THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF COMMUNICATION SCIENCES AND DISORDERS

LOW-TECHNOLOGY VISUAL SCENCE DISPLAY AUGMENTATIVE AND ALTERNATIVE COMMUNICATION (AAC) INTERVENTION FOR A YOUNG CHILD WITH AUTISM

LINDSAY ERIN RILEY

SPRING 2015

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Communication Sciences and Disorders
with honors in Communication Sciences and Disorders

Reviewed and approved* by the following:

Kathryn Drager
Professor of Communication Sciences and Disorders
Thesis Supervisor

Ingrid Blood
Professor of Communication Sciences and Disorders
Honors Advisor

* Signatures are on file in the Schreyer Honors College.

ABSTRACT

Many studies have shown Augmentative and Alternative Communication (AAC) interventions to benefit individuals with complex communication needs. One AAC display option in particular that has recently shown great promise is the Visual Scene Display (VSD) layout (Wilkinson, Light, & Drager, 2012). However, studies to date on VSDs with children have only involved the use of high-tech computerized AAC systems and have neglected to explore the effects of VSDs within low-tech systems.

The purpose of this paper is to evaluate the effectiveness of low-tech VSDs combined with effective modeling on increasing the frequency of communication acts by a young child with autism. This research is apart of a larger study directed by a doctoral candidate that evaluated young children who have complex communication needs. Low-tech VSDs were an effective tool in increasing communication acts with a 4-year old child with autism.

TABLE OF CONTENTS

LIST OF FIGURES

ACKNOWLEDGEMENTS

I would like to give a special thanks to my thesis advisor, Dr. Kathryn Drager, for her guidance and instruction through this entire process. She has provided me with an excellent platform to continue research in the future and I am extremely grateful. I would also like to recognize that this case study is part of a larger study directed by Doctoral Candidate, Nimisha Muttiah. Without Nimisha's hard work and dedication this research would truly not be possible and I would like to thank her for her endless patience and assistance in my studies. Lastly, I would like to thank my honors advisor, Dr. Ingrid Blood, who I am forever appreciative of for the constant support and direction she has given me during my undergraduate studies.

Chapter 1

Introduction and Literature Review

Considering the significance of communication to human existence, individuals with complex communication needs often find themselves having difficulty. While typically developing children acquire communication skills with seeming ease, children with communication disorders who do not typically develop speech, language, and literacy skills are faced with many disadvantages. These children are often unable to actively engage with their environment and communication partners. Drager, Light, and McNaughton (2010) stressed the significant risks these children encounter. With a wide range of potential risks, likely affecting overall quality of life, they argued that without communication all other aspects of learning are hindered, including language, literacy, and socialization. For this reason, children with complex communication needs may feel isolated from the world.

Fortunately, individuals with communication disorders are able to access communication through Augmentative and Alternative Communication (AAC) systems (Wilkinson, Light, & Drager 2012). AAC can be described as "an area of clinical practice that attempts to compensate (either temporarily or permanently) for the impairment and disability pattern of individuals with severe expressive communication disorders (i.e., the severe impairments in speech-language, reading and writing)" ("Communication Services," n.d., para. 2). AAC is broken down into two general categories, unaided and aided forms of communication. Unaided systems support communication without involving external aids. This includes gestures, body language, facial expressions, and sign language. Aided forms of communication involve the use of additional tools or equipment. Aided communication systems can simply be a paper and pencil or a communication book but can also be a high-tech computerized system with speech output ("Augmentative and Alternative," n.d., para. 5).

As one adult who uses AAC said, "The silence of speechlessness is never golden. We all need to communicate and connect with each other – not just in one way, but in as many ways as possible. It is a basic human need, a basic human right. And more than this, it is a basic human power" (Williams, cited in Beukelman & Mirenda, 2005, p.3). Without the means to communicate individuals with complex communication needs lack this basic right and often are unable to interact with their environment in any way. As complex individuals we use communication for a number of reasons in our daily lives. There are four purposes for communication: expressing needs and wants, developing social closeness, exchanging information, and fulfilling social etiquette routines (Light, 1988).

Expressing wants and needs involves asking for a desired object or action. Social closeness communication has the goal of developing personal relationships. While the main focus of exchanging information is to either obtain new information or convey new information to others it does also involve the development of social relationships. For example, one needs to be able to express and share feelings in order to connect to others. Social etiquette routines are often brief forms of communication that include greetings and polite discourse (Light, 1997).

These purposes of communication vary in significance depending on the stage of life. For preschoolers, developing social closeness is of great importance because they have already begun to express needs and wants and soon will be entering a very social environment in elementary school (Light, 1997). At such a significant time in development it is crucial that young children with complex communication needs utilize AAC in order to enhance their social communication development. In particular, young children with autism spectrum disorder (ASD) can greatly benefit from the use of AAC.

Autism is characterized by the Diagnostic and Statistical Manual of Mental Disorders as a disorder in which an individual has "persistent difficulties in the social use of verbal and nonverbal communication" (American Psychiatric Association, 2013, p. 50). Often these individuals have difficulty with the form, content, and use of language leaving them unable to understand how to effectively communicate with others ("Autism," n.d.). However, through the use of AAC interventions children with autism are able to maximize their functional communication skills and in turn improve both receptive and expressive language skills while also reducing challenging behaviors (Drager et al., 2010).

