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# Exploring Social Development in a Child with Autism Who Uses the Language Acquisition through Motor Planning (LAMP) Treatment Approach

Danielle L. Giangrasso

*The College at Brockport*, [dgian1@u.brockport.edu](mailto:dgian1@u.brockport.edu)

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Exploring Social Development in a Child with Autism Who Uses the Language Acquisition  
through Motor Planning (LAMP) Treatment Approach

Danielle Giangrasso  
Fall 2015

A capstone project submitted to the Department of Education and Human Development of The  
College at Brockport, State University of New York in partial fulfillment of the requirements for  
the degree of Masters of Science in Education

**Abstract**

This study reviews how the communication device called Language Acquisition through Motor Planning (LAMP) influenced a specific child's social development. The child in this study has autism and communicates nonverbally. I collected qualitative and quantitative data by recording field note observations, tracking behavioral data such as eye contact and social initiation, and having participants who personally know the child complete a survey regarding their thoughts on this topic. Findings were derived from the research. The findings were 1) socialization occurs more with adults, 2) LAMP gives opportunities to socialize, 3) communication occurs mostly when there is a highly motivating reason to use communication, 4) communication attempts occur more when the student is feeling strong emotions, and 5) the environment has an effect on the student's social development. Conclusions of this study include that 1) LAMP is well worth investigating as a positive device for assisting students with autism who typically experience communication delays with their social development, 2) communication derives from a want or need to socialize, and 3) for this child, learning a new way to communicate required consistency and routine from the natural communication partners.

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## **Chapter 1: Introduction**

A growing number of students receive special education services including speech and language therapy. About 20 percent of students receiving special services fall into the category of speech and language impairments (Boser, 2009). One of the main deficits of autism is deferred language skills. The Language Acquisition through Motor Planning (LAMP) treatment approach to communication was developed in 2004 with the intention of giving students who communicated nonverbally and had autism an opportunity to independently use functional communication spontaneously (Halloran & Halloran, 2006).

### **Problem Statement and Research Question**

Students with autism spectrum disorder often struggle with communication (Cafiero & Meyer, 2008). Although various alternative and augmentative communication strategies and approaches exist that address the importance in teaching language skills to students with autism, little research has been done on the most beneficial forms (Halloran & Halloran, 2006). One type of alternative and augmentative communication is called LAMP, Language Acquisition through Motor Planning. Literature surrounding alternative and augmentative communication shows how different types support students with autism in the area of communication and language development by focusing on the apparent strengths of these students including structure and visual learning (Halloran & Halloran). Little research has been done regarding how the LAMP approach impacts a student's social development. While researching, I was exposed to many articles that explored alternative and augmentative communication and the influence on students with autism. The LAMP approach was not mentioned in these articles. By better understanding how LAMP can impact a student with autism, the student's teachers and I can become more knowledgeable on how to better support this child.

## **Conceptual Framework**

Acquiring operational language communication skills is a substantial achievement in early childhood; however, some disabilities make obtaining functional language skills difficult (Johnston, McDonnell, Nelson, & Magnavito, 2003). Students with disabilities will often need support systems to improve their life functioning and promote valued outcomes, including meaningful relationships (Wolowiec-Fisher & Shogren, 2012). For many students with communication-related support needs, assistive technology, specifically alternative and augmentative communication, is a crucial part of that support system (Wolowiec-Fisher & Shogren). “Empirical evidence has emerged validating effective strategies for teaching alternative and augmentative communication use with young children” (Johnston et al., 2003, p. 263). Because of successful studies involving LAMP, it seems to be a fitting communication intervention (Halloran and Halloran, 2006). My goal is to research how this specific language system influences a specific student’s social development.

Peers can play an important role in a child’s social development. This is because peers often support communication skill growth, help form an individual’s sense of belonging, encourage feelings of self, and guide critical thinking skills (Wolowiec-Fisher & Shogren, 2012). Most children develop positive peer relationships with natural external support. However, relationships between children with or without disabilities may not develop without using definite supports (Wolowiec-Fisher & Shogren). Particularly, students with communication needs can experience difficulties in forming positive peer relationships (Wolowiec-Fisher & Shogren).

### **Significance of the Problem**

This research is significant because it highlights the need for communication aids and the importance of communication for students with autism spectrum disorder. Around 33 to 55 percent of students with autism won't develop the skills necessary for communication to independently meet their daily needs (Cafiero & Meyer, 2008). The type of alternative and augmentative communication in my research (LAMP) is tailored to meet students' needs by implementing visual features and structure. This research problem is also significant because little research has been done on the subject of LAMP influence on social development. The research is important because it gives us the opportunity to find out if social development changes (or can further change) while using the communication system.

