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## EFFECTS OF NATURALISTIC TIME DELAY ON PROMOTING FUNCTIONAL REQUESTS USING AAC IN PRESCHOOLERS WITH AUTISM SPECTRUM DISORDERS

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Digital Object Identifier: <https://doi.org/10.13023/etd.2019.467>

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EFFECTS OF NATURALISTIC TIME DELAY ON PROMOTING FUNCTIONAL  
REQUESTS USING AAC IN PRESCHOOLERS WITH AUTISM SPECTRUM  
DISORDERS

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THESIS

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A thesis submitted in partial fulfillment of the  
requirements for the degree of Master of Science in Education  
in the College of Education at the University of Kentucky

By

Brianna Rinaldi

Lexington, Kentucky

Director: Dr. Jennifer Grisham-Brown, Professor of Special Education

Lexington, Kentucky

2019

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## ABSTRACT OF THESIS

### EFFECTS OF NATURALISTIC TIME DELAY ON PROMOTING FUNCTIONAL REQUESTS USING AAC IN PRESCHOOLERS WITH AUTISM SPECTRUM DISORDERS

The purpose of this study was to teach preschool children with autism spectrum disorders to make requests with a speech generating device using a naturalistic time delay prompting procedure. The participants in this study were two males, enrolled in a public preschool program, between four and five years old. Both participants showed significant delays in expressive communication requiring alternative and augmented communication. The study utilized a multiple probe design across behaviors. Results showed utilizing naturalistic time delay increases independent requests using a speech generating device.

KEYWORDS: Time Delay, AAC, Preschool, Autism spectrum disorders

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Brianna Rinaldi

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December 13, 2019

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## **Chapter One: Review of Literature**

### **Introduction**

Children with autism spectrum disorder (ASD) often show delayed expressive communication. These expressive communication skills are vital to express wants and needs, share interests and interact with peers and adults (Lane, Shepley & Lieberman-Betz, 2016). Due to the importance of these skills, early childhood professionals are faced with the challenge of meeting these needs through systematic instruction while also considering recommended practices for young children (Division for Early Childhood of the Council for Exceptional Children [DEC], 2014). Bruder (2010) emphasized the natural environment as the best instructional setting for young children. For many children, this includes home, daycare, and inclusive preschool classrooms. Unstructured play activities within these environments allow the child to lead the activity and, in turn, allow adults to incorporate the child's interests into structured opportunities to increase communication (Noonan & McCormick, 2014).

Historically, expressive language instruction for young children with ASD occurred in highly structured settings in a one-on-one instructional format. Thus, children with ASD did not generalize targeted skills to their typical settings. Early childhood professionals called for more naturalistic teaching methods to embed systematic instruction into everyday activities (Lane & Brown, 2016).

### **Naturalistic Language Interventions**

A commonly used naturalistic language intervention is enhanced milieu teaching (EMT; Lane, Lieberman-Betz, & Gast, 2016). Using EMT strategies involves the adult purposely disrupting the environment by denying access to materials or interrupting the routine to

necessitate communication from the child. EMT includes responsive interaction techniques, environmental arrangement strategies, and prompting procedures including mand-model, naturalistic time delay, and incidental teaching. (Grisham-Brown & Hemmeter, 2017; Lane & Brown, 2016).

In addition, best practice in early childhood stresses the importance adult's using responsive interaction strategies (e.g., positive affect, turn taking with material; DEC, 2014; Wolery & Hemmeter, 2011). Sessions occur in the child's natural environment during unstructured, age-appropriate activities. Materials are selected by the child and then controlled by the adult to motivate communication and, as such, reinforcement is relevant to the child's communicative behavior (Ingersoll, 2010). These naturalistic methods have shown to be effective at increasing independent verbal requests (cf. Lane, Lieberman-Betz, & Gast, 2016).

Naturalistic time delay is one option to promote spontaneous use of language, specifically increases in initiations during routine activities. A pause in routine serves as the antecedent for a verbal initiation from the child. If needed the adult models the correct respond (Noonan & McCormick, 2014). In 1994, Leung (1994) used a graduated time delay procedure and highly desired toys with multiple components (i.e. puzzle, shape sorter). Reinforcement was natural to the activity, as students were motivated to gain access to reinforcement to put the toy together. All three participants began to use the phrases taught within the 10s delay. Participants also generalized the skill to another setting in at least 8 out of 10 trials and another toy in at least 9 out of 10 trials.

More recently, Liber, Frea, and Symon (2008), used a graduated time delay procedure to teach children with ASD to ask a peer to play and engage in a play sequence. All participants increased their unprompted initiations and requests during play. Two participants showed the

ability to use the skills taught, in different settings and with different, larger groups of peers during generalization probes.