AAC is a broad term that encompasses a variety of methods and systems that can be used to communicate. For example, AAC devices can either be high-tech, meaning the system is computerized, utilizing a digital screen and voice output features, or low-tech, in that it is a non-computerized system. Throughout previous research there has been great speculation on the effects of these different types of AAC systems. Son, Sigafoos, O'Reilly, and Lancioni (2006) attempted to analyze the effectiveness of the two AAC types by conducting a study that compared the acquisition rates of low-tech versus high-tech AAC systems. The study consisted of 3 phases: baseline, intervention, and preference. This type of design allowed the researchers to compare the results between the two systems. Results from Son et al., (2006) found that both system types, high and low-tech, could be a viable AAC option to improve communication for a child with autism.

It is important to consider the various designs that can be used within AAC devices. Two options for design layouts are traditional grid and visual scene displays (VSD). Grid layouts are composed of symbols that are organized in boxes, which can sometimes make their use difficult for younger children due to the fact that there is a lack of contextual information to provide support (Drager et al., 2004). In contrast, Wilkinson, Light, and Drager (2012) describe VSDs as images of scenes with multiple language concepts embedded within. Drager et al. (2004) conducted a study to determine which of these display options was most conducive for communication and learning for typically developing children. Findings from the research verified that such visual scenes hold promise for AAC intervention by demonstrating that typically developing 2 ½ year old children performed better using VSDs than grid displays.

One way in which VSDs may further enhance communication is through the incorporation of human figures in the contextualized scenes. Wilkinson and Light (2011) attempted to evaluate the effects of human figures on visual attention and communication acts. Results from the study showed that the adult participants placed greater attention on the human figures despite other distracting elements present in the scene. Wilkinson and Light also suggested that children with autism, although having different viewing patterns, pay attention to human figures just as non-disabled children did. Furthermore, they also noted that by incorporating photographs of a child with familiar people in social scenes, the foundation for social communication is established.

While the studies done by Drager et al. (2004) and Wilkinson and Light (2011) clearly display the advantages of VSDs and the incorporation of humans within them, they were conducted with typically developing children and adults. This allowed the researchers to determine the effects of VSDs on learning with no other outside influences, which is valuable when determining a developmental baseline on a topic in which there is very little information. This type of study is significant because it provides information on the demands of a particular system and establishes a control group to be used for comparison on research with disabled children, similar to the current study.

Ganz, Hong, Gillilan, Morin, and Svenkerud (2015) recently published one of the first studies that evaluated the effect of VSDs on children with autism. The study explored whether or not young children with autism would be more likely to use a VSD over a traditional grid layout and if there would be secondary effects on speech. Ganz et al. (2015) found VSDs to increase in-context AAC use for one of the participants for both making spontaneous remarks and responding to questions. Findings from this research verifies that VSDs may be a useful tool in not only increasing communication for typically developing children but also children with autism and other complex communication needs.

Another way in which children with autism may be able improve their communication is through the use of aided modeling. Drager (2009) makes note that while typically developing children are exposed to hundreds of thousands of verbal models by the time they are one, children who need AAC to communicate receive much fewer models of the type of language they are expected to use. Aided modeling interventions require the individual who is communicating with the child to use both the AAC and speech input in attempt to expand the vocabulary of the user. By doing so the communicator provides a model that is effective in showing the child the type of output communication that is expected of him/her (Drager, 2009).

More specifically, aided modeling may be particularly effective in improving comprehension of verbal input for children with autism based on their strong visual-spatial abilities (Drager, 2009). Currently, there are five studies that have been conducted to investigate the effects of aided modeling interventions on children with autism (Acheson, 2006; Cafiero, 1995, 2001; Dexter, 1998; and Drager et al., 2006). Although each study had different foundations and utilized varying strategies, the evidence suggests that aided modeling interventions can be successful in increasing comprehension and/or production in children with autism (Drager, 2009).

Despite the significant amount of research which indicates the benefits of AAC intervention, including low-tech devices, VSD displays, and the effects human figures have on acquisition rates, there is a lack of research on low-tech VSDs. Previous research is instead centered on the effect of VSDs within high-tech devices. In order to account for this gap the current study assesses the effects of low-tech VSDs by incorporating and combining valuable aspects of the past research, including aided modeling, to create an AAC system and intervention that increases the communication acts of a young child with autism. The following research will evaluate the effectiveness of a low-tech VSD system combined with effective modeling on increasing the communication acts of a young female with autism.

Chapter 2

Method

Research Design

This case study is part of a larger study that investigated the effectiveness of low-tech VSD interventions on the communication acts of young children with complex communication needs. The study utilized a single subject multiple probe research design to determine the effectiveness of low-tech VSD combined with effective modeling. In this type of design the single subject serves as his or her own control for comparison. Data was first collected on one particular behavior during the baseline phase. Once stability of the measured behavior, communication turns, was reached during the baseline phase the intervention was initiated. Data from the baseline phase served as a benchmark for comparison against data collected during the intervention phase. An increase of communication turns during the intervention phase compared to the baseline phase would suggest that the intervention was effective. Although the larger study incorporated 3 participants, for the purposes of this paper data from only one participant will presented in a case study design, with a baseline and intervention phase for a single participant.