### **Purpose of the Research Study**

The purpose of this research study is to analyze the effect of a communication system called Words for Life, and the theory behind it, LAMP, on the social development of a specific third grade child who communicates nonverbally and has autism. The research question guiding this investigation was "How is social development influenced through using the LAMP Words for Life communication system?"

### **Methodology**

This study uses a mixed methods research design to address the research question. The primary researcher collected numerical data on eye contact and social initiation. The data was then interpreted/analyzed through coding. Qualitative data was also collected through distributing surveys and collecting field-note observations. This data was then interpreted/analyzed as well. Using a mixed methods research design was a good option for this research question because both quantitative as well as a qualitative perspectives could am



analyzed in order to explore the research problem. The purpose of this study is both narrow and broad, and the question is both specific and open ended, so mixed methods research was the most appropriate way to approach this topic. A mixed methods design helped to obtain a more complete picture of how the student's social development is impacted by the LAMP device. The qualitative data (surveys and field note observations) helps build on the quantitative data (tracking eye contact and social initiation) by helping to obtain more detailed information, thus explaining the results of my numerical data.

### **Rationale**

I am interested in this research because I work closely with the main participant (the student using the LAMP device) through my job. I previously was the student's aide in his classroom from December 2014-June 2015. I have helped him learn to use his communication device from day one. I prompt him hand over hand, visually, and verbally when appropriate to use his communication device and I frequently use most to least prompting with him (most being hand over hand, least being just a verbal prompt). We use his device primarily for sensory activities, during his daily walks, during individual and group speech therapy, and while reading books. I try to create opportunities where using specific vocabulary words will help him understand the concept of the communication device. For example, I would engage him in a highly motivating activity like pulling him fast or slow on the scooter depending on his use of the communication device. He would tell me "go" or "fast" if he wanted to go for a fast ride on the scooter. I still help him and other students use the communication device daily in the same way through my job as a teacher assistant. The effect LAMP was having on the child's social development was interesting to me because his past teachers and I noticed him improving in the area of social development for example, making more eye-contact with people, staying focused

for extended periods of time during social activities, and taking an interest in more purposeful play (i.e.: looking at the pictures in books rather than stimming, or repeatedly flipping through the pages) when he began using the device. I decided to base my research study on this topic to look closer at how the LAMP device was helping this child's social development and literacy skills.

### **Definition of Terms**

Alternative and Augmentative Communication- All types of communication, excluding oral speech, that are used to express thoughts, needs, wants, and ideas.

Aided Language- Alternative and augmentative communication that helps produce expressive communication with the use of an external device.

Autism- Defined by Individuals with Disabilities Education Act (IDEA) as a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a child's educational performance at varying degrees.

Event Recording Sheet- Recording how many times a specific behavior occurred during a specific time interval.

Eye Contact- Any time the student holds eye contact with a peer or an adult for longer than two seconds

Interval Recording Sheet- Recording if a behavior occurred during a specific time interval.

Social Initiation- Any time the student physically moves himself or manipulates the environment in order to be physically closer to a peer or to an adult.

Stim/Stimming- The repetition of physical movements, sounds, or repetitive movement of objects common in individuals with developmental disabilities, but most prevalent in people with autism spectrum disorders.

## Chapter 2: Literature Review

Through this literature review, I describe alternative and augmentative communication and its relation to autism and how LAMP specifically relates to autism. I will also explore autism and social development as well as alternative and augmentative communication and social development.

**Alternative and augmentative communication.** The ability to connect and communicate with others is important (Hourcade, Pilotte, West, and Parette, 2004). When there is a barrier to communication, people can lose a big part in their ability to connect with the world. Exchanging thoughts and feelings with others is an important way people socialize. Technologies such as augmentative and alternative communication can help people who lack the means to communicate to connect with others in a meaningful way (Hourcade et al.). Alternative and augmentative communication refers to an “integrated group of components, including the symbols, aids, strategies, and techniques used by individuals to enhance communication” (Hourcade et al., p. 235). The word “augmentative” refers to the ability to increase natural speech and/or writing and “alternative” refers to the ability to substitute spoken communication and/or writing (Baxter, Enderby, Evans, Judge, 2011). Separation from the rest of society often happens as a result of communication needs (Hourcade et al.). Research shows that alternative and augmentative communication increases both functional communication as well as participation in the home, school, and community, and decreases difficult behaviors. Additionally, literacy skills can increase as a result of the use of alternative and augmentative communication (Cafiero & Meyer, 2008).

