A LANGUAGE ANALYSIS OF PARENT-CHILD STORYBOOK READING
WITH TYPICALLY DEVELOPING PRESCHOOLERS
AND PRESCHOOLERS WITH AUTISM SPECTRUM DISORDERS

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A Thesis

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**Purpose:** Parents are strongly encouraged to read to their preschool children to facilitate language and literacy development. Book reading exposes children to new vocabulary, complex sentence structures, and a variety of story plots. Adequate exposure to these models requires the child to maintain joint attention during the book reading experience. Past research has shown that it is difficult for children with ASD to maintain joint attention, which could negatively affect parent-child book reading interactions. The current study examined the language use and joint attention of parents and children with and without ASD during book reading interactions.

**Methods and Procedures:** Six families participated in this study, which resulted in a total of six preschool-age children (3 ASD, 3 TD) and 12 parents (6 mothers, 6 fathers). Each parent was videotaped while reading an age-appropriate book to his or her child. Parents were instructed to read as they normally would. Following the book reading interaction, parents independently completed a literacy-based questionnaire. Videos were transcribed and analyzed for language use and joint attention. The questionnaires were informally analyzed to check for differences between the participant groups.

**Results:** During the book reading interactions, mothers and fathers of children with ASD produced a lower MLU-m, elicited less joint attention via verbal bids, and used a higher percentage of redirections and unrelated utterances. Parents of children with ASD were also found to delete words from the text more frequently than the parents of TD children. In addition, the children with ASD were found to respond to fewer questions and requests.
**Conclusions:** Due to the small participant size, it is difficult to make any definitive conclusions based on the results of this study. However, this study did present meaningful differences between the participant groups, which causes one to question if the parent-child reading techniques (i.e., dialogical reading) suggested by the literature are enough for parents who read to their children with ASD. Future research should be conducted to discover if there are techniques that may be beneficial for children with ASD during book reading interactions.
This thesis is dedicated to:

My father, Daniel Hiipakka

My mother, Laura Hiipakka

My brother, Erik Hiipakka

To every family affected by autism spectrum disorders
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CHAPTER 1: INTRODUCTION

Shared book reading is a common practice in American culture. Preschool children are frequently read to in classrooms, daycares, as well as in their homes. Parents are strongly encouraged to read to their young children on a regular basis to promote the development of a variety of skills. Studies have shown that shared book reading increases language development, listening skills, and literacy skills (Sénéchal, 2006; Whitehurst et al., 1994; Whitehurst et al., 1988). Book reading exposes children to new vocabulary, complex sentence structures, and social situations that may not arise during a typical day. In addition, a child’s emergent literacy skills during the preschool years are predictive of the child’s literacy skills later in life (Sénéchal, 2006).

Parent-child book reading requires the ability to maintain joint attention. Joint attention is an important part of learning situations (Tomasello, 1992). A child's ability to learn during book reading interactions may be hindered if he or she is unable to maintain joint attention. Furthermore, a parent’s ability to read and teach during a book-reading situation may be hindered if the child is not attending to both the book and his or her parent. This causes potential issues for some children with autism spectrum disorders who have difficulties with joint attention.

Autism is a neurological developmental disorder that currently affects 1 in 110 children (Centers for Disease Control and Prevention, 2010). Children with autism spectrum disorders (ASD) primarily exhibit difficulties with socialization, language, and restrictive/repetitive activities or routines (APA, DSM-IV, 1994). The Autism Society of America also identifies sensory processing difficulties as primary hallmarks of the disorder, although the DSM-IV definition includes them only as related features. A range of related difficulties may include co-
morbid diagnoses, such as attention deficit disorder or anxiety disorder. The level of these difficulties varies from child to child; some children are diagnosed with high-functioning autism while others have a more severe form of the disorder. Most children are diagnosed with autism around three years of age (Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005); however, some symptoms of the disorder appear as early as the first year of life (Adrien et al., 1992; Mars, Mauk, & Dowrick, 1998).

The affects of ASD are typically life-long and can affect almost all areas of development depending on the overall severity. The developmental areas commonly affected include socialization, language, auditory processing, and joint attention. Impairment in the ability to maintain joint attention is a primary feature of ASD and joint attention is typically a large part of social situations. Joint attention is known as the ability to maintain attention between a communication partner and a mutually interesting object. Joint attention can be seen during parent-child book reading interactions when the child must attend to the book and his or her parent.

Very little research is available concerning ASD and parent-child book reading interactions. It is unclear if the language used during book reading interactions is similar for children with and without ASD. Currently, the available recommendations for parents regarding the most beneficial ways to use books to foster language development rely on interactions with typically developing children. These recommendations are based on children that are able to maintain joint attention successfully. These children have the ability to maintain joint attention, which allows them to acquire the language and literacy skills their parents are focusing on during book reading interactions.

This study sought to add to the literature on joint attention as well as the literature on
parent-child book reading. The purpose of this study was to explore the possible differences in language use and the differences in the amount of engagement during book-reading experiences between parents and their children with and without ASD. In addition, this study attempted to begin to fill the gap regarding the lack of appropriate book reading recommendations for parents of children with ASD. This study includes an in-depth comparison of language and joint attention between parents and children with and without ASD during storybook reading interactions.
CHAPTER 2: REVIEW OF THE LITERATURE

Parent-Child Book Reading and Literacy Development

The development of literacy, or reading and writing skills, is a process that begins early in life and occurs over several years of an individual’s childhood. The ability to read effortlessly and fluently is built upon many different areas. Scarborough (2001) described the development of advanced reading abilities and listed areas that affect this development. A skilled and fluent reader must be able to comprehend language and easily recognize a variety of words. Language comprehension skills are built upon one’s background knowledge, vocabulary, experience with language structure, verbal reasoning, and literacy knowledge. Word recognition is developed via phonological awareness, decoding abilities, and the development of sight words. Development of these areas begins early in a child’s life, possibly even during infancy.

Parents are often encouraged to read to their children as soon as possible to hopefully promote emergent literacy skills. These skills are the foundation of later developing literacy skills for reading and writing. Emergent literacy skills fall into two main areas, including print awareness (i.e., letter recognition, sight words, writing letters, etc.) and phonological awareness (i.e., letter sounds, rhyming, blending of sounds, etc.). Book reading provides parents with opportunities to teach their children skills in the areas of print awareness and phonological awareness.

Studies have shown that when children have more exposure to books, they exhibit higher vocabulary levels and are more successful with listening comprehension tasks later in life (Hargrave & Sénéchal, 2000; Sénéchal, 2006). In addition, parental involvement in reading and writing instruction at home increases the literacy skills of young children. Possibly most importantly, it has been found that the emergent literacy skills during the preschool years are
predictive of later reading skills during the early elementary years (Sénéchal, 2006). Home-based shared book reading interactions are an acceptable way to provide experiences that promote the development of emergent literacy skills (Whitehurst et al., 1994; Whitehurst et al., 1988).

**Benefits of Shared Book Reading**

During storybook reading, children are exposed to language learning situations that may not arise during a typical day. Several studies have found that interactive parent-child book reading can have a positive influence on a child's language development (Dale, Crain-Thoreson, Notari-Syverson, & Cole, 1996; Deckner, Adamson, & Bakeman, 2006; Ninio, 1983; Ninio & Bruner, 1978; Payne, Whitehurst & Angell, 1994; van Kleek, Gillam, Hamilton, McGrath, 1997). Children are exposed to advanced vocabulary and complex sentence structures during book reading; they are also presented with different story plots that include concepts, which are not typically experienced during everyday life.

Studies of typically developing children have shown that adults use a longer mean length of utterance (MLU-m) during book reading situations (Crain-Thoreson, Dahlin, & Powell, 2001; Hoff-Ginsberg, 1991). This exposure to more complex language and a larger MLU-m has the potential to increase the child's lexicon as well as the child's experiences with more syntactically mature sentence structures. The child can also gain a better understanding of the world around him or her by learning about different social situations presented in books (i.e., emotions, problem-solving, etc.).

According to Phillips, Norris, and Anderson (2008), parent-child shared book reading is not enough in itself to encourage development in all areas of literacy. The parent cannot merely read through a book and expect his or her child to learn the crucial emergent literacy skills
needed for later reading success. The parent needs to engage the child in interactive storybook reading and alter the reading style to meet the learning needs of the child. When the child is truly engaged and is challenged to learn during book reading experiences, he or she is more likely to develop literacy skills.

**Parent Reading Techniques**

A child’s early literacy skills are largely dependent upon the quality of the child’s book reading experiences. Many parents exhibit different styles of reading to their children. The reading style can dramatically affect the success and opportunities for learning during a book reading interaction. For example, some parents may read directly through the text without stopping to ask questions, label pictures, or point out specific words. Other parents may turn book reading into a learning experience by asking questions, making comments, and teaching letters or letter sounds; these parents attempt to actively engage the child in the book reading interaction.

Several researchers have observed and qualitatively studied parent-child book reading interactions. Parents’ reading styles have been found to be affected by a variety of factors including education, culture, socioeconomic status, and gender (Bus, Leseman, & Keultjes, 2000; Lyytinen, Laasko, & Poikkeus, 1998; Marvin & Mirenda, 1993; Ninio, 1980). The level of attachment between the parent-child dyad can also affect the parental reading style (Frosch, Cox, & Goldman, 2001). In addition, parents of children with disabilities may need to vary their reading style to fit their child’s needs and attention level.