In 2016, Lane et al. (2016), used a naturalistic language intervention, that included components similar to naturalistic time delay, to promote functional verbal requests in young children with ASD. The classroom teacher modified the environment and waited 5 s for a request before providing a verbal model. Researchers found that students made gains in verbal requests within their typical classroom environment.

Naturalistic time delay has also been used to teach labeling. During play sessions, Duenas, Plavnick and Maher (2019) taught 3 children to verbally label play items during play and clean up routines. Interventionists used a model and a 5 s delay. Social reinforcement, such as praise, was used to reinforce the label instead of providing the item which would have reinforced a request. All three participants learned to tact quickly and maintained the skill over two weeks. The study also evaluated the social validity of the naturalistic interventions. The nine early childhood providers that were surveyed favored the naturalistic intervention to more structured language interventions and reported that it was easy to implement.

### **Augmented and Alternative Communication**

Although estimations vary, Zager, Wehmeyer, and Simpson (2012) estimate that between 40% and 50% of children with ASD never develop functional speech, requiring some children to use alternative modes of expressive communication. Thus, naturalistic language interventions that focus on speech only might be counterproductive for some young children with ASD (Olive et al., 2006). For children who are initially nonverbal and those that remain nonverbal, augmented and alternative communication (AAC) systems are available. Similar to children who are verbal, spontaneous initiations are an important area of intervention. While students make

initial gains in this area using AAC, generalization to natural environments is typically limited (Koegel, 2000). However, naturalistic language interventions have shown to increase generalization (Leung, 1994; Liber et al., 2008) can be utilized to increase the use of AAC systems. Aided forms of communication, including speech generating devices (SGD), have been effective for promoting communication in individuals with ASD (Ganz, 2015). Even very young children have shown increases in expressive communication using SGD (Ronski et al., 2010).

The context in which AAC is implemented has been studied very little (Schepis, Reid, Behrmann, & Sutton, 1998; Ganz, 2015). Schepis et al. (1998) utilized naturalistic language interventions in combination with a SGD to increase total initiations (gestures, vocalizations and use of SGD) and comments. Four young children with ASD were introduced to a SGD during typical routines (snack and free play). Classroom staff were trained to use naturalistic interventions including child driven activities and natural social cues (i.e. expectant delay, questioning looks) and verbal and gestural prompts to encourage SGD use. Students showed gains in total initiations (i.e. gestures, vocalizations) and specifically began using the SGD to make unprompted requests and comments. In a similar study, Olive et al. (2007) utilized enhanced milieu teaching (EMT) to increase independent requests using a SGD. Researchers conducted 5 min child lead play sessions with preschool aged participants utilizing EMT procedures and most-to-least prompts. Students quickly began to use the SGD to request desired items. Researchers concluded that naturalistic language interventions can be combined with SGD to increase communication behaviors in young children with limited verbal abilities.

Lorah (2018), also demonstrated that three young children diagnosed with Autism learned to discriminate and request items using an iPad Mini as an SGD when trained in the natural environment. This study utilized preference assessments to identify motivating objects

for each participant. During intervention, participants moved through phases in which the number of items on the screen increase from one to four items. Investigators used a 5 s delay followed by a full physical prompt during back and forth play sessions. Once the participant activated the device, they gained access to the preferred item for 30 s. All three participants made immediate gains and met criteria. One participant met criteria in three sessions, the minimum number needed. Lorah (2018) concluded that training within the natural environment is effective for acquisition of SGD skills.

### **Rationale**

This study seeks to add to the literature, extending work by Schepis et al. (1998) and Olive et al. (2007), by evaluating the effects of naturalistic language interventions for children with ASD, that allows children to use AAC as mode of expressive communication. Both studies involved the use of the Cheap Talk with picture symbols and pre-recorded messages. The proposed research will extend this by include a tablet, that includes speech generating software, during play-based sessions.

### **Research Question**

The research question for this study was as follows: Is there a functional relation between naturalistic time delay prompting and an increase in independent use of SGD to request during daily play routines for children with ASD?

## **Chapter Two: Method**

### **Participants**

Participants were selected by the researcher using the following criteria. Participants needed to have a diagnosis of ASD and be between three and five years old. Regular attendance

in the preschool program was also required. Participants needed to be receiving speech language therapy for expressive communication and making little progress with traditional speech. Finally, no prior usage of a SGD was required.

**Chris.** Chris was a five-year-old boy diagnosed with Autism Spectrum Disorder. He attended a public early childhood classroom for three hours a day, four days per week. During the study, Chris was in his third year of the preschool. Within the preschool program, Chris received special education, speech and occupational therapy. Chris had significant delays in expressive communication, fine motor abilities and social and play skills. During free choice, Chris often chose to work with letters, puzzles and vehicles. On the playground, he loved to swing and dig in the mulch. Chris was able to verbalize letter names but was not yet verbalizing words. He was able to use puzzle pieces to spell different animals and vehicles. He was just beginning to show an interest in writing letters but had difficulties because of delays in fine motor skills. Throughout the day, Chris exhibited self-harming behaviors when he became frustrated. These behaviors were most prevalent during unstructured play time when peers tried to interact.