Often, it is forgotten that speech is only a single part of a bigger, more complex pattern. Speech is more holistic in the interpersonal sense. Essentially, speech can be represented as verbal language as well as visual. Literacy generally refers to text as what others read or write. For example, text can include traffic signals or advertisements. For alternative and augmentative communication users, text in this sense is the central part of communication. Because text is viewed in this way, alternative and augmentative communication users are able to become active members in society. The alternative and augmentative communication community has recognized this, and because of modern media and different forms of communication, visual text is closer to auditive text. This means that the holistic approach towards communication is more widely accepted today, and the written form of text (including visuals) is considered an acceptable replacement of auditive text (Magnusson & Kalinnikova-Magnusson, 2014). The two types of alternative and augmentative communication systems include; unaided language communication and aided language communication. The first type, unaided language communication, helps produce expressive communication without the use of an external device. An example of this kind of language system would be sign language. The second type, aided language communication, requires an external device for production of expressive communication (Hourcade et al., 2004). An example of this type of communication is Language Acquisition through Motor Planning (LAMP) communication (Halloran & Halloran, 2006).

Age and/or cognitive prerequisites (Cafiero & Meyer, 2008) are not a limit when it comes to who can benefit from the use of alternative and augmentative communication. This kind of technology is expanding and is better able to help a variety of individuals with different kinds of communication needs. Alternative and augmentative communication strategies have a great prospective to enhance the lives of people with communication needs through improving and

expanding educational opportunities, aiding in social relationships, and encouraging independence (Baxter et al., 2011). Since the 1950's and 1960's, there has been a greater emphasis on and awareness of the rights of individuals who came from minority backgrounds. This included people with disabilities, and that movement was the start of much advocacy and legislation for people living with disabilities (Hourcade et al., 2004). Since alternative and augmentative communication began in the 1950's, the philosophy of this service has transformed from pullout therapy to teach isolated skills to a more inclusive model where the natural environment is considered a more appropriate place to teach these skills. The natural environment refers to functional language being used in daily routines. Naturalistic teaching strategies are generally used when teaching aided language communication skills. These strategies include revolving instruction around the child's interests, following the child's lead, modeling the communication frequently, prompting the child's communication, using natural consequences during teaching, and keeping up with interaction between the child and the interventionist (Hourcade et al.). The most common naturalistic teaching strategies are "...incidental teaching, natural language paradigm/pivotal response training, milieu teaching, and enhanced milieu teaching (Nunes & Hanline, 2007, p. 178)." The increasing use of alternative and augmentative communication services is considered a direct result of inclusion, mainly because teachers were concerned for their students with disabilities participating in the classroom setting. Because alternative and augmentative communication gave students the ability to communicate more in class, students with disabilities were able to participate more fruitfully and comprehensively in inclusive classrooms (Hourcade et al.).

*Alternative and augmentative communication and autism.* On average, children in elementary school increase their vocabulary by 3,000 words per year (Da Fonte, Pufpaff, & Taber-Doughty, 2010). Communication difficulties are prevalent in individuals with autism spectrum disorder and their skills are deeply impacted, including vocabulary usage. Most often, children with autism are visual learners rather than auditory learners so comprehension language production are affected (Cafiero & Meyer, 2008). Also, students with autism are more at risk for needs regarding literacy development (Da Fonte et al.). The strategies used in alternative and augmentative communication employ visuals in a way that helps provide children with autism an opportunity to learn how to offer coherent language input (Cafiero, 2001), which can be useful in promoting their literacy development (Da Fonte et al.). Research has documented success and usefulness of using visuals while implementing alternative and augmentative communication (Nunes & Hanline, 2007). Students with autism may also show problems with motor planning and “conscious structuring of motor movement to accomplish a task” (Halloran & Halloran, 2006), which results in speech needs. Speaking requires sophisticated motor planning involving the tongue, mouth, lips, and facial muscles. All children with autism spectrum disorder should be provided with the essential tools, strategies, or technology needed to be able to communicate as well as have interventions that address functional communication (Cafiero & Meyer).

Alternative and augmentative communication can offer a framework for language development for students with autism. Visual language systems help to give students with autism an opportunity to communicate (Cafiero & Meyer, 2008). When visual input is provided it permits the child to comprehend and learn more language. Research says visual input refers to pointing to a word or picture while verbally saying the word (Cafiero & Meyer). Research also tells us that not only was speech output effective when combined with visual feedback, it was

more effective than just visual feedback itself (Ferris & Fabrizio, 2009). Language Acquisition through Motor Planning (LAMP) provides both visual feedback and speech output since the device produces words after the child has followed a specific motor pattern. Even though it was noted above that individuals with autism have trouble with motor planning, choosing an icon is a simpler motor plan than pronouncing a word (Halloran & Halloran, 2006).

