of initiated communication, and (d) level of engagement. Communication was defined as a participant touching a picture or symbol in the book, using their communication system, or a communication board that was provided. Participant engagement was defined as a participant looking at the book or at the person reading the book for at least three seconds.

Table 4 provides a summary of the research questions, data sources, and a brief description of how the data were analyzed.

Table 4

*Description of Research Questions, Data Sources, and Analysis.*

| Research Question  | Data Source   | Data Analyzed   |
|--|---|---|
| What effect does the English-only intervention package have on participants' accuracy answering reading comprehension questions? | Asking the participants English-only comprehension questions about the story being read | Number of questions participants answered correctly within 10 seconds |

|  |  |   |
|--|--|---|
| What effect does the bilingual intervention package have on participants' accuracy answering reading comprehension questions?      | Asking the participants Spanish-only comprehension questions about the story being read  | Number of questions answered correctly within 10 seconds  |
| What effect does the English-only intervention package have on participants' total number of responses?                            | Asking the participants comprehension questions in English about the story being read  | Total number of responses to questions (correct and incorrect answers were recorded)  |
| What effect does the bilingual intervention package have on participants' total number of responses?                               | Asking the participants comprehension questions in Spanish about the story being read  | Total number of responses to questions (correct and incorrect answers were recorded)  |
| What effect does the English-only intervention package have on participants' total communication attempts during the book reading? | Observing participants' communication during the book reading such as touching a picture in the book, using a symbol, or using a communication board or device | Total number of communication attempts during the book reading session  |
| What effect does the bilingual intervention package have on participants' total communication attempts during the book reading?    | Observing participants' communication during the story, such as touching a picture in the book, using a symbol, or using a communication board or device       | Total number of communication attempts during the book reading session  |
| What effect does using the intervention have on participants' level of engagement?   | Measuring participants' engagement during the book reading session   | Number of acts of engagement (defined as looking at the book or looking at the person reading the book) per 10-second time period |

The intervention was to be conducted until a consistent difference in the level and/or trend of the data patterns for one intervention package had reached an 80% success rate across three sessions. Eighty percent was chosen as the criteria given its use in similar reading studies with participants that have a severe ID (Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee,

2008; Mims, Browder, Baker, Lee, & Spooner, 2009; Browder, Trela, & Jiménez, 2007; Browder, Lee, & Mims, 2011; & Holcombe, Wolrey & Gast, 1994).

### **Reliability and Validity Assessments**

**Interobserver agreement.** Reliability, is an important component of single-case research to help minimize bias that may occur with an individual observer. In order to reduce this bias, the primary investigator trained two graduate students (secondary researchers) in the study procedures, and they assisted in collecting data and coding the videos, starting at baseline and occurring throughout the intervention for all of the participants. The secondary researchers were trained and role played the study procedures. The primary and secondary researchers watched video together, collected data and then compared the data to ensure that there was an understanding of what engagement was, answering a question, what a correct answer was and communication. Once all researchers reached 100% reliability they began coding the videos independently. The secondary researchers were finishing a certificate and masters program in Special Education with an emphasis in low incidence disabilities. They both had interned for the past two years in various classrooms for students with low incidence disabilities. The primary and secondary researchers observed the video sessions and compared their data after the sessions had been completed. Approximately 40% of the sessions were observed by two researchers (Kazdin, 1982; Kennedy, 2005). The sessions that were observed were not the same sessions that were watched to attain coding reliability. Reliability estimates were calculated using the point-by-point method in which the number of agreements was divided by the number of agreements plus disagreements and multiplied by 100. Reliability data were collected on: participants correctly answering the questions, participant engagement, total number of participant responses, and total participant communication attempts.

**Procedural reliability.** Procedural reliability assessments were conducted simultaneously with data collection reliability checks. Data were collected on the interventionists' compliance with planned procedures. A procedural reliability checklist was used to determine procedural fidelity of the interventionists during the sessions (see Appendix A and Appendix B). Procedural reliability estimates were calculated by dividing the number of correct teacher behaviors recorded by the observer by the number of planned behaviors that should have been emitted in the session, and multiplying by 100.

**Internal validity.** There are two different threats to the internal validity of the experimental design: history and maturation. History refers to an event that coincides with the experiment that has an influence on the participant. Maturation occurs within the participant and refers to some type of growth other than the actual intervention that could account for the success of the experiment. Most of the threats to internal validity are ruled out through the nature of single-case experiment designs, specifically Alternating Treatment Designs (Kazdin, 1982; Kennedy, 2005). Alternating Treatment Design is a variant of Multielement design; it is flexible in how it is constructed and therefore allows for high levels of experimental control to be built into the design through the use of experimental control and contrasting conditions. The alternation between conditions allows for this design to be done which can account for threats to internal validity such as maturation and history (Kennedy, 2005).

**External validity.** External validity refers to the validity of the experiment being generalized across people, settings, and places. Threats to external validity can be minimized by using a strong experimental design, and by clearly defining the participants and settings in order to assist in replication of the experiment. To maximize the generalizability of findings, the

students' characteristics, history with the independent variables and tasks, setting characteristics, and performance during baseline were described.

**Social validity.** A subjective evaluation was conducted to determine whether the focus of this study, and the behavioral changes that may occur as a result, meet the values of the school community of which the student is a part (Kazdin, 1982). Social validity assessments were conducted as teachers were interviewed pre and post study (see Appendix C).

**Teachers.** Teacher interviews were developed to examine issues related to the ease of implementing the intervention and teachers' views on incorporating students' home languages into instruction. The teachers were asked questions about the current and future usefulness of the study. They were also asked questions about the actual intervention, both the English-only phase as well as the home language phase. The teachers were interviewed pre and post study. In three of the classrooms the teacher implemented, the intervention and in the fourth classroom a long term paraeducator substitute completed the intervention. The teacher as well as the interventionist were interviewed post study in the fourth classroom. All interviews lasted approximately 30 to 45 minutes and took place at a time and setting determined by the teacher.

**Maintenance and generalization.** Probes for maintenance and generalization were not conducted for any participant because they did not reach criteria. These probes would have helped to determine the long-term effects of this intervention on the participants' communication, engagement, and comprehension during book reading sessions.

### **Data Analysis**

Data were analyzed by graphing it and then doing a visual inspection where data patterns were examined to determine intervention effect. Visual inspection refers to "reaching a judgment

about the reliability or consistency of intervention effects by visually examining the graphed data” (Kazdin, 1982, p. 232). Specifically, characteristics of the data that reflect magnitude of the changes across phases and the rate of these changes were used. Data were analyzed to determine if there was a change in level between baseline and intervention, if any trend lines occurred and if there were any overlapping data points. Effectiveness data for the four students are presented in graph format depicting: questions answered correctly, total questions answered, communication and engagement. Each participants’ baseline was compared to intervention sessions to determine the effectiveness of the intervention. In addition the languages of the intervention package were compared to one another using visual analysis procedures. A total of 20 intervention sessions were completed.

### Chapter Three: Results

#### Questions 1 and 2:

**What effect does the English-only intervention package have on participants' accuracy answering reading comprehension questions?**

**What effect does the bilingual intervention package have on participants' accuracy answering reading comprehension questions?**

Figure 1 presents the total number of questions answered accurately during each of the intervention session for all four participants. The participants were asked a total of 10 questions each per session.

**Diego.** The language in which Diego received his intervention package did not appear to have an impact on his accuracy in answering the comprehension questions.

During baseline Diego answered 0 questions. During the English-only intervention he answered a mean of 1.2 questions accurately (ranged from 0 to 2). In the bilingual intervention sessions Diego answered a mean of 1 question accurately (ranged from 0 to 3). Diego never met criteria and therefore never entered the maintenance and generalization phases. Diego was absent for five days after the first two intervention sessions, when he returned to school he resumed with session 3. Diego transferred schools after receiving 10 intervention sessions.

**Alonso.** Alonso answered more questions correctly during the bilingual intervention sessions ( $M = 1.7$ ) than during the English-only intervention sessions ( $M = 1.1$ ).

During baseline Alonso answered 0 questions and during the English-only intervention he answered a mean of 1.1 questions accurately (ranged from 0 to 2). In the bilingual intervention sessions Alonso answered a mean of 1.7 questions accurately (ranged from 1 to 3). Alonso never met criteria and therefore never entered the maintenance and generalization

phases. Alonso was absent for five days after the first two intervention sessions due to illness. When he returned to school he resumed with session 3. Alonso also did not receive intervention for one week because of spring break.

**Santiago.** Santiago answered more questions correctly during the bilingual intervention sessions ( $M = 5.3$ ) than during the English-only intervention sessions ( $M = 4$ ).

During baseline Santiago answered 0 questions and during the English-only intervention he answered a mean of 4 questions accurately (ranged from 2 to 6). In the bilingual intervention sessions Santiago answered a mean of 5.3 questions accurately (ranged from 2 to 8). Santiago never met criteria and therefore never entered the maintenance and generalization phases. Santiago was absent for five days after completing the first two sessions due to illness. When he returned he resumed with session 3. In addition, Santiago did not receive the intervention for five days due to spring break.

**Marco.** Marco answered more questions correctly during the bilingual intervention sessions ( $M = 6.1$ ) than during the English-only intervention sessions ( $M = 5.7$ ).

During baseline Marco answered 0 questions and during the English-only intervention he answered a mean of 5.7 questions accurately (ranged from 3 to 7). In the bilingual intervention sessions Marco answered a mean of 6.1 questions accurately (ranged from 3 to 8). Marco never met criteria and therefore never entered the maintenance and generalization phases. Marco had a high number of absences during the intervention phase. Marco was absent for five days after the second intervention session and upon return began with session 3. In addition, Marco did not receive the intervention for five days because of spring break.

All of the participants answered more questions correctly in the intervention phase than they did during baseline. Three of the four participants answered questions with more accuracy

during the bilingual intervention sessions than they did during the English only sessions. The fourth participant did not demonstrate any difference in accuracy between the two languages. None of the participants met criteria in question accuracy which was set at 80% over three consecutive sessions in a specific language.

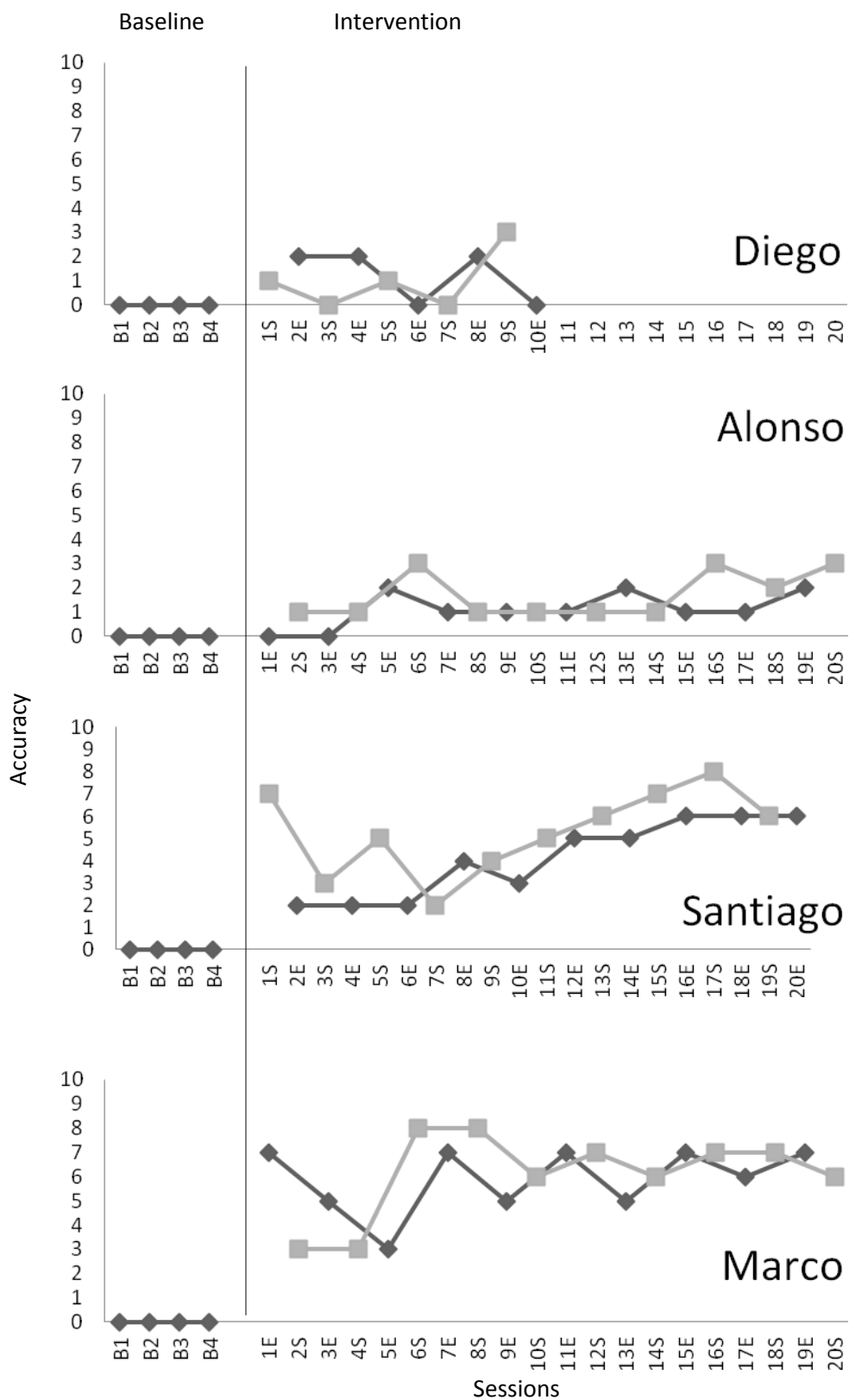


Figure 1. Total number of questions participants answered correctly per each intervention session. ♦ = English and ■ = Spanish

**Questions 3 and 4:**

**What effect does the English-only intervention package have on participants' total number of responses?**

**What effect does the bilingual intervention package have on participants' total number of responses?**

Figure 2 presents the total number of questions the participants answered for the 10 comprehension questions that were asked during each intervention session.