**Allen.** Allen was a four-year-old boy diagnosed with ASD. He also attended a public preschool program for 3 hours a day, 4 days a week. Allen received special education, occupational therapy and speech therapy within the preschool classroom. Allen did not verbalize any words and often screamed to communicate. During free choice, Allen liked to build with blocks and color using markers but needed teacher redirection as he often wandered around the classroom watching others. On the playground, Allen enjoyed chasing bubbles and swinging.

**Reliability data collector.** Two reliability data collectors were used during the study. Both were trained on data collection procedures for the study before beginning. The first

reliability data collector, Kathryn, was a lead teacher in a public preschool classroom. Kathryn had a Bachelor's degree in Interdisciplinary Early Childhood Education and a Master's in Learning and Behavior Disorders. She was in her seventh year as a lead teacher during the study. The second reliability data collector was Julie, a certified speech language pathologist (SLP). Julie had a Master's in Communication Sciences and Disorders. She worked in the public schools as a SLP for six years. Both data collectors were trained in collecting reliability data during their master's coursework and before the study began.

### **Setting**

The study took place in a preschool classroom in a public early childhood center. Chris attended the AM session with nineteen students aged three to five. The class included six students with Developmental Delay; one student with Autism and six students with Speech and Language Delays. The remaining six students qualified for preschool based on a low family income. Allen attended the PM session. This class had eighteen students aged three to five including one student with ASD, four with developmental delays, four with speech and language impairments, and one child who was hard of hearing. The remaining students were low income or paid tuition. All children spoke English as their first language and all students were Caucasian. The author was the lead teacher in the classroom. There also was a full time para-professional in the classroom. A floating assistant, and two speech language pathologists were frequently in the classroom as well.

Sessions for both participants occurred in the classroom during free choice time and on the playground. The classroom had several interest areas including dramatic play, blocks, hand toys, playdough, sensory, library, art, writing, and science. Materials were developmentally appropriate, labeled with pictures and rotated to fit current theme. During free choice time,

children engaged in interest area activities for one hour and were allowed to move through interest areas at their own pace. The playground had climbing equipment, balls, trikes on a path, balance beams and swings. Children were able to choose where they played during the thirty-minute playground block.

## **Materials**

Materials needed for research included an Apple iPad with GoTalk Now app. The GoTalk Now was programmed with three pages. Each page had two buttons with a picture and a word. One button had the target action and the other had an action related to the play routine. For example, on the playground the target action was push and the other action was slide. In the block area the target action was build and the other action was drive the car. Materials were selected based on the child's interests and target words. In the writing area, the child had access to paper and colored pencils, whiteboard and dry erase markers and a Lakeshore magic board. These materials were used for the target word "write." In the block area materials included wood unit blocks, hollow blocks, and accessories. Magnetic blocks were also available as a table toy to target the word "build" At the playdough table, playdough was available to target the word "make." On the playground, an adapted swing was used to target the word "push" and bubbles were available to target "blow bubbles." On rainy days, a swing in the occupational therapy room was used and bubbles were made available in the science center. Both swings allowed the child to sit in the swing with the AAC device in the participant's lap.

## **Data Collection**

Data were collected by the researcher on the number of times the participant independently used a SGD to request an action during routine play activities. Two sessions were conducted each day, two days a week. Sessions were conducted throughout the day as they



naturally occurred during free choice time and on the playground. Sessions lasted five to ten minutes and included five sessions per trial. Independent responses involved the student independently activating the SGD by pressing the correct button within five seconds of the natural cue (pausing play routine). Independent responses were scored as a (I) on the data sheet. If the child did not respond within five seconds, the researcher provided the controlling prompt (physical). These responses were scored as (P) on the data sheet. When the child selected the incorrect picture, it was scored as (X) on the data sheet. This allowed for analysis of independent, prompted and incorrect responses. Criterion was set at correct use of AAC in four out of five trials across four sessions.