***LAMP communication.*** Halloran and Emerson established the Language Acquisition through Motor Planning (LAMP) approach. LAMP was inspired through their work with nonverbal students with autism and they found that by using the LAMP approach to access core words on a speech-generating device helped to offer a means for developing autonomous communication. As noted before, LAMP is the approach behind a type of aided communication that falls under the branch of alternative and augmentative communication. There are five components to this theory which are unique and consistent motor plan, readiness to learn, joint engagement, auditory signal, and natural consequence. The LAMP theory proposes that a simple, consistent, unique motor pattern paired with auditory output will reflect consistent and unique motor patterns used in natural speech and give individuals with language and auditory processing difficulties an opportunity to communicate functionally. The goal behind the LAMP theory is to increase language and communication through emulating the neurological process that is typically seen with standard speech development by combining consistent motor movement with consistent auditory feedback and a visual response (Halloran & Halloran, 2006, p. 2). In 2004, a study showed that just a few sessions brought participants to proficiency with independent use of the words they were taught. The LAMP approach towards communication is proving to be a likely intervention through accomplishment in the field and ongoing research (Halloran & Halloran).



**Autism and social development.** People with autism experience a variety of language and communication challenges that include processing what others communicate as well as generating communicative production (Cafiero, 2001). The language a student uses should be given careful consideration. Vocabulary does not only impact a student's communication skills but also their interaction with others and participation opportunities (Da Fonte, Pufpaff, & Taber-Doughty, 2010). Many studies have shown that children with autism exhibit a different order of social-communicative behaviors. Autism spectrum disorder includes neurobiological deficits that are believed to lead to a lifelong impairment in many areas of development, including social development. Some characteristics of social development that have been shown to be impaired include joint attention, imitation, and play. Research suggests that children with autism may follow a different social path than children without autism (Wu & Chiang, 2014). When these social behaviors are compromised "...the lack of mutuality or interpersonal engagement in language acquisition will account for many of the atypical features of language found in children with autism..." (Wu & Chiang, p. 391). In one study, researchers identified two of the social behaviors that are typically significantly impaired in children with autism spectrum disorder including initiating joint attention and responding to joint attention. Their research showed that initiating joint attention is possibly more influenced by social-motivation processes and self-initiation of behavior goals than responding to joint attention. Because children with autism normally show less social motivation, they begin to focus more on objects rather than people, and joint attention is compromised. This also explains why some students with autism develop slowly in the area of language and other features of processing social information (Wu & Chiang).

Many studies have shown that there is a prevalence of motor impairments in children who have autism. About 41% of children with autism aged 2-6 and 27% of children with autism aged 7-18 presented strong evidence of oral motor and/or hand muscle dyspraxia. These kinds of motor impairments may affect a child's language and thus their social interaction. Dyspraxia is strongly linked to impairing the social and communicative development of children since the mouth follows a motor pattern to speak words. Several researchers have also concluded that there is evidence to show auditory processing difficulties in children with autism. If sounds and words are not perceived right away, it impairs the student's ability to attend to these sounds on their own. This directly influences the language-related difficulties experienced by some people with autism, which then affects their social development (Halloran & Halloran, 2006).

*Alternative and augmentative communication and social development.* When alternative and augmentative communication is used in the classroom, it promotes meaningful friendships and social relationships because the student has an increased ability to communicate with peers (Fisher & Shogren, 2012). In the classroom, peers are natural communication partners for the students with and without disabilities using alternative and augmentative communication. Peers are very important to a child's social development because they "...support the development of communication skills, shape an individual's sense of belonging, influence feelings of self and safety, and foster critical thinking skills" (Fisher & Shogren, p. 25). It is important that students develop relationships with peers for these purposes, however, these relationships may not progress without support from families, therapy, and/or school. Students with disabilities and communication needs are especially vulnerable to experiencing challenges in creating positive peer relationships. Evidently, peers are a normal part of the learning environment where students with disabilities spend a majority of their time learning, playing, and

living. When caring for students who use alternative and augmentative communication, peers are considered natural communication partners. When peers are a part of this learning process, social development grows (Fisher & Shogren).

In one study conducted by Ching Chung and Carter in 2013, the researchers evaluated an intervention for students with disabilities that included a speech-generating device and peer initiation. They found that students' interactions with peers increased along with the use of the speech-generating device. People involved in the study (other students, teachers, and parents) regarded the intervention as socially significant and important. One parent of a child using alternative and augmentative communication noted that since he was involved in the intervention and spending more time with his peers, his use of his device was increasing at home. This study showed that with adult support, students with disabilities and communication needs are positively influenced in the area of social interaction and development when provided with the chance to use alternative and augmentative communication (Chung & Carter).