**Diego.** Diego answered more questions during the bilingual intervention sessions ( $M=2.2$ ) than he did during the English-only intervention sessions ( $M=1.8$ ).

During baseline Diego answered 0 questions. During the English-only intervention sessions Diego answered a mean of 1.8 questions (ranged from 0 to 4). During the bilingual intervention sessions Diego answered a mean of 2.2 questions (ranged from 0 to 3).

**Alonso.** Alonso answered more questions during the bilingual intervention sessions ( $M=3.9$ ) than during the English-only intervention sessions ( $M=3.4$ ).

During baseline Alonso answered 0 questions. During the English-only intervention sessions Alonso answered a mean of 3.4 questions (ranged from 2 to 5). During the bilingual intervention sessions Alonso answered a mean of 3.9 questions (ranged from 1 to 7).

**Santiago.** Santiago did not have a difference in the number of questions he answered during the bilingual interventions ( $M=9.4$ ) when compared to the English-only intervention sessions ( $M=9.6$ ).

During baseline Santiago answered 0 questions. During the English-only intervention sessions Santiago answered a mean of 9.6 questions (ranged from 8 to 10). During the bilingual intervention sessions Santiago answered a mean of 9.4 questions (ranged from 7 to 10).

**Marco.** Marco did not have a difference between the number of questions he answered during the bilingual intervention sessions ( $M=9.5$ ) when compared to the English-only intervention sessions ( $M= 9.2$ ).

During baseline Marco answered 0 questions. During the English-only intervention sessions Marco answered a mean of 9.2 questions (ranged from 6 to 10). During the bilingual intervention sessions Marco answered a mean of 9.5 questions (ranged from 6 to 10).

All of the participants demonstrated an increase in the number of questions that they answered. None of the participants answered more questions overall in either the English-only intervention sessions or the bilingual intervention sessions.

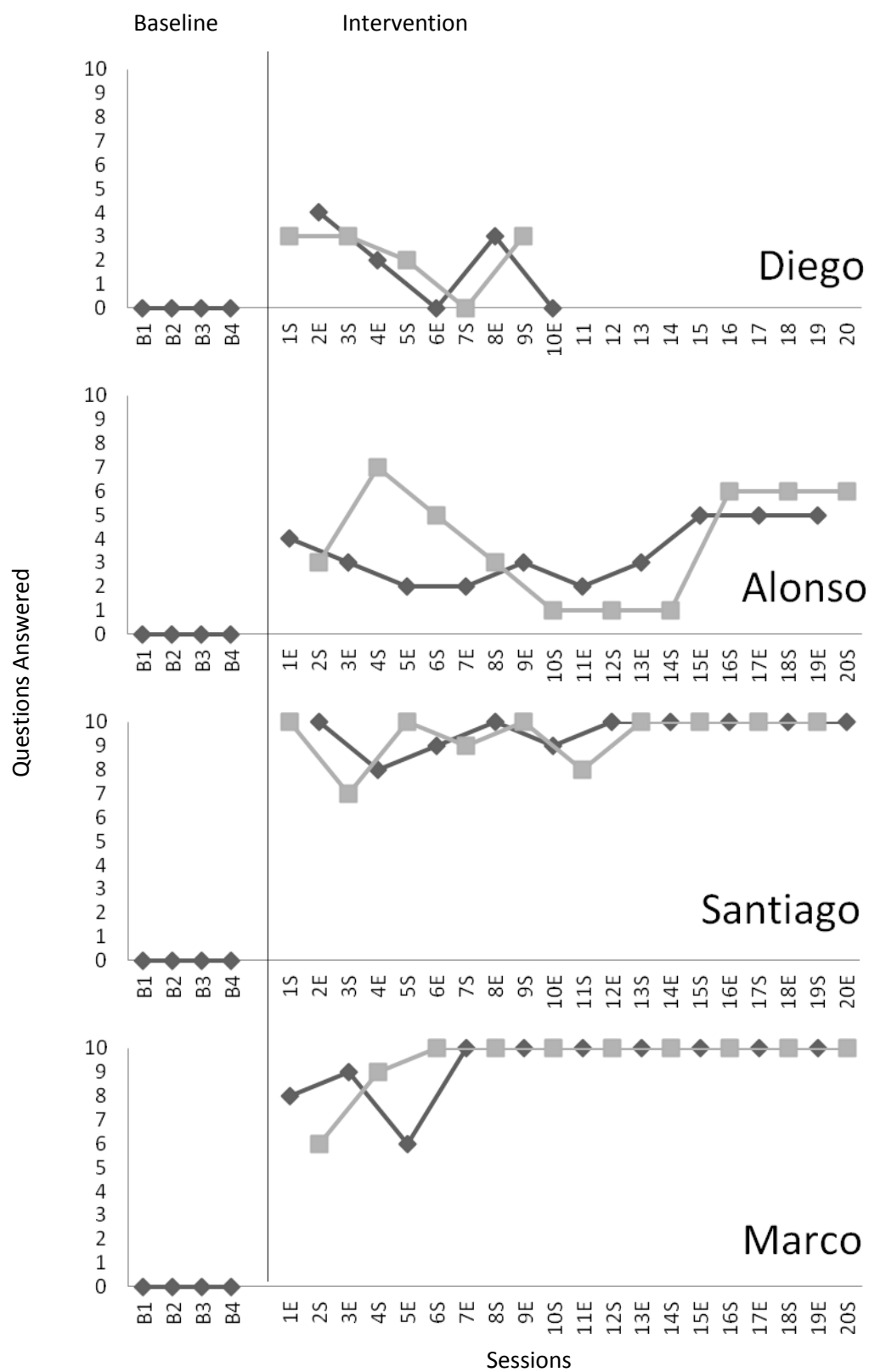


Figure 2. Total questions that participants answered during each intervention session.

◆ = English and ■ = Bilingual

**Questions 5 and 6:**

**What effect does the English-only intervention package have on participants' total communication attempts during the book reading?**

**What effect does the bilingual intervention package have on participants' total communication attempts during the book reading?**

Figure 3 represents the total number of times participants initiated communication during each session.

**Diego.** Diego communicated more during the bilingual intervention sessions ( $M = 7.2$ ) than he did during the English-only intervention sessions ( $M = 6.6$ ).

During baseline Diego communicated a mean of .25 times (ranged from 0 to 1). During the English-only intervention sessions Diego communicated a mean of 6.6 times (ranged from 3 to 10). Diego communicated a mean of 7.2 times (ranged from 5 to 10) during the bilingual intervention sessions.

**Alonso.** Alonso communicated more during the bilingual intervention sessions ( $M = 19.4$ ) than he did during the English-only intervention sessions ( $M = 14.7$ ).

During baseline Alonso communicated an average of 1 time. During the English-only intervention sessions Alonso communicated a mean of 14.7 times (ranged from 5 to 27). Alonso communicated a mean of 19.4 times (ranged from 5 to 37) during the bilingual intervention sessions.

**Santiago.** Santiago communicated more during the bilingual intervention sessions ( $M = 24.9$ ) than he did during the English-only intervention sessions ( $M = 19.4$ ).

During baseline Santiago communicated a mean of 2.5 times (ranged from 1 to 4). During the English-only intervention sessions Santiago communicated a mean of 19.4 times

(ranged from 11 to 28). Santiago communicated a mean of 24.9 times (ranged from 12 to 39) during the bilingual intervention sessions.

**Marco.** Marco communicated more during the bilingual intervention sessions ( $M=25.7$ ) than he did during the English-only intervention sessions ( $M=23.8$ ).

During baseline Marco communicated a mean of 2.75 times (ranged from 2 to 3). During the English-only intervention sessions Marco communicated a mean of 23.8 times (ranged from 11 to 35). Marco communicated a mean of 25.7 times (ranged from 18 to 32) during the bilingual intervention sessions.

Data analysis for all participants indicates that this intervention package, implemented in both English and Spanish was effective in increasing initiated communication when compared to baseline levels. In addition all participants communicated on average slightly more during the bilingual intervention sessions than they did during the English-only intervention sessions.

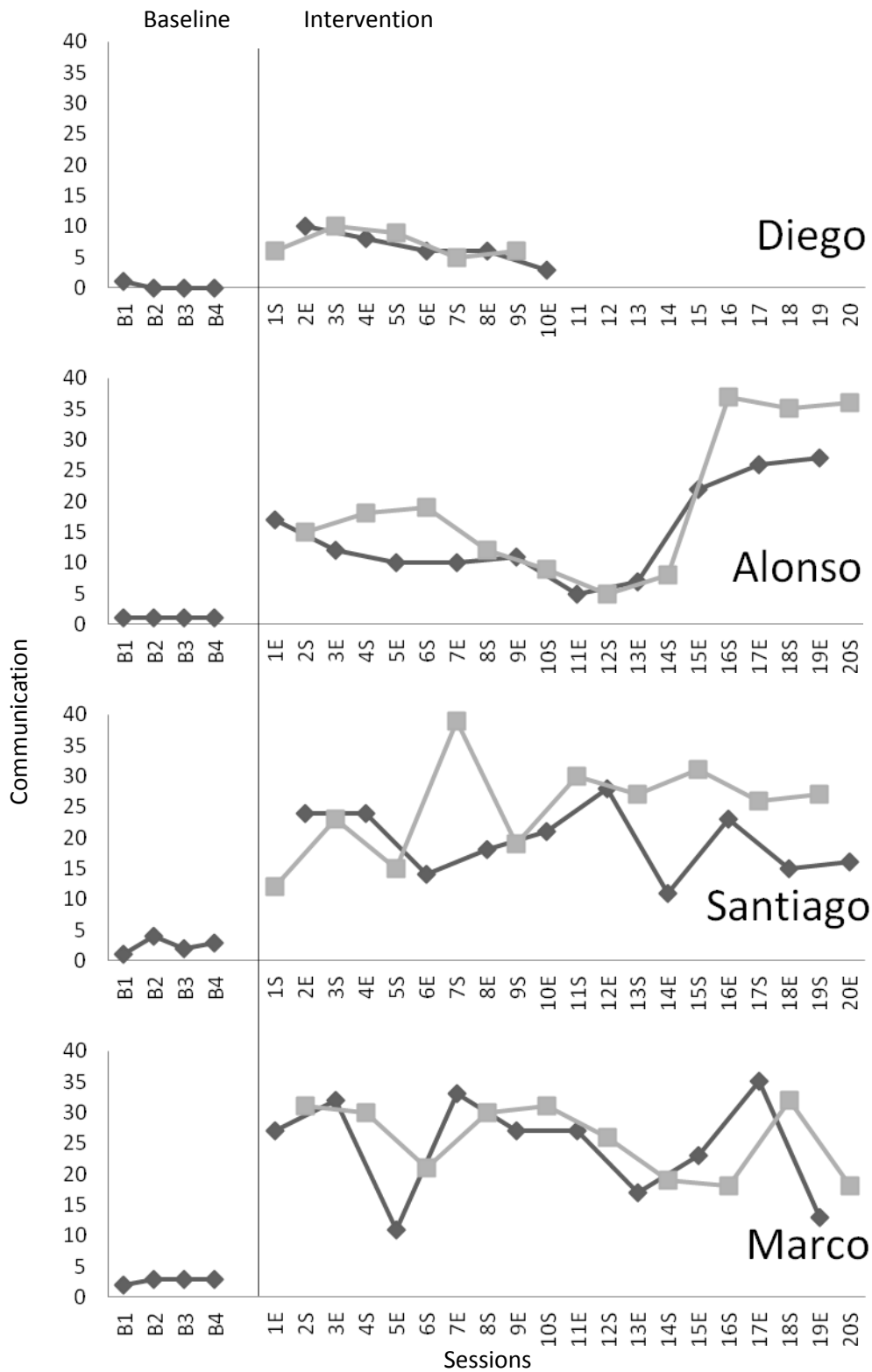


Figure 3. The total number of times participants communicated per session.