Researchers have suggested specific techniques that can be used to facilitate language and literacy development while keeping the interaction enjoyable and interesting for the child. Teachers and other professionals, including speech-language pathologists, have recommended
many of these techniques to parents of young children. The hope is that the parents’ use of these techniques will facilitate language and literacy development, which will enhance children’s development of reading skills later in school.

Kaderavek and Sulzby (1998) provide a list of scaffolding techniques that can be used during book reading to facilitate language use and learning. Some of these techniques include labeling, commenting, text elaboration, story retelling, direct questions, pausing, and tag questions. The use of these techniques should be varied depending on the child’s age and language abilities to truly follow the idea of “scaffolding.” Scaffolding provides the child with support while also challenging the child at a level that prevents frustration.

Whitehurst et al. (1994) conducted a book reading intervention study that involved the children’s schools and home environments. The parents and teachers in the experimental group were trained to use interactive reading techniques during book reading interactions. The children in the experimental group, who were actively involved in the book reading interactions due to their parents’ use of the trained reading techniques, were found to have more language advancements at the completion of the study. It appears that a child’s parents and the use of interactive reading techniques are a primary factor in a child’s emergent literacy skills and language development. A parent’s reading style does in fact affect the intensity of learning during book reading interactions.

One specific style of parent-child book reading is dialogic book reading. The dialogic style of book reading implements strategies and feedback models that are meant to promote language development and literacy skills. During dialogic book reading, the parent actively engages the child in the book reading interaction. The parent uses techniques such as open-ended questions to encourage the child to be an active participant. The parent also uses specific
feedback strategies to provide advanced language models. These strategies include recasts, expansions, extensions, and other corrective models.

The primary goal of dialogic book reading is to increase oral language skills, specifically vocabulary and grammar. Studies have shown that dialogic book reading increases oral language skills more effectively than regular shared book reading alone (Crain-Thoreson & Dale, 1999; Hargrave & Sénéchal, 2000; Lonigan, Anthony, Bloomfield, Dyer, & Samwel, 1999; Whitehurst et al., 1988, 1994). While dialogic book reading has been shown to increase oral language skills, other studies have shown that there is a minimal impact on the other areas of literacy development, such as print awareness and print knowledge (Sénéchal et al., 2001).

Previous studies have been conducted to determine the efficacy of home-based interventions to promote emergent literacy. Many of these studies specifically included dialogic book reading, while others included at least some of the techniques within the dialogic book reading method. Hockenberger, Goldstein, and Haas (1999) taught mothers to use commenting during book reading to relate the text to their child's life and past experiences. The parent training was found to be effective, as all mothers were able to increase their use of commenting; in addition, most mothers were able to increase their use of other conversational acts as well as their level of responsiveness to their child. Another study by Huseyin (2008) trained parents to use dialogic storybook reading techniques; the use of these techniques was shown to improve the children’s overall attitude toward book reading. Improving the child's attitude toward book reading may increase overall attention and interaction during parent-child book reading situations. This increase in attitude, attention, and interaction will be beneficial for the child's learning.
Book Reading as a Context for Children with ASD

During book reading interactions, a child must not only attend to the book, he or she must also attend to the reader. The act of attending to both the book and the reader is called joint attention. As previously mentioned, book reading provides excellent opportunities for learning. Unfortunately, learning in the areas of vocabulary, syntax, story grammar, pragmatics and other literacy skills is less attainable if joint attention cannot be maintained. Children with autism spectrum disorders (ASD) tend to have difficulty with joint attention, which can have a negative impact on parent-child book reading interactions.

Autism Spectrum Disorders (ASD)

In order to acknowledge the difficulties children with ASD may have during parent-child book reading interactions, it is important to identify and comprehend the developmental areas these children frequently struggle with. As previously mentioned, children with autism spectrum disorders (ASD) typically have deficits in three main areas. The areas in which these children typically struggle include socialization, language, and restrictive/repetitive activities or routines (APA, DSM-IV, 1994). The severity of ASD differs across those affected; some individuals are diagnosed with high-functioning autism while others have a more severe form of the disorder. The specific developmental areas commonly affected by ASD include joint attention, social skills, and expressive/receptive language.

Joint Attention

Joint attention refers to the ability to maintain attention between a communication partner and a mutually interesting object. There are two types of joint attention: ‘dyadic’ (adult + child) and ‘triadic’ (adult + child + object) (Leekam & Ramsden, 2006). Researchers have suggested that ‘triadic’ joint attention is built upon ‘dyadic’ interactions during the infancy years
Therefore, if a child fails to maintain dyadic interactions as an infant, he or she may struggle or be unable to maintain triadic interactions later in life, such as during parent-child book reading interactions. Deficits in the area of joint attention are typically one of the first indicators of ASD and can be observed in children with ASD as early as six months of age (Clifford & Dissanayake, 2008). This suggests that children with ASD likely have trouble with dyadic and eventually triadic joint attention.

Difficulties with joint attention typically persist throughout childhood for children with ASD (Baron-Cohen, 1988; Landry & Loveland, 1988). Sometimes the joint attention abilities of children with ASD increase as the child ages (Mundy, Sigman, & Kasari, 1994). However, even with these increases in joint attention skills, many children with ASD continue to struggle to maintain levels of joint attention that allow successful learning. Therefore, it may be beneficial to teach joint attention skills to children with ASD at an early age.

Very few studies have examined interventions for joint attention deficits. One study by Whalen and Schreibman (2003) used both Discrete Trial Training (DTT) and Pivotal Response Training (PRT) techniques to teach joint attention responding and initiating to children with ASD. Clear prompts for joint attention were used when necessary with prompted and unprompted responses consistently reinforced. Reinforcement was natural to ensure a realistic training environment. The child was allowed to choose activities and errors were minimized when possible to maintain overall motivation. The results of this study showed that joint attention abilities were improved after intervention. Unfortunately, these skills did not continue to improve after intervention was complete. It appears that some children with ASD must be taught how to engage in joint attention; it is not a skill that can be learned via natural development. In addition, children with ASD may need continual instruction in order to ensure
that joint attention skills continue to develop as the child ages.

Another study by Kasari, Freeman, and Paparella (2006) also attempted to teach joint attention to children with ASD. In this study, the preschool-aged children with ASD engaged in joint attention intervention for 30 minutes daily for a span of 5-6 weeks. Intervention was conducted in a semi-structured format incorporating positive reinforcement, a prompting hierarchy, and techniques from milieu teaching. After the intervention period, the children showed greater responsiveness to joint attention and also initiated showing behaviors. When playing with their mothers, these same children initiated joint attention more often, which suggested that some joint attention skills generalized. Furthermore, increases in joint attention resulted in language gains that were maintained post-intervention.

These studies suggest that joint attention can be taught to some children with ASD, and that doing so may benefit language development. However, in a more recent study, Taylor and Hoch (2008) found that teaching responding to joint attention was more successful than teaching the children how to initiate joint attention. The ability to initiate joint attention is an important skill for successful socialization. Future research needs to investigate interventions that will increase both initiating and responding to joint attention. In addition, researchers must study the long-term effects of joint attention interventions on a child's overall development (i.e., joint attention, language, social skills, literacy skills, etc.).

Social Development

Deficits in socialization, or pragmatics, may be amplified by the inability to maintain joint attention. Pragmatics includes the ability to use language functionally and appropriately across a range of social contexts. It also involves the ability to recognize social cues from communication partners and vary one’s communication style based on those cues.
Individuals with ASD tend to have both expressive and receptive pragmatic deficits; the severity of these deficits varies across individuals. The commonly observed expressive pragmatic deficits during social situations include poor prosody, reluctance to initiate conversation with others, lack of topic maintenance, providing too much or too little information, and a lack of facial expression and gestures during communication (Paul, Orlovski, Marcinko, Volkmar, 2009; Shriberg, Paul, McSweeny, Klin, & Cohen, 2001).

Many of the same issues are seen in regards to receptive pragmatics. Some common deficits include the inability to comprehend figurative language, difficulties understanding humor, troubles with inferencing (using the context to understand others), and difficulties recognizing the facial expressions/body language of others (Baron-Cohen, Wheelwright, & Jolliffe, 1997; Happe & Frith, 1996; Ozonoff & Miller, 1996). Due to these pragmatic deficits, many individuals with ASD eventually have trouble developing and maintaining relationships with others.

Parent-child book reading interactions serve as excellent opportunities for a parent and child to bond and socialize with each other. A child with ASD may miss that opportunity to bond with his or her parent due to his or her pragmatic deficits, which hinder the ability to socialize with others. In addition, receptive pragmatic deficits may have an impact on the overall learning that occurs during book reading. Many children’s books include figurative language, humor, and a variety of emotions. A child with ASD may struggle to understand these pragmatic aspects of books. The child may also have trouble making inferences about the story, which is an important skill for successful reading comprehension (Oakhill, 1984).
The language skills of children with ASD vary based on the severity of the disorder. Some children with ASD have advanced language skills for their age while others remain nonverbal. The lack of first words and phrases during the early childhood years is typically the first cause for concern, as reported by caregivers of children with ASD (DeGiacomo & Fombonne, 1998; Wetherby et al., 2004). Some children with ASD eventually develop highly proficient expressive language abilities, even if they had delayed language abilities during the early childhood years. Conversely, other children do not develop expressive language at all.