### **General Procedures**

Prior to beginning sessions, the researcher determined target vocabulary based on observation of the participants. Three words were selected based on the child's interests, materials selected most frequently and centers the child visited daily. Researcher and speech language pathologist determined that both participants would utilize line drawings and 2 pictures would appear on the screen. It was also decided that a full physical prompt would be used as the controlling prompt. Procedures were identical for both Chris and Allen. The researcher conducted sessions during free choice time one-on-one with the participant. The participant was directed to a classroom area with a variety of preferred activities. The researcher established joint attention by joining the participant in play or engaging the student in a play activity. During playdough sessions, the researcher established play routines by imitating the participant rolling the playdough and taking turns with the student making the next letter in the alphabet. In writing sessions, a play routine was established by taking turns with the utensil. The researcher wrote letters of the alphabet and the participant tried to imitate. In the block area, the researcher took

turns placing a block on the tower to establish a routine. On the playground, a play routine was established when the child sat in the swing and the researcher pushed the swing. Finally, the researcher blew bubbles for the participant to pop. The researcher then used an environmental arrangement strategy (i.e., paused play, withheld the desired material) and looked expectantly at the participant waiting for an initiation. The researcher allowed for five opportunities during each play session.

**Probe sessions.** The researcher joined the child in play and placed the AAC next to the child. During play, the researcher imitated the child's play by taking turns, and establishing joint attention. After the play routine was established, researcher paused play, made eye contact, and waited five seconds for an initiation. No prompts to use the AAC were provided during probe sessions. The response was recorded as an independent correct response (I) or no response or incorrect response (X). Regardless of participant's response, play resumed. The sessions continued for five to ten minutes or until five trials had occurred.

**Intervention sessions.** Intervention play sessions included utilizing naturalistic time delay and were identical for both participants. The researcher followed the child's lead, assisted the child, or imitated child's play. The AAC was positioned next to the participant and the researcher established a play routine by taking turns with the participant engaging in the play behavior. After the play routine was established, the researcher provided the unexpected event by stopping, making eye contact, and waiting 5 s for an initiation. When the participant independently activated the device, a correct response was recorded (I) and play continued. If the participant did not initiate a response using the device within 5 s. a physical prompt was delivered (researcher activated the iPad with the participant's hand). A prompted response (P) was then recorded and play continued. When the child activated the device, whether prompted or

unprompted the researcher provided verbal feedback with positive affect (i.e. “Okay! Let’s write.”). The session continued until five trials had occurred. Table 1 shows the target words for each child and the environmental strategy.

Table 1  
Target vocabulary and environmental strategy

Activity	Environmental Strategy	Target Vocabulary	Researcher response
Writing letters (Chris)	Researcher and participant took turns with the writing utensil then the researcher wrote a letter and withheld utensil.	Write	Gave utensil to participant
Playdough (Chris)	Researcher imitated rolling playdough and paused	Make a letter	Researcher shaped the playdough into the next letter
Swinging (Chris and Allen)	Researcher pushed the child on the swing and let the swing come to a stop	Push	Researcher pushed the swing again
Blowing Bubbles (Allen)	Researcher blew bubbles and student watched and popped them	Blow bubbles	Researcher blew more bubbles
Build (Allen)	Researcher and participant took turns placing a block on top of a tower then researcher would pause	Build	Researcher took her turn placing a block on top

**Generalization sessions.** Generalization occurred after the child reached criteria and moved to the next tier of instruction. Sessions occurred with another familiar adult in the classroom and followed the same time delay procedures. Julie the participant’s SLP, and the reliability data collector, conducted generalization sessions. She engaged in a play routine with

the participant and then pauses and wait expectantly for an initiation. Generalization sessions were conducted the same as probe sessions.

### **Experimental Design**

A multiple probe design (Gast & Ledford, 2014) across behaviors was used to evaluate the effects of naturalistic time delay to promote expressive communication, using SGD as the mode of communication, in young children with disabilities. This design allowed for examination of the same non- reversible behavior across multiple behaviors. The multiple probe design involves time-lagged introduction of the intervention across multiple tiers, determining if the naturalistic time delay intervention alone is effective in this context. Intermittent probe sessions were used to monitor the target behavior in untreated tiers for purposes of detecting potential covariation, although it was not expected that the student will increase AAC use without intervention. Sporadic probes also decrease the likelihood of testing effects.

### **Reliability**

Interobserver agreement (IOA) was conducted by a trained observer for 20% of baseline sessions and 30% of intervention sessions. Mean agreement was analyzed using a point by point method by dividing the number of agreements by the number of agreements and disagreements and multiplied by 100. IOA for baseline sessions was 100%. IOA for intervention sessions ranged from 90% to 100% for an average of 95%. Procedural fidelity data of researcher behaviors were recorded by the same trained observer. Fidelity was recorded using a checklist during 20% of baseline and 30% of intervention sessions. The observer watched the researcher to ensure she placed the iPad within the child's reach, established joint attention, manipulated the environment and responded appropriately to the participant's response. Data were analyzed by dividing the number of observed steps by the total number of steps and multiplied by 100.

Procedural fidelity for baseline sessions was 100% and ranged from 95% to 100% for an average of 98% for intervention sessions.

