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Shared Book Reading Experiences for Young Children Who Use Augmentative and Alternative Communication (Aac) Systems

Braelyn Nicole Wence
Illinois State University, braelynnicole@hotmail.com

SHARED BOOK READING EXPERIENCES FOR YOUNG CHILDREN WHO USE AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC) SYSTEMS

BRAELYN N. WENCE

66 Pages

Shared book reading is an evidence-based interactive literacy activity that promotes development of oral language and emergent literacy skills in young children; however, literature regarding best practices for parents of children with developmental disabilities under the age of five years, specifically those with complex communication needs, is severely limited. In this descriptive study, the parent and child behaviors of five families with children between 35-48 months who use augmentative and alternative communication (AAC) systems were coded and analyzed during parent-child shared book reading interactions. Three families had previous training on AAC use during shared book reading; two families did not have previous training and did not use their child's AAC system during typical shared book reading interactions at home. Thus, shared book reading without AAC was considered "typical" for these two families, and behaviors were compared across two conditions: shared book reading without AAC versus with AAC. Data showed parents used a variety of shared book reading strategies with an increase in strategies when AAC was present, children relied on multimodal means of communication during shared book reading, and the use of shared book reading strategies and AAC increased the duration of literacy activities. Directions for future research and the implications of the study are discussed.

KEYWORDS*:* augmentative and alternative communication (AAC), emergent literacy, families, literacy, multimodal communication, parents, parent-child interaction, preschoolers, reading, toddlers

SHARED BOOK READING EXPERIENCES FOR YOUNG CHILDREN WHO USE AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC) SYSTEMS

BRAELYN N. WENCE

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BRAELYN N. WENCE

COMMITTEE MEMBERS:

Ciera Lorio, Chair

Heidi Harbers

Tricia Larkin

Amy Yacucci

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CHAPTER I: INTRODUCTION

Shared book reading is a home- and therapeutic-based approach involving an adult reading a book to a child and utilizing a variety of methods to keep the child engaged (Pollard-Durodola et al., 2011). The process of shared book reading promotes further development in language and literacy as well as cognitive and social-emotional domains. More specifically, research shows shared book reading interactions have positive effects on receptive and expressive language, phonemic and phonological awareness, understanding of print, and understanding of emotional situations (Aram & Shapira, 2012; Blewitt et al., 2009; Pullen & Justice, 2003; U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse, Early Childhood Education, 2015).

Oral language and code-related skills (i.e., understanding of print, letter-sound knowledge) in the early years contributes to later school readiness, specifically in the areas of decoding and reading comprehension (Mol et al., 2009; Storch & Whitehurst, 2002). During shared book reading, parents have multiple opportunities to build a child's oral language and code-related skills. For example, parents and children can engage in conversational exchanges during shared book reading, and parents can expand upon the child's current expressive language abilities; these expansions allow for the child to auditorily receive semantically- and syntactically-rich language models (Rezzonico et al., 2015). Pullen and Justice (2003) concluded that prekindergarten exposure and performance on the semantic (vocabulary) and syntactic (grammar) domains of language account for a significant variation in later reading ability; thus, increased understanding of vocabulary and grammar in the younger ages correlates with stronger literacy skills in early elementary years and beyond. Furthermore, understanding of print is established during shared book reading by giving the child exposure to the conventions of print

that build early literacy skills, such as following text from left to right and top to bottom as well as turning the pages in the correct manner (Conrad, 2008; Treiman et al., 2016). Finally, shared book reading can begin to facilitate phonological awareness (i.e., word awareness, syllable awareness, rhyme, etc.) in preschool-age children. Phonological awareness is a robust predictor of early reading achievement, as it supports the development of decoding skills (Pullen & Justice, 2003). In addition to readiness for academic areas, shared book reading facilitates readiness for social situations through the transference of emotions depicted by book characters and the emotional connection built between the adult and child during shared book reading experiences. Shared book reading can provide the child with information and behavioral norms for social situations, which will allow for the enhancement of pragmatic language skills (Aram & Shapira, 2012).

Shared Book Reading Strategies

Shared book reading interventions are developed on the basis of Vygotskian principle, which implies that the progression of language and cognitive skills for children is highly-correlated to contingent, structured interactions with caregivers that focus on the child's interests and enhancement of the child's experience in their environment (Dowdall et al., 2020). Whitehurst (1992) used this principle to develop a method of shared book reading called dialogic reading. Dialogic reading is different from simply reading to a child in that there is an increase in interactive quality as well as the use of evocative behaviors, including the use of questions beyond and around the context of the book and positive reinforcement and encouragement of the child's participation (Dowdall et al., 2020). Examples of caregiver prompts used to support child oral language practice during dialogic reading include (a) completion prompts, (b) recall prompts, (c) open-ended prompts, (d) wh-prompts, and (e) distancing prompts. These strategies

can be summarized by the mnemonic CROWD and are used to actively involve the child in reading books with caregivers (Whitehurst, 1992; Zevenbergen & Whitehurst, 2003). During dialogic reading, parents also expand upon child utterances, exposing children to more complex vocabulary and syntactic structures (Whitehurst, 1992).

Dialogic reading slightly varies between age groups; however, the principle remains the same. For children between the ages of 2-3 years, caregivers are encouraged to ask the child completion questions to encourage filling in the blank, simple wh-questions (i.e., who, what, where) to provoke naming responses for referents in the pictures of the book, and open-ended questions about objects, attributes, and elements within the story (Fleury, 2015; Zevenbergen & Whitehurst, 2003). In contrast, to engage children ages 4-5 years, all CROWD prompts are used (Whitehurst, 1992; Zevenbergen & Whitehurst, 2003). Additionally, caregivers are encouraged to explicitly teach vocabulary during shared book reading regardless of the child's age to increase receptive and expressive vocabulary repertoire (Lorio & Woods, 2020; Roskos & Burstein, 2011). Evidence shows the progression of development in language and literacy for children is greatly attributed to the caregiver's competence in these strategies of dialogic shared book reading (Dowdall et al., 2020; Landry et al., 2012).

Shared Book Reading with Children that have Language Disorders

Although evidence of the benefits of shared book reading for language and literacy outcomes for typically developing children has been well-documented, less is known about shared book reading and its outcomes for children with language impairments (U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse, Early Childhood Education, 2015; U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse, Early Childhood Education Interventions for Children with Disabilities, 2010).

The amount of evidence for children below the age of three with language impairments is even more limited (Lorio et al., 2021).

Children with language delays, language impairments, and children with autism spectrum disorder (ASD) all show significant benefits from shared book reading interactions with parents (Crain-Thoreson & Dale, 1999; Crowe et al., 2004; Fleury et al., 2014). Crain-Thoreson and Dale (1999) conducted a study analyzing the changes in linguistic performance of children with language delays prior to and following an 8-week shared book reading intervention period on dialogic reading strategies for parents and staff members of a school. Following the intervention period, it was found that parents and staff members altered their shared book reading style to be consistent with the instruction they received on dialogic reading strategies. This addition of dialogic reading strategies into shared book reading interactions resulted in a higher frequency of verbal utterances, longer utterances, a production of more and different words, and greater participation from the children in the study. The changes in these linguistic components were greatly correlated to the changes in adult behavior and use of strategies; thus, the higher level of incorporation of dialogic reading strategies by parents and other adults was shown to enhance the semantic and syntactic oral language abilities of children with language delays.

Children with language impairments have demonstrated improvement in language and pragmatic behaviors as a result of interactive parent-child shared book reading (Crowe et al., 2004). Crowe and colleagues (2004) analyzed the results of an interactive reading routine, *Complete Reading Cycle* (CRC), on preschool children with language impairment. CRC focuses on four primary elements: (a) establishing joint attention, (b) eliciting a response, (c) providing a response, and (d) giving feedback by acknowledging, elaborating, or correcting a response. A total of 8-10 training sessions were implemented with three mothers over six weeks, resulting in

increased CRC technique use as well as reduction of mother utterance length and complexity to match the level of the children's language learning needs. Following the training sessions, the children showed increased active verbal and nonverbal communication, increased utterance length, and increased diversity of semantic vocabulary used. These findings suggest a collection of multiple strategies during parent-child shared book reading interactions facilitated growth of both oral language and the ability to participate in interactions with communication partners for children with language impairments.

It is believed that children with ASD are at risk of developing language disorders as well as experiencing difficulty with literacy-based activities due to the deficits that characterize ASD (Fleury et al., 2014). Fleury and Hugh (2018) conducted a descriptive study to analyze the shared book reading practices of 17 children with ASD and their caregivers as well as 20 typically developing children and their caregivers in nine shared book reading sessions. The purpose of the study was to identify factors that inhibit or promote engagement in shared book reading interactions for these two populations. The findings were consistent with previous studies in that children with ASD engaged in a greater amount of disruptive or unengaged behaviors, while their typically developing peers were passively engaged (i.e., looking at books, listening to reader) during shared book reading experiences. The use of a specific book type as well as the quality of adult reading facilitated greater enjoyment and attention to shared book reading for the children with ASD specifically. Children with ASD had greater difficulty interacting with their caregiver during fiction texts; in contrast, nonfiction books elicited more interaction. Subsequently, it was found that adults should intentionally support the active participation of preschoolers with ASD during shared book reading by utilizing dialogic reading strategies and preferred texts. Children with ASD and resulting language impairments demonstrated an increase

in passive engagement, more verbal participation, and a growth in vocabulary as a result of accommodations and the integration of strategies in shared book reading interactions with their caregivers.

Shared Book Reading with Children that Use AAC

Children with complex communication needs typically have extensive receptive and/or expressive language disorders, requiring AAC systems to support their communication needs. Many children that use AAC have limited exposure to literacy materials and high-quality literacy experiences (Kent-Walsh et al., 2010); thus, there is limited research on the use of AAC systems in literacy-based activities (Light et al., 1994). In contrast to shared book reading experiences for typically developing children and children with language impairments, patterns of participation were asymmetrical for parents versus children utilizing AAC systems during shared book reading (Light et al., 1994). Parents typically dominated the interaction and focused on the labeling of pictures rather than reading the story, asking questions, or relating the story to the child's utterances. The children did not frequently get the opportunity to ask questions, make comments, or turn pages like their typically developing peers, thus limiting their participation in literacy activities.