There is not a concrete number for the portion of individuals with ASD that remain nonverbal. Prizant (1983) found that approximately 50% of individuals with ASD remain nonverbal, even after receiving intervention. In contrast, more current studies have found that approximately 25% of individuals with ASD remain nonverbal (Lord et al., 2006; Sigman & McGovern, 2005). This variability in percentages may be due to intervention improvements, increases in the number of children diagnosed with autism (more children with mild forms of autism are being diagnosed which makes the number of more severe cases seem smaller), and changes in the definition of “nonverbal.” Nonetheless, children with ASD have varying language abilities ranging from highly proficient language skills to no expressive language at all.

Insufficient pragmatic skills and deficits in the ability to maintain joint attention can have a notable effect on the language development of children with ASD. The social-pragmatic approach to language development suggests that language development is centered on the child's social world and his or her ability to engage in that environment (Tomasello, 1992). The ability to participate in a highly structured and rich social environment is thought to increase the child's knowledge and opportunities to use language. Dawson et al. (2004) examined the relationship
between joint attention and language abilities in children with ASD. This study showed that the level of joint attention exhibited by children with ASD was a valid indicator of present-level language skills. Joint attention is considered an important prerequisite for language development over time (Bono, Daley, & Sigman, 2004; Bopp, Mirenda, & Zumbo, 2009; Tomasello, 1992). A child's ability to initiate and respond to joint attention is positively correlated with higher levels of expressive and receptive language skills (Charman, Baron-Cohen, Swettenham, Baird, Drew & Cox, 2003; Smith, Mirenda, Zaidman-Zait, 2007).

A study on toddlers (between 18 - 33 months) with ASD found that gesture use and non-verbal cognitive ability are the best predictors of current expressive and receptive language abilities (Luyster, Kadlec, Carter, & Tager-Flusberg, 2008). More specifically, the same study found that children with ASD have better receptive language abilities when they are able to respond to joint attention initiations by adults. Expressive language abilities were more advanced in the children with ASD who had higher-level imitation skills.

Studies on videos of infants who were later diagnosed with autism showed similar findings. One such study by Mitchell et al. (2006) found that children with ASD exhibited delays in early language and communication. These same children were found to understand fewer phrases (receptive language) and had a decreased use of gestures by 12 months of age. At 18 months, these children still had a delay in understanding phrases as well as single words; furthermore, these children also produced fewer single words and gestures as compared to children who did not have ASD. Based on this and other research, it appears that gesture use is very important for both receptive and expressive language development.

The quality of parent responsiveness has been found to be a valid predictor of the vocabulary development of children with ASD. When parents use verbal utterances that follow
their child’s level of attention and when they respond to their child’s communicative acts, they decrease the child’s need to attend to others for vocabulary development (McDuffie & Yoder, 2010). Fortunately, parents of children with ASD have been shown to be able to match their behaviors to their child's focus of attention just as well as parents of TD children (Siller & Sigman, 2002). In addition, the children with ASD had more advanced levels of joint attention and language growth in the long run when their parents were able to match the their focus of attention to a higher degree. These are very important findings because, as previously mentioned, children with ASD tend to struggle with joint attention, which could make learning, specifically language learning, quite difficult.

Clearly there are many factors that affect the language development of a child with ASD. Imitation skills, gesture use, parent responsiveness, and the ability to maintain joint attention all are valid predictors of the language skills of a child with ASD. However it is still difficult to make predictions about the progression of language development for children with ASD since the disorder itself is so variable. Tager-Flusberg et al. (2009) developed a framework for describing the development of spoken language, which can be applied to children with ASD. The framework combines development in all language domains, including phonology, semantics, syntax, morphology, and pragmatics. This framework was developed as a tool for assessing the language skills of children with ASD; however, it follows the progression of language development for typically developing (TD) children as the specific progression of language development for children with ASD is unknown. Table 1 displays a summary of each of the phases included in the Tager-Flusberg et al. (2009) framework.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Type of Communication</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase One</td>
<td>&quot;Preverbal Communication&quot;</td>
<td>The child is able to intentionally communicate through the use of babbles and gestures. Typically developing (TD) children tend to reach this phase by the age of 6-12 months.</td>
</tr>
<tr>
<td>Phase Two</td>
<td>&quot;First Words&quot;</td>
<td>The child independently uses single words to communicate, with a small portion of his or her speech being intelligible to others. TD children usually meet this phase around 12-18 months.</td>
</tr>
<tr>
<td>Phase Three</td>
<td>&quot;Word Combinations&quot;</td>
<td>The child's vocabulary is expanding at a rapid rate. The child is able to combine words into two- and three-word utterances for intentional communication. TD children generally reach this phase by 18-30 months.</td>
</tr>
<tr>
<td>Phase Four</td>
<td>&quot;Sentences&quot;</td>
<td>The child has an abundant number of words in his or her vocabulary to meet daily communication needs. These children are able to combine words into meaningful sentences. Their use of morphological markers is developing and they are attempting to use these markers on a consistent basis. TD children in this phase are usually between the ages of 30-48 months.</td>
</tr>
<tr>
<td>Phase Five</td>
<td>&quot;Complex Language&quot;</td>
<td>The final phase is typically reached by the end of the preschool years (approximately 48-60 months of age for TD children). These children have a rich vocabulary that can be used successfully in a variety of situations. Their expanded vocabulary allows them to communicate a variety of ideas and topics using complex syntactic skills.</td>
</tr>
</tbody>
</table>

It is very common for children with ASD to meet the criteria in a variety of framework phases at the same time and never fully complete one phase before moving onto the next. In addition, children with ASD may have advanced abilities in one language domain and significant deficits in other domains. For example, a child with ASD may have an extremely large vocabulary and adequate syntactic abilities for communication, but his or her pragmatic abilities are largely lacking, which causes communicative situations to be less than optimal. The Tager-Flusberg et al. (2009) framework may help professionals better identify the areas of concern for
children with ASD, especially since the language abilities within this population of children tend to be highly variable.

Need for Current Study

As previously mentioned, Siller and Sigman (2002) showed that parents of children with ASD were able to match their behaviors to their child's focus of attention during play-based activities just as well as parents of TD children who were matched for language abilities. This same study showed that the children with ASD had better joint attention and language growth in the future when their parents were able to match the their focus of attention to a higher level. This study suggests that parents of children with ASD are socializing with their children during play-based activities just as well as parents of TD children based on the child's language abilities. However, it is questionable if the socialization and language use during book reading activities differs for children with ASD, as compared to TD children.

The current study is a continuation of a previous study on parent-child book reading and ASD completed by Terrell, et al. (2009); the first author of the current study was an assistant for this previous study. In the Terrell, et al. (2009) study, the researchers primarily compared the similarities and differences between mothers' and fathers' utterance types and pointing behaviors during book reading interactions. The current study examined the language use of mothers and fathers as they read to their child with ASD or their TD child. The language used by the child during book reading was also examined. Since joint attention is necessary to fully engage in book reading, the current study also analyzed the children’s ability to maintain triadic joint attention. Very little research is available concerning parent-child book reading for children with special needs, such as ASD. This exploratory study contributes to the literature available concerning parent-child book reading, ASD, and joint attention. Research questions included the
following:

1. Does the language used by mothers and fathers of children with ASD differ when compared to mothers and fathers of TD children during book reading interactions? Is there a difference in mean length of utterance? Is there a difference between parents' pragmatic use of language (i.e., comments, questions, redirections, etc.)? Does one group produce more utterances that are unrelated to the book?

2. How does the language use of children with ASD differ from children who are TD? How does the mean length of utterance differ? Is there a difference between the children's pragmatic use of language (i.e., comments, questions, responses to questions, etc.)? Is there a difference between the number of child utterances that are unrelated to the book?

3. Do parents of children with ASD add, delete, substitute, or repeat portions of the text more often than parents of children with typical development?

4. Is there a difference in the percentage of parent or child utterances that successfully elicit joint attention during book reading interactions?

   Based on past research and personal experience with children with ASD, the researcher expected that there would be variable results at the completion of data analysis. All children with ASD are unique in their strengths and weaknesses and no two parents are alike. In general, the researcher expected to see differences between the pragmatic use of language between parents of TD children and children with ASD. For example, based on literature, there is the possibility of more directive language during the book reading interaction (Evans & Schmidt, 1991), which might be characterized by fewer and more brief utterances. Regarding the children with ASD, it would be expected that their language would be less advanced than TD children, and that they might also differ in their use of language in context. The researcher also expected
to find differences in the ability to maintain joint attention during book reading; the children with ASD will likely have more difficulty than the TD children. Because the children with ASD are expected to have difficulty with joint attention, this may result in more instances of parent utterances that are used to redirect the child to the book. Due to the small sample size of this study, the researcher was not expecting to obtain any results that could be generalized to the broad population. Instead, it was expected that this study would help the researcher develop new questions for future studies on parent-child book reading and joint attention.
CHAPTER 3: METHOD

Participants

A relatively small number of participants were sought to establish feasibility of method as this is an exploratory and qualitative study. Six children (4 boys, 2 girls) along with their fathers and mothers participated in this study. Two children with ASD were recruited from the University of Wisconsin – Stevens Point (UWSP) Center for Communicative Disorders. These two children were videotaped during a previous study conducted by Drs. Pamela Terrell and Maggie Watson. An additional four children (one with ASD and three TD) were recruited from the northwestern Ohio area by Bowling Green State University's clinical supervisors and faculty members.