### **Chapter Three: Results**

Criteria was set as an independent correct response on four out of five trials. Once the participant reached criteria for four consecutive data points intervention moved to the next tier. During baseline, Chris showed consistency in data. Chris showed a low level of frequency across baseline in all three tiers. Data showed an immediacy of effect to a high level once intervention began and a therapeutic trend. Chris reached criteria for the first target action in five sessions and for the second target in four sessions, which was the minimum number of sessions. Due to the end of the school year, Chris did not meet criteria on the final target word. The first two tiers had no overlap of data. Chris also generalized the behaviors to different teachers as well. Data for Chris shows a basic demonstration of effect.

Allen made slower progress. Allen also showed a zero level, with no variability across all three tiers during baseline. He showed a therapeutic trend and reached criteria for the first target action in ten sessions. Allen did not show immediate changes in level once intervention was applied. In the second tier, Allen made gains but did not reach criteria due to the end of the school year. Allen also did not have any overlap of data. Figure 1 and 2 show data graphs of the results.

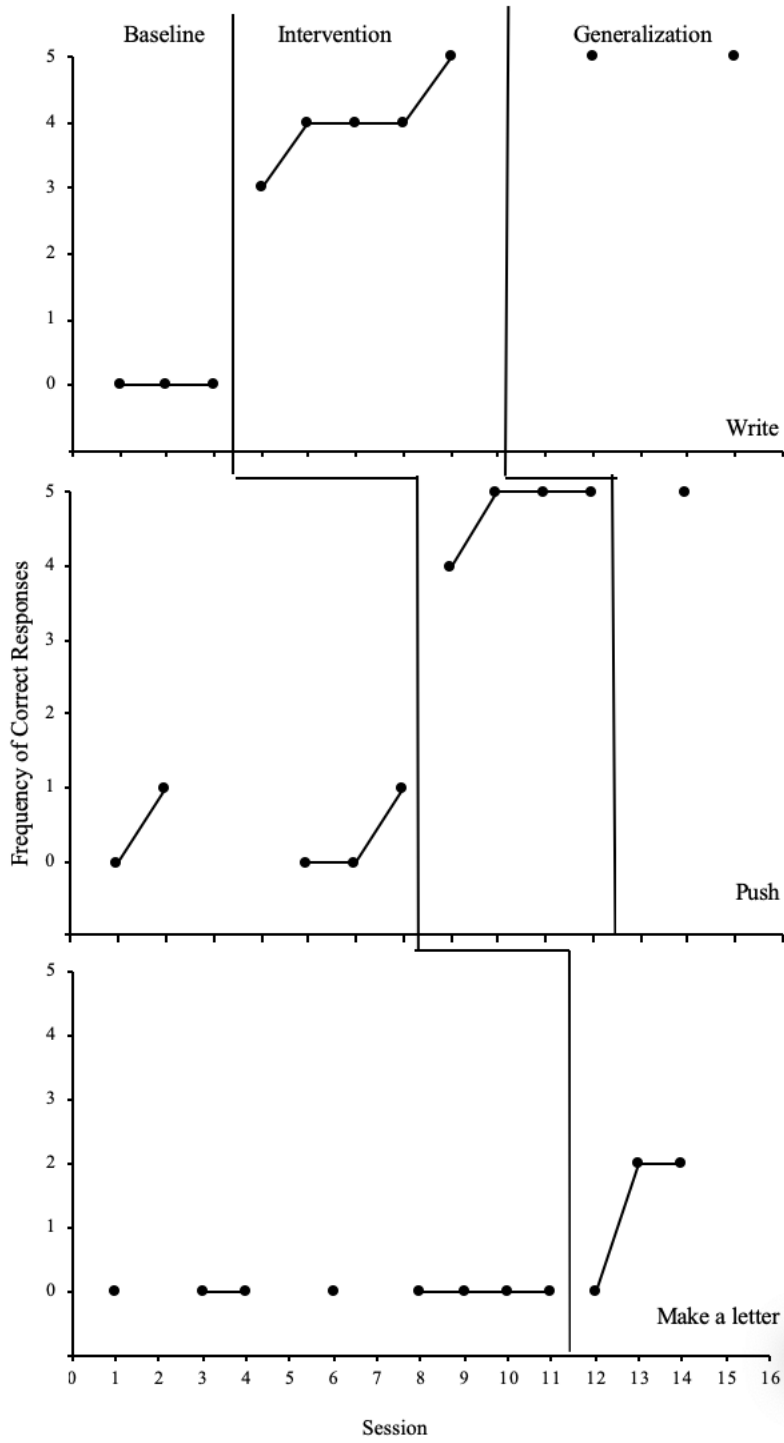


Figure 1: Frequency of correct responses for Chris

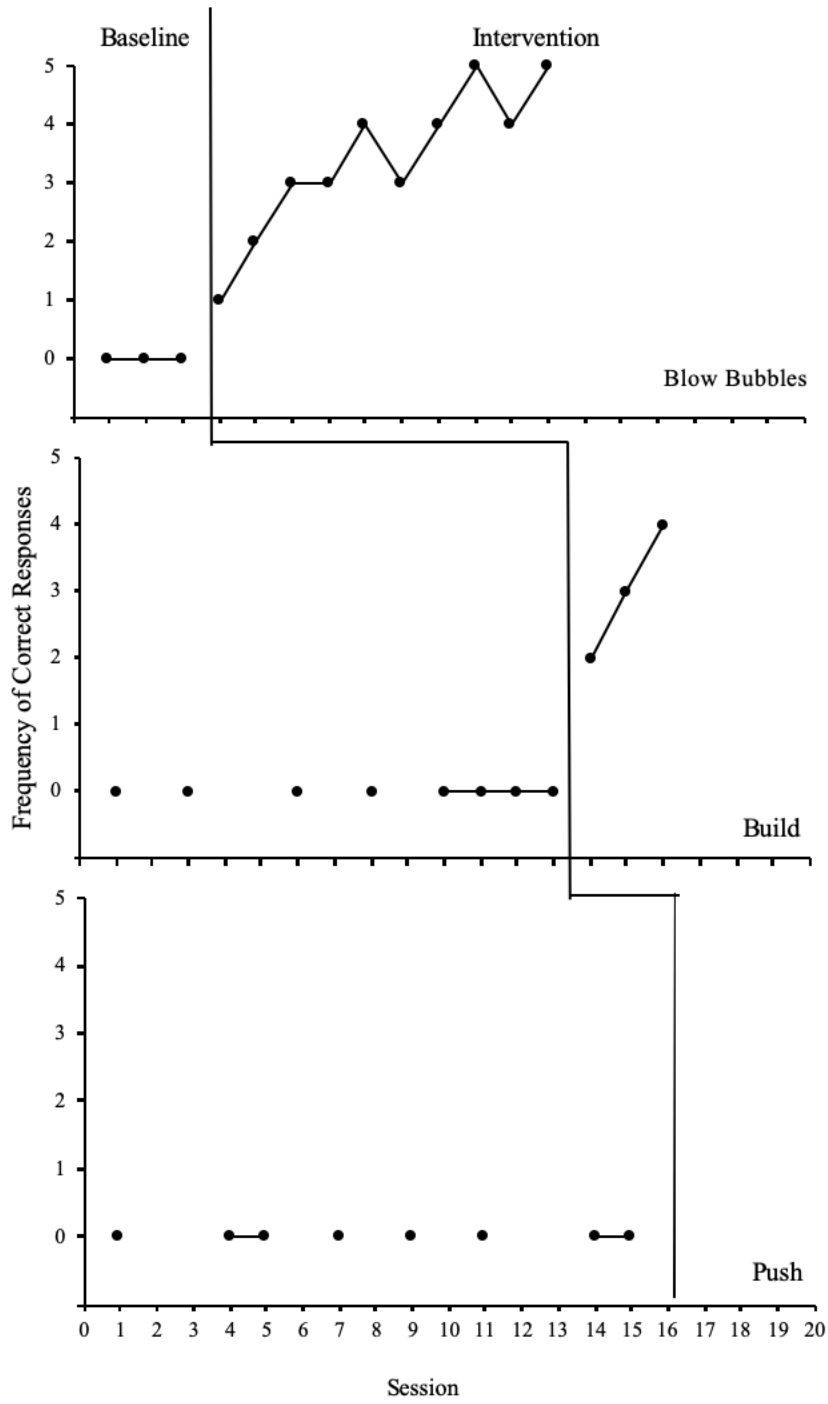


Figure 2: Frequency of correct responses for Allen

## Chapter Four: Discussion

This research study attempted to answer the question: Is there a functional relation between naturalistic time delay prompting and an increase in independent use of SGD to request during daily play routines for children with ASD?

Young children need to be educated in a natural environment to aid with generalization. Sessions in this study, occurred in the child's classroom with familiar adults. Materials were selected based on the child's interests and play sessions were natural and routine. Participants successfully learned to request item using an SGD when the play session was paused. One participant met criteria in the minimum number of sessions. The other made steady progress towards criteria. Similarly, Leung (1994) and Liber et al. (2008) used naturalistic time delay to teach verbal expressive communication. Both studies showed an increase in spontaneous verbal requests and the skills were generalized to different settings.

Koegel (2000) showed that even students who make gains with AAC have difficulty generalizing to their typical environment. Because naturalistic language interventions occur within the child's typical environment and have shown generalization gains with verbal speech, this study aimed at using time delay to teach SGD. Schepis et al (1998) and Olive et al. (2007) concluded that naturalistic language interventions utilizing classroom staff and materials can be used to increase SGD use. This study supports that naturalistic language interventions are effective to teach expressive communication using a SGD to a child with limited verbal abilities. However, Allen did not show a functional relationship and without three replications experimental control was not reached.