♦ = English and ■ = Spanish

**Question 7:****What effect does using the intervention have on participants' level of engagement?**

Figure 4 illustrates the percentage of participant engagement per session.

**Diego.** During baseline Diego's mean percentage score was 47.75% (ranged from 45% to 50%). For the entire intervention Diego's mean percentage score was 44.9% (ranged from 27% to 62%). Analysis of data indicates a decrease in engagement across the intervention sessions.

**Alonso.** During baseline Alonso's mean percentage score was 56.25% (ranged from 55% to 59%). For the total intervention Alonso's mean percentage score was 68.8% (ranged from 40% to 96%). Analysis of data indicates a slight increase in engagement across the intervention sessions.

**Santiago.** During baseline Santiago's mean percentage score was 74.25% (ranged from 72% to 76%). For the entire intervention Santiago's mean percentage score was 78.9% (ranged from 64% to 93%). Analysis of data indicates a slight increase in engagement across intervention sessions.

**Marco.** During baseline Marco's mean percentage score was 58% (ranged from 53% to 66%). For the intervention Marco's mean percentage score was 75% (ranged from 52% to 97%). Analysis of data indicates an increase in engagement across the intervention sessions.

Analysis of the data indicates that for three of the participants, the intervention did not influence engagement. For Diego, engagement went down during the intervention sessions.

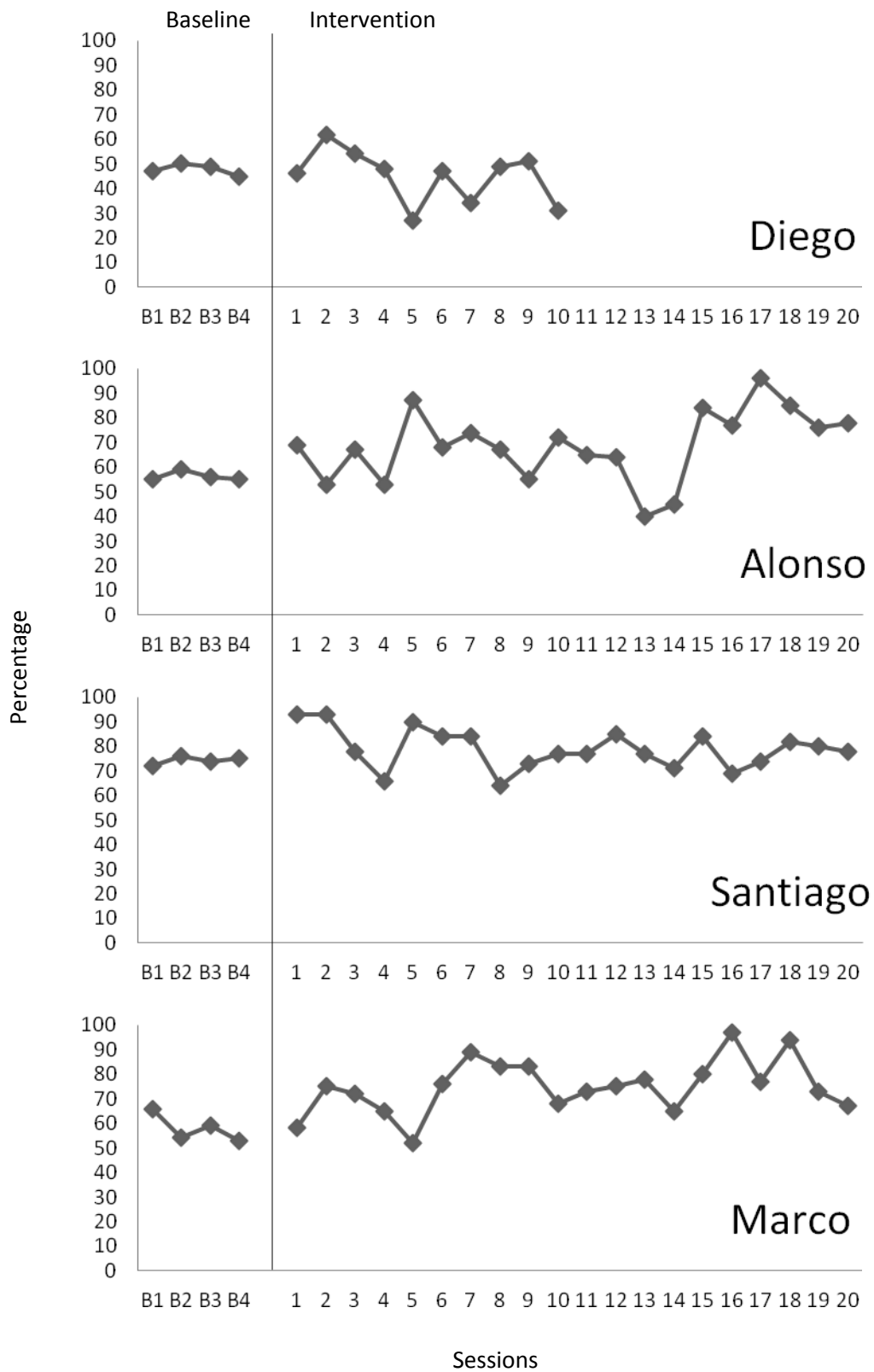


Figure 4. Percentage in which participants were engaged during each session.

## Reliability

**Interobserver agreement.** Interobserver agreement was high throughout all of the sessions. Interobserver agreement was collected over 40% of the intervention sessions and 50% of the baseline sessions for these specific areas: (1) accuracy in answering questions, (2) total questions answered, (3) communication, and (4) engagement. The mean percentage of agreement was 100% on student responding to questions and communicating during baseline sessions and 96.25% for engagement during baseline. During instructional sessions, the mean percentage of agreement was 98.3%. Interobserver agreement data for individual participants are displayed below.

*Table 5. Mean Percentage Interobserver Agreement for Each Participant During Baseline and Intervention.*

| Participant           | Accuracy in answering questions | Total questions answered | Communication | Engagement |
|-----------------------|---------------------------------|--------------------------|---------------|------------|
| Diego Baseline        | 100%                            | 100%                     | 100%          | 96%        |
| Diego Intervention    | 100%                            | 100%                     | 98%           | 94%        |
| Alonso Baseline       | 100%                            | 100%                     | 100%          | 95%        |
| Alonso Intervention   | 100%                            | 100%                     | 97%           | 96%        |
| Santiago Baseline     | 100%                            | 100%                     | 100%          | 94%        |
| Santiago Intervention | 100%                            | 100%                     | 93%           | 95%        |
| Marco Baseline        | 100%                            | 100%                     | 100%          | 100%       |
| Marco Intervention    | 100%                            | 100%                     | 100%          | 100%       |

**Procedural reliability.** Results of the procedural reliability checks during baseline sessions for all participants were 100% (mean percentage). Procedural reliability data (mean percentage) for each participant during intervention sessions were as follows: Diego, 99%

(ranged from 98% to 100%); Alonso, 100%; Santiago, 93% (ranged from 90% to 100%); and Marco, 99% (ranged from 98% to 100%).

### **Social validity**

All four of the interventionists and the one classroom teacher who did not implement the intervention were asked post-study questions about the effectiveness of the study. They all stated that they enjoyed reading with the participants. They all reported that the symbols assisted the participants in communicating and answering questions. The interventionists who worked with the participants who did not have a formal communication system (Marco, Alonso, and Diego) stated that they were surprised how quickly they began to use the symbols in the book and on the communication board. When asked if they felt a particular language helped the participants in understanding the text there were mixed answers. Santiago and Alonso's interventionists felt that the bilingual intervention package helped with the participants comprehension and communication. Diego's interventionist did not think the language of instruction influenced participant performance. Marco's interventionist did think the language influenced the performance and that Marco did slightly better on the Spanish days. However she felt because she did not speak Spanish it was hard to really determine the effectiveness of it when compared to English. This was a sentiment also shared by Santiago's interventionist and Diego's interventionist. They all felt that reading instruction is important and is something they would like to continue to do in the classroom. Marco's interventionist and Alonso's interventionist would like to extend the bilingual intervention to other students in their classroom.

## **Chapter Four: Discussion**

The present study examined the effects of several variables on the listening comprehension of ELL learners who have a diagnosis of ID and/or ASD. The listening reading comprehension intervention, when provided bilingually (in Spanish), increased communication across all four participants. This intervention also increased participants responding to questions; two of the participants responded to questions more frequently with the bilingual intervention, and the other two participants responded equally to questions in both languages. However, both the English-only intervention and the bilingual intervention did not affect participants' comprehension or engagement levels. Prior to this study the use of a listening reading comprehension intervention had not been applied to learners who were nonverbal, ELL, and had severe IDs.

### **Total Responses**

Prior to this study, the participants had little-to-no exposure to reading comprehension questions. Research tells us that students who use AAC and have an ID are restricted in their literacy activities in the amount of time, the number, range, and quality of experiences (Sturm, 2004). Many people who use AAC and have an ID then have difficulties in developing reading and writing skills and this is partly due to the limited access they have to supportive literacy experiences at home and school (Light & Kelford Smith, 1993). In school, children who use AAC and have an ID receive less instructional time than their non-disabled peers: they have less exposure to the general curriculum and less access to formal instruction (Taibo, Iglesias, Mendez & Gonzalez Raposo, 2009 & Koppenhaver and Yoder, 1992). Typically students who use AAC and have an ID are provided with content relating to therapeutic and behavioral goals and not academic goals. (Light & Kelford Smith, 1993 & Morgan, Moni & Jobling 2006). Even if the

students who use AAC and have an ID are involved in literacy skills the challenges they face with communicating can severely restrict their participation in the literacy activities, making them passive participants (Light & Kelford Smith, 1993). The finding that all participants demonstrated an increase in the number of attempts to answer comprehension questions provides some evidence that when students who have an ID and use AAC are given the means and opportunity to communicate during literacy activities, they are very likely to do so. The participants typical book reading experiences were quite different from the book reading they had during intervention. The typical book reading consisted of the following: being read to in a group of three or more students, the teacher read the book in front of all of the students decreasing physical access to the book which impedes opportunity to point, having no formal communication system, having no communication boards that accompanied the book, the book was read once, they were not asked comprehension questions but identification questions and only this on occasion. During the intervention the participants were given a communication board that correlated with the book that was being read, and the books were modified with picture symbol vocabulary. This provided the participants with a mean in which to communicate. They had close physical access to the book in the dyad sessions which gave them greater opportunity to engage with the modified book and use it as a communication tool. In addition the reading of the book twice gave them more knowledge of the book, in order to answer questions and more opportunities in which to communicate. They were also asked questions consistently during the book reading sessions.

Not only was there a marked increase in response attempts between baseline and across intervention sessions for each participant in this study, there were also continuous gains made during the intervention by two of the participants. The present study provides evidence that

through purposeful, guided literacy activities, students who use AAC can increase their communication skills and increase their responding to teacher prompted questions.

### **Communication Attempts**

An increase in communication attempts measured as pointing to a symbol in the book, a picture in the book, using the communication board, using their communication system or their voice, occurred immediately after the intervention package was introduced to the participants. This improvement is further underscored by the limited communicative opportunities of each of the four participants outside of this intervention. Only one of the four participants, Santiago, had a formal communication system, the Vantage Lite, and that was restricted to school day use and typically resulted in an occasional one-word utterance as reported in interviews with his teacher. The other three participants used a combination of American Sign Language and symbols, but this was done inconsistently and not across activities. The increases in communication exhibited during this intervention could be due to any or all of the following factors: increased exposure to literacy activities, consistency of communication system and symbols, and modeling of literacy by the interventionists.