All child participants were preschool-age and between the ages of 4 – 6 years. The mean age of the children was 57.5 months, or 4 years, 10 months. Only one of the children (TD-2) had not yet been enrolled in any type of preschool or daycare center. All families used English as their primary language in the home. One child (ASD-3) spent some time in Brazil and was likely exposed to another language during her stay. However, her mother reported that only English was spoken in the home. All parents had completed at least some college, with a majority of the parents having a bachelor's degree or higher. Table 2, which is displayed below, represents the participants of this study. Much of the information presented in Table 2 was collected via the case history.
Table 2. Child participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Gender</th>
<th>Birth Order</th>
<th>Number of siblings with ASD diagnosis</th>
<th>Education</th>
<th>Therapy History</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASD-1</td>
<td>4;5</td>
<td>Male</td>
<td>Only child</td>
<td>n/a</td>
<td>Daycare only</td>
<td>ABA</td>
</tr>
<tr>
<td>ASD-2</td>
<td>5;1</td>
<td>Male</td>
<td>1st of 2</td>
<td>1</td>
<td>P-T Preschool</td>
<td>ABA, Speech/Language</td>
</tr>
<tr>
<td>ASD-3</td>
<td>4;7</td>
<td>Female</td>
<td>1st of 2</td>
<td>1</td>
<td>P-T Preschool</td>
<td>ABA, Speech/Language</td>
</tr>
<tr>
<td>TD-1</td>
<td>4;11</td>
<td>Male</td>
<td>2nd of 2</td>
<td>0</td>
<td>F-T Preschool</td>
<td>n/a</td>
</tr>
<tr>
<td>TD-2</td>
<td>5;9</td>
<td>Male</td>
<td>2nd of 2</td>
<td>0</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>TD-3</td>
<td>4;0</td>
<td>Female</td>
<td>Only child</td>
<td>n/a</td>
<td>F-T Preschool</td>
<td>n/a</td>
</tr>
</tbody>
</table>

*P-T = part-time; F-T = full-time; ABA = Applied Behavior Analysis

Three of the six children in this study were typically-developing while the other three had an official diagnosis of ASD, as documented by a neurologist and/or a diagnostic team. Each child with ASD received a diagnosis of ASD by the age of two or three years. All three children with ASD had received or were receiving some type of behavioral and/or speech-language intervention at the time of data collection.

The researcher was unable to match the children for language level due to the inability to formally assess each child's language skills. The researcher also did not have access to the children's speech and language records. Therefore, the researcher has identified each child's alleged language level using the framework provided by Tager-Flusberg et al. (2009) (see Table 1.). The language level was determined via parent report, medical diagnoses, and researcher observations. Table 3 shows the perceived language levels of each of the children. Due to the lack of specific language information on each child, the researcher matched each child with ASD to a TD child based on gender and age. After participant recruitment, there was no more than an
eight month difference between each age and gender matched pair.

Table 3. Child participant language levels

<table>
<thead>
<tr>
<th>Child</th>
<th>Language Phase</th>
<th>Child</th>
<th>Language Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASD-1</td>
<td>Phase 3-4</td>
<td>TD-1</td>
<td>Phase 5</td>
</tr>
<tr>
<td>ASD-2</td>
<td>Phase 4</td>
<td>TD-2</td>
<td>Phase 5</td>
</tr>
<tr>
<td>ASD-3</td>
<td>Phase 3-4</td>
<td>TD-3</td>
<td>Phase 5</td>
</tr>
</tbody>
</table>

*Based on language development framework in Tager-Flusberg et al. (2009)

Procedures

Informed Consent

Informed consent was collected from each parent prior to videotaping and data analysis (see Appendix C). Due to the lack of abstract cognitive abilities at the preschool age, official consent was not collected from the children. Consequently, the data collection session ended immediately if any child appeared to be uncomfortable with the videotaping procedures based on his or her behaviors, body language, and parent report. This occurred once during the progression of the study; one child was reportedly have a "bad day" and his parents requested the researcher return to collect data at a different time. When the researcher returned to the family's home a week later, the child was in much better spirits. Before collecting any data, the researcher answered all questions to the parents’ satisfaction. The parents' questions were also answered following the data collection when necessary.

Questionnaire and Case History

The mothers and fathers individually completed a questionnaire concerning emergent literacy and parent-child book reading interactions. The questionnaire provided the researcher with valuable information concerning the family’s current reading habits and the child's emergent literacy skills. The questionnaire used was developed by Boudreau (2005). This
questionnaire took no longer than 10-15 minutes to complete. Brief case histories were also completed; the parents completed this document together (see Appendix C). The case history used for data collection at BGSU was slightly different from the case history used in the UWSP study. The new case history included questions concerning when and where a diagnosis occurred for the children with ASD. The parents were asked to provide the assessment tool used to determine the diagnosis (if known) and to identify the specific type of ASD their child was diagnosed with (i.e., Asperger syndrome, PDD-NOS, autism, etc.). In addition, parents were asked to identify the primary language spoken in the home, including any additional languages spoken. Only families with English as their first language were used for the purposes of this study.

**Video Collection**

Each parent was videotaped individually while reading to his or her preschool child. The protocol for videotaping followed the same steps as in the UWSP study to maintain data collection consistency. A total of six age-appropriate books were used for data collection purposes. The books were chosen based on recommendations from a librarian and early childhood education professors. The chosen books were recently published to prevent the children and parents from being familiar with the texts. All six books were narratives and included a rich storyline with brightly detailed pictures. A list of the books used for the purposes of this study is presented below:

- **Pete and Pickles** by Berkeley Breathed (2008)
- **A Visitor for Bear** by Bonny Becker (2008)
- **Too Many Toys** by David Shannon (2008)
- **Ladybug Girl** by David Soman and Jacky Davis (2008)
Five of the six storybooks were displayed in front of the parent-child dyad at the beginning of the book reading session. The parent was asked to choose one book and then read to his or her child as he or she normally would. Only one parent was allowed in the room during videotaping sessions. When the first parent completed reading, the chosen book was put aside and the sixth book from the set was offered to the second parent along with the four other books from the previous reading session. Videotaping took no longer than 30-45 minutes for each parent-child dyad.

**Qualitative and Quantitative Analyses**

All language used by each parent and child in the videos was transcribed and analyzed using the *Systematic Analysis of Language Transcripts* (SALT, Miller & Chapman, 1998). Analysis was partially based on a previous study that included book reading transcription (Girolametto, Hoaken, Weitzman, & van Lieshout, 2000). The following language components were collected via SALT: total number of utterances, total number of words, MLU-m in morphemes, and total time spent in book reading interaction. Additional analyses were conducted to collect further data on the following areas:

- Pragmatic function of language (communicative intents—e.g., comments, requests for objects, requests for information, questions, responses to requests, etc.)
- Words or phrases added, deleted, substituted, or repeated from the story text by the parent
- Language use that was unrelated to the story (e.g., comments about the child, the room, regulatory utterances, etc.)
- the number of utterances eliciting joint attention during the book reading situation.

The areas listed above were measured by counting the number of times each occurred during the book reading interaction. When analyzing the children's responses to their parent's requests or questions, both correct and incorrect responses were counted and considered responses. If a child did not respond either verbally or physically to his or her parent's bid, that instance was not counted as a response.

Joint attention is considered any instance where the adult and child are both focusing on the same object (i.e., the book). For the purposes of this study an operational definition of joint attention was defined as follows: any instance when a verbal bid by either the parent or the child resulted in the parent-child dyad focusing on the same object (i.e., the book). Clearly this is not a comprehensive measure of joint attention, as the parent and child could be focusing on an object without the occurrence of a verbal bid. However, due to the nature of this study, joint attention was collected in regards to verbal bids to maintain consistency of data collection.

Any utterance that related to the book and was meant to elicit joint attention was considered a verbal bid. If this verbal bid was successful at initiating joint attention, it was counted as one instance of joint attention. The number of successful instances of joint attention and unsuccessful instances of joint attention were compared to obtain a percentage. Both parent and child utterances were analyzed. Examples of successful and unsuccessful instances of joint attention are listed below:

a. **Successful Instance of Joint Attention:** Mother says, “Oh, look at the bird.” And points to the picture. Child looks toward where his mother is pointing.
b. **Unsuccessful Instance of Joint Attention**: Father says, “Can you point to the dog?” Child does not appear to be looking at the picture and does not follow through on the request.

c. **Successful Instance of Joint Attention**: Child says, “There’s a truck!” Father looks at truck in picture and says, “Yup, you’re right! That’s a nice blue truck!”