Natural language procedures paired with most to least prompting systems were also shown to increase communication in children with limited verbal abilities by utilizing an SGD (Olive et al. 2007). Specifically, a naturalistic time delay procedure was used to prompt spontaneous use of a SGD. One participant reached criteria across three behaviors and a second participant made progress. The data suggest that natural time delay was effective in teaching beginning AAC skills.

### **Limitations of the Study**

There were several limitations within the study. The first limitation is the time in which the study was conducted. The study took place at the end of the school year. The preschool program was only in session 3 hours a day, four days a week, which limited the number of sessions the investigator could conduct before school ended for the summer. Due to the end of the school year, Allen did not meet criteria in the second intervention tier and thus did not receive interventions on the last target behavior. Generalization data on the third behavior for Chris were not collected. A second limitation is that only two students participated in the study. Additional participants could have shown more experimental control and additional examples of effect. Finally, because of lack of time, experimental control was not able to be met. Allen did not reach criteria so three replications of effect was not shown.

### **Future Research**

This study shows that the use of SGD for preschoolers should continue to be studied. Future research would be useful for caretakers and practitioners to show that naturalistic language interventions can be effective for teaching young children to utilize SGD to make requests and comments. Research can investigate utilizing SGD within the home with parents as the communication partner. Future research can also investigate spontaneous speech while using

SGD. Finally, research could focus on utilizing time dealy to teach more complex SGD to students who have mastered basic AAC skills such as increasing number of pictures on each page, and expanding beyond requesting items to social communication (i.e “my turn,” I want to play...”).

## APPENDIX A: Parental Consent

For ORI Use Only:



Consent to Participate in a Research Study

### **Effects of Enhanced Milieu Teaching on Promoting Functional Requests Using AAC in Preschoolers with Autism Spectrum Disorders**

#### **WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?**

You are being invited to take part in a research study about promoting communicative initiations in young students utilizing alternative and augmentative communication (AAC). AAC is method of communication that uses alternative forms to supplement or replace oral speech. In this study, an Apple iPad will be used to supplement speech. Your child is being asked to participate because he or she displays verbal communication delays and is a candidate for AAC use. If you agreed that your children can take part in this study, he or she will be one of two children to do so.

#### **WHO IS DOING THE STUDY?**

The person in charge of this study is Brianna Rinaldi of University of Kentucky Department of Early Childhood, Special Education, and Rehabilitation Sciences. She is being guided in this research by Dr. Jennifer Grisham-Brown, a professor in the University of Kentucky Department of Early Childhood, Special Education, and Rehabilitation Sciences. There may be other people on the research team assisting at different times during the study.

#### **WHAT IS THE PURPOSE OF THIS STUDY?**

By doing this study, we hope to learn whether children who are taught using language interventions such as a pause during play will increase their use of AAC to initiate play.

#### **ARE THERE REASONS WHY YOU SHOULD NOT TAKE PART IN THIS STUDY?**

There are no known negative effects if you and your child participate in this study. Standard instructional procedures will be used that are proven to be successful with other children.

#### **WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?**

The research procedures will be conducted at Ezra Sparrow Early Childhood Center. Each session will take about 10 minutes. Sessions will be conducted 3 days per week for no more than 2 months.

#### **WHAT WILL YOU BE ASKED TO DO?**

You will be asked to share your child's IEP information with the researcher. Your child will engage in play and be asked to utilize an Apple iPad to communicate their wants.

#### **WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?**

To the best of our knowledge, the things your child will be doing have no more risk of harm than he or she would experience in everyday life.

#### **WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?**

There is no guarantee that your child will get any benefit from taking part in this study. However, some people have experienced increases in communication through augmented means. Your willingness to let your child take part may, in the future, help society as a whole better understand this research topic.

#### **DO YOU HAVE TO TAKE PART IN THE STUDY?**

If you decide to let your child take part in the study, it should be because you really want to volunteer. Your child will not lose any benefits or rights he or she would normally have if you choose not to volunteer. Your child can stop at any time during the study and still keep the benefits and rights he or she had before volunteering.

#### **IF YOU DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?**

If you do not want your child to be in the study, there are no other choices except not to take part in the study.

#### **WHAT WILL IT COST YOU TO PARTICIPATE?**

There are no costs associated with taking part in the study.

#### **WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?**

You and your child will not receive any rewards or payment for taking part in the study.

#### **WHO WILL SEE THE INFORMATION THAT YOU GIVE?**

We will make every effort to keep confidential all research records that identify you to the extent allowed by law.