Communication and literacy are closely connected and for an individual to be successful in literacy they must also be proficient in language (Beukelman & Mirenda, 2005). This can be challenging for individuals that rely on AAC to communicate. AAC users do not always have consistent access to their communication systems and are reliant on others for the vocabulary that is found in these systems, unless they can become spellers, which is linked to reading. This intervention created opportunities for highly interactive literacy instruction, with greater frequency and dedicated time than would have been had otherwise. Research supports that these

kinds of rich reading and writing literacy programs result in improved emergent literacy skills and increased communication and conventional literacy skills (Sturm, 2004).

While this study primarily explored literacy instruction and, specifically, reading comprehension, it was also an opportunity for exposure to a communication system (i.e. communication boards and symbols in the book). Students who are nonverbal need many different types of supports in order to become communicators. One of these supports is the need for proper instruction in learning what the symbols that are found in communication systems represent. If multiple symbol sets are used across activities, then some students may struggle in comprehending the meaning of symbols given the variability in how different symbol sets represent words. According to Beukelman and Mirenda (2005), no one system of symbols has been shown to be more effective than another in teaching communication to individuals who use AAC. What has been suggested is that the system that is used for face to face communication should also be used for language and literacy instruction. The symbol set used in the books were the same ones that were used on the communication boards. Having the same symbols used for the literacy intervention and for the participants' communication may have been a reason why the participants displayed an increase in their communication during the interventions.

Participants were provided with modeling as they watched the interventionists point to the symbols in the book every time the word appeared in the text of the book. This practice demonstrated to the participant how the symbols had meaning and represented the word that was just read to them. The interventionists would read the sentence and if the highlighted vocabulary was in that sentence, they would point to the symbol in the book. For example one of the books had the line "There is a shark in the park." As the interventionists read this sentence, they pointed to the symbols on the page for "shark" and "park." This action was performed as part of

the reading activity to help participants develop an understanding of the meaning of the symbol and its connection to the associated word. Using this technique provided both speech and symbol input during activities. This technique is similar to aided language stimulation, a technique used to teach students to communicate using AAC (Dexter, 1998; Harris & Reichle, 2004; Bruno & Trembath, 2006; Drager, Postal & Carrolus, 2006; & Dada & Alant, 2009). This technique has been found to be effective in teaching vocabulary, syntax, and symbol comprehension for students with disabilities including Autism. In aided language stimulation, the facilitator points to the symbols on the student's communication system as they say them out loud. For example, the facilitator may say "it is time to play outside for recess" and as they say the words, they are also pointing to the symbols "play", "outside", and "recess."

### **Comparison of Intervention Language**

This study also examined the effect of an intervention package being implemented in both Spanish and English. Similar effects were seen in reading comprehension, total responses, communication attempts, and engagement when both languages were used. However, all participants initiated communication, answered questions and answered questions with slightly greater accuracy and frequency during the bilingual intervention sessions than the English-only sessions. On average the participants communicated 18 times during the bilingual intervention sessions and 16 times during the English-only intervention sessions. This upward trend continued with total questions answered which during the bilingual intervention sessions averaged 7 times and during the English-only interventions sessions averaged 6.5 times. There was also a slight increase in accuracy on average during the bilingual intervention sessions where the participants answered questions on average correctly 3.6 times but 3 times during the English-only sessions. While these differences may not be large enough to be considered

statistically significant, they do support a positive trend and allow for hypothesizing that if the intervention sessions were to continue, this upward trend could also continue, with the bilingual intervention demonstrating greater efficacy than the English-only intervention package.

Students with severe IDs who speak another language at home may be more successful in developing academic skills if some of their instruction builds on their preexisting home language knowledge. This hypothesis clearly parallels the larger area of research on ELLs who do not have disabilities. Multiple studies have demonstrated that students who receive academic instruction in their home language have positive literacy outcomes in English (August, Shanahan & Escamilla, 2009; August & Shanahan 2006; Duran, Roseth & Hoffman, 2009; Menken & Kleyn, 2009). Bilingual programs or dual-language programs have been extremely successful in teaching literacy to ELL students by providing instruction in both English and the students' home language. Some programs do so by instructing in both languages simultaneously while others do not introduce English until third grade, once emergent literacy skills have been solidified in their home language. Students are expected to develop and maintain literacy in both of the languages in which they have been receiving instruction. Bilingual programs for teaching ELL, in particular paired bilingual programs, have been found to be more effective to teach reading than English-only programs (Cheung & Slavin, 2005).

Research tells us that English literacy development is impacted by a number of different factors including: similarities and differences between the student's first and second language, age, English oral proficiency, and cognitive ability (August, Shanahan & Escamilla, 2009). These factors all could have influenced the success of this intervention and the rate at which the participants acquired new skills. Furthermore, if students are able to read in their first language, it gives them an advantage in learning how to read in their second language (August, Shanahan

& Escamilla, 2009). Additionally, research has been conducted with students diagnosed with moderate IDs who were participating in vocational programs; results identify that when instruction was provide in their home language, in this case Spanish, they developed the skills faster and with greater accuracy (Duran, 1993). It is therefore possible that as the participants become more successful in answering comprehension questions in Spanish, they may also eventually become more successful in answering comprehension questions in English.

As research continues to emphasize the role of home language in the development of English language literacy skills, it becomes increasingly important for teachers to know what language is spoken at home and what the students' level of proficiency in that language is. Acquiring this simple information can become quite complicated when teachers do not speak the same language as the parents, when parents of a child with a severe ID who also is nonverbal have not supported literacy activities in the home, when parents have limited literacy themselves, and especially when families have immigrated from countries where more than one language or dialect is spoken. Having this vital background knowledge is necessary even to just coordinate an IEP meeting requiring an interpreter. This information can also assist teachers in deciding what skills the students have in both languages and can assist to design an instructional plan for students' literacy acquisition (August, Carlo, Dressler & Snow, 2005).

### **Inconclusive Findings**

Three of the seven research questions had inconclusive findings. Specifically, those pertaining to accuracy in reading comprehension, both in English and the students' home language, and engagement.

**Reading comprehension.** The primary focus of this intervention was an examination of the effects of a bilingual intervention package and an English-only intervention package on

participants responding to reading comprehension questions. Even though accuracy was low, participants responded on average to 3.7 questions per session (ranged from 3 to 8). Participants demonstrated slightly more success during the bilingual sessions. Several factors could have influenced correct responding rates (1) the students being ELL, (2) having different books for each block, (3) not using prompting to instruct, (4) use of novel books, and (5) limited exposure to the interactive literacy activity. Other studies have demonstrated success in teaching reading comprehension skills to students with severe disabilities (Browder et al., 2007; Browder et al., 2008; Mims et al., 2009; Zakas et al., 2009). There are some fundamental differences between those studies and the present study. The first being that all participants in this study were ELL. The other studies relied on the system of least prompts in order to teach comprehension skills using three to six books for the entire intervention. In addition they also did not move on to a new book until the participants had met criteria in answering questions with the book they were currently reading. The present study used a book twice, once on the English-only day and once on the bilingual day. Prompting was used in this study but it was not a part of the intervention as it was for the Mims et al. study. These differences are likely to have contributed to the low correct response rate to comprehension questions.

**Engagement.** Performance related to engagement remained primarily static during the baseline and intervention phases. Data illustrates that for some of the participants' engagement was lower during the intervention phase than baseline phase. A contributing factor could have been the length of the sessions with baseline being shorter than the intervention sessions. The duration of the reading sessions went from averaging seven minutes to averaging twenty minutes. Teachers reported that during early intervention sessions students demonstrated negative behaviors more frequently; this was also verified by the researcher when coding the

videos. The teachers also anecdotally reported that as students participated in more intervention sessions, they seemed to become familiar with the activity and enjoyed the individual attention from the interventionists, ultimately demonstrating greater patience and attention span. This could also be seen when watching and coding the videos.

Given the finding of no improvement in engagement it would seem likely that there should be limited improvement in answering questions or communicating. However, as described above, data demonstrates increases in total responses and in communication attempts. This finding could have implications as to how engagement is defined or should be defined for students with severe ID who are also nonverbal. The present study established the definition of engagement by asking teachers familiar with the participants how they would define engagement for their specific student. All four teachers stated that they defined engagement as when the student looked at the academic material (the book in the case of this study) or the teacher (the interventionist in the case of this study). This definition was used as the measurement in this study and data were collected based on this observable behavior. On average participants were engaged 63% of the time during the baseline phase and were engaged just 66% of the time during the intervention phases. This study collected data on behavior such as eye contact (i.e., looking at the academic material or teacher), however, lack of eye contact is a common characteristic of children with autism and using it as a central criterion for measuring engagement may reflect a deeper flaw in using typical behavior to assess atypical students. Students with severe ID who are nonverbal may show engagement in a number of ways that the definition in this study did not capture.

**Teacher interviews.** All four of the teachers were interviewed before the study began and after the study had been completed. In addition one of the interventionists (the only one who

was not the classroom teacher) was interviewed at the end of the study. Through the coding of the interviews multiple needs emerged across all four teachers. The needs that emerged from data analysis include: teacher preparation programs, literacy instruction, and teaching ELL students. It is important to begin examining how teachers are prepared to teach students with severe disabilities. Teachers reported on their competence in teaching verbal students literacy skills but reportedly struggled to teach students who were nonverbal and had severe ID literacy skills. All of the teachers felt it was important to incorporate the participants' home language in instruction but they did not feel as though they had the skill set and information to do it appropriately. Post study interviews revealed that teachers still felt that the home language was important to incorporate.

### **Limitations**

Much of the existing literature on educational interventions for children with autism have limited applicability and is generated in artificial settings (Donnellan et al., 1985). The present research was one attempt to contribute to the development of interventions that could assist children with severe disabilities in natural environments. It provides empirical documentation for the effectiveness of using modified books to increase communication and response to questions. The findings of this study are of value in that they could assist educators to select an instructional procedure that improves communication and question response rate during book reading. Furthermore, this study taught several tasks with high reliability, indicating that educators can successfully implement these procedures in natural settings. Information gathered outside of laboratory settings is critical to assist educators to meet the complex needs of students with severe disabilities. Efforts were made to establish methodological rigor in this investigation,

however, use of the natural environment and associated variables presented several challenges. Limitations of this study must be acknowledged.

First, it would have been desirable to have had bilingual interventionists. None of the interventionists were bilingual, and three of the four were not very familiar with Spanish. This had an impact on how the interventionists pronounced the Spanish that was embedded throughout the bilingual intervention. One reason why there may not have been a substantial difference between the English-only intervention days and the bilingual interventions days is because of the teachers speaking Spanish without a Spanish accent and without confidence or fluency.

A second limitation was the multiple absences that occurred across all of the participants. Many of the participants had medical challenges that impacted their learning and school attendance; for example, severe allergic reactions and seizures. Not only did this impact their school attendance it may have also negatively impacted their learning. Health challenges related to the students' disabilities can also affect reading and reading instruction. Students with health challenges can have an increased number of absences, may not be able to attend to the task due to discomfort, fatigue or pain, sensory or physical challenges, and may suffer from the effects of medication (Heller, Fredrick & Diggs, 1999).

Another limitation of this study was the way engagement was defined given the participants' diagnoses. There is a lack of information on teaching reading to students who have ASD. The goal of this study was not to implement the intervention package with participants who had a specific disability. However, three of the participants in this study were diagnosed with autism. The specific nature of this disability could have affected the results of the study.

How engagement was defined may not have been appropriate because of the typical social traits associated with autism (e.g., avoiding eye contact).

Last it was thought that all of the participants met the requirements, given the prescreening process. However as the study progressed it became apparent that some of the participants may not yet have had the prerequisite skills necessary in order to answer comprehension questions. For some of the participants they were still learning how to listen to a story and answer questions. This could have been missed because the books used during the prescreening process were ones that were highly motivating to all of the participants as well as familiar. Other participants already had these skills.