Despite this evidence, Chipinka (2016) found favorable results in the increase of the child's communicative turns, accuracy of responses to comprehension questions, comprehension of grammar within literacy contexts, and production of story retells for one child aged 12 years and nine months (12;9) during shared book reading experiences with the use of aided AAC modeling. Aided AAC modeling integrates the parental use of spoken language and simultaneous use of the AAC system to provide models on the system for the child. Prior to aided AAC modeling intervention training, Chipinka (2016) observed a lack of child

communication attempts using her speech-generating device (SGD), use of nonverbal gestures (i.e., pointing) to respond to parent questions, and no modeling on the SGD from the parent. Following training in aided AAC modeling intervention, the parent pointed to AAC symbols on the SGD as she read, commented, or asked questions and provided modeling opportunities for the child to be stimulated with rich language. Although this is an effective shared book reading method for parents and their children with AAC systems, limited research on the practice is still evident and being explored.

Oftentimes, children with complex communication needs requiring AAC systems have trouble building their expressive communication from single- to multi-word utterances utilizing their AAC systems. As in typical language development, children progress from 1-word to multi-word utterances; thus, this progression is paramount for the development of communication skills for children with complex communication needs as well (Binger et al., 2008). Binger and colleagues (2008) implemented a study to evaluate the use of aided AAC modeling in expanding the utterance length and symbol selection of children between the ages of 2;6 (30 months) and 7;11 (95 months) who use AAC systems in parent-child shared book reading interactions. Following a period of intervention teaching parents how to expand the child's selection to multi-symbol productions, it was found that children were successfully able to increase utterance length utilizing their SGDs; thus, their language development was linear to their typically developing peers. Again, the research on children that use AAC during shared book reading interactions is limited; however, from the few studies available in the literature, it is evident that the inclusion of AAC during parent-child shared book reading is beneficial to both the child's language development and their AAC use. With further research on this topic, the field can better

guide parents in strategies to use during shared book reading interactions with their child that uses AAC.

Purpose of the Current Study

The oral language, understanding of print, and phonological awareness skills obtained in shared book reading experiences are essential for a child to have a strong foundation for the development of reading and writing skills in the later academic years. This is especially true for children who are delayed in language or have complex communication needs. Despite this, there is evidence of limited literacy engagement for children with language impairments and even less for children utilizing AAC systems in shared book reading interactions (Light & Smith, 1993). The research on shared book reading with young children under five that use AAC is also limited. In fact, in a systematic review of shared book reading interventions with infants and toddlers, Lorio and colleagues (2021) found only one study that included children that used AAC. To expand this area of research on shared book reading and AAC, this descriptive study examined the parent and child behaviors observed during shared book reading with the inclusion of an AAC system. The literature summarized above primarily included children between the ages 42-60 months, so this study focused on a less researched group, including children 35-48 months. This age group was chosen not only due to the limited research on younger populations but also because this is an age range where emergent literacy development is crucial (Whitehurst & Lonigan, 1998). We expect the findings of this study will support clinical practice and inform future research on this topic.

The following research questions were explored in the current study:

1. What do shared book reading experiences look like for parents and their toddlers/preschoolers that use AAC?

a. What are the primary strategies used by parents?

b. What is the frequency of child initiations and responses?

c. What is the overall duration of the shared book reading experience?

CHAPTER II: METHODS

Participants

Participants were primarily recruited from a private practice in central Illinois, which employed specialists who were highly experienced in the use of speech generating devices (i.e., Saltillo, Tobii-Dynavox, etc.). Additional participants were recruited via AAC-specific groups/pages on the social media platform, Facebook. All children in the study had to meet the following eligibility criteria: (a) between 18 months (1;6) and 48 months (4;0); (b) qualified for and received training on an augmentative and alternative communication (AAC) system; (c) hearing and vision within functional limits or corrected to be within functional limits; and (d) has 50 spoken words or less. Parents in the study needed to be fluent in English, and they provided consent for their and their child's participation in the study. All recruitment efforts and data collection procedures were approved by the university's institutional review board (appendix D).

Five family dyads participated in the study. Each of the five families used and had previous training on AAC systems. All caregivers were female and the mother of the participating child. All were white/Caucasian and had at least some college experience, holding either an associate's or bachelor's degree. The mean age of the participating parents was 31.2 years (range = 24-40). The family dynamic varied in terms of parents and children; family units consisted of 1 single mother and 4 married mothers with fathers, and the number of children within the household ranged from one (the child in the study) to four. Annual income for the families had a vast range: one family with less than $20,000 per year, three families within the $40,000-$59,999 per year range, and one family with more than $100,000 per year.

In terms of the children, there were three females and two males, which included four of solely white/Caucasian descent and one of white/Caucasian and black/African American descent.

The first and only language of all the children was English. The mean age of the children was 41.4 months (range = 35-48). Three of the children were born full-term, while the other two were born 14-21 days prior to their due date. Three of the five children had diagnoses of deficits in vision (i.e., strabismus, CVI, etc.) or hearing (i.e., bilateral sensorineural mild/moderate hearing loss); however, all deficits were corrected with glasses or cochlear implants and were deemed by the parents to be functional for shared book reading activities. All children were receiving ongoing therapeutic services at the time of the shared book reading sessions, including speech, feeding/nutrition, occupational, physical, developmental, behavioral, and vision therapies. On the MacArthur-Bates Communicative Development Inventories (MB-CDI; Fenson et al., 2006), three parents reported their child having zero verbal words, one parent reported their child having three verbal words, and one parent reported their child having between 20-23 verbal words and beginning to string those words together to form phrases and sentences; thus, all the participants had less than 50 verbal words in their expressive repertoire. See Table 1 for additional demographic information separated by family.

Table 1

Additional Demographic Information for Each Family

Family	*Child Age in Months*	*Child Race*	*Number of Verbal Words*	*Time in Therapeutic Services*
A	40	White/Caucasian	3	2 years; 3 months
B	47	White/Caucasian	0	6 weeks
C	48	White/Caucasian	0	1 year; 2 months
D	35	White/Caucasian; Black/African American	20	1 year; 8 months
E	37	White/Caucasian	0	11 months

Setting and Materials

Data collection was conducted during shared book reading sessions, which were held in a comfortable environment of the family's choosing (i.e., home). The research team, including the principal investigator and an undergraduate research assistant, conducted all observations and video recordings of book reading sessions via Zoom, a video-conferencing platform. The research team observed and recorded the shared book reading sessions online from a secure research lab.

The children's books, *There are No Bears in This Bakery* by Julia Sarcone-Roach and *A Piglet Named Mercy* by Kate DiCamillo, served as the sole materials for the shared book reading sessions. These books were chosen because they were expected to increase the interest and engagement of the child during the shared book reading experiences. Each book presented with a low page count (36 and 32 pages, respectively) and followed a typical narrative structure, including colorful pictures, which could encourage parent-child discussions beyond the text. The books were published in 2019, which increased the probability that the families were unfamiliar with the book. The researcher chose books that were likely unfamiliar to the families to prevent instances of rote memorization of the book's contents as well as rehearsed shared book reading strategies. *There are No Bears in This Bakery* presented with an ATOS Book Level of 2.5 and 0.5 Accelerated Reader (AR) points, while *A Piglet Named Mercy* presented with an ATOS Book Level of 2.4 and 0.5 Accelerated Reader (AR) points. These levels indicated a complexity low enough to facilitate interest and understanding for the child, as well as a complexity high enough to offer language-rich shared book reading experiences between the parent and child. Each of the books were culturally responsive, indicating inclusivity for the cultural beliefs, ideas, and traditions of all participants in the study.

Procedures

Survey and Inventory

Informed consent was obtained from each family prior to participation in the study. Once the families consented to be participants, parents completed a survey regarding their family's home literacy practices and their child's AAC use. It included eight questions related to book reading and the child's response to print. The final portion of the survey was dedicated to gaining insight into the complex communication needs and typical AAC use within the home and daily routines. It consisted of seven questions regarding the type of AAC, length of time the AAC had been used, activities of daily living in which the AAC system was used, expressive vocabulary utilizing AAC, and their use of AAC in shared book reading interactions. See appendix A for the complete Qualtrics survey.

After completion of the survey, the research team sent each participating family a parent handout, a copy of the MB-CDI, and the two books for shared book reading sessions via mail. The parent handout explained directions for the completion of the MB-CDI and included a request to abstain from looking at the books prior to the shared book reading sessions to observe first exposure to literacy content. The MB-CDI was utilized to obtain an inventory of each participating child's spoken language repertoire. The completion of this inventory confirmed the child's eligibility status for the study by indicating if the child meets the requirement of 50 spoken words or less.

Video Collection

In the previously completed survey regarding home literacy and child AAC use, two families reported that although their child used AAC, the family did not include AAC in their typical shared book reading sessions. Based on this information, the researchers decided to

examine two different shared book reading videos for these families: (a) one video of the families engaging in shared book reading as they normally did, without AAC; and (b) another video of the family using the child's AAC system during shared book reading. All other families reported using AAC regularly during their typical shared book reading experiences; therefore, only videos of shared book reading sessions that included AAC were examined.

Video collection was conducted through Zoom. Each participating family was contacted to set up a shared book reading session that correlated with their availability. For families with videos of two shared book reading sessions, the second session was conducted 7-10 days following the first and different books were used during each session. The books used during shared book reading sessions were counterbalanced across participant dyads. A video collection checklist was utilized by researchers to ensure each shared book reading session was conducted in a similar manner. The checklist included specifics on researcher environment, directions for recording on Zoom, and information, questions, and instructions for the family. See appendix B for the Video Collection Checklist. Following video collection, families were allowed to keep the books they used during the book reading sessions.

Video Coding

All shared book reading videos were transported into The Observer XT by Noldus, which is video analysis software (Noldus Information Technology, 2010). The Observer XT was programmed with a specific coding scheme, including "state" and "point" behaviors that may be demonstrated by both the caregiver and child during shared book reading interactions. "State" behaviors could occur for an extended period of time and the length of the behavior was recorded, whereas "point" behaviors were only recorded for frequency, not duration. All behaviors were analyzed for the modality in which they were communicated (i.e., gestures,

verbally, using AAC, etc.). Definitions and examples of each "state" and "point" behavior can be found in the coding manual. See appendix C for a copy of the coding manual.

To confirm coding reliability, the first author provided training on the use of the coding manual to an independent observer. Training included side-by-side coding with the first author while reviewing one shared book reading video. Then, the independent observer practiced coding two videos independently, and met with the first author to receive feedback on their coding reliability. Finally, the independent observer coded three videos independently and achieved 80% reliability or higher across all three videos. No videos from the current study were used as practice videos during the training process. Once the independent observer was considered reliable, inter-observer reliability measures were conducted on at least 20% of the videos collected in the current study. Reliability measures resulted in a Cohen's kappa of 0.67, which suggests substantial agreement between raters (McHugh, 2012). The set of reliability videos were randomly selected by a researcher not involved in the coding process.