Participant

To recruit participants, the primary investigator contacted pre-schools, schools, and Speech-Language Pathologists who worked in Intermediate Units (IU) and Early Intervention (EI) and asked them to distribute information about the study. In addition, the families of individuals receiving services at the Penn State Speech and Hearing clinic were also contacted and invited to participate. Through these efforts three participants were recruited with varying complex communication needs including autism, developmental delay, and a genetic disorder. All of the participants were between the ages of 2 and 5 and were candidates for AAC based on their significant communication impairments.

The participant presented and discussed in this case study, Lauren (not real name), was a female aged 4 years and 10 months at the start of the study, who had a diagnosis of autism spectrum disorder. Based on her significant communication impairments restricting her participation in educational and social settings she was judged to be an appropriate participant for this study. Prior to the study the participant, caregivers, and teachers were asked to complete questionnaires to determine her communication abilities as well as other pertinent information. The specific assessments utilized included the MacArthur-Bates Communicative Development Inventory and the Communication Matrix Profile assessment. The Communicative Development Inventory provided a detailed account of the participant's vocabulary repertoire. From the inventory it was concluded that Lauren ranked within the 5th percentile for her age, producing 2 words, 2 signs, and 4 PECs. Furthermore, the Communication Matrix Profile assessment was used to determine the participant's expressive communication skills. The assessment revealed that Lauren fell within Level III (Unconventional Communication) meaning her use of communication, while intentional, was not symbolic (see appendix A). Once again, these results, revealing delayed language and expressive language skills, confirm the appropriateness of Lauren's fit within the study.

In addition to communication assessments the study incorporated additional questionnaires and evaluations. A preference assessment was given to Lauren's caregiver to assess her likes and dislikes. The assessment displayed her preference in singing old McDonald and playing on the slide (see appendix B). This information proved to be highly valuable when selecting session activities that would be interesting, thus encourage communication during sessions. Prior to the study Lauren's experience with AAC use entailed of inconsistent use of 15-20 PCS pictures displayed in a folder. She had adequate vision, hearing, and motor skills, according to parent report, which allowed her to effectively interact and utilize the AAC system and intervention.

Materials

From the preference assessment, which was completed by Lauren's mother, specific toys and activities were identified as being of interest to her. For example, some of the age appropriate toys and songs that were used with Lauren were Old MacDonald farm animals, pull-back cars, and singing the happy birthday song. Some of the toys utilized were from the preschool and others were brought in.

Two AAC options were available. The first option was 3x2 grid display AAC systems using Picture Communication Symbols (PCS), which consisted of 6 colored line drawings representing each of Lauren's preferred activities (see appendix C). The second option was low-tech VSD displays, which contained personalized pictures of Lauren engaging in preferred activities (see appendix D). The VSDs utilized 3D Velcro hotspots to highlight specific items or activities within the scene. Both the grid displays and VSDs were placed in page protectors and organized in binders. These materials were used to target the communication skills of the participant.

Procedure

Sessions occurred once or twice per week and lasted 10 minutes each. The participant completed six baseline sessions and five intervention sessions for a total of 11 sessions. Throughout both baseline and intervention sessions, the participant was observed and recorded in natural child-centered play settings such as singing favorite songs and engaging in preferred activities in the hallway at her preschool. The main researcher of the study implemented sessions. Lauren's aid was also present to help facilitate and observe. During baseline sessions, the researcher promoted communication with the use of a low-tech AAC in grid format, displaying the Picture Communication Symbols (PCS) (see appendix C for an example of the type of grid used).

Intervention sessions included the child being presented with low-tech VSD displays while the grids were still available. The researcher utilized a least-to-most prompting hierarchy during intervention sessions. Following this hierarchy the researcher first presented the low-tech VSD depicting a certain song or play activity with hotspots. The researcher then modeled the hotspots on the personalized VSDs by pointing to them in order to show certain vocabulary items, express ideas, and make choices also while using speech. Models were provided at least eight times within the 10-min session. The researcher also provided at least eight opportunities for the participant to take a communication turn within the 10-min. Opportunities were presented by providing a choice, asking a questions, and etc. Actions considered to be a turn included: making a choice, answering a question, making a comment, taking a turn, requesting, asking a question, and greetings. If Lauren responded to any of the given opportunities the researcher would then fulfill the intent while also expanding on the communication turn with speech, sign, or aided AAC. If Lauren did not respond to an opportunity the researcher would then provide an expectant delay of five sec while maintaining eye contact. This pause was then followed by gestural and verbal cues to the VSD as well as modeling an appropriate response.

Data Analysis

Each 10-min session was recorded and later viewed in order to identify and code for the number of communication turns the participant made. The dependent variable was the number of communication acts made by Lauren during baseline and intervention sessions. For parameters of the study, communication turns were counted only when the she communicated with the intention to send a message to the communication partner. More specifically, the turn must have been intentional, communicative, and symbolic. In order for the turn to be considered intentional the Lauren must have consciously and deliberately initiated or responded to communication. Furthermore, for the participants turn to be regarded as communicative her attempt at communication must have conveyed a message using either non-conventional or conventional forms. Lastly, for the turn to be counted as symbolic there must have been a 1:1 correspondence between the symbol and its reference. In other words, the Lauren had to point to the item she wanted to communicate on the PSC grid or VSD in order to show she was using the AAC to communicate rather than simply gesturing to the physical object in front of them. The independent variable was the combination of a low-tech VSD display and effective modeling.

In addition to coding for total communication turns, the number of unique communication turns was also recorded. Unique communication turns were counted each time the Lauren made a new communication relating to different topics. For example, a communication turn conveying the she wanted more of something and a communication turn conveying that she wanted to play with the slide would be considered different and thus unique communication turns.