### **Future Research**

Further research needs to be conducted in order to determine if using a student's home language does indeed have a positive impact on students' reading comprehension and communication. This study should be replicated with interventionists who are bilingual in Spanish and English in order to determine if the interventionist's fluency in the participant's home language impacts the success of the intervention. In addition this study should be replicated with a large participant pool. The few studies that have been conducted with students who had moderate disabilities and were ELL had mixed results (Duran, 1989; Duran, 1993; Rohena, Jitendra & Browder, 2002; Rosa-Lugo & Kent-Walsh, 2008; & Spooner, Rivera, Browder, Baker & Salas, 2009). Two studies that have had positive results were both conducted with students that had moderate disabilities and were verbal (Duran, 1993 & Spooner, Rivera, Browder, Baker & Salas, 2009). However, both of these studies were also implemented by interventionists who were fluent in Spanish. Even with these studies, there has not been

sufficient research done with this population to be able to state conclusively that students with severe disabilities should be taught in their home language.

Future research could extend the book format to a tablet computer that can be programmed with the student's specific home language to review the vocabulary and ask the questions. This would allow for the teachers to meet their students' linguistic needs in a way that may not be traditionally possible because of the difficulty of finding staff who are bilingual in multiple languages and have a desire to work with students with severe disabilities. The use of technology would increase the reproducibility of the study and its procedural fidelity. The tablet computer could be used to ask participants questions about the story in their home language which would improve the pronunciation of the vocabulary words and questions.

The participants in this study were not provided with daily instruction in the content area of reading. This study was the first time participants were provided with daily reading activities. One reason why they may not have answered the comprehension questions accurately could be that they did not have prerequisite skills in place that would assist them in successfully answering comprehension questions. It may be helpful to develop future research projects in which students with severe disabilities are exposed to different emergent literacy sub skills in order to develop an appropriate sequence of reading skills for effective literacy instruction. Further research could replicate this study and modify it by including reading comprehension as a later skill to be taught to the participants once they have shown that they have basic text awareness. Last, family perspective and involvement needs to be explored. Families need to be included and more research needs to be conducted about how to increase the involvement of Culturally and Linguistically Diverse (CLD) families in the school, to ascertain what role they feel they have in their child's education and how they view literacy. Surveys have been

completed with families but those surveys usually exclude families who are not fluent in English. More surveys and studies need to be done in which the family's home language is incorporated. In addition more information should be obtained with regard to the selection and use of a communication system what language to emphasize.

The findings of this study are of value in that they could assist in creating meaningful instruction for students who have severe IDs, are nonverbal, and ELL. This study found that using modified books helped to improve students communication and response rate when asked questions by a teacher.

## REFERENCES

- Alamsaputra, D. M., Kohnert, K. J., Munson, B., & Reichle, J. (2006). Synthesized speech intelligibility among native speakers and non-native speakers of English. *AAC: Augmentative & Alternative Communication*, 22(4), 258-268.
- Alberto, P. & Troutman, A. (2009). *Applied Behavior Analysis for Teachers*, (8<sup>th</sup> Edition). Upper Saddle River, NJ: Pearson Education, Inc.
- August, D., & Shanahan, T. (2006). *Developing literacy in second-language learners: Report of the national literacy panel on language-minority children and youth*. New Jersey: Lawrence Erlbaum Associates.
- August, D., Shanahan, T., & Escamilla, K. (2009). English language learners: Developing literacy in second-language learners – report of the national literacy panel on language-minority children and youth. *Journal of Literacy Research*, 41, 432-452.
- Browder, D. M., Wakeman, S. Y., Spooner, F., Ahlgrim-DeLzell, L., & Algozzine, B. (2006). Research on reading instruction for individuals with significant cognitive disabilities. *Exceptional Children*, 72, 392-408.
- Browder, D. M., Mims, P. J., Spooner, F., Ahlgrim-DeLzell, L., & Lee, A. (2009). Teaching elementary students with profound disabilities to participate in shared stories. *Research and Practice in Severe Disabilities*, 33, 3-12.
- Browder, D. M., Trela, K., & Jiménez, B. (2007). Training teachers to follow a task analysis to engage middle school students with moderate and severe developmental disabilities in

- grade-appropriate literature. *Focus on Autism and Other Developmental Disabilities*, 22(4), 206-19.
- Browder, D. M., Lee, A., & Mims, P. (2011). Using shared stories and individual response modes to promote comprehension and engagement in literacy for students with multiple, severe disabilities. *Education and Training in Autism and Developmental Disabilities*, 46(3), 339-51.
- Bridges, S. (2004). Multicultural issues in Augmentative and Alternative Communication and language: Research to practice. *Top Language Disorders*, 24(1), 62-75.
- Carlisle, J. F., Beeman, M., Davis, L. H., & Spharim, G. (1999). Relationship of metalinguistic capabilities and reading achievement for children who are becoming bilingual. *Applied Psycholinguistics* 20(4), 459-78.
- Chapple, D. (2011). The evolution of augmentative communication and the importance of alternative access. *Perspectives on Augmentative and Alternative Communication* 20, 34-37.
- Chiang, H., & Lin, H. (2007). Reading comprehension instruction for students with autism spectrum disorders: A review of the literature. *Focus on Autism and Other Developmental Disabilities*, 22, 259-267.
- Donnellan, A. (1985). *Classic readings in autism*. New York: Teachers College Press.
- Duran, E. (1993, July 12). Effective communication programming for language minority students with severe disabilities. *The National Symposium on Effective Communication for Children and Youth with Severe Disabilities*. Virginia, McLean.

- Fernandes, B. (2011). iTherapy: The revolution of mobile devices within the field of speech therapy. *Perspectives on School Based Issues, 12*, 35-40.
- Fallon, K.A., Light, J., McNaughton, D., Drager, K., & Hammer, C. (2004). The effects of direct instruction on the single-word reading skills of children who require augmentative and alternative communication. *Journal of Speech Language Hearing Research, 47*, 1424-1439.
- Figuroa, R., Fradd, S., & Correa, V. (1989). Bilingual Special Education and this special issue. *Exceptional Children, 56*(2), 174-9.
- Hargrave, A.C., & Senechal, M. (2000). A book reading intervention with preschool children who have limited vocabularies: The benefits of regular reading and dialogic reading. *Early Childhood Research Quarterly, 15*(1), 75-90.
- Hoover, J., Klingner, J., Baca, L. & Patton J. (2008). *Methods for teaching culturally and linguistically diverse exceptional learners*. New Jersey: Pearson Education Inc.
- Kazdin, A. (1982). *Single-case research designs: Methods for clinical and applied settings*. New York: Oxford University Press.
- Kennedy, C. H. (2006). *Single-case designs for educational research*. Boston: Pearson Education Inc.
- Light, J., McNaughton, D. (1993). Literacy and augmentative and alternative communication (AAC): The expectations and priorities of parents and teachers. *Topics in Language Disorders, 13*(2), 33-46.

- Light, J., McNaughton, D., Weyer, M., & Karg, L. (2008). Evidence-based literacy instruction for individuals who require augmentative and alternative communication: a case study of a student with multiple disabilities. *Seminars in Speech and Language*, 29, 110-122.
- Mims, P., Browder, D., Spooner, F., Baker, J., & Lee, A. (2009). Increasing participation and comprehension of students with significant cognitive disabilities and visual impairments during shared stories. *Education and Training in Developmental Disabilities*.
- Mueller, T., G., Singer, G., H., S., & Grace, E., J. (2004). The individuals with disabilities education act and California's proposition 227: Implications for English language learners with special needs. *Bilingual Research Journal*, 28(2), 231-252.
- National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. (NIH Publication No. 00-4754). Washington, DC: U.S. Department of Health and Human Services.
- Peregoy, S., & Boyle, O. (2001). *Reading, writing & learning in ESL: A resource book for K-12 teachers*. New York: Priscilla McGeehon.
- Rohena, E., I., Jitendra A., K., & Browder, D., M. (2002). Comparison of the effects of Spanish and English constant time delay instruction on sight word reading by Hispanic learners with mental retardation. *The Journal of Special Education*, 36(3), 169-184.
- Rummel-Hudson, R. (2011). A revolution at their fingertips. *Perspectives on Augmentative and Alternative Communication*, 20, 19-23.

- Rosa-Lugo, L., I., & Kent-Walsh, J. (2008). Effects of parent instruction on communicative turns of Latino children using augmentative and alternative communication during storybook reading. *Communication Disorders Quarterly, 30*(1), 49-61.
- Spooner, F., Rivera, C., J., Browder, D., M., Baker, J., N., & Salas, S. (2009). Teaching emergent literacy skills using cultural contextual story-based lessons. *Research & Practice for Persons with Severe Disabilities, 34* (3), 102-112.
- Sturn, J. M., & Clendon, S. A. (2004). Augmentative and alternative communication, language, and literacy: Fostering the relationship. *Topics in Language Disorders, 24*(1), 76.
- Swinehart-Jones, D., & Heller, K. W. (2009). Teaching students with severe speech and physical impairments a decoding strategy using internal speech and motoric indicators. *Journal of Special Education, 43*(3), 131-144.
- Taibo, M. L. G., Iglesias, P. V., Mendez, M. S., & del Salvador, M., Gonzalez Raposo. (2009). A descriptive study of working memory, phonological awareness and literacy performance of people who use AAC. *International Journal of Special Education, 24*(3), 1-20.
- Tsybina, I., & Eriks-Brophy, A. (2010). Bilingual dialogic book-reading intervention for preschoolers with slow expressive vocabulary development. *Journal of Communication Disorders, 43*(2010), 538-556.

### **Appendix A: Procedure Checklist: English**

- Review the vocabulary with the student in English before the book is read.
- Discuss with student prior knowledge related to vocabulary word.
- When reading the book to the student highlight the vocabulary in the book that was reviewed before the book reading began in English (the vocabulary word that is also in symbol form in the book).
- At the end of the first book reading give the student the one to two sentence summary of the book in English.
- Begin reading the book to the student again.
- Ask the student the comprehension question in English.
- Wait five seconds for a response.
- If they answer the question correctly praise the student and give them a marker.
- If the student answers incorrectly ask the student the question again in English.
- Wait five seconds for a response.
- If the student begins to go towards the wrong answer use hand over hand to guide them to the correct answer and tell the student the answer to the question.

*OR*

- If the students does not respond after 10 seconds use hand over hand to guide them to the correct answer and tell the student the answer to the question.
- Repeat this procedure for all questions.

### **Appendix B: Procedure Checklist: Bilingual**

- Review the vocabulary with the student in Spanish before the book is read.
- Discuss with student prior knowledge related to vocabulary word.
- When reading the book to the student highlight the vocabulary in the book that was reviewed before the book reading began in Spanish (the vocabulary word that is also in symbol form in the book).
- At the end of the first reading of the book give the student the one to two sentence summary of the book in Spanish.
- Begin reading the book to the student again.
- Ask the student the comprehension question in Spanish.
- Wait five seconds for a response.
- If they answer the question correctly praise the student and give them a marker.
- If the student answers incorrectly ask the student the question again in Spanish.
- Wait five seconds for a response.
- If the student begins to go towards the wrong answer use hand over hand to guide them to the correct answer and tell the student the answer to the question.

*OR*

- If the students does not respond after 10 seconds use hand over hand to guide them to the correct answer and tell the student the answer to the question.
- Repeat this procedure for all questions.

## Appendix C: Teacher Interviews

### Interview Questions: Prestudy

1. Please tell me about your teaching background? (Probe: How long you have been teaching, what grades you have taught, and what type of students you have taught?)
2. Please describe the type of training you received in your credential program for teaching students who are nonverbal? (Probe: What type of strategies and tools did your program cover?)
3. Please describe the type of training you received for teaching students who are English Language Learners? (Probe: Mention that the classes or training do not have to include students with disabilities who are ELL)
4. Tell me about your current classroom, the grade level you teach, and the students whom you teach?
5. Can you describe your students who use AAC and who are also ELL?
6. What role do you feel reading has in your students' academic instruction?
7. How do you teach reading?
8. What role do you think your student's home language has in their instruction?
9. Do you incorporate your student's home language in the instruction they receive?
10. What role does the parent have in the classroom?

### Interview Questions: Poststudy

1. What was your role in the study?
2. Do you think the reading comprehension study was effective? Why or why not?
3. Do you think that one package was more successful than the other package?
4. What would you change in the study?
5. Is there any component of the study that you will continue to use now that the intervention is over?
6. How easy do you feel it would be to use the intervention on your own?
7. What role do you think your student's home language has in their instruction?
8. How do you feel about using the student's home language in their instruction?
9. Is there anything else you would like to share about this study?