Data Analysis

Data from video coding included frequency of "state" and "point" behavior outcomes for parent and child as well as duration of the "state" behaviors. Descriptive statistics including frequency means and ranges and rate per minute of "point" behaviors were calculated for each behavioral outcome by modality type. Rate per minute of "point" behaviors was calculated by dividing the total number of each "point" behavior by the total length of the book reading session. These descriptive statistics were utilized to determine what shared book reading experiences look like for parents and their toddlers/preschoolers that use AAC as well as if there are differences evident between the two videos collected for the families that reportedly did not

use AAC during typical shared book reading experiences (shared book reading without AAC vs. shared book reading with AAC).

CHAPTER III: RESULTS

The primary goal of this study was to analyze shared book reading interactions of parents and toddlers/preschoolers that use AAC. Descriptive data was collected via a Qualtrics survey, the MB-CDI, and coding of "state" and "point" behaviors during video recorded shared book reading sessions. Overall, the data showed that yes/no questions, wh-questions, and models/comments dominated the parental side of the interaction in shared book reading sessions. Children more frequently used initiations rather than responses while reading with parents, and the overall duration of shared book reading sessions including AAC were much longer than those sessions that did not include AAC.

Survey Results

The parents reported on literacy experiences and AAC use in the Qualtrics survey. All AAC systems were different sizes of the high-tech Accent system by the Prentke Romich Company (PRC) with various access methods, including direct finger selection and eye gaze. Two of five parents reported that their child used their AAC system every day. The length of training on the AAC systems ranged from three weeks to one year. In terms of literacy, two parents reported they had a designated time for reading at home, while three did not have a set time for literacy activities. The parents reported onset of family shared book reading ranged from infancy through up to two years of age. Additionally, three of five families reported incorporating AAC during typical shared book reading interactions, and two of five families reported previous explicit training on how to use AAC during shared book reading. See Table 2 for in-depth literacy and AAC information separated by family.

Table 2

Literacy and AAC Information for Each Family

Family	*Designated Time for SBR?*	*Hours of SBR Per Week*	*Age of Child at Onset of SBR*	*Type of AAC System with Access Method*	*AAC Used Every Day?*	*Length of Time Using AAC*	*AAC Typically Used During SBR?*	*Training in AAC Use During SBR?*
A	Yes	2	Birth	Accent, Eye Gaze	Yes	5 months	Yes	Yes
B	No	1	1 year	Accent, Direct Selection	No	> 1 year	Yes	Yes
C	No	<1	Infant	Accent, Eye Gaze	No	1 year	Yes	No
D	Yes	1	9 months	Accent, Direct Selection	Yes	~ 2 months	No	No
E	No	15	2 years	Accent, Direct Selection	No	3 weeks	No	No

Note: SBR = shared book reading

Shared Book Reading Session Data

Three families (A, B, & C) had one video coded of shared book reading with AAC, while two families (D & E) had two videos coded, one without AAC and one with. The families chose to read their books in various comfortable spaces within their home: two families in their living room, two families in their home office, and one family in the bedroom of the child. The reading space for families with more than one video was consistent across both sessions.

Parent Shared Book Reading Strategies in Sessions with AAC

The first research question was in relation to shared book reading strategies used when AAC was included in parent-child shared book reading interactions. Overall, the means and

ranges for both frequency and rate per minute of each parent shared book reading strategy revealed that modeling/commenting, yes/no questions, and wh-questions were most prevalent. See Tables 3-4 for means and ranges of overall frequency and rate per minute of each parent shared book reading strategy utilized during sessions.

Table 3

Means and Ranges for Frequency of Parent Shared Book Reading Strategies

Parent Shared Book Reading Strategy	*Mean*	*Range*
Modeling/Commenting	16	7-32
Yes/No Questions	6.6	5-9
Wh-Questions	2.2	0-6
Affirmations	1.4	0-4
Expansion/Extension	0.8	0-2
Repetitions	0.4	0-1
Completion Questions	0	0
Prediction Questions	0	0
Defining Vocabulary	0	0

Table 4

Means and Ranges for Rate Per Minute of Parent Shared Book Reading Strategies

Parent Shared Book Reading Strategy	*Mean*	*Range*
Modeling/Commenting	2.41	1.01-4.91
Yes/No Questions	1.01	0.68-1.61
Wh-Questions	0.31	0-0.86
Affirmations	0.21	0-0.58
Expansion/Extension	0.11	0-0.27
Repetitions	0.06	0-0.15
Completion Questions	0	0
Prediction Questions	0	0
Defining Vocabulary	0	0

Of the total 137 parent shared book reading strategies used during the five shared book reading sessions with AAC, 42% (n = 57) were delivered verbally, 26% (n = 36) were delivered via a combination of verbal communication and gestures, 20% (n = 28) were delivered with a combination of verbal communication and AAC, 8% (n = 11) were delivered via a combination of verbal communication, gestures, and AAC, and 4% (n = 5) were delivered with AAC only. See Figures 1-5 for specific data on types of parent shared book reading strategies and modalities used by each family.