In another study by Nunes and Francis Hanline in 2007, the researchers explored the use of alternative and augmentative communication by a child with autism and parent influence. They point out that intervention programs are most effective when they are applied in natural language-learning settings (such as the home), applied before the child is five, and actively involve the child's family. The authors think that involving the family as language intervention agents will help these programs in being more successful. This is important because the family knows the child better and communicates with them in a variety of different contexts. With the joint engagement (Halloran & Halloran, 2006), that the student in the study experienced positively influenced social interaction. The authors' point of view is that communication interventions that are applied within the family's regular happenings and routines are more likely

to encourage a good contextual fit. The main finding in this study was that the parent increased her use of naturalistic strategies (Nunes & Hanline).

### **Chapter 3: Applications and Evaluation**

Chapter three describes the context, goals, and objectives of my research. I also explain the participants involved in the research, the research setting, my positionality as the researcher, data collection methods, study procedures, instruments used, and the criteria that makes this research study trustworthy.

#### **Context, Goals, and Objectives**

The target student in this research study is a student who was in third grade at the time of data collection. The student was purposefully selected to participate in this study because he uses the Language Acquisition through Motor Planning (LAMP) communication device. There are six other participants in the study who completed a survey on the target student's social development. The goal was to see how the LAMP communication device influences the target student's social development. In order to meet this goal, the goal objectives had to be addressed and met. The goal objectives were to hand out and collect surveys completed by the six other participants, collect numerical data on the student's eye contact and social initiation, take field note observations on the target student, hand out the same surveys again to the six participants (six weeks later) so they can revise or edit their answers from before, and analyze all data and artifacts as they pertain to the target student and the study's goal.

#### **Participants and Setting**

A maximum of seven people participated in this study. One participant was a child who communicates nonverbally and has autism who is currently learning to use an alternative and augmentative communication system called LAMP (Language Acquisition through Motor Planning) Words for Life. One participant was the student's classroom teacher. One participant

was the student's classroom assistant teacher. One participant was a teacher's aide in the student's classroom. One participant was the student's speech teacher. The other two participants were the student's parents. All participants work with the student every day. Data is reported in aggregate form and represented through graphs. The student participant was purposefully selected because he was appropriate for participating in the study. He was considered appropriate for the study because he is learning to use the LAMP Words for Life communication system. The other six participants were also purposefully selected to participate in this study because they worked closely with the student who is learning to use the communication system. The research study was conducted in the student's school in a suburban village during his daily routines. This means that data was collected in different classrooms that are a part of the student's everyday schedule (ex: classroom, therapy rooms, music room, gym).

### **Positionality as the Researcher**

I have earned my Bachelor of Science degree at The College at Brockport, State University of New York in the area of Health Science. I hold dual initial certification in the areas of General and Special Education for New York State. I am currently earning my Master of Science in Education through The College at Brockport's Literacy Education B-12 program, which will be complete as of August 2016. The College at Brockport's Literacy Education B-12 program has helped me as a researcher by providing necessary materials and opportunities for me to expand and refine my research writing skills. I have learned about various strategies and techniques that promote the literacy learning of students with disabilities throughout my graduate level courses. I firmly believe that when we alter our teaching methods to fit the needs of the students and are open to new technology and change that will benefit the students, the student's literacy opportunities will grow and learning will be enriched. This is my first research

experiment at the graduate level. I have worked at a daycare where I grew up since August 2009 where I worked with students of all ages (from birth-12 years old) and abilities. From December 2014 - June 2015 I worked in a special education setting in a 12:1:1 classroom as a teacher aid and from September 2015 - present I have worked in a special education setting in a 6:1:1 classroom as the assistant teacher.

### **Methods of Data Collection**

For this study, the methods of data collection include 1) surveys of six adult participants who are in close contact with the student, 2) field note observations of the student, and 3) behavioral data collection on the student regarding sustained eye contact for longer than two seconds and social initiation with teachers or peers. The social behaviors were recorded as functional behavior assessments. For the behavior “sustained eye contact”, the kind of functional behavior assessment that was used is an event recording form. For the behavior “social initiation”, the kind of functional behavior assessment that was used is an interval recording form. The purpose of using the survey was to gain insight and perspective on what people who work closest to the student think about his social development as he uses the communication system. The purpose of the field note observations was to have data that describes the student’s behaviors while using the communication system. The purpose of collecting data using an event recording form for the student’s eye contact was to have data that displays any changes in this behavior over time. This behavior was described as “Any time the student holds eye contact with a peer or an adult for longer than two seconds”. The purpose of collecting data using an interval recording form for the student’s attempts towards social initiation was also to have data that displays any changes in this behavior over time. This behavior was described as “Any time the

student physically moves himself or manipulates the environment in order to be physically closer to a peer or to an adult”. Data was collected every week for six weeks.