### Appendix E: Data Collection Engagement

Engagement (will be taken on a ten second interval)

Book Reading Session:            Date:                            Participant

| Frequency | Engaged | Not Engaged | Frequency | Engaged | Not Engaged |
|-----------|---------|-------------|-----------|---------|-------------|
| 1         | E       | N           | 33        | E       | N           |
| 2         | E       | N           | 34        | E       | N           |
| 3         | E       | N           | 35        | E       | N           |
| 4         | E       | N           | 36        | E       | N           |
| 5         | E       | N           | 37        | E       | N           |
| 6         | E       | N           | 38        | E       | N           |
| 7         | E       | N           | 39        | E       | N           |
| 8         | E       | N           | 40        | E       | N           |
| 9         | E       | N           | 41        | E       | N           |
| 10        | E       | N           | 42        | E       | N           |
| 11        | E       | N           | 43        | E       | N           |
| 12        | E       | N           | 44        | E       | N           |
| 13        | E       | N           | 45        | E       | N           |
| 14        | E       | N           | 46        | E       | N           |
| 15        | E       | N           | 47        | E       | N           |
| 16        | E       | N           | 48        | E       | N           |
| 17        | E       | N           | 49        | E       | N           |
| 18        | E       | N           | 50        | E       | N           |
| 19        | E       | N           | 51        | E       | N           |
| 20        | E       | N           | 52        | E       | N           |
| 21        | E       | N           | 53        | E       | N           |
| 22        | E       | N           | 54        | E       | N           |
| 23        | E       | N           | 55        | E       | N           |
| 24        | E       | N           | 56        | E       | N           |
| 25        | E       | N           | 57        | E       | N           |
| 26        | E       | N           | 58        | E       | N           |
| 27        | E       | N           | 59        | E       | N           |
| 28        | E       | N           | 60        | E       | N           |
| 29        | E       | N           | 61        | E       | N           |
| 30        | E       | N           | 62        | E       | N           |
| 31        | E       | N           | 63        | E       | N           |
| 32        | E       | N           | 64        | E       | N           |



## Appendix G: Book Questions, Summary, and Vocabulary

### Bunny Cakes

Whose birthday was it?

¿De quien era el cumpleaños?

What kind of cake did Max want to make?

¿Que tipo de torta queria hacer Max?

Max had to go to the store because he broke what?

¿Max tuvo que ir a la tienda por que rompio que?

What did Max want for his cake?

¿Que queria Max para su torta?

Who gave Max the eggs?

¿Quien le dio los huevos a Max?

After Max bumped the table, what did he have to buy?

¿Despues que Max empujo la mesa, que tuvo que comprar?

What did the grocer give Max?

¿Que le dio el cajero a Max?

Where was Max not allowed to go into?

¿A donde no podia entrar Max?

Max and Ruby made Grandma two what?

¿Max y Ruby le hicieron a Abuela dos de que?

Max and Ruby made two cakes because it was Grandma's what?

¿Max y Ruby hicieron dos tortas por que era el que de Abuela?

### Summary

Max and Ruby make birthday cakes for Grandma.

Max y Ruby hacen tortas de cumpleaños para Grandma.

### Vocabulary List/Answers

grandma, worm, eggs, candy, grocer, milk, flour, kitchen, cake, birthday

abuela, gusano, huevos, caramelo, cajero, leche, harina, cocina, torta, cumpleaños

## My Lucky Day

What did someone yell?

¿Que grito alguien?

Who was at the door?

¿Quien estaba en la puerta?

The piglet had to be washed because he was \_\_\_\_\_.

El cerdo tuvo que ser lavado por que estaba \_\_\_\_\_.

Who made dinner for the piglet?

¿Quien le hizo la comida a el cerdo?

What did the fox do to make the piglet tender?

¿Que hizo el zorro para hacer el cerdo tierno?

How did the fox feel after the massage?

¿Como se sentia el zorro despues de el masaje?

What did the piglet pick up the rest of?

¿Que recogio el cerdo?

What kind of day did the piglet have?

¿Que tipo de dia tuvo el cerdo?

Who did the piglet go visit next?

¿A quien fue a visitar proximo el cerdo?

What does the fox keep trying to make with the piglet?

¿Que es lo que el zorro trata de hacer con el cerdo?

### Summary

A pig tricks a fox into washing him, cooking for him, and massaging him.

Un cerdo engaña a un zorro a que lo lave, le cocine, y lo masajee.

### Vocabulary List/Answers

rabbit, piglet, filthy, fox, massage, exhausted, cookies, bear, lucky, dinner  
conejo, cerdo, sucio, zorro, masaje, agotado, galletas, oso, suerte, comida

## Peace at Last

Why did they all go to bed?  
¿Por que se fueron a sus camas?

What noise was Mrs. Bear making?  
¿Que ruido hacia Senora Oso?

What was Baby Bear pretending to be?  
¿Que se pretendaba ser Bebe Oso?

Where did Mr. Bear go after he left the living room?  
¿Donde se fue Senor Oso cuando salio de la sala?

What was making the DRIP DRIP sound?  
¿Que hacia el ruido DRIP DRIP?

What was making the WHOO noise in the garden?  
¿Que hacia el ruido WHOO en el jardin?

Where is Mr. Bear sleeping now?  
¿Ahora donde esta durmiendo Senor Oso?

Where is Mr. Bear sleeping now?  
¿Ahora donde esta durmiendo Senor Oso?

The book is about Mr. Bear trying to do what?  
¿El libro se trata de Senor Oso tratando de hacer que?

Mr. Bear is looking for somewhere to sleep in his \_\_\_\_\_.  
Senor Oso esta buscando donde dormir en su \_\_\_\_\_.

### Summary

Mr. Bear goes from room to room trying to find somewhere quiet to sleep.  
Senor Oso anda de cuarto en cuarto buscando un sitio callado para dormer.

### Vocabulary:

tired, snore, airplane, kitchen, faucet, owl, car, bed, sleep, house  
cansado, roncar, avion, cocina, cano, buho, coche, cama, dormir, casa

## Spike and the City

The first thing Spike did in the city was ride an \_\_\_\_\_.

La primera cosa que Spike hizo en la ciudad fue tomar un \_\_\_\_\_.

Who was in the clouds with spike?

¿Que estaba en las nubes con Spike?

What was the city full of?

¿De que estaba llena la ciudad?

Who did Spike say woof to?

¿A quien le dijo Spike woof?

What drove by?

¿Qué paso manejando?

What did Spike see on a leash?

¿Qué vio Spike en una correa?

Spike followed the skateboard under \_\_\_\_\_.

Spike siguió la patineta por debajo de \_\_\_\_\_.

Where did Spike get wet?

¿Donde se mojó Spike?

Where did Spike go?

¿Donde se fue Spike?

Where did Spike get lost?

¿Donde se perdió Spike?

### Summary

Spike visits the city.

Spike visita la ciudad.

### Vocabulary:

elevator, pigeons, smells, dog, truck, cat, feet, fountain city, park Ascensor, palomas, olores, perro, camión, gato, pies, fuente, ciudad, parque

## **Badger's Fancy Meal**

What kind of meal did Badger want?

¿Qué tipo de comida quería Tejón?

How did Badger want to eat the mole?

¿Come quería Tejón comer al topo?

Who did Badger want to make into a burger?

¿A quién quería Tejón convertirlo en hamburguesa?

Who did Badger see next?

¿A quién vio Tejón proximo?

How is Badger feeling?

¿Cómo se siente Tejón?

Who kicked Badger?

¿Quién pateo a Tejón?

After Badger was kicked, what did he do?

¿Después que Tejón fue pateado, que hizo?

Where did Badger land after being kicked?

¿A dónde cayo Tejón despues de ser pateado?

What was gone from Badger's den?

¿Que faltaba en la guarida de Tejón?

Who is the book about?

¿De quién se trata el libro?

### **Summary**

The Badger goes looking for a fancy meal.

El Tejón sale a buscar una comida especial.

### **Vocabulary List/Answers**

fancy, taco, rat, rabbit, hungry, horse, flew, den, food, badger

especial, taco, rata, conejo, hambre, caballo, volo, guarida, comida, tejon

## The Snowy Day

What had fallen during the night?

¿Qué cayó durante la noche?

Where did he go after breakfast?

¿A dónde fue después del desayuno?

What did he find sticking out of the snow?

¿Qué encontró asomando por la nieve?

What did Peter make first?

¿Qué hizo Pedro primero?

What did Peter make next?

¿Que hizo Pedro despues?

What did Peter put in his pocket?

¿Qué puso Pedro en su bolsillo?

What did his mother take off?

¿Qué le saco su madre?

How did he feel when his snowball was not in his pocket?

¿Cómo se sintió cuando su bola de nieve no estaba en el bolsillo?

Who did he go out in the snow with?

¿Con quién fue a la nieve?

What did Peter do in the snow?

¿De quién se trata el libro?

### Summary

Peter plays in the snow.

Peter juega en la nieve.

### Vocabulary:

snow, outside, stick, snowman, angel, snowball, socks, sad, friend, play

Nieve, afuera, palo, hombre de nieve, angel, bola de nieve, calcetines, triste, amigo, jugar

## The Wolf's Chicken Stew

What did the wolf love to do?

¿Que le gustaba hacer el lobo?

Who was getting closer to the chicken?

¿Quien se acercaba mas al pollo?

The wolf wanted to make the chicken \_\_\_\_\_.

El lobo queria hacer pollo \_\_\_\_\_.

What did the wolf run home to do?

¿El lobo corrio a su casa a hacer que?

What did wolf make first?

¿Que hizo el lobo primero?

What did wolf make next?

¿Que hizo el lobo despues?

What did the baby chicks give the wolf?

¿Que le dieron los pollitos al lobo?

What is Uncle Wolf baking tomorrow?

¿Que va a hornear el Tio Lobo mañana?

What did Wolf set out to find?

¿Que busca el lobo?

Who does the wolf want to fatten up?

¿A quien quiere engordar el lobo?

Summary:

A wolf tries to fatten up a chicken to eat but ends up feeding her family.

Un lobo trata de engordar a un polla para comerselo pero termina dando de comer a su familia de este.

Vocabulary:

eat, wolf, fat, cook, pancakes, cake, kiss, cookies, dinner, chicken

comer, lobo, gorda, cocinar, panqueques, torta, besos, galletas, comida, pollo

## Dinosaur backyard

Where did the dinosaur used to live?

¿Donde vivia antes el dinosaurio?

What did the dinosaur hatch from?

¿De donde nacio el dinosaurio?

What was the dinosaur as big as?

¿Que tan grande era el dinosaurio?

What did the dinosaur eat?

¿Qué comia el dinosaurio?

The dinosaur weighted as much as twenty \_\_\_\_\_.

El dinosaurio pesaba tanto como veinte \_\_\_\_\_.

The dinosaur would have made the neighborhood shake like pudding because he was so \_\_\_\_\_.

El dinosaurio hubiera hecho sacudir la vecindad como pudin porque era tan \_\_\_\_\_.

The dinosaur lived in the swamp because he needed lots of what?

¿El dinosaurio vivia el pantano por que necesitaba tanta que?

Where did the dinosaur sleep?

¿Dónde dormia el dinosaurio?

What had a very long neck?

¿Que tenía el cuello muy largo?

What are the boy and his sister saving for the dinosaur?

¿Que le estan guardando al dinosaurio el nino y su hermana?

Summary:

There use to be big dinosaurs.

Antes habían dinosaurios muy grandes.

Vocabulary:

backyard, egg, car, vegetables, trucks, heavy, water, outside, dinosaur, lima beans  
patio, huevo, coche, verduras, camiones, pesado, agua, afuera, dinosaurio, habas

## Hello is this Grandma?

What is Logan dialing?  
Que esta marcando Logan?

Who did Logan call first?  
A quien llamo Logan primero?

Who did Logan call after?  
A quien llamo Logan despues?

Who does Logan call now?  
Ahora quien llama Logan?

The crocodile invites Logan over for \_\_\_\_\_  
El cocodrilo invita Logan para \_\_\_\_\_

What went "brring"?  
Que hizo Brring?

What does grandma invite Logan to?  
A que invita abuela a Logan?

What does grandma blow out?  
Que sopla la abuela?

Grandma says phones at the table are what?  
Abuela dice que los telefonos en la mesa son que?

Who is Logan trying to call?  
A quien esta tratando de llamar Logan?

### Summary:

Logan is trying to call his grandma.  
Logan esta tratando de llamar a su abuela.

### Vocabulary:

Grandma, sheep, duck, number, crocodile, party, phone, lunch, candles, rude  
Abuela, oveja, pato, numero, cocodrilo, fiesta, telefono, almuerzo, velas, maleducado

### **Shark in the Park**

Where is pup?  
Donde esta cachorro?

What is in the park?  
Que hay en el parque?

Who barks?  
Quien ladra?