Figure 1

Parent Shared Book Reading Strategies by Modality for Family A

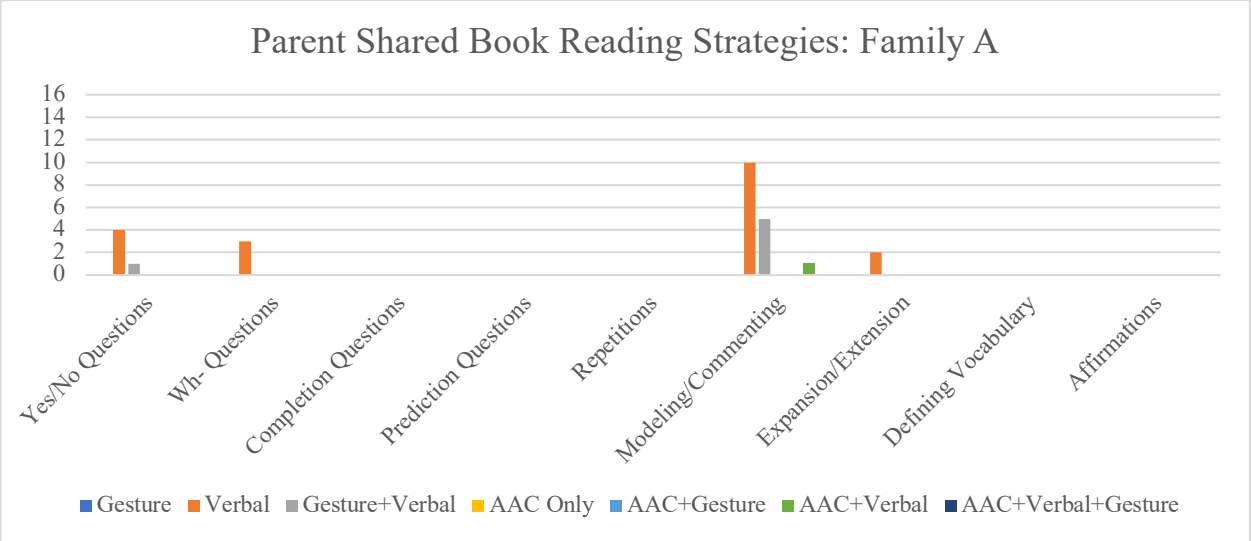


Figure 2

Parent Shared Book Reading Strategies by Modality for Family B

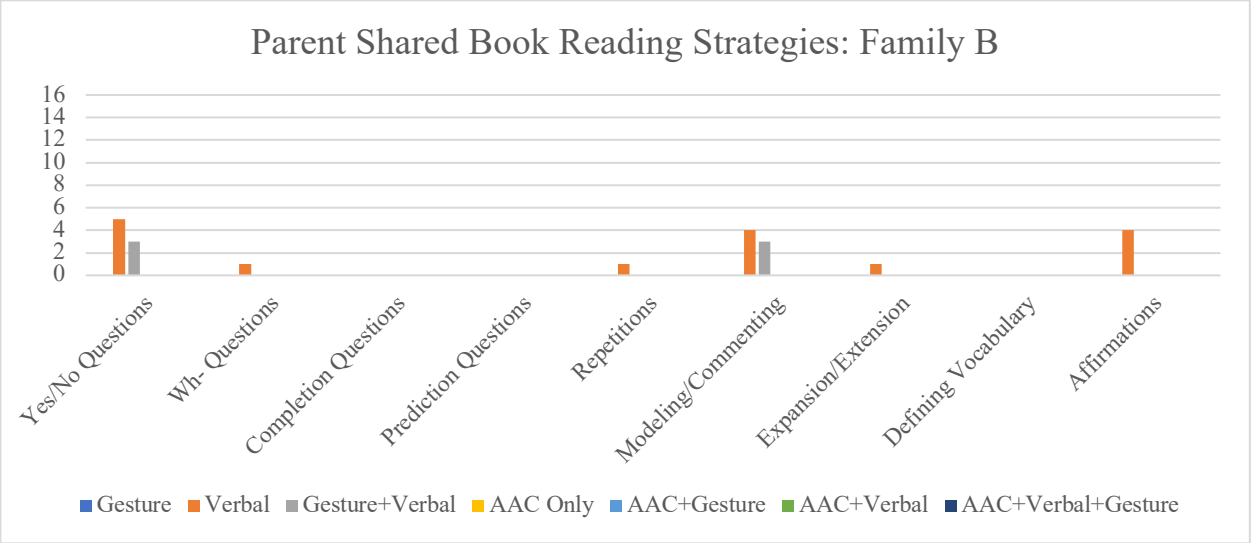


Figure 3

Parent Shared Book Reading Strategies by Modality for Family C

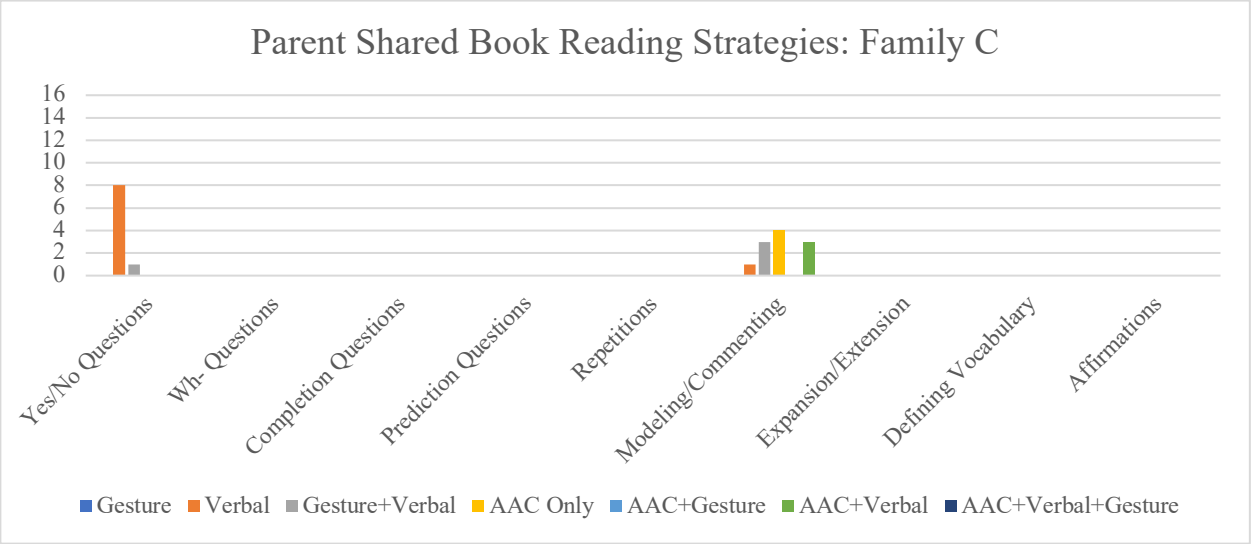


Figure 4

Parent Shared Book Reading Strategies by Modality for Family D

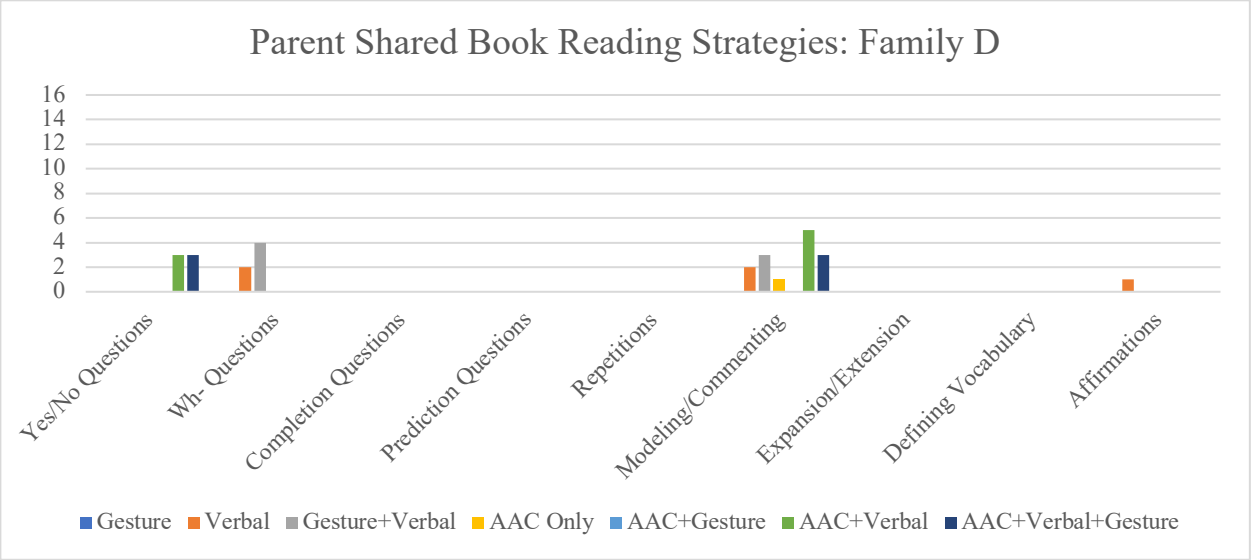
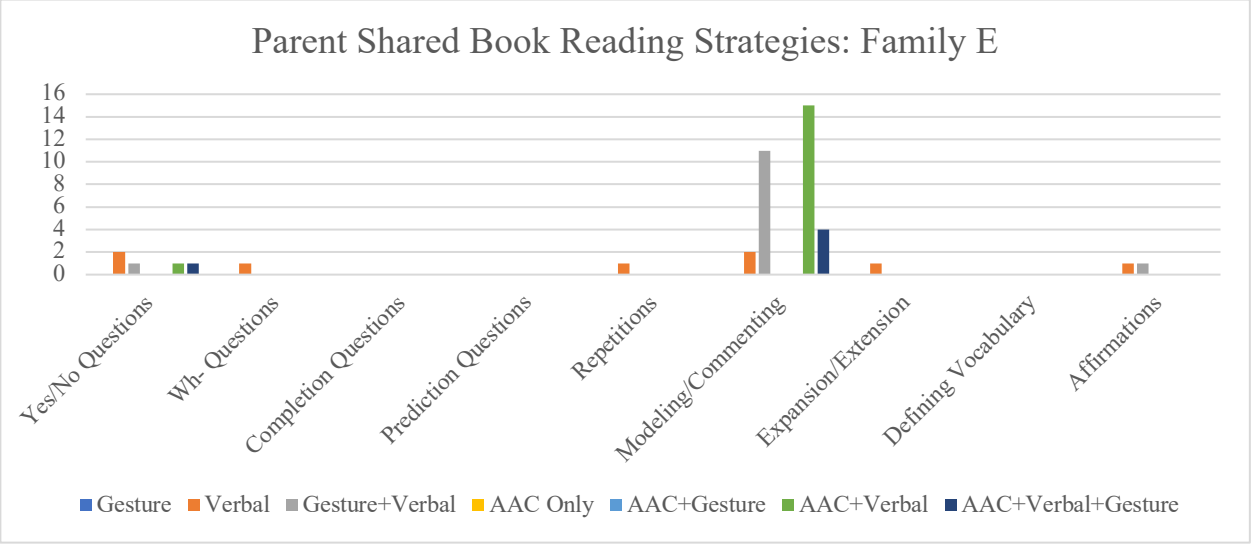


Figure 5

Parent Shared Book Reading Strategies by Modality for Family E



Parent Shared Book Reading Strategies in Sessions without AAC vs. with AAC

Two videos were coded for families D and E, one without AAC and one with. This was due to their self-report that their child's AAC system was not typically used during shared book reading activities. The videos of shared book reading without AAC gave a picture of "typical" shared book reading for these families. For individual shared book reading strategies, the mean frequency and rate per minute varied across conditions (No AAC vs. AAC) with the highest prevalence of each shared book reading strategy evident when AAC was included in the interaction. See Tables 5-6 for the mean frequencies and rates per minute for each parent shared book reading strategy for both conditions.

Table 5

Mean Frequency and Rate Per Minute of Shared Book Reading Strategies without AAC

Parent Shared Book Reading Strategy	*Mean Frequency*	*Mean Rate Per Minute*
Modeling/Commenting	4.5	1.11
Yes/No Questions	2.5	0.62
Wh-Questions	0.5	0.12
Completion Questions	0	0
Prediction Questions	0	0
Repetitions	0	0
Expansion/Extension	0	0
Defining Vocabulary	0	0
Affirmations	0	0

Table 6

Mean Frequency and Rate Per Minute of Shared Book Reading Strategies with AAC

Parent Shared Book Reading Strategy	*Mean Frequency*	*Mean Rate Per Minute*
Modeling/Commenting	23	3.46
Yes/No Questions	5.5	0.81
Wh-Questions	3.5	0.81
Affirmations	1.5	0.23
Repetitions	0.5	0.08
Expansion/Extension	0.5	0.08
Completion Questions	0	0
Prediction Questions	0	0
Defining Vocabulary	0	0

There were 15 total parent shared book reading strategies used when AAC was not included in the interaction, in which 53% (n = 8) were delivered verbally, 40% (n = 6) were delivered via a combination of gestures and verbal communication, and 7% (n = 1) were delivered via gesture. Of the total 69 parent shared book strategies used when AAC was present, 35% (n = 24) were delivered with a combination of AAC and verbal communication, 29% (n = 20) were delivered with a combination of gesture and verbal communication, 19% (n = 13) were delivered verbally, 16% (n = 11) were delivered with a combination of AAC, gestures, and verbal communication, and 1% (n = 1) were delivered with solely AAC. See Figures 6-7 for shared book reading strategies by modality for each condition (No AAC vs. AAC).

Figure 6

Shared Book Reading Strategies by Modality without AAC for Families D & E

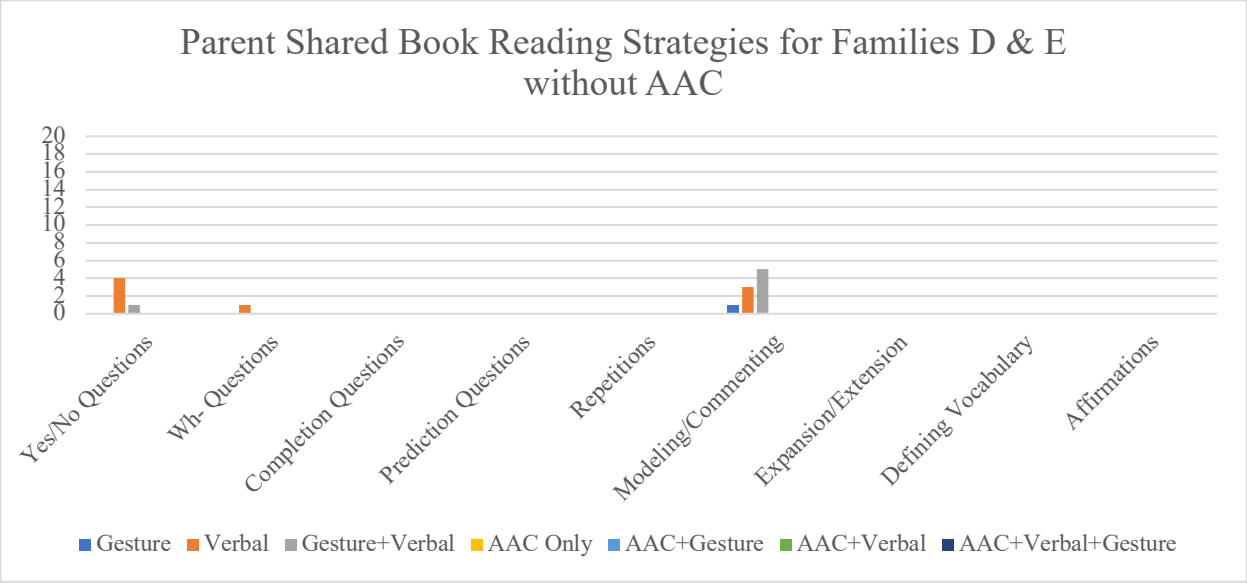
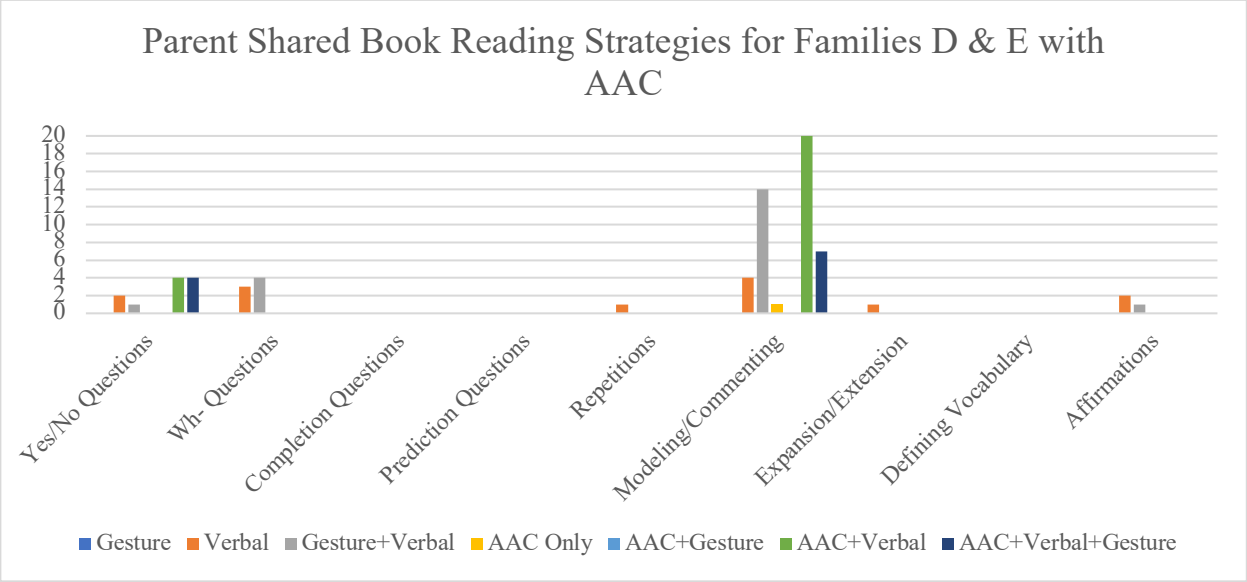