The data was compiled and compared across participants. An undergraduate student in the Bowling Green State University Communication Sciences and Disorders department analyzed the data independently to check for reliability. This student analyzed the first five minutes of each video. She transcribed each video using SALT and then collected data on text alterations, joint attention, and pragmatic use of language. Percent agreement was obtained by completing a point-by-point analysis. The specific percentages of agreement for each category are as follows: Total Number of Utterances, 88% agreement; Mean Length of Utterance, 82% agreement; Pragmatic Function Coding, 82% agreement; Joint Attention, 77% agreement; and Text Alterations, 91% agreement.
CHAPTER 4: RESULTS

Because this study included a relatively small participant number, a descriptive comparison of the groups was a focus of the analysis. The limited number of participants allowed the researcher to analyze the data from a variety of angles and focus on the data that presented robust differences between participant groups. The most prevalent differences between participant groups were found in the following areas: joint attention, child responses to parental requests, amount of redirections used by parents, utterances that were unrelated to the text, and the number of text alterations.

Emergent Literacy Questionnaire

The results of the questionnaires provided the researcher with a wealth of information concerning the families' use of books and other literacy practices in the home. Each of the parents reportedly attempted to read to their son or daughter on a weekly basis. There appeared to be no difference between the TD and ASD group in terms of time spent per week in shared book reading. The mean time spent reading per week was 2.67 hours and 2.33 hours for the TD and ASD groups respectively. Each family reportedly owned a variety of books for both children and adults.

All parents reported pointing out letters and sounds to their children during book reading interactions. Two parents of TD children included that they tend to point out words with their children rather than individual sounds because their children know all of the letters and sounds at this point in time. All children with ASD and two TD children reportedly knew all of the letters of the alphabet as well as the corresponding sounds. One TD child was still learning the letters and corresponding sounds at the time of the video collection; this child reportedly knew between 10-15 letters and 6-10 sounds.
There was a difference between the participant groups in terms of the frequency of child-initiated book reading interactions. The parents of TD children reported that their children asked to be read to on a daily to weekly basis. The parents of the children with ASD reported that their children only asked to be read to on occasion or never at all. In addition, there was a difference in the overall reported child interest in book reading. The parents of TD children reported their children's interest in books as a mean of 3.5 on a 5-point scale ("1" being the least liked activity and "5" being the favorite activity). The parents of children with ASD reported a mean of 2.5 on the same 5 point scale.

Joint Attention

As previously mentioned, joint attention is a crucial part of parent-child book reading experiences. When a child is engaged in a book reading interaction, he or she is able to learn new vocabulary, answer questions, ask questions, make comments, and follow the progression of the story. Joint attention is essential for a child's learning and social interaction.

In order to have a workable operational definition of joint attention, the focus of analysis was the number of utterances that successfully elicited an occurrence of joint attention. The means of the percentage of utterances that elicited joint attention are displayed in Table 4 for fathers, mothers, fathers + mothers, and children. A graph is also included in Figure 1 to visually display how these means vary across all participant groups.
Table 4. Mean percentage of utterances eliciting joint attention

<table>
<thead>
<tr>
<th>Participant Group</th>
<th>Typically Developing (TD)</th>
<th>Autism Spectrum Disorders (ASD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fathers</td>
<td>92.7 % (86 - 98%)</td>
<td>38.7% (6 – 100%)</td>
</tr>
<tr>
<td>Mothers</td>
<td>96.0 % (89 – 100%)</td>
<td>55.3 % (20 – 100%)</td>
</tr>
<tr>
<td>Fathers + Mothers</td>
<td>94.3 % (86 – 100%)</td>
<td>47.0 % (6 – 100%)</td>
</tr>
<tr>
<td>Children</td>
<td>98.8 % (95 – 100%)</td>
<td>70.8 % (0 – 100%)</td>
</tr>
</tbody>
</table>

Figure 1. Mean percentage of utterances eliciting joint attention

Parents of TD children were able to elicit joint attention from their children via verbal communication nearly 100% of the time. The parents of children with ASD were only successful at eliciting joint attention approximately 50% of the time. Two parents (mother and father) of a child with ASD were able to elicit joint attention 100% of the time. When these parents were taken out of the percentage calculations, the remaining 4 parents in the ASD group had an average of 20.5%. This is a large gap and quite concerning considering the need for joint attention during book reading activities. Clearly there is a very large discrepancy between the TD and ASD groups in terms of the percentage of parent utterances eliciting joint attention. The
large difference between the groups was expected by the researcher considering the symptoms of ASD.

Not only did the children with ASD respond to fewer bids for joint attention, they also were less successful at having their bids for joint attention responded to. One contributing factor to this may have been the high percentage of unintelligible utterances within the ASD participant group. Some of the children with ASD were very difficult to understand; the parents of these children may not have responded to verbal bids because they simply did not understand their child's speech.

Mean Length of Utterance

The mean length of utterance in morphemes (MLU-m) is a measurement typically used to document the development of a child's expressive language. It is based on the number of morphemes within a child's utterance. This measurement has established norms, which help professionals identify if a child's language is developing appropriately. By the age of four years, a child should have an MLU of roughly 4.22 and an MLU of 5.71 at the age of five years old (Leadholm & Miller, 1992). Typically, MLU-m's are collected during free-play situations. For the purposes of this study, the MLU-m was used to determine the complexity of a parent and/or child's utterances during a book reading interaction. The mean MLU-m of fathers, mothers, fathers + mothers, and children, as well as the ranges, are presented in Table 5.

<table>
<thead>
<tr>
<th>Participant Group</th>
<th>Typically Developing</th>
<th>Autism Spectrum Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fathers</td>
<td>4.89 (4.03 – 5.89)</td>
<td>3.84 (3.63 – 4.14)</td>
</tr>
<tr>
<td>Mothers</td>
<td>5.87 (5.32 – 6.41)</td>
<td>3.47 (2.96 – 4.16)</td>
</tr>
<tr>
<td>Fathers + Mothers</td>
<td>5.38 (4.03 – 6.41)</td>
<td>3.66 (2.96 – 4.16)</td>
</tr>
<tr>
<td>Children</td>
<td>2.31 (1.27 – 3.20)</td>
<td>1.76 (1.30 – 2.34)</td>
</tr>
</tbody>
</table>
As presented in Table 5, the TD children had a very low MLU-m for their ages (4;0 – 5;9 years). This low MLU-m is likely due to a number of different reasons. First, non-standard calculations were used for this study; replies to questions in the form of one-word utterances were calculated into the final MLU-m, which probably lowered the overall numbers. There were also a limited number of opportunities to communicate freely during the video collection; the book reading situations provided fewer opportunities for spontaneous language as compared to the free-play contexts on which the Leadholm and Miller norms were based. Another possible contributing factor is that all books used in the study were unfamiliar to the children. One parent of a TD child reported that her child might have communicated more if he was familiar with the story. A parent of a child with ASD made the same comment.

Based on the graph displayed in Figure 2, parents of children with ASD appeared to communicate with a slightly lower MLU-m during book reading, as compared to parents with TD children. This lower MLU-m may be a result of the parents attempting to meet their child's language needs. Children with more severe forms of ASD tend to have lower language skills; the parents of children with ASD may have been using less complex language to stay within their child's language abilities.
Figure 2. Mean MLU-m in morphemes

<table>
<thead>
<tr>
<th></th>
<th>Fathers</th>
<th>Mothers</th>
<th>Parents</th>
<th>Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD</td>
<td>4.89</td>
<td>5.87</td>
<td>5.38</td>
<td>2.31</td>
</tr>
<tr>
<td>ASD</td>
<td>3.84</td>
<td>3.47</td>
<td>3.66</td>
<td>1.76</td>
</tr>
</tbody>
</table>

Pragmatic Language

During joint book reading interactions, many parents ask their children questions, request actions (i.e., pointing to pictures, turning pages, etc.), and make comments. A child is expected to respond to these requests and questions. The child is also encouraged to ask questions about the book and make comments when appropriate. This type of language use during storybook reading would fall under the category of pragmatics.

After analyzing the data collected during this study, the researcher found no significant differences between the ASD and TD groups in terms of questions, requests, and comments made by the parents. Both groups of parents asked questions, made requests, and made comments about the book. However, the children's responsiveness to questions, requests, and comments differed between groups. The TD children responded to their parents more often than did the children with ASD. With repetition or cues, the children with ASD continued to struggle to answer questions or follow through with requests.

Figure 3 displays the mean percentage of child responses to a parent's questions and
requests. The TD children responded to 56% of their parents’ questions and requests whereas the children with ASD responded to 22%. The child identified as ASD-2 responded to approximately 67.5% of his parents’ questions and requests. His percentages were a lot higher than the other two children with ASD. When this child is taken out of the mean, the ASD mean drops to 7%. Both correct and incorrect responses were counted as responses during video analysis. If a child did not respond to his or her parent's bid, that instance was not counted as a response.

**Figure 3.** Mean percentage of child responses

*Ranges: TD Children (23 – 64%), ASD Children (0 – 68%)*

Sometimes parents need to redirect their children to the activity at hand, such as book reading. In this study, the parents of TD children rarely redirected their children during the story book reading interactions. The TD children were able to focus on the book without requiring much prompting from their parents to do so. This is consistent with the level of joint attention TD children were able to maintain. Redirections were primarily used by parents of children with ASD, which is expected since joint attention was less successful for this participant group. See
Table 6 and Figure 4 for a visual representation of the number of redirections produced by each group of parents.