Who does pup tell about the shark?  
A quien le cuenta el cachorro sobre el tiburon?

The sharks nose is pointy and \_\_\_\_ .  
La nariz del tiburon es puntiaguda y \_\_\_\_\_. (filosa)

Who does pup tell about the shark next?  
A quien le cuenta el cachorro sobre el tiburon despues?

What is sharp on the shark?  
Que tiene filudo el tiburon?

What is sam the sheep doing?  
Que esta haciendo Sam la oveja?

Where are they all going?  
Adonde van todos?













What was in the lake?  
Que habia en el lago?

Summary:  
Pup thinks there is a shark in the park  
El cachorro cree que hay un tiburon en el parque.













Vocabulary:  
Park, Shark, Pup, Pig, Sharp, Hen, Teeth, sleeping, lake, snake  
Parquet, tiburon, cachorro, cerdo, filudo, gallina, dientes, durmiendo, lago, culebra

## Appendix H: Communication Boards (not actual size)

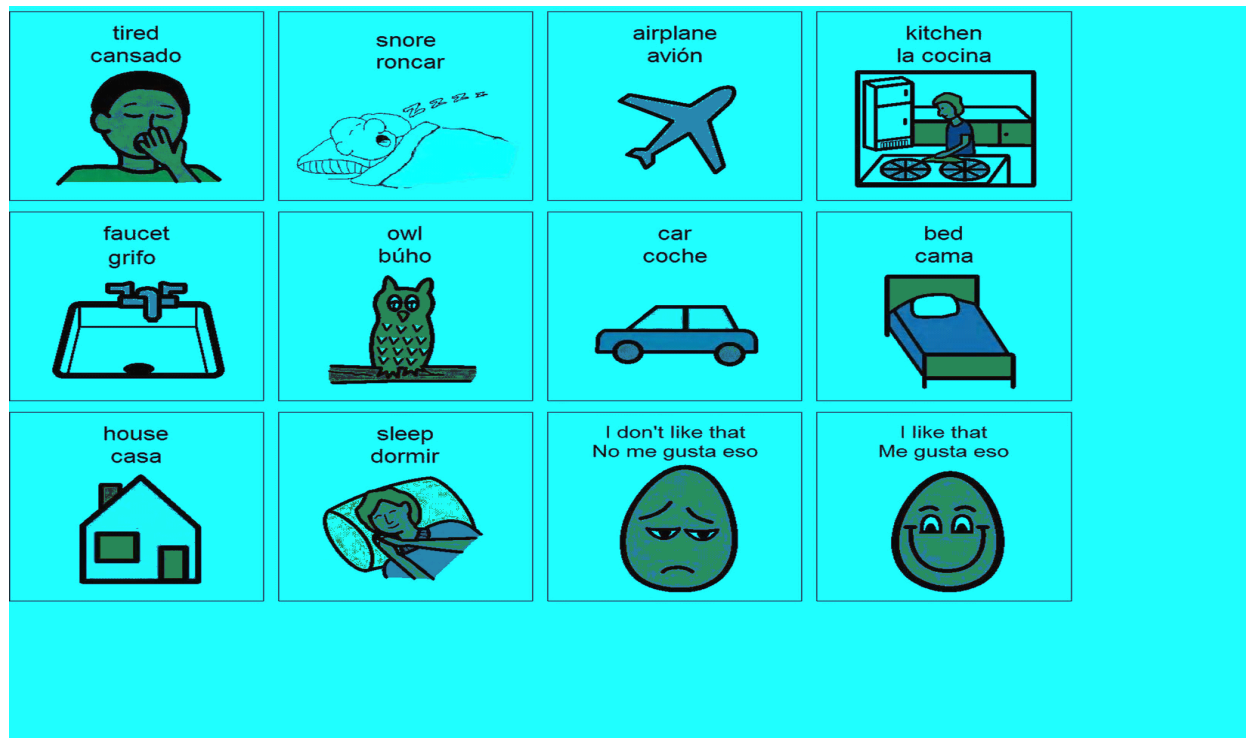
### Bunny Cakes

|   |   |  |   |
|---|---|--|---|
| <p>abuela<br/>grandmother</p>  | <p>gusano<br/>worm</p>             | <p>huevo<br/>egg</p>                          | <p>caramelo<br/>candy</p>             |
| <p>cajera<br/>clerk</p>        | <p>leche<br/>milk</p>              | <p>harina<br/>flour</p>                       | <p>torta<br/>cake</p>                 |
| <p>la cocina<br/>kitchen</p>   | <p>¡Cumpleaños!<br/>Birthday!</p>  | <p>No me gusta eso<br/>I don't like that</p>  | <p>me gusta eso<br/>I like that</p>  |

### My Lucky Day

|   |  |  |   |
|---|--|--|---|
| <p>conejo<br/>rabbit</p>   | <p>cerdo<br/>piglet</p>       | <p>sucio<br/>dirty</p>                        | <p>zorro<br/>fox</p>                  |
| <p>masaje<br/>massage</p>  | <p>agotado<br/>exhausted</p>  | <p>galletas<br/>cookies</p>                   | <p>suerte<br/>lucky</p>               |
| <p>oso<br/>bear</p>        | <p>comida<br/>dinner</p>      | <p>I don't like that<br/>No me gusta eso</p>  | <p>I like that<br/>Me gusta eso</p>  |

## Peace at Last



## Spike and the City



## Badgers Fancy Meal

|                              |                          |  |                                     |
|------------------------------|--------------------------|--|-------------------------------------|
| <p>fancy<br/>especial</p>    | <p>taco<br/>taco</p>     | <p>rat<br/>rata</p>                          | <p>rabbit<br/>conejo</p>            |
| <p>hungry<br/>hambriento</p> | <p>horse<br/>caballo</p> | <p>flew<br/>volo</p>                         | <p>den<br/>guarida</p>              |
| <p>food<br/>comida</p>       | <p>badger<br/>tejon</p>  | <p>I don't like that<br/>No me gusta eso</p> | <p>I like that<br/>Me gusta eso</p> |



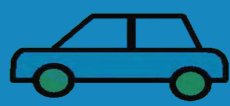

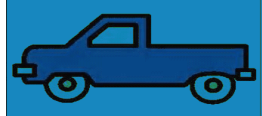

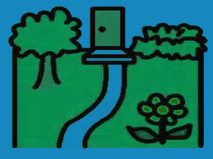
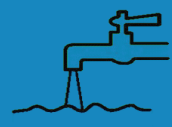




## Snowy Day

|                                    |                           |  |                                     |
|------------------------------------|---------------------------|--|-------------------------------------|
| <p>snowing<br/>nieve</p>           | <p>outside<br/>afuera</p> | <p>feet<br/>pies</p>                         | <p>stick<br/>palo</p>               |
| <p>snowman<br/>hombre de nieve</p> | <p>angel<br/>angel</p>    | <p>snowball<br/>bola de nieve</p>            | <p>socks<br/>calcetines</p>         |
| <p>sad<br/>triste</p>              | <p>friend<br/>amigo</p>   | <p>I don't like that<br/>No me gusta eso</p> | <p>I like that<br/>Me gusta eso</p> |

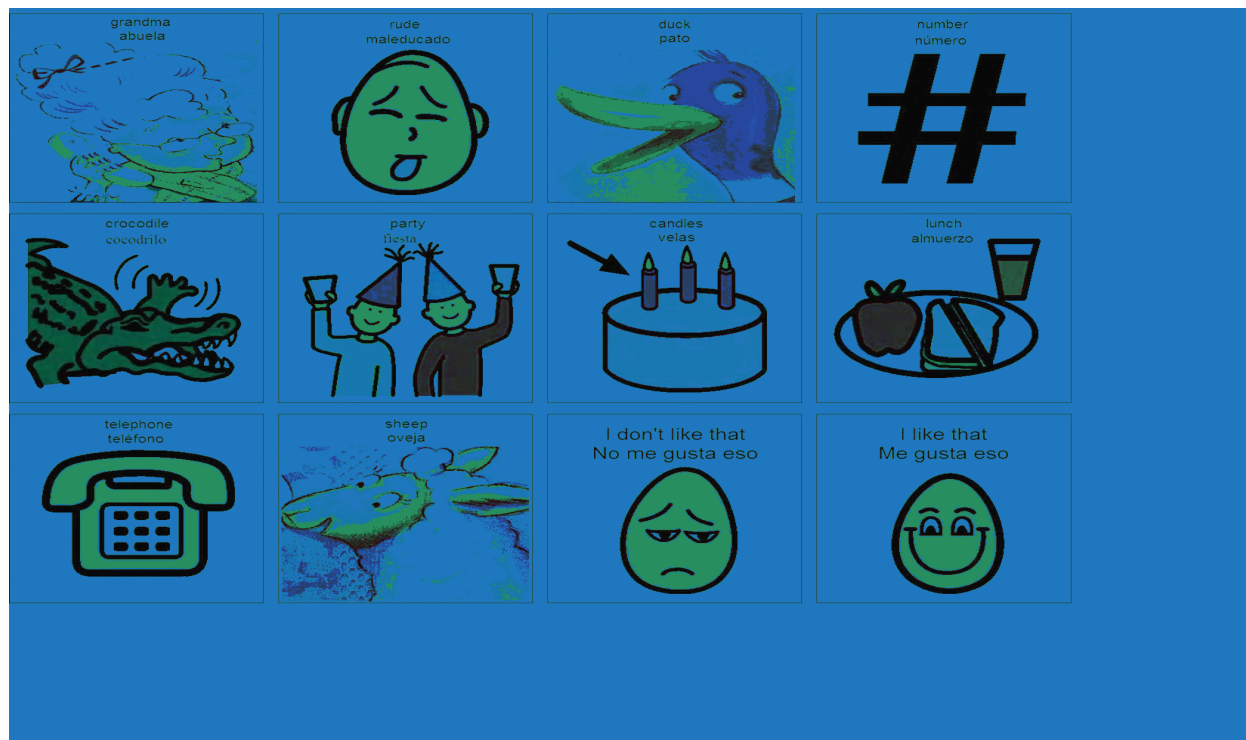
### The Wolf's Chicken Soup

|  |   |  |   |
|--|---|--|---|
| <p>eat<br/>comer</p>      | <p>wolf<br/>el lobo</p>  | <p>cook<br/>cocinar</p>                       | <p>pancakes<br/>panqueques</p>       |
| <p>cake<br/>torta</p>     | <p>kiss<br/>un beso</p>  | <p>cookies<br/>galletas</p>                   | <p>dinner<br/>comida</p>             |
| <p>chicken<br/>pollo</p>  | <p>fat<br/>gordo</p>     | <p>I don't like that<br/>No me gusta eso</p>  | <p>I like that<br/>Me gusta eso</p>  |