Figure 7

Shared Book Reading Strategies by Modality with AAC for Families D & E

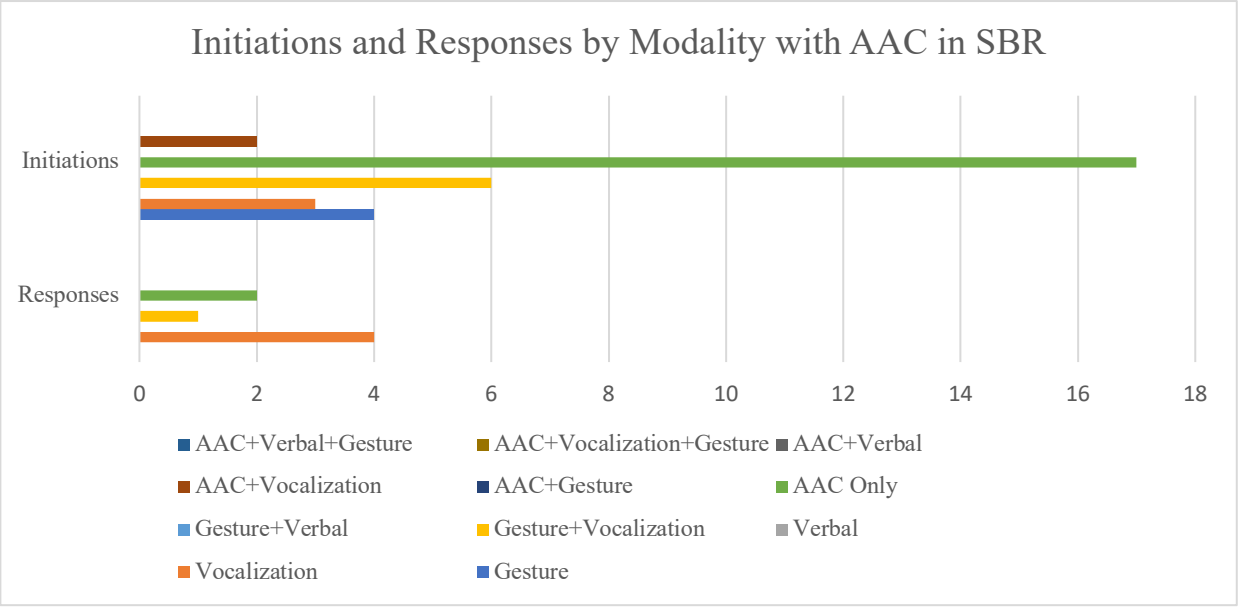


Child Initiations and Responses During Shared Book Reading with AAC

The second research question corresponded to data on child initiations and responses during shared book reading sessions with AAC. Across all shared book reading sessions including AAC, the mean frequency and rate per minute of child initiations was 6.4 (range = 1-15) and 0.94/min (range = 0.18-2.16/min), respectively. Additionally, the mean frequency and rate per minute of child responses was 1.4 (range = 0-4) and 0.23/min (range = 0-0.72/min), respectively. Of the total 32 child initiations, 53% (n = 17) were with AAC only, 19% (n = 6) were a combination of gestures and vocalizations, 12.5% (n = 4) were gestures, 9% (n = 3) were vocalizations, and 6% (n = 2) were a combination of AAC and vocalizations. Subsequently, out of the seven responses made by children, 57% (n = 4) were vocalizations, 29% (n = 2) were via AAC only, and 14% (n = 1) were vocalizations. View Figure 8 for child initiations and responses by modality when AAC was used in shared book reading.

Figure 8

Child Initiations and Responses by Modality with AAC in SBR



Child Initiations and Responses in Sessions without AAC vs. with AAC

Child initiations and responses were analyzed and coded in two separate shared book reading session for families D and E, one without AAC and one with AAC. When AAC was not integrated into the shared book reading session, the mean frequency and rate per minute of child initiations was nine (range = 7-11) and 2.18/min (range = 1.65-2.72/min). The mean frequency and rate per minute of child initiations when AAC was included was six (range = 3-9) and 0.91/min (range = 0.43-1.38 /min), respectively. In terms of child responses, the mean frequency and rate per minute of child responses when AAC was not integrated in the shared book reading interaction was one (range = 0-2) and 0.25/min (range = 0-0.49/min), respectively. The mean frequency and rate per minute when AAC was included was 0.5 (range = 0-1) and 0.08/min (range = 0-0.15/min), respectively. See Figures 9-10 for modality types for initiations and responses across both conditions.

Figure 9

Child Initiations for Shared Book Reading Sessions without AAC vs. with AAC

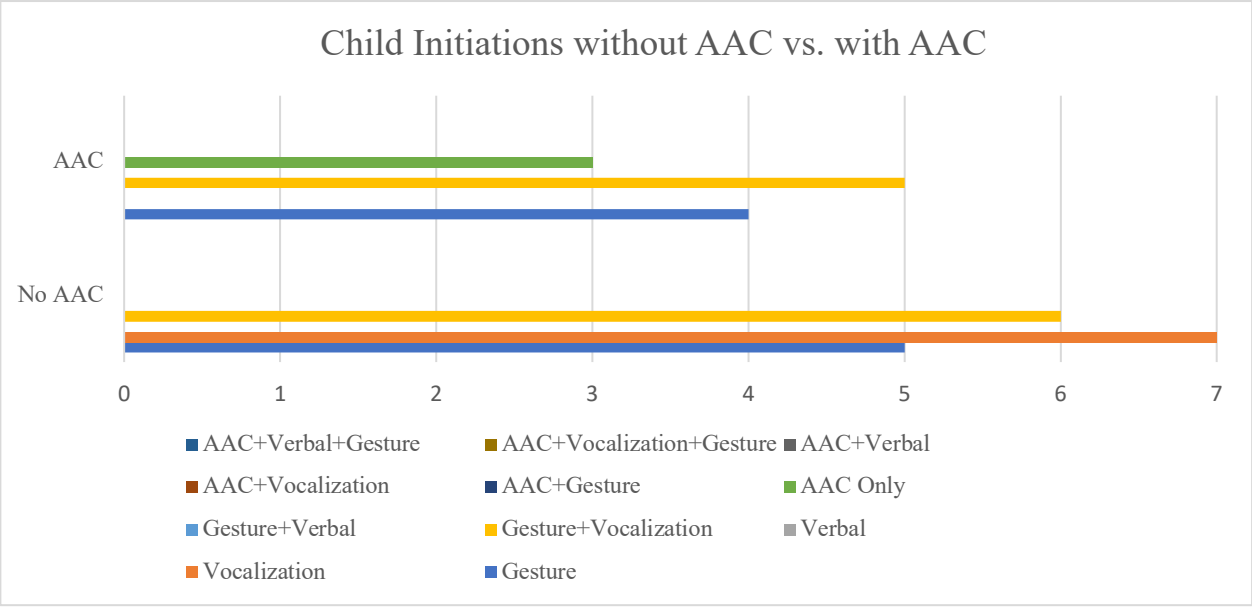
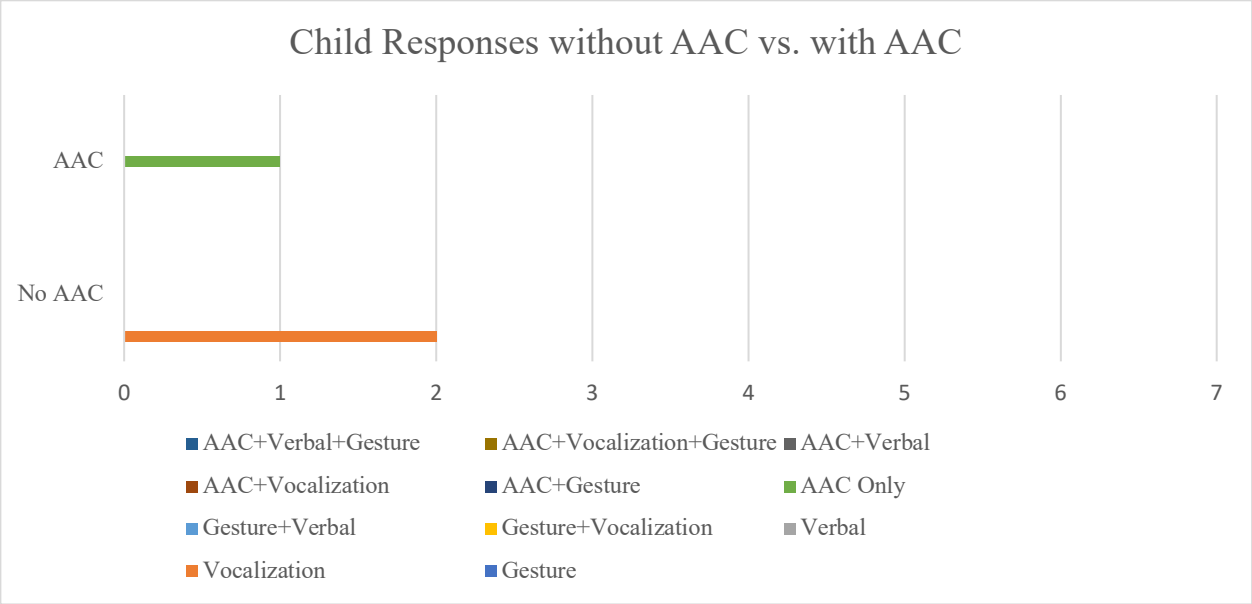


Figure 10

Child Responses for Shared Book Reading Sessions without AAC vs. with AAC



Total Duration of Shared Book Reading Sessions with AAC

The third and final research question related to the overall duration of the shared book reading interaction. The mean duration of shared book reading sessions with the inclusion of an AAC system was approximately 6 minutes and 41 seconds. See Table 7 for the overall duration of each shared book reading session with AAC separated by family.