**Table 6.** Mean percentage of redirections

<table>
<thead>
<tr>
<th>Participant Group</th>
<th>Typically Developing (TD)</th>
<th>Autism Spectrum Disorders (ASD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fathers</td>
<td>3.2% (0 – 5.2%)</td>
<td>12.6% (6 – 19%)</td>
</tr>
<tr>
<td>Mothers</td>
<td>2.8% (0 – 3.1%)</td>
<td>9.4% (8 – 10%)</td>
</tr>
<tr>
<td>Fathers + Mothers</td>
<td>3.0% (0 – 5.2%)</td>
<td>11.2% (6 – 19%)</td>
</tr>
</tbody>
</table>

**Figure 4.** Mean percentage of redirections

In addition, the parents and their children with ASD occasionally produced utterances that were completely unrelated to the text. For example, one parent-child dyad in the ASD participant group discussed tickling and squeezing. The parents later explained that their child needed sensory stimulation. Another child with ASD was repeating songs and rhymes during the book reading interaction, which appeared to serve a rote or routine language function. Table 7
and Figure 5 display the percentage of unrelated utterances used by both participant groups during the book reading interactions. Redirections were included as unrelated utterances, as the redirections did not relate to the story presented in the book. The unrelated utterances and redirections rarely occurred in the TD participant group. The TD children and their parents primarily produced utterances that related to the book.

Table 7. Mean percentage of unrelated utterances

<table>
<thead>
<tr>
<th>Participant Group</th>
<th>Typically Developing (TD)</th>
<th>Autism Spectrum Disorders (ASD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fathers</td>
<td>2.4% (0 – 5.6 %)</td>
<td>17.3% (4 – 27 %)</td>
</tr>
<tr>
<td>Mothers</td>
<td>0.7 % (0 – 0.9 %)</td>
<td>8.1 % (3 – 13 %)</td>
</tr>
<tr>
<td>Fathers + Mothers</td>
<td>1.4 % (0 – 5.6%)</td>
<td>13.4 % (3 – 27%)</td>
</tr>
<tr>
<td>Children</td>
<td>1.8% (0 – 6.6 %),</td>
<td>20.5% (0 – 44 %)</td>
</tr>
</tbody>
</table>

Figure 5. Percentage of unrelated utterances
Text Alterations

Sometimes it is necessary to alter the text of a storybook to make the words or story line more understandable for a child. Parents may change the text to make the story shorter, more interesting, or to hold the child's attention. A parent may alter the text without changing the actual story presented in the book, or a parent may ignore the text and develop a completely new story line using the pictures of the book. During video analysis, the researcher collected data on the number of words repeated, added, deleted, or substituted from the text of each story.

The parents of TD children rarely changed the text of the story and completely read all pages of the books. These parents tended to read the story word for word. The parents of children with ASD deleted more words from the text than did the parents of TD children. There were no differences between groups in regards to text repetitions, additions, and substitutions. None of the parents ignored the text completely and all parents followed the storyline presented in the book.

Table 8 and Figure 6 show the percentage of words deleted from the text across participant groups. Multiple text deletions were present across all parent-child storybook interactions in the ASD group. These text deletions were intentional, while the few text deletions in the TD group were likely accidental (i.e., "has not" changed to "hasn't" or "I will" changed to "I'll"). Three parents of children with ASD purposely skipped multiple pages in the books, which increased the number of words deleted from the text in the ASD group.
Table 8. Percentage of words deleted from text across participants

<table>
<thead>
<tr>
<th></th>
<th>Fathers</th>
<th>Mothers</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD – 1</td>
<td>0 %</td>
<td>0.34 %</td>
</tr>
<tr>
<td>TD – 2</td>
<td>0.10 %</td>
<td>0.17 %</td>
</tr>
<tr>
<td>TD – 3</td>
<td>0</td>
<td>0.10 %</td>
</tr>
<tr>
<td>TD Total</td>
<td>0.033 %</td>
<td>0.203 %</td>
</tr>
<tr>
<td>ASD – 1</td>
<td>1.20 %</td>
<td>1.37 %</td>
</tr>
<tr>
<td>ASD – 2</td>
<td>1.41 %</td>
<td>6.40 %</td>
</tr>
<tr>
<td>ASD – 3</td>
<td>53.0 %</td>
<td>59.4 %</td>
</tr>
<tr>
<td>ASD Total</td>
<td>18.54 %</td>
<td>22.39 %</td>
</tr>
</tbody>
</table>

Figure 6. Percentage of words deleted from text
Book reading experiences are an important part of a child's language and social development. Book reading is also a common experience in a child's everyday life during the preschool years. Many preschool classes have an allotted time period for storybooks and group reading. If a child is fully engaged while reading a book, he or she will have the opportunity to learn a wealth of new information. It is difficult to obtain new information and adequately socialize with others during book reading activities when the child is not engaged. This is a risk for children with ASD since many of these children struggle to maintain joint attention (Dawson et al., 2004; Mundy, Neal, & Glidden, 2001; Swettenham et al., 1998).

This study presented some differences between the two participant groups. Quantitatively, the researcher was able to show differences between groups in terms of MLU-m, joint attention, unrelated utterances, text alterations, and the children’s responses to requests. This study did not lend itself to statistical analysis. However, the magnitude of differences on the measures collected support the conclusion that these were indeed genuine differences. A study with a larger participant pool and the ability to do analysis of variance or other statistical measures would be important to conduct to validate these findings. Follow-up studies in the future should seek to verify the findings of this study through the use of statistical significance.

Mean Length of Utterance

As stated in the results, the parents of children with ASD produced a lower MLU-m as compared to the parents of TD children. The discrepancy was even greater between the two groups of mothers. The mothers of children with ASD produced a much lower MLU-m than the mothers of TD children. A study by Blake, Macdonald, Bayrami, Agosta, and Milian (2006) revealed that parents of typically developing children altered their utterances during storybook
reading based on their child’s age. Children with ASD frequently have language skills below the levels of their age-matched peers. For this specific study, it is possible that the parents of children with ASD attempted to communicate with less complex language based on their children’s perceived language abilities. The parents may have been matching their child’s “language age” with hopes of increasing the child's overall comprehension during conversation. The MLU-m of parents with ASD might also be lower because they were trying to simply their language since the language used in the book is more complex.

**Joint Attention**

As mentioned earlier, joint attention is difficult for children with ASD and this was evident while collecting data throughout the study. The reason for this difficulty with joint attention is currently unknown, but it may be due to a variety of issues including deficits in auditory processing, cognition, or an overall lack of interest in the activity. The children with ASD responded to fewer bids for joint attention and were also less successful at eliciting attention of their parents. In addition, many of the children with ASD produced utterances that were unrelated to the story. Their parents may not have responded to the unrelated utterances in hopes of shifting the child's attention back to the book. Studies have shown that it is possible to teach joint attention skills to children with ASD (Isaksen & Holth, 2009; Kasari, Freeman, & Paparella, 2006; Patten & Watson, 2011). It would be interesting to see how these teaching mechanisms work when incorporated during shared book reading activities.

Dialogic reading has been found to increase preschool children's expressive language and emergent literacy skills. However, children with ASD may need their parents or teachers to do more than just dialogic reading to truly benefit from reading activities. These children may require a mixture of dialogic reading and joint attention intervention during book reading to
adequately attend and learn.

Parent Report

Following the book reading experience, the researcher discussed the book reading interaction with the parents and explained the main objectives of the study. When the researcher asked if this was a typical book reading experience, almost all parents stated that it was indeed typical. However, some parents stated that their child may have talked more if the book was familiar as all books used in this study were unfamiliar to the families. One parent stated that her TD son would have answered more questions and would have attempted to independently tell the story if they were reading a familiar book. She reported that her son usually sits back and "takes it all in" when they read a new book together. A parent of a child with ASD said that her child attends more when they read a familiar book. Her child will point out pictures, read portions of the story from memory, and look at the pictures more intently when the book is familiar. Another parent of a child with ASD reported that he was surprised his child agreed to sit through the book reading interaction; his child rarely liked to be read to and tended to enjoy reading books independently. With that said, some of the data collected from this study may not be representative of the families' everyday parent-child book reading experiences. However, it would be interesting to further this study by analyzing if the data changes in any way across participant groups when familiar versus unfamiliar books are read to the children.

Following the Child's Lead

"Following the child's lead" is a strategy that is taught to many parents of children with ASD. The thought is that following the child's lead will increase joint attention and socialization because the parent is incorporating the child's interests. The researcher observed many of the parents of children with ASD using this strategy. For example, in one parent-child dyad, the
mother would allow the child to turn the pages, even if the page had not yet been completely read. The mother would respond to the child's action (i.e., "Oh, you want to turn the page already?") and then discussed the picture displayed on the new page. Another set of parents of a child with ASD used expansions (i.e., Child: "Vacuuming.", Father: "Yeah, he's vacuuming the dirt.") and extensions (i.e., Child: "It's happy.", Father: "He's sad. He's locked up.") to follow their child's lead. This set of parents may have received training in this technique as they had been bringing their son to a university clinic for speech and language services.

The act of following a child's lead may be a good way to elicit joint attention and social interaction, but it has the risk of decreasing the amount of information a child learns, especially during book reading activities. For example, if a parent continuously skips pages in a book because the child turns the page, that child will miss the language used on those pages. The child will also miss the aspects of the story presented on those pages as well as the pictures which could be discussed or described by the parent. However, if a parent forces his or her child to listen to every page of a book, the act of book reading may become a negative experience for the child. The child may learn that book reading is a situation in which he or she has no control; the child learns that it is an experience that is lengthy and tiresome. To prevent this learned negative view towards books, a parent may choose to read shorter, simpler books. However, in this case, the child is read a book below his or her age level and is again missing out on learning more complex language, vocabulary, and story grammar.