Reliability

Reliability was calculated for both baseline and intervention phases and checked randomly for approximately 20% of the data. After an initial coding two additional research members coded the videos in order to check for consistency of documented communication turns between both researchers. Reliability for Lauren was 97.5% overall for turns from a range of 85-100%, using the formula: dividing the total number of agreements by the total number of agreements, disagreements, and omissions and multiplying by 100. These numbers indicate high accuracy for the coding of the data.

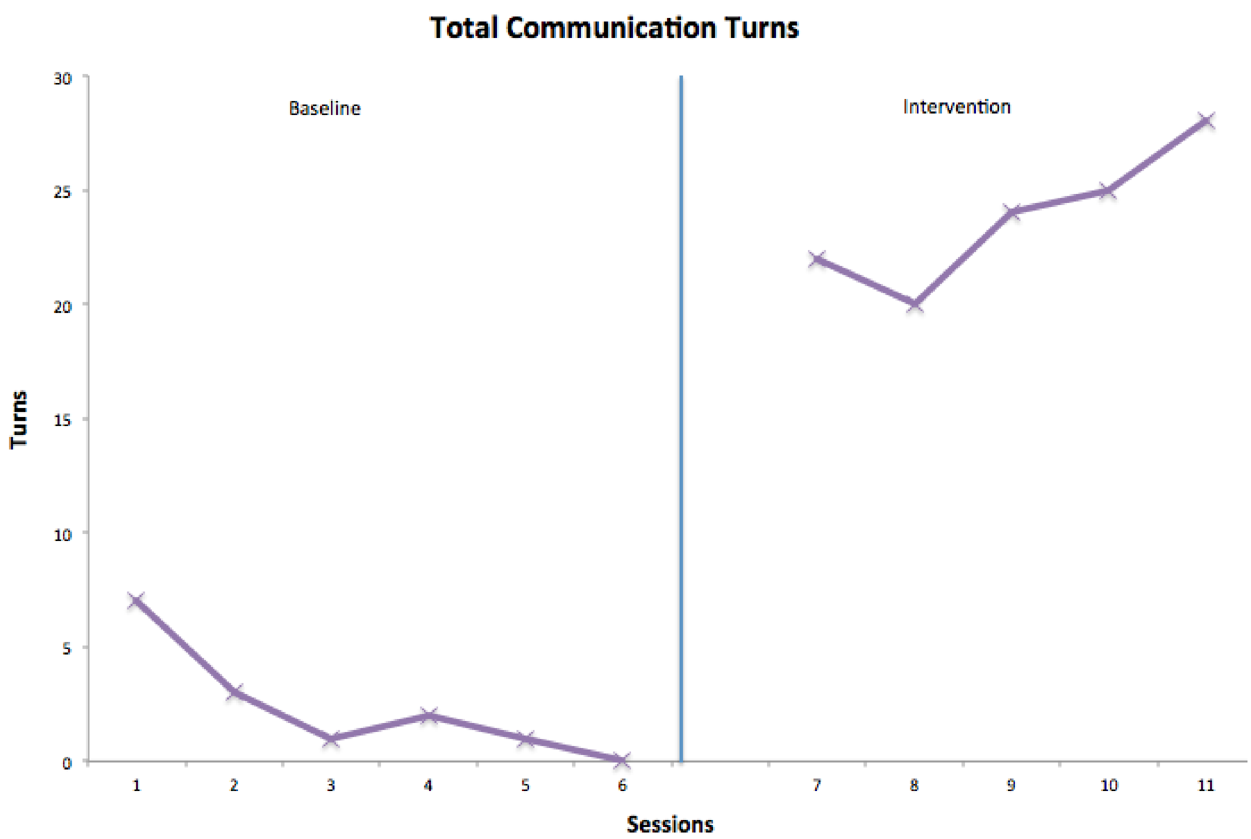
Furthermore, in effort to confirm reliability, inter-observer agreement (IOA) and procedural integrity were measured. IOA was measured for 3 min of every session to determine the number of steps that were followed correctly in the prompting hierarchy. Procedural integrity was checked in entirety for one in every three intervention sessions to determine whether the researcher provided at least eight opportunities and eight models within the 10-min intervention session. Reliability for both was found to be 100% by dividing the number of steps followed correctly by the number of steps followed incorrectly multiplied by the number of correct steps then multiplied by 100. In addition, it was found that the number of models and opportunities given were consistently above the required number of eight. After the data were coded for reliability, the total number of communication turns and total number of unique communication turns were plotted in a graph to compare the number of turns between baseline and intervention sessions.