Table 7

Duration of Shared Book Reading Sessions with AAC by Family

Family	*Duration of Session*
A	7 minutes 22 seconds

(Table Continues)

Table 7, Continued

Family	*Duration of Session*
B	6 minutes 57 seconds
C	5 minutes 35 seconds
D	6 minutes 58 seconds
E	6 minutes 31 seconds

Total Duration of Shared Book Reading Sessions without AAC vs. with AAC

The total duration of each shared book reading session for families D and E was calculated to determine if the inclusion of an AAC system lengthened or shortened the overall literacy-based interaction. See Table 8 for the total time of each session for families D and E. The mean duration of sessions without AAC was approximately 4 minutes and 9 seconds, while the mean duration of sessions with AAC was approximately 6 minutes and 45 seconds.

Table 8

Shared Book Reading Session Duration for Families D and E

Family	*No AAC Session Duration*	*AAC Session Duration*
D	4 minutes 15 seconds	6 minutes 58 seconds
E	4 minutes 3 seconds	6 minutes 31 seconds

CHAPTER IV: DISCUSSION

Interpretation of the Findings

Research Question #1: Parent Shared Book Reading Strategy Use in Sessions with AAC

The data for parent shared book reading strategy use revealed six different strategies throughout the five shared book reading sessions with the child's AAC system present: modeling/commenting, yes/no questions, wh-questions, affirmations, expansions/extensions, and repetitions. Each individual family used a variety of the named strategies ranging from between 2-6 different strategies per book reading session: families B and E (n = 6), family D (n = 5), family A (n = 4), and family C (n = 2). In terms of modalities, families A and B heavily used verbal and verbal+gesture modalities with little to no AAC inclusion, while families C, D, and E used a greater variety of modalities including AAC. As stated previously, families A and B received previous explicit training on AAC use during shared book reading while families C, D, and E did not. The use of a variety of strategies and frequent AAC inclusion in shared book reading by parents who did not receive explicit training supports the notion that all families are capable of providing rich language and literacy experiences for their children, specifically those with children that have complex communication needs.

Although all families can provide rich language and literacy experiences to their children via shared book reading, an increase in parent shared book reading strategies is warranted to achieve optimal child outcomes in oral language and emergent literacy skills (Whitehurst & Lonigan, 1998; Zevenbergen & Whitehurst, 2003). These skills can be taught via explicit parent coaching (Blom-Hoffman et al., 2006). Families A and B were the only families with previous explicit shared book reading training with the inclusion of the child's AAC system; however, this training did not display an increase in their variety of strategies or use of AAC during shared

book reading interactions when compared to those families who did not receive parent coaching (families C, D, & E). Unfortunately, this training was not a part of the current study and data on the training procedures and fidelity was not collected; thus, it is unknown whether this training was aligned with evidence-based practices that support adult learning of new intervention strategies.

Although the procedures of the parent coaching for families A and B are unknown, it is important to highlight what general and literacy-based adult learning/coaching should look like, according to the literature. Dunst, Trivette and Hamby (2010) conducted a study to determine the outcomes of four adult learning methods, one of which was coaching. Results of this study provided evidence that coaching methods that actively involved adult learners in acquiring knowledge and skills, consistently using it, reflecting on new knowledge or practice, and performing self-assessment had the most positive consequences for adult individuals acquiring new skills. The interventions also produced the most favorable outcomes when the coaching was implemented in small groups of less than 30 individuals, over multiple sessions, and for greater than 10 hours in total. Chipinka (2016) utilized some of these coaching methods when providing aided AAC modeling intervention/coaching sessions during shared book reading to one-parent child dyad. Her intervention/coaching sessions allowed multiple opportunities for parent practice with feedback that resulted in satisfactory outcomes in increasing the frequency of parent shared book reading strategy use and parental and child use of the AAC system during literacy-based interactions. To align with the literature and evidence-based practices, shared book reading coaching should follow a systematic, explicit route and correctly implement adult learning procedures with multiple opportunities for parent practice with feedback. By doing this, parents

are more likely to increase their use of shared book reading strategies and AAC use, resulting in positive child language and emergent literacy outcomes (Chipinka, 2016; Whitehurst, 1992).

Research Question #2: Child Initiations and Responses During Shared Book Reading with AAC

Across all five families using AAC systems during parent-child shared book reading interactions, initiations were most prevalent, while responses were observed less frequently. Child initiations were most often produced via the AAC modality (53%), and responses were most often produced by vocalizations (57%) followed by AAC (29%). This data provides evidence that children are relying on their AAC systems and are using multiple communication modalities in their system during communicative interactions and literacy-based activities. It also furthers the evidence that AAC systems should be utilized during literacy-based activities, such as shared book reading (Chipinka, 2016).

Research Question #3: Duration of Shared Book Reading Sessions with AAC

The duration of the shared book reading sessions with AAC were relatively short with a mean of six minutes and 41 seconds across the five sessions. This length of time was greater than the mean duration of parent-child shared book reading interactions using parent shared book reading strategies in two similar studies with preschool children with autism spectrum disorder, in which the means were four minutes and 29 seconds (Fleury et al., 2014) and six minutes (Westerveld et al., 2020). In the same study, Fleury and colleagues (2014) compared the duration of shared book reading sessions with parent shared book reading strategies (i.e., four minutes and 29 seconds) to shared book reading sessions without the inclusion of strategies, in which the mean was two minutes and 45 seconds. The data from these two studies as well as the study at

hand provides evidence that the inclusion of shared book reading strategies and AAC systems may increase the overall duration of parent-child shared book reading interactions.

Although the inclusion of shared book reading strategies and AAC systems increased the overall duration of shared book reading interactions, the time was still relatively short (< seven minutes). This suggests that parents can target language in a short naturalistic routine. In less than seven minutes, parents had time to model verbal language and AAC use as well as provide opportunities for their child to initiate and respond to a communication partner through a variety of modalities. While this is a great naturalistic opportunity to expand the receptive language, expressive language, and emergent literacy skills of children, it is also a great opportunity for parents to learn how to further these skills through parent coaching.

No AAC Versus AAC in Shared Book Reading Interactions

As previously stated, families D and E participated in two shared book reading sessions, one without AAC and one with AAC. This was done to compare a "typical" parent-child shared book reading session (without AAC) to a shared book reading session that incorporated the child's AAC system. There was a substantial difference in parent shared book reading strategies, child initiations and responses, and overall duration between the two conditions. First, there was a greater variety and frequency of parent shared book reading strategies in a wider variety of modalities when AAC was present. Modeling and commenting with the AAC system contributed highly to this drastic difference. This can be attributed to AAC systems providing parents with more opportunities to model language and set up language learning opportunities for their child. Additionally, the presence of AAC opens more possibilities for modality types (i.e., AAC, AAC+Vocalization, AAC+Gesture, etc.). The parental integration of the AAC system and shared book reading strategies during literacy interactions will provide aided language stimulation

models to the child and reinforce their current or future use of a multimodal communication system; this, in turn, models how to be an efficient and effective communicator to their child with complex communication needs.

The children made a conscious effort to initiate and respond to their parents regardless of whether the AAC system was present; however, the modality was different. When the AAC system was included in the interaction, vocalizations were eliminated and replaced by AAC usage. This may be attributed to the ability to convey messages more clearly with the AAC system over vocalizations alone. This clear level of communication with AAC may also increase the back-and-forth nature of the shared book reading session if used consistently.

Finally, the presence of AAC substantially increased the duration of the parent-child shared book reading interactions by approximately two minutes. This can be attributed to the increased opportunity for language learning and aided language stimulation models and navigation/wait time on the AAC system. This is important to note, as literacy-based interactions may increase in duration and therefore facilitate greater growth for children if their primary method of communication (AAC system) is involved.

Limitations and Direction for Future Research

The findings of this descriptive study offer a comprehensive description of five families' use of parent shared book reading strategies, child communication, and duration of parent-child shared book reading interactions when an AAC system was integrated. Limitations of the study include the limited participant sample and length of time with the families and should be compensated for in future research. Although there are typically small sample sizes in AAC research, the insufficient sample size in this study prevented the utilization of statistical tests and made it difficult to identify significant relationships. Subsequently, there was a variable sample

in terms of experiences, levels of training, time spent in intervention, and length of time with AAC; thus, it was difficult to analyze and attribute strategies and communication to specific aspects of the participants' lives. To obtain statistical results that can be generalized to the greater population, a larger study on the typical behaviors of parents and their toddlers/preschoolers that use AAC during shared book reading should be conducted. Lastly, three of the five families in this study only met with the research team one day for a shared book reading session. In future research, the study should continue over a longer period, allowing the child to provide evidence of their abilities across multiple days.

Implications and Suggestions for Future Research

In the past, early communicators, specifically in the early intervention age group (0-3 years), were considered too young or prelinguistic to use AAC systems for functional communication; however, the field is starting to recognize AAC as a possible method of communication for children ages 0-3 years (Cress & Marvin, 2003). Despite this, a meta-analysis performed by Cress and Marvin (2003) stated that AAC interventions have been limited to ages 3-8 years, and this research is often generalized to interventions with children under three years who are at risk of being limited verbal communicators. Research on AAC use and interventions for children in the toddler and early preschool years should be capitalized within the near future, as this age is critical for the development of receptive and expressive language (Dowdall et al., 2020).

Future research should also focus on AAC use within shared book reading interactions for toddlers and preschoolers, as the current research is significantly limited (Lorio et al., 2021). Shared book reading is a common, naturalistic family routine for young children; thus, toddlers and preschoolers that use AAC should be included in the literature to identify best practices and

benefits of shared book reading for this specific population. Binger and colleagues (2008) found that aided AAC modeling aided children in expanding utterances on their AAC systems during shared book reading interactions. More practices in enhancing the language and emergent literacy skills of those with complex communication needs during shared book reading interactions should be researched to develop parent training/coaching procedures for using AAC systems to build foundational language skills during shared book reading and other literacy-based activities.