Directions for Future Research

While the group differences in this study cannot be generalized owing to the small-n nature of the work, they are nonetheless quite suggestive due to the magnitude of the differences observed and the consistent patterns between participants with ASD and children with typical
development. No definite answers can be proposed when considering the small number of participants involved in this study. However, this study poses additional research questions that may be of interest for future studies:

- How should professionals counsel parents if their child with ASD is experiencing difficulty attending to parent-child book reading? What types of books should parents choose for their children with ASD if joint attention and overall interest are primary issues? Should parents continue choosing age-appropriate books or books that are shorter and simpler?

- Can book reading be implemented as a type of language or joint attention intervention for children with ASD? Which techniques increase the likelihood of joint attention and successful book reading experiences? Can parents be taught to use these techniques during book reading interactions at home?

- How would the data change if specific factors of the study were altered? How would the data change if shorter books were used? Would there be a significant difference if the parents read familiar books instead of unfamiliar books? Would the ability to maintain joint attention change if parents responded to all of their children's utterances and actions, despite whether or not each was related to the text?

In summary, differences were found between the ASD and TD participant groups during book reading experiences. Differences were seen in terms of the language use and engagement characteristics of the children and parents. These differences are important to consider when investigating the best types of interventions to promote language development using books, especially in regards to children with ASD. These differences are also important when counseling parents of children with ASD about shared book reading, joint attention, and literacy.
development.

As previously stated, much the literature concerning parent-child book reading and techniques to encourage language and literacy development during book reading (i.e., dialogic book reading) is based on interactions between typically developing children and their parents. With this in mind, the book reading techniques suggested in the literature may not be applicable to children with ASD due to their difficulties with joint attention. This study is a step toward finding the answers needed to develop effective book reading techniques and recommendations for parents of children with ASD. With future research, parents of children with ASD may be able to engage in more successful book reading experiences with their child while also promoting language and social development.
References


Early Childhood Special Education, 16, 213-235


APPENDIX A. Scripts for Participant Recruitment

A Language Analysis of Parent-Child Storybook Reading with Typically Developing Preschoolers and Preschoolers with ASD
Ciera Hiipakka & Lynne Hewitt, Investigators

Script for Supervisor Involvement

Hi. I’m working on my Master’s thesis with Dr. Hewitt, and we are looking to locate preschool children with and without ASD for a storybook reading study, titled “A Language Analysis of Parent-Child Storybook Reading with Typically Developing Preschoolers and Preschoolers with ASD.” I have some consent forms explaining about the study, and we are asking if you have any suitable clients if you could pass them along. Below is a script you can use to talk to them. Thank you for your help! (NOTE: All clinical supervisors are very familiar with Ciera so introducing herself is not necessary.)

Script for Participant Recruitment for Supervisor Use

To be provided to BGSU clinical supervisors for communicating with their former or current clients with autism in order to obtain consent for participation in the study listed above:

SCRIPT (for in-person use—modified as needed if used via telephone):

Hi NAME OF CLIENT. I’ve been asked to let you know about a study that is currently being conducted in the Communication Sciences and Disorders department at Bowling Green State University. One of our master’s students, Ciera Hiipakka, is working on a thesis concerning language use during parent-child book reading activities. Ciera is looking to recruit children with autism and also children without autism, between the ages of 3 and 5 years.

This study would only require one hour of your family's time. Ciera is asking to videotape you and your spouse as you read a children's book to your child. This form has all the information you need, and if you are interested, you can contact Ciera directly, or Dr. Hewitt, for further information and to get any questions answered. Thanks for considering it!
A Language Analysis of Parent-Child Storybook Reading with Typically Developing Preschoolers and Preschoolers with ASD

Ciera Hiipakka & Lynne Hewitt, Investigators

To be provided to Dr. Maggie Watson and Dr. Pamela Terrell for communicating with their former research participants, in order to obtain consent for the videos previously collected to be used at BGSU:

SCRIPT:

Hello. I'm calling to let you know that we are interested in continuing our work on book reading with young children. Our former student, Ciera Hiipakka, has graduated and is now studying speech-language pathology at Bowling Green State University in Ohio. Ciera worked with us on our video project while she was a senior here at Stevens Point. She wants to continue on this project for a master's thesis at Bowling Green, and she is asking for your permission to have copies of your child’s video for her study. Would you be possibly willing to let her continue our work by doing some further analysis of the video we took of you?

1. (IF NO). Thanks for your time. We appreciate all your help with this project in the past.
2. (IF MAYBE). Thanks for your interest in helping us. I have some information I can send you about how the videos would be used and stored. Once you look that over, please let us know if you have any questions. Ciera will be happy to give you the details. Then you can let us know what you decide.
3. (IF YES). Thanks so much for being willing to help out. I have some information I can send you about how the videos would be used and stored. Once you look that over, please let us know if you have any questions. Ciera will be happy to give you the details.
APPENDIX B. Informed Consent Forms

Informed Consent Form for Parents

A Language Analysis of Parent-Child Storybook Reading with Typically Developing Preschoolers and Preschoolers with ASD

Who is doing this study?
Ciera Hiipakka and Dr. Lynne Hewitt are studying the language use of parents as they read to their children. This study is being conducted at Bowling Green State University in Bowling Green, Ohio.

What is the study about?
The researchers are interested in viewing videos of families and analyzing the language used during book reading interactions. We are comparing book reading experiences of children who have and who do not have autism spectrum disorders. We are interested in this topic because book reading helps young children’s language development. Our goal is to add what we know about book reading and language development in autism, so that we can provide better assistance to families and help foster their children’s language development.

What happens in the study?
You and your child were selected to participate in this study because he or she is between the ages of 3- and 5-years old, and either has autism or has typical development. We are requesting that both parents take part in the study. The study can take place at your home or in the BGSU Speech and Hearing Clinic, whichever is most convenient for you. Due to ethical standards, if the video is collected in your home and a researcher sees any evidence of child abuse/neglect, the researcher will be required to report this information to authorities.

If you agree to participate, you will each be asked to complete a 10-15 minute questionnaire. If your child is a client in the BGSU Speech and Hearing Clinic, we will also ask you to sign a release of information for us to be able look at your child’s speech and language records. After that, you and your spouse will be videotaped as you each read a book to your child. It is anticipated that each session of book reading will take approximately 15 minutes, with a 5 minute break in between. In the event that these activities are stressful for your child or if he or she loses interest, the session will be ended. The researchers will later transcribe and analyze the language and communication in the videos.

How long will it take?
Your time will be about one hour total or less. The study itself is expected to be finalized within a year. Your family is not required to put in any additional time after the initial one hour of paperwork and video samples.

Are there any risks?
We know of no risks to you or your child from participation in this study.

Can I get the results of the study?
We are happy to share the results of the study if you are interested. A summary of the results (without any identifying information) will be sent to your home if you so desire.

Is this study required?
Taking part in this study is completely voluntary. If you choose to participate in this study, you are free to terminate your family’s involvement at any time. Your withdrawal from the study will not affect your current or future relations with Bowling Green State University or the BGSU Speech & Hearing Clinic. Any information collected about you or your child to date will be destroyed if you decide to terminate your family’s participation.

What do people in the study get for taking part?
We are thankful for your family's help, but there are no prizes or rewards for participation.
Who gets to see my child's information?
The records and data of this study will be kept completely confidential throughout the entire process. No individual will be identified in any reports or publications. All research records (consent forms, videos, data collection forms, and results) will be locked in a private office in the Bowling Green State University Speech and Hearing Clinic. The videotapes and data collection forms will not be labeled with your or your child's real name.

The only people who will view this confidential information are the following:
- Ciera Hiipakka and Dr. Lynne Hewitt
- One or more students in speech-language pathology (to check for consistency in data collection)

If you wish, you may give permission for the videos also to be used for educational purposes. Professors frequently use videos in their classes to help students learn about how children behave. If you agree, there is a possibility that your family's video, which would contain recognizable footage of you and your child, will be shown to students and speech-language pathologists who would like to learn more about book reading and/or autism. Your video will not be used for this purpose unless you give separate permission in the space provided below:

It is OK with me if my child's videotape is shown to students and speech-language pathologists who want to learn about book reading and/or autism. If you circle yes, it is possible that some students will recognize you and/or your son/daughter based on physical appearance.
CIRCLE ONE:   YES   NO

Who can answer questions about this study?
If you have any questions, you may contact Dr. Lynne Hewitt (419)372-6031 (e-mail: lhewitt@bgsu.edu) or Ciera Hiipakka (715)773-0785 (e-mail: cierah@bgsu.edu). You may also contact the Chair, Human Subjects Review Board, Bowling Green State University, (419) 372-7716, (e-mail: hsrb@bgsu.edu), if you have any concerns or questions about you or your child's rights as a research participant.

What does it mean to sign this form?
If you sign below, you acknowledge you have read this entire letter. All of your questions have been answered, you are aware of your responsibilities, and you agree that your family will participate in this study. You will be given a copy of this form.