Chapter 3

Results

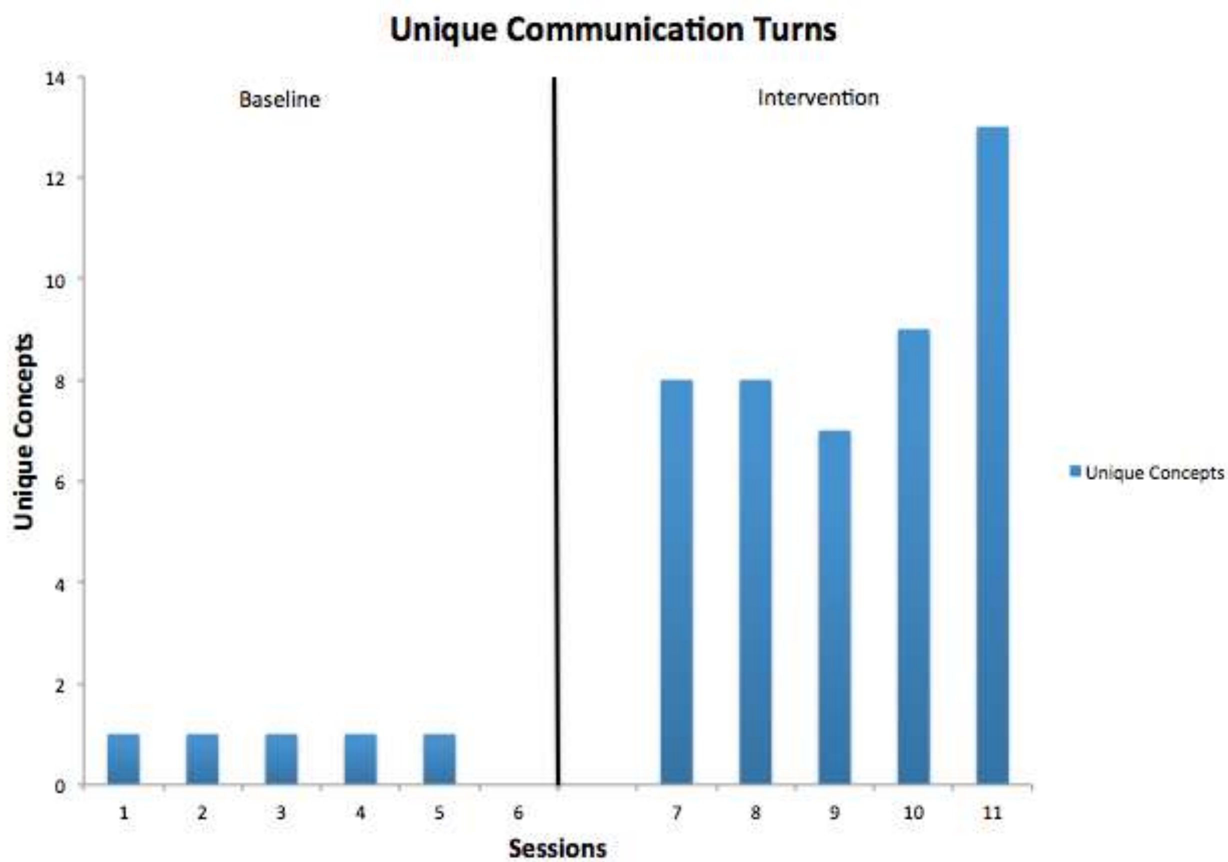
The following results are indicative of the participant's use of a low-tech VSD display. Figure 1 illustrates the number of total communication turns made in both baseline and intervention phases. During the baseline phase Lauren's turns declined to a stable rate, ranging from 0-7 turns. Once intervention sessions began, utilizing the low-tech VSD and effective modeling, her number of turns increased, and ranged from 20-28 communication turns.

Figure 1: Total Communication Turns



In addition, the number of unique communication turns was documented. Figure 2 illustrates the differences in the number of unique communication turns across baseline and intervention sessions. Similar to the rise in total communication turns there was also an increase in unique turns. The graph shows that during the baseline phase Lauren consistently communicated only one unique concept, however, while participating in intervention sessions she expressed between 7-13 unique communication turns.

Figure 2: Unique Communication Turns



Chapter 4

Discussion

This research study evaluated the effectiveness of low-tech VSDs and modeling in increasing the communication acts of a young child with autism. The findings from the case study confirmed the hypothesis that a low-tech VSD intervention combined with effective modeling increased the communication acts for young child with autism. The increase in communication acts may likely be attributed to the use of VSDs. The VSD displays that were used had contextualized scenes that were familiar and personalized to the user, which may have been motivating. By incorporating the language concepts schematically into photographs of natural scenes and events it reduces the demands placed on the child and supports language learning (Drager, 2011). Furthermore, the current study utilized 3D hotspots to depict vocabulary, which may have been more visually engaging thus increasing communication acts.

Wilkinson and Light (2011) found that by incorporating photographs of a child with familiar people in social scenes, the foundation for social communication is established. The current study confirms this information and the incorporation of familiar humans into the VSDs may be credited as a factor increasing communication turns. During baseline Lauren made only 0-7 communication acts each session compared to intervention where she made 22-26. VSDs provided an extremely personalized design that supported language learning and promoted social communication for the user.

Another contributing factor that was likely to increase the number of communication turns was the effective modeling that was used during intervention. By utilizing a modeling intervention the participant with autism may have been able to use her strong visual-spatial skills to increase comprehension, something that would have been much more difficult if spoken words alone were used (Drager, 2009). In addition, Cafiero (1995) stated that when partners model the AAC in addition to speaking the interactions become longer, giving the child more time to process the communicated information (as cited in Drager, 2009). Lastly, Romski and Sevcik (1996) noted that by modeling the AAC it demonstrates how to use the system and that using the system is an appropriate form of communication (as cited in Drager, 2009). These factors may explain the increase of communication turns from baseline to intervention sessions.