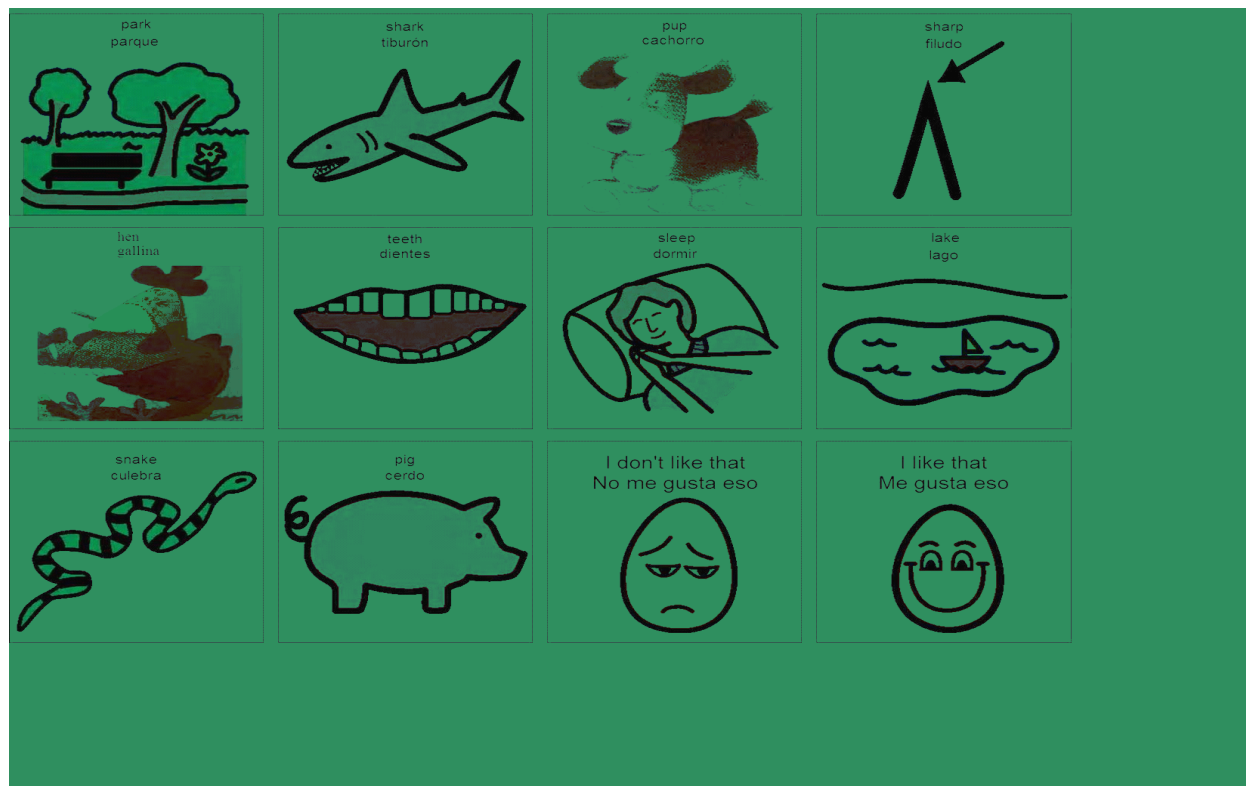
### The Dinosaur in my Backyard

|  |   |  |   |
|--|---|--|---|
| <p>backyard<br/>patio</p>         | <p>egg<br/>huevo</p>         | <p>car<br/>coche</p>                          | <p>vegetables<br/>verduras</p>        |
| <p>pickup truck<br/>camiónes</p>  | <p>heavy<br/>pesado</p>      | <p>outside<br/>afuera</p>                     | <p>water<br/>agua</p>                |
| <p>dinosaur<br/>dinosaurio</p>    | <p>lima beans<br/>habas</p>  | <p>I don't like that<br/>No me gusta eso</p>  | <p>I like that<br/>Me gusta eso</p>  |

## Hello is this Grandma?



## Shark in the Park



## Appendix I: Coding Data

### Question Answering

Asked a question:

A student can answer a question in the following ways:

- Pointing to a picture in the book
- Pointing to a symbol in the book
- Using the communication board
- Using their communication system
- Using their voice
- sign

If they answer in any of these ways mark it in the following way:

| Question               | Answer  | Type of Q. | Communication Attempt | Correct or Incorrect       | Communication type  |
|------------------------|---------|------------|-----------------------|----------------------------|---|
|                        |         |            | Y=yes N=no            | C- correct<br>I-incorrect  | <b>P</b> -picture<br><b>CB</b> -communication board<br><b>S</b> -symbol <b>D</b> -device<br><b>Sg</b> -sign |
| Whose birthday was it? | grandma | R          | <b>Y</b>              | <b>C if it was correct</b> | <b>P if the student pointed at a picture</b>  |

If the participant answers the questions put **Y** (in communication attempt column)

If the answer is correct put **C**

If the answer is incorrect put **I**

If the participant does not answer the question put **N** (in communication attempt column)

Also indicate how they answered the question

## Communication

Record any communication attempt this is defined in the following way:

Any communication that the participant initiated independently (when **not** asked a comprehension question)

This could be when the student:

- points to a picture in the book,
- a symbol in the book,
- the communication board,
- use their device or
- voice
- sign

Take data on it in the following way:

|  |
|--|
| Independent Communication  |
| P-picture CB- communication board S-symbol<br>D-device Sg-sign V-voice |
| PPPP CB CB CB CB Sg  |
|  |

## Engagement:

Engaged is defined as: looking at the book or looking at the reader

| Frequency | Engaged | Not Engaged |
|-----------|---------|-------------|
| 1         | E       | N           |
| 2         | E       | N           |
| 3         | E       | N           |

Every ten seconds record if the participant is engaged or not engaged.

Engaged: circle the E or highlight it

Not Engaged: circle the N or highlight it

## CURRICULUM VITAE

### TALYA KEMPER

#### **Doctor of Philosophy, Special Education**

**Spring 2012**

University of Washington

Dissertation Title: *Promoting Listening Reading Comprehension for English Language Learners who have Severe Intellectual Delay and use Assistive Technology*

Dissertation Committee: Drs. Elizabeth West, Patricia Dowden, Roxanne Hudson, Manka Varghese, and Charles Peck

#### **Master of Arts, Special Education**

**2007**

San Francisco State University

Thesis Title: *The Impact of Peer Assistance on Social Interactions of Students with Disabilities*

Thesis Committee: Drs. Pamela Hunt and Nicholas Certo

#### **Bachelor of Arts, Community Studies**

**2003**

University of California, Santa Cruz

### **PROFESSIONAL EXPERIENCE**

#### **Instructor, University of Washington**

**2008–present**

- Instruct and evaluate graduate and undergraduate students
- Develop syllabi, course assignments, and classroom/online activities
- Design course lectures, discussion themes, and instructional materials including PowerPoint presentations, videos, and handouts
- Select applicable readings and support materials
- Effectively utilize online instructional tools and grading systems
- Courses include:
  - EDSPE 419: Working with Families of Students with Disabilities
  - EDSPE 506: Classroom Management of the Physical Problems of Individuals with Severe or Profound Disabilities
  - EDSPE 419: Working with Families of Students with Disabilities
  - EDSPE 521: Teaching Communication to Young Exceptional Children
  - EDSPE 500: Practicum Seminar for Students in the Low Incidence Program

**Guest Lecturer, University of Washington****2008–present**

- Provide specialized lectures to students in graduate and undergraduate classes on topics including:
  - Inclusion for Secondary Students with Severe Disabilities
  - Inclusion for the Non-Verbal Student in Secondary Academic Classes
  - Implementing Assistive Technology in General Education for Students with Severe Disabilities
  - Augmentative and Alternative Communication: Practical Applications in General Education and Special Education Settings
  - Augmentative and Alternative Communication (AAC): An Introduction for Early Childhood Educators

**Practicum Supervisor, University of Washington****2008–present**

- Supervise graduate students enrolled in the University of Washington’s severe/low incidence program
- Work with local school districts to establish practicum placement settings for graduate students and maintain long term professional relationships with school district personnel
- Observe and evaluate student teacher performance in field work and practicum seminar
- Develop instructional topics and lead seminar classes

**Augmentative and Alternative Communication Teacher,****2007–2008****San Francisco Unified School District**

- Developed the first program in the district designed specifically for secondary students who use AAC
- Taught high school students to become independent communicators using different AAC technologies
- Supervised, trained, and evaluated paraprofessionals
- Trained students’ family members and school staff to support the use of AAC devices
- Collaborated with general education teachers and school administrators to increase mainstreaming opportunities for students who use AAC

**Master Teacher, San Francisco State University****2004–2008**

- Mentored and evaluated special education student teachers
- Provided a classroom-based training site for implementing instructional and behavioral plans with students
- Collaborated with university supervisor to monitor the progress of student teachers and create development opportunities

**Inclusion Support Teacher, San Francisco Unified School District** **2003–2007**

- Led inclusion for secondary students with severe disabilities in general education classes
- Coordinated, trained, and evaluated paraprofessionals
- Facilitated IEP meetings of large educational teams that included: special and general education teachers, service providers, families, lawyers, and interpreters
- Implemented IEP goals in general education classes
- Modified general education coursework to align with students' IEP goals and abilities
- Taught life skills classes with topics including: community-based instruction, sex education, money skills, communication, self advocacy, and community safety

**Instructional Aide, Santa Cruz County Office of Education** **2001–2003**

- Assisted teachers with the implementation of student IEP goals
- Supported students during community-based instruction
- Prepared lesson plans and organized classroom
- Implemented behavioral plans and IEP goals
- Worked in the following classrooms: secondary self contained medically fragile, secondary self contained emotional and behaviorally disturbed, and a self-contained middle school classroom for students with severe disabilities

**CREDENTIALS AND CERTIFICATES**

---

|  |             |
|--|-------------|
| Leadership Education in Neurodevelopmental and<br>Related Disabilities Certificate | <b>2010</b> |
| Cross-Cultural Language and Academic Development Credential                        | <b>2007</b> |
| Special Education Credential: Physical and Other Health Impairments                | <b>2007</b> |
| Special Education Lifetime Level II Credential: Moderate/Severe Disabilities       | <b>2005</b> |

**PUBLICATIONS**

---

Kemper, T., & Pamparo-Fleury, V., (2011). Reading together: A modified dialogic reading approach for children with limited speech. Manuscript under review.

Martin-Herz, S., Kemper, T., Brownstein, M., & McLaughlin, J., (2011). Developmental screening with recent immigrant and refugee children: A preliminary report. Manuscript under review.

**IN PREPARATION**

---

Kemper, T. *Improving Listening Reading Comprehension of Students with Severe Disabilities using the iPad.*

Kemper, T. *Reading with Your Nonspeaking Child: Parents' Views.*

Kemper, T. *Teacher Perceptions of a Bilingual Reading Intervention for Students with Severe Disabilities.*

Kemper, T., & West, E. *Teaching English Language Learners who use Augmentative and Alternative Communication: Perceptions of Practicing Special Educators.*

Koyama, T., West, E., Kemper, T., & Wang, T. *Effects of Language, Word Functions, and Symbol Sets on the Transparency of Picture Symbols.*

West, E., & Kemper, T. *Identifying Training and Support Needs of Paraeducators Who Work with Learners with Autism Spectrum Disorders.*

## PRESENTATIONS

---

Pamparo Fleury, V. & Kemper, T. (2011, May). *Improving the quality of early literacy experiences for young children with autism and other developmental disabilities.* Presentation at the Infant and Early Childhood Conference; Tacoma, WA.

Liberty, L. & Kemper, T. (2011, May). *Written word work: Using magic squares to promote beginning literacy.* Presentation at the Infant and Early Childhood Conference; Tacoma, WA.

Kemper, T. (2010, July). *Ethnographic study of teaching practices for students who use AAC and are English Language Learners.* Presentation at the International Society for Augmentative and Alternative Communication; Barcelona, Spain.

Kemper, T. & Pamparo, V. (2010, July). *Dialogic reading: Adapting shared book reading for young students with Autism and limited verbal ability.* Presentation at the International Society for Augmentative and Alternative Communication; Barcelona, Spain.

Kemper, T. (2010). *After elementary school: How to start a quality high school AAC classroom for students with severe disabilities.* Presentation at the Council for Exceptional Children Conference; Nashville, Tennessee.

Kemper, T. (2009). *After elementary school: How to start a quality high school AAC classroom for students with severe disabilities.* Presentation at the International Technology & Persons with Disabilities Conference; Los Angeles, California.

Kemper, T. (2008). *Empowering the school community with information to understand and accept students with differences and disabilities*. Presentation at the Equity, Opportunity, and Inclusion for People with Disabilities (CAL-TASH) Conference; San Francisco, California.

Doering, K. & Kemper, T. (2006). *Use of checklists for support and feedback to paraprofessionals*. Presentation at the Equity, Opportunity, and Inclusion for People with Disabilities (CAL-TASH) Conference; San Francisco, California.

## **PROFESSIONAL ASSOCIATIONS**

---

Council for Exceptional Children, Member **2009-present**

International Society of Augmentative and Alternative  
Communication, Member **2010-present**

## **PROFESSIONAL EXPERIENCE**

---

**Graduate and Professional Student Senate** **2011-present**

- Represent the College of Education in the area of Special Education
- Address matters that affect graduate students

**Educational Consultant** **2008-present**

- Provide consultation services to schools seeking to include students with severe disabilities. Increasing inclusion in school for students with severe disabilities
- Provide professional development sessions for school teachers on topics including: inclusion, modification of instructional materials, team teaching, high tech communication systems, and incorporating AAC into academics
- Provide professional support to structured social groups for students with Autism Spectrum Disorder

**School Site Council, Member** **2006-2008**

- Elected as teacher representative at Mission High School
- Met with parents, administrators, and community members to discuss concerns and garner support for school wide budgetary decisions

**Inclusion Task Force, Member** **2003-2008**

- Participated in San Francisco's Inclusion Task Force in conjunction with the California State University at Hayward
- Implemented trainings and parent information sessions

**Mission High School Governance Board, Member**

**2004-2008**

- Appointed as representative for special education teachers on school board
- Collaborated on decisions regarding disciplinary policy, master schedule, and curriculum purchases