### **Procedures of Study**

The focal student in this study had been using “LAMP Words for Life” since January of 2015. Data collection started in April of 2015 and ended in May of 2015. This device works by generating a speech output based on the buttons that the user presses. Each button is associated with a specific visual icon that is particular to the device. Each word has either a one, two, or three step motor plan, meaning that the student will either have to press one, two, or three buttons in order to receive the speech output. This is considered a motor plan because icon location on the device never changes, as some aided alternative and augmentative communication devices do.

Surveys were administered to the six adult participants regarding the student’s current social development and behaviors. They were administered by the primary researcher and returned to the primary researcher by each participant when he or she was finished. After six weeks, the surveys were again returned to the same six participants and the participants were directed to review and/or make comments or changes on their previous answers. Twenty-minute field note observation were conducted twice per week and recorded in a journal. Functional behavior assessments were also conducted once per week for the two social behaviors (sustained eye contact and social initiation). For the behavior “sustained eye contact”, an event recording form was used to collect data. For this form, there were selected time slots and during these time slots it was recorded, in the form of tallies, how many times the student made eye contact for longer than two seconds with the primary researcher, his peers, or other adults. For the behavior “social initiation”, an interval recording form was used. For this form, there were selected time



slots throughout the day and during those time slots it was recorded, by circling yes or no on the form, whether or not the behavior occurred during the time slots.

### **Instruments for Study**

The paper instruments used in this study were the field note observation protocol, the self-constructed survey, the event recording form, and the interval recording form. The electronic instrument used in this study was the school owned iPad Air. The iPad Air was utilized through the LAMP Words for Life application. The student carried the iPad air around in order to access the LAMP Words for Life communication application. The iPad air acted as the speech generated communication device since the student did not yet own the actual Accent 1000 communication device that was designed for LAMP Words for Life. It is 9.4 inches by 6.6 inches and weighs about 1 pound. The manufacturer of the iPad Air is Apple.

### **Criteria for Trustworthiness**

In order to ensure validity of this research, data collection was triangulated. Three types of data were collected including field note observations, behavioral data, and surveys. Prolonged engagement for the research process was met because data was collected for six weeks and there were more than three instances of data collection per week. The primary researcher was familiar with the data collection methods and the site where research was taking place. The primary research was also familiar with each of the participants who were in the study. The participants were given an opportunity to decline participation at any point during the research process to ensure honest participation from the research participants. There have been frequent collaboration sessions between the primary researcher and the course advisor in order to help expand the primary researcher's knowledge of research in literacy. There have been

opportunities for the researcher's peers and academic advisors to scrutinize and give feedback on this research project. Information is provided such as the organization of where research took place, the type of people who participated in the study, the number of participants, the data collection methods, the number and length of data collection sessions, and the time period that research took place to ensure transferability so this study could be reproduced if needed. The Institutional Review Board has approved my research.

## **Chapter 4: Analysis**

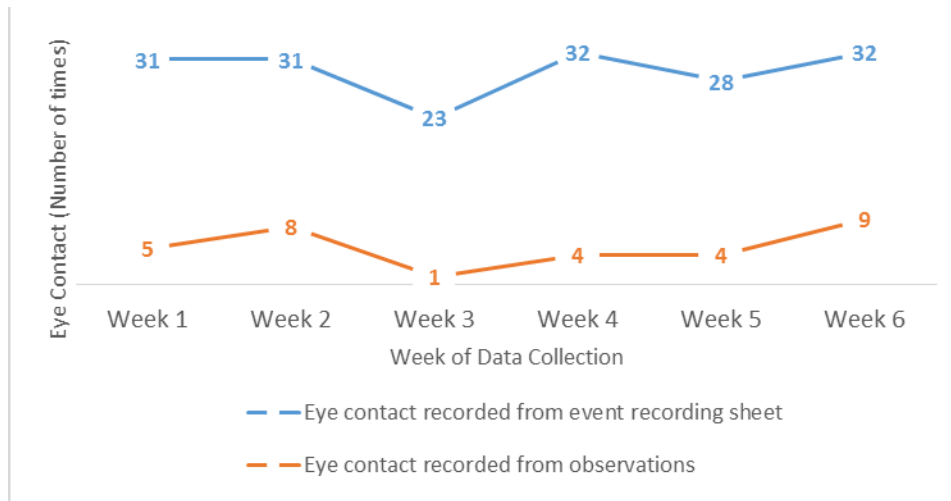
Findings were discovered as a result of this research. The findings were 1) socialization occurs more with adults, 2) LAMP gives opportunities to socialize, 3) communication occurs mostly when there is a highly motivating reason to use communication, 4) communication attempts occur more when the student is feeling strong emotions, and 5) the environment has an effect on the student's social development.