Clinical and education implications

The purpose of this research study was to illustrate the effects of low-tech VSDs on increasing communications acts for young child with autism. However, the ultimate goal is to be able to apply these findings to clinical and educational settings to improve the lives of individuals with complex communication needs. In addition to possibly reducing cognitive demands, low-tech AAC could potentially extend the opportunities for AAC use. Low-tech VSDs are a low-cost AAC option that could be used in schools or communities where access to computers and high-tech devices is limited. Also because of its low-cost it can serve as a way to test out an AAC system before investing in an expensive high-tech device.

The general simplicity and ease in creation of low-tech VSDs allows educators and family members to easily and quickly create personalized AAC displays that can be used to encourage communication. The results support the claim that low-tech VSDs are effective in school/play settings and have the potential to allow for communication in various environments where it would not be appropriate to use a high-tech device such as by a swimming pool, thus increasing the opportunities for communication. With more opportunities to communicate individuals can expand and further develop their ability to express needs and wants, develop social closeness, exchange information, and follow social etiquette routines.

Limitations and directions for future research

While this study provides promise for the use of low-tech VSDs, there are limitations that must be addressed. Conducting the research on only one child with autism can be beneficial because it emphasizes the development of an individual through intervention; however it prevents the results from being generalized to other ages, diagnoses, and levels of development. In addition, with only one participant in a case study design, other factors could contribute to changes in performance. Such factors include general maturation, an event occurring between baseline and intervention, or other treatment that was unknown to the researcher. Also, the current study was conducted solely in the classroom setting; different environments may have yielded different results.

Further research should be conducted using a wider range and number of subjects. Incorporating young children with other diagnoses, ages, and developmental levels would allow for the expansion and verification of the results. Researchers in the future should conduct the same intervention in various environments and communities in order to generalize the findings. In addition, it may be worthwhile to investigate specific features of low-tech VSDs that impact results, such as the photo quality. Lastly, if further research confirms this current study's findings it is critical for professionals to consider how they can design and implement low-tech VSDs and interventions in order to expand the opportunities for children with autism to receive and benefit from AAC systems and interventions.

Chapter 5

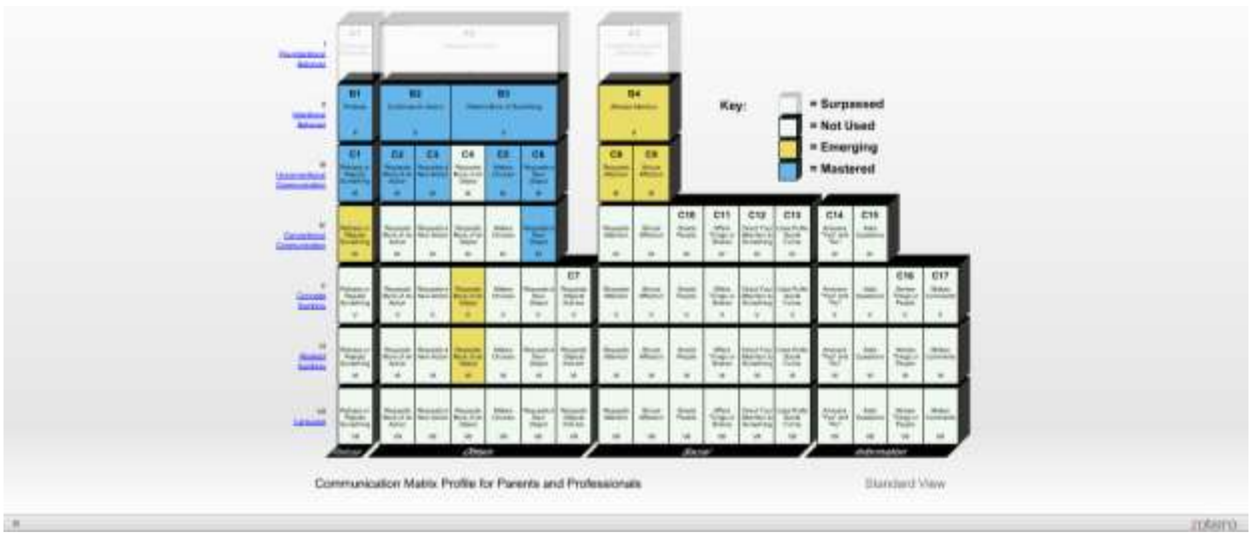
Conclusion

The results of the current study align with, but more importantly, expand upon previous research. For instance, while one specific research study conducted by Drager et al. (2004) hypothesized that VSDs reduced metalinguistic demands from the child by embedding the language concepts within natural scenes it did not explore the effects of low-tech VSDs. In an effort to fill this gap in research, the current study assessed the effectiveness of low-tech VSD systems on learning demands and communication acts for a young child with autism by implementing a low-tech VSD intervention phase that was compared to a baseline phase. Furthermore, by creating a low-tech VSD intervention, the present study revealed that low-tech VSD AAC systems combined with effective modeling were not only successful in reducing expenses and allowing for use in multiple settings but also in increasing communication turns for a child with autism.

Consequently, with the consideration and application of these findings, the opportunity to receive and utilize AAC interventions will be extended. It is of high-priority that measures be taken to make AAC intervention more readily available. Moreover, results from the current study, as well as future research, may potentially benefit lives by providing individuals with complex communication needs access to the power of communication that they otherwise might not have.

Appendix A

Communication Matrix Profile assessment



Appendix B

Preference Assessment by caregivers, parents or teachers/aides

Completed to assess the participants' likes and dislikes.