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APPENDIX A: QUALTRICS SURVEY

Shared Book Reading Observational Study

Start of Block: Informed Consent

INFORMED CONSENT FORM – Shared Book Reading with Toddlers and Preschoolers that use AAC

Dear Caregiver(s),

You are invited to participate in a research study, which aims to examine the shared book reading interactions between toddlers/preschoolers and their caregivers. Your participation in this study will help researchers and other professionals in early childhood better understand how shared book reading interactions look between a caregiver and child with an AAC system included. You have been selected for this study because your child is between the ages of 18 months (1 year, 6 months) and 48 months (4 years), is fluent in English, has 50 spoken words or less, and uses an augmentative and alternative communication (AAC) system.

Family Participation. Participation in this study involves the following: (1) completion of a questionnaire; and (2) one video recorded caregiver-child shared book reading session. Video-recorded shared book reading sessions will be conducted from the comfort of your own home utilizing Zoom, a video conferencing platform. The shared book reading sessions are not expected to last longer than 15-20 minutes.

To protect the children in our study, all participants and researchers will respect a child's refusal to participate. If any child shows signs of agitation during a shared book reading session, they will be allowed to remove themselves from the session and continue at a later time.

Risks, Benefits, and Compensation. As with all research studies, there is potential for a breach in confidentiality; however, the research team will take several measures to assure all identifiable information and video sessions remain in a secured location, and only members of the research team will view and discuss participants in the videos. At the end of the study, all data will be deidentified and videos will be destroyed, unless families provide consent to use videos for educational purposes (i.e., classroom learning, conference presentations). If families provide consent for continued educational use of videos, videos will be labeled with participant ID numbers. There will be no direct link between videos and participant identifying information. All participants of the study will engage in shared book reading with the same books. The books will be purchased by the research team and provided to you to keep as compensation for participating in the study. The IRS may consider these payments (i.e., free books) to be taxable compensation. Recipients of a research participant incentive payment may want to consult with their personal tax advisor for advice regarding the participant's situation. Your participation in this study is

expected to benefit the society at large as we will gain valuable information regarding how caregivers and young children engage in shared book reading while using AAC systems.

Confidentiality. Your family's data will not be linked to your identity in any way once the study is complete. No reference will be made in oral or written reports that could link you to this study. After your data has been deidentified, your data may be used in other research projects. Data will remain confidential to the extent allowed by law. It is our legal and ethical responsibility to report situations of child abuse or neglect to appropriate authorities. However, we are not seeking this type of information in our study nor will you be asked questions about these issues. Participation is voluntary, and you may discontinue participation in the research study at any time without personal or professional consequences.

Researcher Contact Information. Should you have any questions at this time or in the future, please contact the principal investigator of this study, **Braelyn Wence, B.S.** ([redacted]) or the faculty advisor, **Dr. Ciera Lorio, PhD, CCC/SLP** ([redacted]). If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, you are encouraged to contact the ISU Research Ethics & Compliance Office at (309)-438-5527 and/or rec@ilstu.edu.

If you and your family are willing to participate in this study, please confirm consent below. You are ineligible to participate if you are currently within the European Economic Area. We appreciate your consideration to participate in this research. A copy of this consent form is attached to the end of this portion of the questionnaire. Please print this copy for your records.

AAC and Shared Book Reading Informed Consent Document

- ☐ I give consent for my family's participation in the study.
- ☐ I do not give consent for my family's participation in the study.
- ☐ I consent to allow my video to be used for educational purposes.

Skip To: End of Survey If INFORMED CONSENT FORM – Shared Book Reading with Toddlers and Preschoolers that use AAC Dear Ca... = I do not give consent for my family's participation in the study.

End of Block: Informed Consent

Start of Block: Caregiver and Family Demographics

Are you the caregiver that most frequently engages in shared book reading with the child? The caregiver that reads to the child the most should be the one to complete the survey and participate in the shared book reading sessions with the child.

- ○ Yes
- ○ No

Skip To: End of Block If Are you the caregiver that most frequently engages in shared book reading with the child? The car... = No

What is your name?

_____

What is your relationship to the child?

_____

What is your date of birth?

_____

Please select your gender:

- ○ Male
- ○ Female
- ○ Prefer not to say
- ○ Other (please specify): _____

Which of the following best represents your racial or ethnic heritage? Please choose all that apply.

- ☐ White/Caucasian
- ☐ Black/African American
- ☐ Hispanic/Latino
- ☐ Asian/Pacific Islander
- ☐ Native American/American Indian
- ☐ Other (please specify): _____

What is your first language?

_____

Are you fluent in any other languages (i.e., Spanish, Sign Language, French, etc.)? If yes, please indicate those languages in the text box below.

- ○ Yes _____
- ○ No

Please select your highest level of education:

- ○ Some high school
- ○ High school graduate/GED
- ○ Some college
- ○ Associate's degree
- ○ Bachelor's degree
- ○ Professional degree
- ○ Doctoral degree

Please select the caregiver description that best describes your family.

- ○ Single Father
- ○ Single Mother
- ○ Mom/Dad
- ○ Mom/Mom
- ○ Dad/Dad
- ○ Prefer not to say
- ○ Other _____

Display This Question:

If Please select the caregiver description that best describes your family. != Single Father

And Please select the caregiver description that best describes your family. != Single Mother

Please indicate the highest level of education of the other caregiver (if applicable).

- ○ Some high school
- ○ High School Graduate/GED
- ○ Some college
- ○ Associate's degree
- ○ Bachelor's degree
- ○ Professional degree
- ○ Doctoral degree
- ○ I am a single parent. No other caregiver level of education available.

Please select the best option that represents your family's current annual income:

- ○ Less than $20,000 per year
- ○ $20,000-$39,999 per year
- ○ $40,000-$59,999 per year
- ○ $60,000-$79,999 per year
- ○ $80,000-$99,999 per year
- ○ More than $100,000 per year
- ○ Prefer not to say

What is the number of siblings the child participating in the study has?

_____

Please indicate all siblings including the child participating in the study in birth order from oldest to youngest.

_____

_____

_____

_____

_____

End of Block: Caregiver and Family Demographics

Start of Block: Child Demographics

What is the name of the child participating in the study?

_____

What is your child's date of birth?

_____

Was your child born before or after his/her due date?

- ○ Before due date
- ○ After due date
- ○ No (full term)

Display This Question:

If Was your child born before or after his/her due date? = Before due date

How many days before?

_____

Display This Question:

If Was your child born before or after his/her due date? = After due date

How many days after?

_____

Please select the gender of your child:

- ○ Male
- ○ Female
- ○ Prefer not to say
- ○ Other (please specify): _____

Which of the following best represents your child's racial or ethnic heritage? Please choose all that apply.

- [ ] White/Caucasian
- [ ] Black/African American
- [ ] Hispanic/Latino
- [ ] Asian/Pacific Islander
- [ ] Native American/American Indian
- [ ] Other (please specify): _____

What is the child's first language?

_____

Is the child fluent in any other languages (i.e., Spanish, Sign Language, French, etc.)? If yes, please indicate those languages in the text box below.

- ○ Yes _____
- ○ No

Have you ever had vision or hearing concerns about your child? If yes, please explain.

- ○ Yes _____
- ○ No

Display This Question:

If Have you ever had vision or hearing concerns about your child? If yes, please explain. = Yes

Has a doctor ever diagnosed your child with vision or hearing deficits? If yes, please explain.

- ○ Yes _____
- ○ No

Has your child received therapy services?

- ○ Yes
- ○ No

Display This Question:

If Has your child received therapy services? = Yes

What types of therapy has your child received (i.e., speech, occupational, etc.)?

_____

Display This Question:

If Has your child received therapy services? = Yes

What is/was the frequency of those therapy services (i.e., once per week)?

_____

Display This Question:

If Has your child received therapy services? = Yes

When did the therapy services start and end?

_____

Display This Question:

If Has your child received therapy services? = Yes

Have any of your child's therapy sessions focused on shared book reading?

- Yes
- No

Display This Question:

If Have any of your child's therapy sessions focused on shared book reading? = Yes

Were you ever a part of those sessions?

- Yes
- No

Display This Question:

If Were you ever a part of those sessions? = Yes

Did you receive training in how to use AAC during shared book reading sessions with your child?

- Yes
- No

How many spoken words does your child have (oral)? Spoken words = words that are produced consistently across settings. The spoken word does not have to be articulated in the most accurate adult version.

_____

Please list some of those words below:

_____

_____

_____

_____

_____

End of Block: Child Demographics

Start of Block: Early Literacy Questionnaire

Does your child ask you to read to him/her?

- ○ Not currently
- ○ On occasion
- ○ Weekly
- ○ Daily
- ○ Several times per day

How often do you read to your child?

- ○ Not currently
- ○ On occasion
- ○ Once a month
- ○ Weekly
- ○ Daily
- ○ Several times per day

Skip To: End of Block If How often do you read to your child? = Not currently

Display This Question:

If How often do you read to your child? != Not currently

Do you have a designated time for reading?

- ○ Yes
- ○ No

Display This Question:

If How often do you read to your child? != Not currently

On average, how many hours per week do you read to your child?

_____

Display This Question:

If How often do you read to your child? != Not currently

How many books do you typically read in one sitting?

- ○ 1 Book
- ○ 2 Books
- ○ 3 Books
- ○ 4+ Books

At what age did you begin reading to your child?

_____

In comparison to other activities, how would you rate your child's interest in books?

	Activity liked least 1	2	3	4	Favorite activity 5
Interest in books compared to other activities					

On a scale of 1-5, how engaged is your child during shared book reading? Examples of engaged behaviors include when the child is looking at pictures, responding to your questions, helping to turn pages, etc. 1 = not engaged; 5 = very engaged.

	1	2	3	4	5
Engagement					

End of Block: Early Literacy Questionnaire

Start of Block: Alternative and Augmentative Communication (AAC) Questionnaire

What type of AAC system does your child use (i.e., PECS, Dynavox, Prologuo2go, etc.)?

_____

How long has the child been using the AAC system?

_____

Does the child use his/her AAC system every day?

- ○ Yes
- ○ No

Please explain specific times the child uses his/her AAC system during daily living:

_____

_____

_____

_____

_____

How many words does the child consistently use across settings with the AAC system?

_____

Please list some of those words below:

_____

Does your child use their AAC system during shared book reading?

- ○ Yes
- ○ No

Do you have any additional information you'd like to share regarding your child's literacy development, shared book reading practices, language development, or AAC use?