### **Socialization Occurs More with Adults**

Throughout my data collection, I recorded when the student communicated either verbally, nonverbally, or through his device. Socialization occurred primarily with adults. For example, often times most of the student's attempts to socialize occurred with the occupational therapist and speech teacher. The student made more eye contact with his therapy teachers than anyone else. The student would often show positive social behaviors such as smiling, laughing, and listening to the speech teacher during his individual and group speech therapy sessions. When the speech teacher would prompt him to say "hello" to her with his device, he would smile and make eye contact with her. The student was recorded just once interacting socially with a peer. This was when the student was imitating a peer playing an instrument during music class. For question two on the survey "How often does the student make eye contact with you during activities or one on one interaction?" the speech teacher chose the option "many times in one sitting" whereas some of the other responses from participants included "a few times in one sitting" and "never". This is because the speech teacher was the main person that would work on communication with the student. During her therapy sessions with the student, the main focus was using his communication device whereas the other study participants had a different focus when working with this child. For example, the teacher focused on academics, the teacher

assistant helped manage behavior, and the student's parents helped take care of the child's whole being. I frequently observed the student making eye contact after using the LAMP device, seemingly searching for approval or affirmation that he used the device correctly during his speech sessions. One time, he had said the word "go" with LAMP when he was trying to leave the speech room. On one of the behavior data sheets, it showed that the most eye contact for the day was made during the one on one speech session. . It makes sense that the speech teacher encountered most of the student's communication attempts and eye contact because that was her main focus when she was with him. However, it seems that a few of the study participants noticed an increase in the student's eye contact behavior. For question two on the survey "how often does the student make eye contact with you during activities or one on one interaction?" the teacher assistant changed her answer from "a few times a day" to "many times during the day". She also commented next to this question "goes up to students + adults now". The other teacher aid in the room also changed his answer to this question from "never" to "a few times a day".

The graph that follows displays the data collected for eye contact throughout the six weeks of data collection (Figure 1.1). This graph displays data obtained for eye contact through tracking the behavior using event recording forms as well as data obtained through the field note observations. Both types of data show a general increase in the amount of eye contact being made with people throughout the six weeks of data collection. This increase in eye contact could show us an insight as to how LAMP was affecting the student's social development.



*Figure 1.* Eye contact data collected from the event recording sheet (blue) and field note observations (red). This figure illustrates how much eye contact the student made over the six weeks of data collection.

Most of the student's social initiations occurred when the student was with the speech teacher. From the first week to the fifth week there were many instances where the student showed positive social behaviors and communicated nonverbally, verbally, and with the LAMP device while with the speech teacher during individual and group therapy sessions. The student communicated more with the speech teacher in this way because for the student, the speech teacher is a natural communication partner, where communication is worked on regularly and primarily. The LAMP device is supported and modeled frequently when he is in the speech teachers' presence. Furthermore, I observed the student being unresponsive towards a lunch monitor, who he sees minimally every day to just get breakfast. Additionally, there is very little recorded about the student's classroom teacher in the data. The classroom teacher rarely used LAMP with the child. Operating LAMP with the student was primarily the student's aide and the speech teacher's job. Consequently, there is very little data on how the student socialized and communicated with the classroom teacher. This is because both the lunch monitor and the

student's classroom teacher didn't use LAMP with the student, so they were not natural communication partners for him.

When collecting data, it was apparent that socialization occurred less with peers. This is because his peers are not natural communication partners involving LAMP, like his speech teacher and other adults. Students in the class were not permitted to use or model LAMP. I observed the student showing unresponsive behavior towards a peer who was trying to engage him in a game during gym class more than once in my field notes. I also observed the student showing unresponsive behavior towards a friend who was hugging him during music therapy. At first, there were not many opportunities to collect data with the student's peers because there was little interaction between him and his peers. Then more social initiation attempts were made between the student and his peers. While in the library, the student again used the word "hug" on his device to tell me he wanted a hug. When this happened, a student asked him for a hug, and he smiled as his peer hugged him. This response was different than earlier in my data collection when the student was completely unresponsive towards his peers when they tried to play with him and hug him. In group speech therapy, it was noted in the field notes that the student was seemingly aware of his peers as he looked around at them. There were two instances where the student physically moved himself closer to a group of peers, once while they were playing a game and once when they were eating a snack on the ground. For question seven "Can you briefly describe how the student shows or make social connections to others?" the teacher assistant changed her answer to include that the student "...will walk with a student side by side to go outside on the playground or walk down the hallway..." This change in the student's behavior towards peers could have been because he was receiving consistent practice with

LAMP, which allowed him to functionally connect and communicate with his peers in a way that they could understand and communicate back.