1. Preference assessment

Think about what the child might like to do or say. Try to answer each question to the best of your knowledge.

i. What are some of his/her favorite things (favorite play toys, TV shows, games, crafts)?

Lauren loves electronics, the more bells and whistles the better. She likes Elmo and Yo Gabba Gabba. She enjoys books with thick pages and large pictures. She likes to watch a train move around a track.

ii. What are some of his/her favorite activities (play activities, activities in school, classes if in school)?

Lauren loves to take a bath or splash in any water. She loves recess at school because she loves to run and be outside. Lauren enjoys time with her therapists.

iii. What are some of his/her favorite social activities (holiday gatherings, parties, sports gatherings)?

Lauren enjoys watching everyone sing "Happy Birthday". She also likes the lights on a Christmas Tree.

iv. What are some of his/her favorite places (at home, outside, stores, at school, restaurants, movies, parks etc.)?

Lauren loves to go to the park. Her favorite place at home is on our porch and on the porch swing. She also loves to go to the pool, beach, lake etc.

v. What are his/her favorite songs?

Itsy Bitsy Spider, If you are Happy and You Know it, Old MacDonald

vi. What are his/her favorite books (specific titles, topics etc.)?

Lauren enjoys Elmo books, not cartoon pictures but real pictures. She also likes books that have a button for sound.

vii. What are his/her other favorite topics or special interests (TV characters, sports, dinosaurs etc.)?

Lauren likes trains. She also likes Elmo, Baby Einstein, and Yo Gabba Gabba.

viii. What things make the participant angry or unhappy?

Lauren does not like to have her hair brushed. She also does not like loud noises like a vacuum, blender, hair dryer, etc.

ix. What makes the participant happy or laugh?

Lauren loves to crash play. She loves water. She also loves a swing!

x. At what times of the day or during what activities is the participant most likely to engage with others?

I think earlier in the day is better. She engages most with other people during crash play.

xi. At what times of the day or during what activities is the participant least likely to engage with others?

Lauren is very grouchy after her nap.

xii. Who are some of the participant's favorite people (peers, teachers, aides, family members)?

Mom, dad, nana, papa, sister, teacher from daycare, friend from church, her PCA, school staff, and anyone who loves her☺

Appendix C

Low-tech PCS grid AAC

Appendix D

Low-tech VSD AAC

BIBLIOGRAPHY

Acheson, M. J. (2006). The effect of natural aided language stimulation on requesting desired objects or actions in children with autism spectrum disorder. (Doctoral dissertation, University of Cincinnati, 2006). *OhioLINK Electronic Theses and Dissertations Center*. Retrieved March 22, 2015, from http://www.ohiolink.edu/etd/view.cgi?acc_num=ucin1147311601

American Psychiatric Association. (2013). Autism Spectrum Disorder. In *Diagnostic and statistical manual of mental disorders* (5th ed.), 50-51. Washington, DC.

Augmentative and Alternative Communication (AAC). (n.d.). Retrieved March 22, 2015, from http://www.asha.org/public/speech/disorders/AAC/

Autism. (n.d.). Retrieved March 22, 2015, from http://www.asha.org/PRPSpecificTopic.aspx?folderid=8589935303§ion=Signs_and_Symptoms

Beukelman, D. R., & Mirenda, P. (2005). Augmentative and alternative communication: Supporting children and adults with complex communication needs (3rd ed.). Baltimore: Paul H. Brookes Publishing Co.

Cafiero, J. M. (1995). Teaching parents of children with autism picture communication symbols as a natural language to decrease levels of family stress (Doctoral dissertation, University of Toledo, 1995). *Dissertation Abstracts International-A 56*(07), 2636.

Cafiero, J. (2001) The effect of an augmentative communication intervention on the communication, behavior, and academic program of an adolescent with autism. *Focus on Autism and Other Developmental Disabilities, 16*, 179-193.

Communication Services and Supports for Individuals With Severe Disabilities: FAQs. (n.d.). Retrieved March 22, 2015, from http://www.asha.org/NJC/faqs-aac-basics.htm

Dexter, M. E. (1998). The effects of Aided Language Stimulation upon verbal output and augmentative communication during storybook reading for children with pervasive developmental disabilities (Doctoral dissertation, The Johns Hopkins University, 1998). *Dissertation Abstracts International-A 56(07), 2636*.

Drager, K. D. R., Light, J. C., D'Silva, K., Larsson, B., Pitkin, L., & Stopper, G. (2004). Learning of dynamic display AAC technologies by typically developing 3-year-olds: effect of different layouts and menu approaches. *Journal of Speech, Language, and Hearing Research, 47,* 1133-1148.

Drager, K. D. R., Postal, V. J., Carrolus, L., Castellano, M., Gagliano, C., & Glynn, J. (2006). The effect of aided language modeling on symbol comprehension and production in two preschoolers with autism. *American Journal of Speech-Language Pathology, 15*, 112-125.