- ○ Yes
- ○ No

Display This Question:

If Do you have any additional information you'd like to share regarding your child's literacy develo... = Yes

Explain below:

_____

_____

_____

_____

_____

End of Block: Alternative and Augmentative Communication (AAC) Questionnaire

VIDEO COLLECTION CHECKLIST – Shared Book Reading with Toddlers and Preschoolers that use AAC

This checklist will be utilized to ensure every video is collected in a consistent manner. Please check off each step of the checklist while meeting with families to record shared book reading sessions.

- ☐ Ensure you are in a private, quiet environment.
- ☐ Log onto your computer approximately 5-10 minutes prior to the session.
- ☐ Log into Zoom and go to a designated Zoom invitation.
- ☐ Once the family logs into Zoom, briefly introduce yourself to the family.
- ☐ Give a one-sentence summary of what the study is about: “This study is being conducted to observe the interaction between caregivers and their children during shared book reading while using AAC systems.”
- ☐ Thank them for their participation.
- ☐ Get out the list of participants and their assigned books.
- ☐ Inquire if the caregiver has the appropriate book ready and with them. Ask about their experience with the specific book prior to beginning book reading: “Have you read this book before? Have you read it with your child?”
- ☐ Ensure the caregiver knows to focus only on the primary book: “Please make sure you focus your interaction on the book provided. If there are other books around that may cause distraction, please remove them at this time.”
- ☐ Ensure each family has their AAC system ready for use.
- ☐ Ask them if they have any questions prior to the shared book reading activity and answer any questions they may have.

- Give them a few minutes to set up (if required).
- When they are ready, instruct the family to read as they normally do.
- Press “record” on the bottom right side of the task bar.
- Turn off your volume and camera to prevent disturbing the shared book reading interaction.
- When they have finished reading, press “stop recording.”
- Thank them once again for their participation.
- Log off Zoom and allow Zoom time to download the video as an mp4 file.
- Find the mp4 file in your documents and rename it as “SBR Session_family’s ID number.”

APPENDIX C: CODING MANUAL

Shared Book Reading with Toddlers and Preschoolers that use AAC – Coding Manual (Wence & Lorio, 2022)

This manual includes definitions and descriptions of parent and child behaviors coded in Observer XT by Noldus during shared book reading videos.

Coder Name: _____
Date Reliability Status Achieved: _____

Parent Behaviors

All parent behaviors are coded as mutually exclusive behaviors and in a minute-by-minute basis (per minute). Behaviors that are marked as "state" can occur for an extended period of time and will be indicated through briefly writing out the behavior and its characteristics (as found in the table below). Behaviors that are marked as "point" occur at specific times rather than for an extended period and can be indicated by measuring the frequency of the behavior (not the duration). "Point" behaviors should be marked with the modality in which the behavior occurred.

The "state" and "point" behaviors are as follows:

- State:
    - Overall duration of the shared book reading experience
    - Reading text
    - Off-topic behavior
    - Uncodeable
- Point:
    - Asking questions (must be related to the current context)
        - Yes/no questions
        - Wh- questions
        - Completion
        - Prediction
    - Repetition
    - Modeling/Commenting (must be related to the current context)
    - Expanding/Extending Child's Utterances (must be related to the current context)
    - Defining Vocabulary (must be related to the current context)
    - Affirm

"Point" behaviors should be indicated as one of the following modalities:

- Verbal
- Gesture

- Gesture+Verbal
- AAC Only
- AAC+Verbal
- AAC+Gesture
- AAC+Gesture+Verbal

Definitions and Examples of Parent Behaviors

The following table indicates "state" and "point" behaviors with definitions and examples of each:

Behavior	Definition	Examples
STATE BEHAVIORS		
Overall duration of the shared book reading experience	Measurement of the time of the shared book reading activity (start to finish)	
Reading text	Parent reads text as written in the book	
Off-Topic Behavior	Parent says or does something that is not related to the current activity or context	i.e., answering or looking at their phone during the activity, talking to a spouse or child in another room, talking about something happening outside the window, etc.
Uncodeable	Parent says something that cannot be coded	i.e., audio issues, parent isn't in the camera view and/or cannot be heard by the microphone, background noise prevents parent from being heard, etc.
POINT BEHAVIORS		
Asking Questions	Parent asks questions related to the current context, otherwise code as "off-topic behavior"	
Yes/no questions	Do, Is, Are	i.e., "Do you like this book?" "Is that a piggy on the page?"
Wh- Questions	Who, What, Where, When, Why, and How	
Completion	Fill-in-the-blank type questions/prompts	i.e., "Look! The bear is _____."
Prediction	Any question or prompt that encourages children to think about what might happen next	i.e., "What do you think this book is about?" "What do you think will happen next?"

Repetition	Parent repeats the child's utterance without expanding or extending it	i.e., The child says "He is angry." The parent repeats back, "He is angry."
Modeling/Commenting	Parent provides models or comments related to the current context, otherwise code as "off-topic behavior"	i.e., pointing, shaking head, animal sounds, comments about book content, etc.
Expanding/Extending	Rephrasing a child's utterance to be grammatically correct or to incorporate additional information or new vocabulary	i.e., Child: "He sit." Parent: "Yes! He sits down on the couch."
Defining Vocabulary	Parent must state the word and provide a definition or description of the word	i.e., "It says she was terrified. That means she was really scared."
Affirm	Parent affirms child's response to a question or comment without expanding or extending the child's utterance	i.e., "Awesome!" "You're right!" "So cool!"

The following table indicates the modalities in which "point" behaviors can be performed:

Modality of Communication	Definition	Examples
Verbal	Words – single words, phrases, or sentences	
Gesture	Gestures that have communicative intent	i.e., pointing, shaking head, nodding head
Gesture+Verbal	A combination of the previous two communication modalities – words, phrases or sentences in combination with gestures	i.e., The parent says "Yes!" while nodding their head.
AAC Only	Communication using the AAC system	
AAC+Verbal	A combination of the "verbal" and "AAC only" modalities – use of the AAC system accompanied by words, phrases, or sentences	i.e., The parent selects "I am hungry" on the AAC system and states it verbally.
AAC+Gesture	A combination of the "gesture" and "AAC only" modalities – use of the AAC	i.e., The parent selects "Yes" on the AAC system and nods their head up and down.

	system accompanied by a gesture with communicative intent	
AAC+Gesture+Verbal	A combination of the "verbal," "gesture," and "AAC only" modalities – use of the AAC system while also utilizing words and gestures with communicative intent	i.e., The parent selects "I am hungry" on the AAC system, states it verbally, and puts their hands on their stomach.

Child Behaviors

All child behaviors are coded as mutually exclusive behaviors and in a minute-by-minute basis (per minute). Behaviors that are marked as "point" occur at specific times rather than for an extended period and can be indicated by measuring the frequency of the behavior (not the duration). "Point" behaviors should be marked with the modality in which the behavior occurred.

"Point" behaviors are as follows:

- Point:
    - Initiation
    - Response

"Point" behaviors should be indicated as one of the following modalities:

- Gesture
- Vocalization
- Verbal
- Gesture+Vocalization
- Gesture+Verbal
- AAC Only
- AAC+Gesture
- AAC+Vocalization
- AAC+Verbal
- AAC+Vocalization+Gesture
- AAC+Verbal+Gesture

Definitions and Examples of Child Behaviors

The following table indicates "state" and "point" behaviors with definitions and examples of each:

Behavior	Definition	Examples
POINT BEHAVIORS		
Initiation	The child initiates a communicative attempt during conversation or interaction.	i.e., beginning a new topic, shifts interest and directs attention to it, etc.
Response	The child responds to a previous utterance in a conversation or interaction.	

The following table indicates the modalities in which "point" behaviors can be performed:

Modality of Communication	Definition	Examples
Gesture	Gestures that have communicative intent	i.e., pointing, shaking head, nodding head
Vocalization	The child makes verbal communication attempts that do not qualify as true words.	i.e., babbling
Verbal	Words – single words, phrases, or sentences	
Gesture+Vocalization	A combination of the "gesture" and "vocalization" modalities – the use of gestures and verbal approximations/vocalizations simultaneously.	i.e., A child may wave and say /h/ or /æ/.
Gesture+Verbal	A combination of the "gesture" and "verbal" modalities – the use of words, phrases, or sentences along with gestures	i.e., The child says "Yes!" while nodding their head.
AAC Only	Communication using the AAC system	
AAC+Gesture	A combination of the "gesture" and "AAC only"	i.e., The child selects "dog" on the AAC system while

	modalities – use of the AAC system accompanied by a gesture with communicative intent	simultaneously pointing to the family dog.
AAC+Vocalization	A combination of the "vocalization" and "AAC only" modalities – use of the AAC system along with a verbal approximation/vocalization that does not qualify as a true word.	i.e., The child selects "hat" on the AAC system while vocalizing /æ/.
AAC+Verbal	A combination of the "verbal" and "AAC only" modalities – use of the AAC system accompanied by words, phrases, or sentences	i.e., The child selects "mom" on the AAC system while verbally stating "mom."
AAC+Vocalization+Gesture	A combination of the "gesture," "vocalization," and "AAC only" modalities – the use of the AAC system as well as a vocalization/approximation and gesture	i.e., The child selects "mom" on the AAC system, verbalizes /a/, and points to his/her mother.
AAC+Verbal+Gesture	A combination of the "gesture," "verbal," and "AAC only" modalities – the use of the AAC system as well as a gesture and words, phrases, or sentences	i.e., The child selects "mom" on the AAC system, verbally says "mom," and points to his/her mother.

APPENDIX D: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

Date: 11-12-2021

IRB #: IRB-2021-176
Title: Shared Book Reading Experiences for Young Children Who Use Augmentative and Alternative Communication (AAC) Systems
Creation Date: 4-5-2021
End Date:
Status: Approved
Principal Investigator: Ciera Lorio
Review Board: Illinois State University IRB
Sponsor:

Study History

Submission Type Initial	**Review Type** Expedited	**Decision** Approved
Submission Type Modification	**Review Type** Expedited	**Decision** Approved

Key Study Contacts

Member Braelyn Wence	**Role** Co-Principal Investigator	**Contact** bnwence@ilstu.edu
Member Patricia Larkin	**Role** Co-Principal Investigator	**Contact** pllarki1@ilstu.edu
Member Amy Yacucci	**Role** Co-Principal Investigator	**Contact** ayacucc@ilstu.edu
Member Heidi Harbers	**Role** Co-Principal Investigator	**Contact** hmharbe@ilstu.edu
Member Ciera Lorio	**Role** Principal Investigator	**Contact** cmlorio@ilstu.edu
Member Braelyn Wence	**Role** Primary Contact	**Contact** bnwence@ilstu.edu