<table>
<thead>
<tr>
<th>Printed Name of Parent/Guardian</th>
<th>Signed Name of Parent/Guardian</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Principal Researcher:</th>
<th>Ciera M. Hiipakka, B.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-researcher:</td>
<td>Lynne E. Hewitt, Ph.D., CCC – SLP</td>
</tr>
<tr>
<td>Department of Communication Sciences and Disorders, Bowling Green State University</td>
<td></td>
</tr>
</tbody>
</table>
Informed Consent Form for Parents

A Language Analysis of Parent-Child Storybook Reading with Typically Developing Preschoolers and Preschoolers with ASD

Who is doing this study?
We are researchers at Bowling Green State University in Bowling Green, Ohio. We are studying the language use of parents as they read to their typically developing children or children with autism. Our names are Ciera Hiipakka and Dr. Lynne Hewitt. I, Ciera Hiipakka, received my bachelor's degree from the University of Wisconsin – Stevens Point in May of 2009; I am currently attending Bowling Green State University for a master's degree in Speech-Language Pathology. For this particular study, we are working in collaboration with Dr. Pam Terrell and Dr. Maggie Watson from the University of Wisconsin – Stevens Point.

What is the study about?
Last year, you were involved in a book reading study through the University of Wisconsin – Stevens Point. We are interested in furthering this study by viewing the videos of your family and analyzing the language used during the book reading interactions. Book reading has been found to be an important contributor to a young child's language development. Our hope is to increase our understanding of book reading and language development.

What happens in the study?
If your family decides to take part in this study, we will re-analyze the videos you previously made at Stevens Point here at Bowling Green State University, in Dr. Hewitt’s lab. We will make written transcripts of the language used in the videos so we can look at types of words used and other measures of language. We will not write down any identifying information about you or your child (such as names or places) in our transcripts. We will store the videos in a locked room to which only Dr. Hewitt and her assistants have access.

Can I get the results of the study?
We are happy to share the results of the study if you are interested.

How long will it take and where will it be?
The entire study is expected to be finalized within a year and a half. Your family is not required to put in any additional time. We will simply be analyzing the videos here in Bowling Green, Ohio.

Are there any risks?
Participation in this study involves no risk to you or your child.

Is this study required?
Taking part in this study is completely voluntary. If you choose to take part, you are free to end your family's participation at any time. Your withdrawal from the study will not affect your current or future relations with the University of Wisconsin - Stevens Point or Bowling Green State University. Any information collected about you or your child to date will be destroyed.

What do people in the study get for taking part?
We are thankful for your family's help, but there are no prizes or rewards for participation.
Who gets to see my child's information?
The records and data of this study will be kept confidential throughout the entire process. No individual will be identified in any reports or publications. All research records (consent forms, videos, data collection forms, and results) will be locked in a private office in the Bowling Green State University Speech and Hearing Clinic. The videotapes and data collection forms will not be labeled with your or your child's real name.

The only people who will view this confidential information are the following:
- Ciera Hiipakka and Dr. Lynne Hewitt
- One or two speech-language pathology graduate student (to check for consistency in data collection)

Who can answer questions about this study?
If you have any questions, you may contact Lynne Hewitt (419)372-6031 (E-mail: lhewitt@bgsu.edu). You may also contact the Chair, Human Subjects Review Board, Bowling Green State University, (419) 372-7716, (E-mail: hsrb@bgsu.edu), if you have any problems or questions about you or your child's rights as a research participant.

What does it mean to sign this form?
If you sign below, it means that you have read this entire letter. You have had all your questions answered, you are aware of your responsibilities and you agree that your family will participate in this study. You will be given a copy of this form.

<table>
<thead>
<tr>
<th>Printed Name of Parent/Guardian</th>
<th>Signed Name of Parent/Guardian</th>
<th>Date</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td></td>
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<thead>
<tr>
<th>Printed Name of Parent/Guardian</th>
<th>Signed Name of Parent/Guardian</th>
<th>Date</th>
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</tbody>
</table>

Principal Researcher: Ciera M. Hiipakka, B.S.
Department of Communication Sciences and Disorders, Bowling Green State University

Co-researcher: Lynne E. Hewitt, Ph.D., CCC - SLP
Department of Communication Sciences and Disorders, Bowling Green State University
APPENDIX C. Case History

**Case History Form**

**Child's Date of Birth:** ___________________

(To be filled in by researcher.)

**Participant Number:** ___________________

**Social History:**

Family members living in the home (e.g., mother father children, ages and genders, others):
_____________________________________________________________________________________

Are any languages other than English spoken in your home? ____YES   _____ NO

If yes, please provide details: ___________________________________________________________

How often and for what length of time has your child attended daycare?________________________
____________________________________________________________________________________

How often and for what length of time has your child attended preschool?______________________
_____________________________________________________________________________________

Mother’s education: How many years of education? (Please circle)

Some high school       Graduated High School       Some college
Graduated college  Some graduate work   Completed graduate degree

Mother’s occupation: ____________________________

Father’s education : How many years of education? (Please circle)

Some high school       Graduated High School       Some college
Graduated college   Some graduate work   Completed graduate degree

Father’s occupation: ____________________________

**Developmental History:**

Does your child have any history of speech/language difficulties or delays? ______yes       _____no

If yes, please explain:_______________________________________________________________

Describe concerns you have about child’s development, if any:
                                                                                             
___________________________________________________________________________________

Has your child ever received speech-language therapy or other therapy for a developmental problem?   
_____YES       _____NO

If yes, please provide details: ___________________________________________________________

If your child has been diagnosed with a developmental problem, such as autism or a related disorder, please also provide the following information:

Child’s age at time of diagnosis: _____________________________

Who did the diagnosis (e.g., family physician; developmental pediatrician; psychiatrist; speech language pathologist; neuropsychologist…)?

___________________________________________________________________________________

What diagnosis was given (e.g., autism; autism spectrum; PDDNOS; Asperger syndrome…)?

___________________________________________________________________________________

If you know what assessment your child received, please list it here (e.g., ADOS, ADI-R):

___________________________________________________________________________________
### APPENDIX D. Raw Data

<table>
<thead>
<tr>
<th>Time Reading</th>
<th>Total Utts</th>
<th>% Intell. Utts.</th>
<th>All/Ask</th>
<th>Comment</th>
<th>Echolalia</th>
<th>Expansion</th>
<th>Extension</th>
<th>Redirect</th>
<th>Res-Act</th>
<th>Res Info</th>
<th>Res Old</th>
<th>VN Q</th>
<th>Res 2Q</th>
<th>% Utts elic.</th>
<th>Total Questions/Req</th>
<th>Uncorr.</th>
<th>% Utts elic.</th>
<th>Tgt Del%</th>
<th>Tgt Add%</th>
<th>Tgt Sub%</th>
<th>Tgt Rep%</th>
</tr>
</thead>
<tbody>
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<td>73</td>
<td>4.76</td>
<td>29</td>
<td>1</td>
<td>40</td>
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<td>0</td>
<td>11</td>
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<td>96</td>
<td>0</td>
<td>0.21</td>
<td>0.55</td>
<td>0</td>
</tr>
<tr>
<td>TD - 1 C with Mother</td>
<td>6:19</td>
<td>21</td>
<td>1.94</td>
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<td>7</td>
<td>4</td>
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<td>0</td>
<td>0</td>
<td>100</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>TD - 1 Mother</td>
<td>6:42</td>
<td>61</td>
<td>5.89</td>
<td>100</td>
<td>8</td>
<td>22</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>15</td>
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<td>38</td>
<td>0</td>
<td>89</td>
<td>0.34</td>
<td>0.68</td>
</tr>
<tr>
<td>TD - 1 C with Mother</td>
<td>6:42</td>
<td>19</td>
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APPENDIX E. Human Subjects Review Board (HSRB) Approval

November 4, 2009

TO: Ciera Hiipakka
CDIS

FROM: Hillary Harms, Ph.D.
HSRB Administrator

RE: Human Subjects Review Board Project No.: H10T114GE7

TITLE: A Language Analysis of Parent-Child Storybook Reading with Typically Developing Preschoolers and Preschoolers with ASD

The BGSU Human Subjects Review Board (HSRB) has completed its review of your project involving research with human subjects.

Your project has been approved as submitted. This approval is effective November 3, 2009 and expires on November 2, 2010. You may begin subject recruitment and data collection.

The approved version of the consent document(s) is attached. Consistent with federal OHRP guidance to IRBs, the consent document(s) bearing the HSRB approval/expiration date stamp is the only valid version and copies of the dated document(s) must be used in obtaining consent from research subjects.

You are authorized to use human subjects for 12 months, but only in the manner described in your proposal. If you seek to make any changes in your project activities or procedures (including increases in the number of participants), those changes must be approved by the HSRB prior to their implementation. If any anticipated adverse reactions develop during the course of your project, you must temporarily suspend your research and notify the Chair of the HSRB.

Please notify the Board in writing (fax: 372-6916 or e-mail: hsr@bgusa.edu) when you have completed your project. If you have any questions, please contact the Chair of the HSRB or me at 372-7716. Good luck with your research project.

COMMENTS:
Stamped original consent form is coming to Ciera via campus mail.

C: Dr. Lynne E. Hewitt

RESEARCH CATEGORY: EXPEDITED 47