Drager, K. (2009). Aided Modeling Interventions for Children With Autism Spectrum Disorders Who Require AAC. *Perspectives on Augmentative and Alternative Communication, 18,* 114-120. doi: 10.1044/aac18.4.114

Drager, K., Light, J., & McNaughton, D. (2010). Effects of AAC interventions on communication and language for young children with complex communication needs. *Journal of Pediatric Rehabilitation Medicine: An Interdisciplinary Approach*, *3,* 303-310. Retrieved February 16, 2014, from http://www.ncbi.nlm.nih.gov/pubmed/21791864. doi 10.3233/PRM-2010-0141

Drager, K. (2011). Early Intervention for Children Who Require Augmentative and Alternative Communication. Presented at the Ohio Speech Language-Hearing Association (OSLHA), Columbus, Ohio.

Ganz, J., Hong, E., Gilliland, W., Morin, K., & Svenkerud, N. (2015). Comparison between visual scene displays and exchange-based communication in augmentative and alternative communication for children with ASD. *Research in Autism Spectrum Disorders, 11,* 27-41. Retrieved March 22, 2015, from Science Direct. doi:10.1016/j.rasd.2014.11.005

Light, J. (1988). Interaction involving individuals using augmentative and alternative communication systems: State of the art and future directions. *Augmentative and Alternative Communication, 4*(2), 66-82. doi:0743-4618/88/0402-0066

Light, J. (1997). Communication is the essence of human life: Reflections on Communicative

Competence. *Augmentative and Alternative Communication, 13*, 61-78. doi:0743-4618/97/1302-0061

Light, J. (1988). Interaction involving individuals using augmentative and alternative communication systems: State of the art and future directions. *Augmentative and Alternative Communication, 4*(2), 66-82. doi:0743-4618/88/0402-0066

McKelvy, M. L., Hux, K., Dietz, A., & Beukelman, D. R (2010). Impact of Personal Relevance and Contextualization on Word-Picture Matching by People With Aphasia. *American Journal oF Speech-Language Pathology, 19* (1), 22-33. doi: 1044/1058-0360(2009/08-0021)

Son, S., Sigafoos, J., O'Reilly, M., & Lancioni, G. E. (2006). Comparing two types of Augmentative and alternative communication systems for children with autism. *Pediatric Rehabilitation, 9*(4), 389-395. Retrieved February 16, 2014, from http://ezaccess.libraries.psu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=23620069&site=ehost-live. doi:10.1080/13638490500519984

Wilkinson, K. M., & Light, J. (2011). Preliminary investigation of visual attention to human figures in photographs: Potential considerations for the design of aided AAC visual scene displays. *Journal of Speech, Language and Hearing Research, 54*(6), 1644-1657. Retrieved February 16, 2014, from http://ezaccess.libraries.psu.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a2h&AN=70104366&site=ehost-live. doi:10.1044/1092-4388(2011/10-0098)

Wilkinson, K. M., Light, J., & Drager, K. (2012). Considerations for the composition of visual scene displays: Potential contributions of information from visual and cognitive sciences. *Augmentative and Alternative Communication*, *28*(3), 137–147.

ACADEMIC VITA

Lindsay Riley
Ler5177@psu.edu

EDUCATION

The Pennsylvania State University, University Park, PA 16802
The Schreyer Honors College
Bachelor of Science in Communication Sciences and Disorders **05/2015**

HONORS

Mason Tewksbury Family Scholarship, Recipient **2012-2013**
Whitney Trustee Scholarship for the Scholars, Recipient **2013-2014**
Margaret C. Decker Scholarship, Recipient **2014-2015**
Remmey Family Trustee Scholarship, Recipient **2014-2015**

RELEVANT EXPERIENCE

Research Assistant **01/2013-12-2013**
The College of Health and Human Development, University Park, PA
- Assisted a doctorate student with research on low-technology Augmentative and Alternative Communication interventions for children with complex communication needs.
- Created low-technology visual scene displays used in intervention sessions.
- Analyzed and coded session videos for data collection.

Tutor **09/2012-05-2013**
Mid-State Literacy Council, University Park, PA
- Served as tutor for a culturally and linguistically diverse student over the course of a year.
- Utilized effective teaching strategies and skills ultimately improving the students level of English proficiency from beginner to intermediate.
- Demonstrated cultural competence while facilitating instruction to ensure maximum success for student.

PRESENTATIONS

Muttiah, N., Drager, K., Bongo, H., & Riley, L. (2014, July). *A Low-Tech Visual Scenes Display Augmentative and Alternative Communication (AAC) Intervention for young children with complex communication needs.* Paper presented at the International Society of Augmentative and Alternative Communication (ISAAC), Lisbon, Portugal.

EMPLOYMENT

Child Care Provider **01/2014- Present**
- Employed by multiple families over the course of my college career, providing part time care for children ranging from 7-13 years of age.
- Responsibilities include managing children's schedules, assisting with homework, and preparing engaging and educational activities.
- Received positive feedback from previous employers leading to further employment.

Head Lifeguard **05/2008- 08/2013**
Penn's Farms Condominium Association, Bethlehem, PA
- Closely monitored community swimming pool to ensure well-being of all visitors.
- Enforced pool policies and regulations to maintain safety and security of all children and adults present.
- Promoted to Head Lifeguard based on performance in three previous summers.

ACTIVITIES

Penn State Dance Marathon (THON), Committee Member **09/2012-05/2014**
- Raised money for pediatric cancer through mail and sidewalk solicitation.
- Collaborated with committee members and captains to ultimately carry out a successful THON weekend.

The National Student Speech Language Hearing Association, Member **09/2012-Present**
- Attended monthly meetings in effort to supplement course material and network with students who have similar interests.
- Participated in numerous speech and language related service activities in order to gain experience.