Your information and your child's information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined results we have gathered. Your child will not be personally identified in these written materials. We may publish the results of this study; however, we will keep your child's name and other identifying information private.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. Only initials or a fictitious name will be used to identify your child during the study and data will be stored in the office of Dr. Grisham Brown at the University of Kentucky.

We will keep private all research records that identify you to the extent allowed by law. Also, we may be required to show information which identifies you to people who need to be sure we have done the research correctly; these would be people from the University of Kentucky.

#### **CAN YOUR TAKING PART IN THE STUDY END EARLY?**

If you decide to let your child take part in the study you still have the right to decide at any time that you no longer want he or she to continue. Your child will not be treated differently if you decide he or she should stop taking part in the study.

The individuals conducting the study may need to withdraw your child from the study. This may occur if your child has already mastered the information being taught or refuses to follow directions related to the study.

**ARE YOU PARTICIPATING OR CAN YOU PARTICIPATE IN ANOTHER RESEARCH STUDY AT THE SAME TIME AS PARTICIPATING IN THIS ONE?**

Your child may take part in this study if you are currently involved in another research study. It is important to let the investigator know if your child is in another research study. You should also discuss with the investigator before you agree to participate in another research study while your child is enrolled in this study.

**WHAT IF NEW INFORMATION IS LEARNED DURING THE STUDY THAT MIGHT AFFECT YOUR DECISION TO PARTICIPATE?**

If the researcher learns of new information in regards to this study, and it might change your willingness to stay in this study, the information will be provided to you. You may be asked to sign a new informed consent form if the information is provided to you after you have joined the study.

**WHAT ELSE DO YOU NEED TO KNOW?**

There is a possibility that the data collected from you may be shared with other investigators in the future. If that is the case the data will not contain information that can identify you unless you give your consent or the UK Institutional Review Board (IRB) approves the research. The IRB is a committee that reviews ethical issues, according to federal, state and local regulations on research with human subjects, to make sure the study complies with these before approval of a research study is issued.

**WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS, CONCERNS, OR COMPLAINTS?**

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study, you can contact the investigator, Brianna Rinaldi at 516-302-3314 or Dr. Jennifer Grisham-Brown at 859-257-8943 or email at [jennifer.grisham-brown@uky.edu](mailto:jennifer.grisham-brown@uky.edu). If you have any questions about your rights as a volunteer in this research, contact the staff in the Office of Research Integrity at the University of Kentucky between the business hours of 8am and 5pm EST, Mon-Fri. at 859-257-9428 or toll free at 1-866-400-9428. We will give you a signed copy of this consent form to take with you.

\_\_\_\_\_  
Signature of person agreeing to take part in the study

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed name of person agreeing to take part in the study

\_\_\_\_\_  
Name of (authorized) person obtaining informed consent

\_\_\_\_\_  
Date

APPENDIX B: Data Sheets

Baseline

Observer: \_\_\_\_\_ Participant: \_\_\_\_\_

Verb: \_\_\_\_\_

I- Independent response      X- incorrect response

P- Prompted response      0- No response

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Trial	1	2	3	4	5
Response					

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Trial	1	2	3	4	5
Response					

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Trial	1	2	3	4	5
Response					

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Trial	1	2	3	4	5
Response					

Naturalistic Time Delay

Observer: \_\_\_\_\_ Participant: \_\_\_\_\_

Verb: \_\_\_\_\_

I- Independent response      X- incorrect response

P- Prompted response      0- No response

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Trial	1	2	3	4	5
Response					

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Trial	1	2	3	4	5
Response					

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Trial	1	2	3	4	5
Response					

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Trial	1	2	3	4	5
Response					

### Naturalistic Time Delay Procedural Fidelity

Observer: \_\_\_\_\_ Participant: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Verb: \_\_\_\_\_

Steps Researcher...	Completed (If observed mark with a check)				
	Trial 1	2	3	4	5
Places iPad in students reach					
Establishes joint attention (joins participant in play or invites them to play and establishes routine)					
Manipulates the environment (pauses play)					
Waits 5 s for a response					
<b>If student responds correctly</b> , provides material and continues play					
<b>If student responds incorrectly or not at all</b> , provides physical prompt and continues play					
Provides verbal feedback (i.e. "you want the [item])					
Total number of behaviors observed					

#### IOA

Trial	1	2	3	4	5
Response					



### Baseline Procedural Fidelity

Observer: \_\_\_\_\_ Participant: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Setting: \_\_\_\_\_

Verb: \_\_\_\_\_

Steps Researcher...	Completed (If observed mark with a check)				
	Trial 1	2	3	4	5
Places iPad in students reach					
Establishes joint attention (joins participant in play or invites them to play and establishes routine)					
Manipulates the environment (pauses play)					
Waits 5 s for a response					
Records response					
Continues play					
<b>Total number of behaviors observed</b>					

### IOA

Trial	1	2	3	4	5
Response					

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## **Vita**

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