### **LAMP Gives Opportunities to Socialize**

Throughout the data collection, I recorded when the student used LAMP for communication. Most of the times that the student used LAMP, it gave him a chance to socialize and make eye contact with the people around him because most responses were in response to what someone had said or done or he was being prompted to communicate by an individual. For example, one day in speech therapy I observed the teacher taking a ball away from the student. The student immediately turned to his device, showing signs that he knew LAMP would help him communicate what he wanted. He made eye contact with the teacher when he attempted to get back the ball by saying “go” and “more” on his device. Before LAMP, the student would have not had a functional strategy to communicate that he wanted the ball. He would have resorted to nonverbal behaviors that could have been misconstrued as “acting out”. Because LAMP was available and the student was familiar with how to use it, he was able to communicate his want in a way others could understand. For question ten on the survey, “In what ways do you see the “LAMP Words for Life” communication system helping a student grow socially?” the speech teacher answered “it gives him a more effective way to let others know what he wants or how he feels other than tantrumming.” The classroom teacher answered “the student is growing in his ability independently state his needs and wants while using the device”.

The student made more eye contact when LAMP was present. Many times, the student was observed physically looking at LAMP when he was asked a question and made eye contact

when he was asked a question. This was because the student was beginning to understand that LAMP is his way of communicating. The student was observed using LAMP while walking in the hallway to say “hi” to people he walked by, while making eye contact. Also, the student made eye contact with another student and used his device to say “hello” to the other student during his occupational therapy session. Without LAMP, the student would have not had an opportunity to communicate with peers and adults in this way. In addition, it was recorded on the event recording sheet that the least amount of eye contact was made on the playground when LAMP was not being utilized.

Most of the student’s socialization occurred during the student’s speech therapy sessions because LAMP was utilized in every session. For example, during speech the teacher asked the class if they had news to share. The student was able to participate by using LAMP to say “eat”. The teacher wrote down the news that the student wants to eat. Another time, he responded through LAMP with “yellow” because he was showing the class his yellow cup. The student also participated in speech by telling the teacher which activity he wanted to do. He would say “book” on his device. When the book was over, he requested another book by saying “go book” and “more book”. Participation is considered a type of socialization and participation in the group was a big stepping stone for this student. When LAMP was available to the student participation was not possible. Because participation is now possible, he is utilizing LAMP in different ways and in different contexts that are consequently facilitating growth in his social development. During another speech session, the student was telling the teacher he wanted to leave the classroom by saying “go” on his device. Before the student left, he used LAMP to tell the speech teacher that he wanted a hug. Because of LAMP, he is able to communicate when he wants affection, which is a part of socializing. In another particular speech session the student



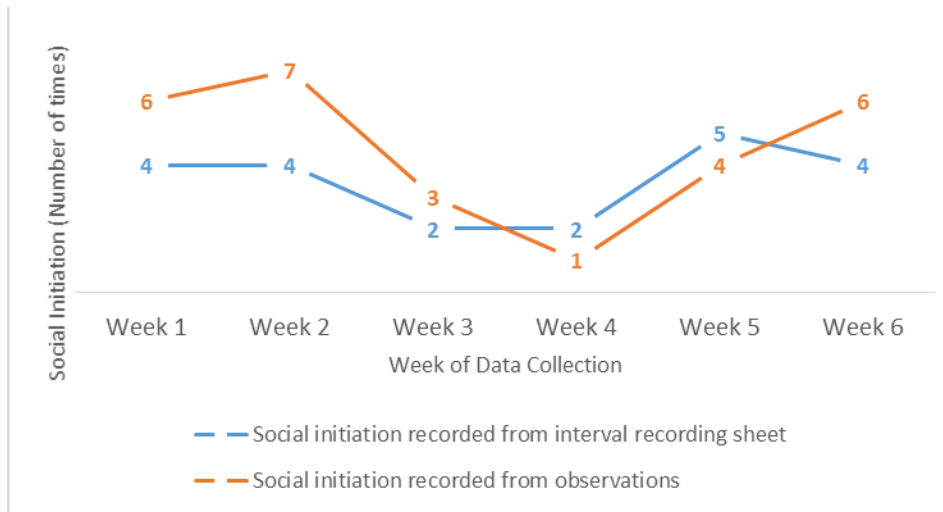
was pressing buttons on his device so the teacher followed through with his communication requests. For example, the student said “go” so the teacher got up from the table and left. The student thought this was funny so he kept on saying words on his device and the teacher consistently “acted” them out. Through LAMP, the student and the speech teacher were socializing. The social experience was enhanced through the availability of LAMP because there was a mutual understanding that involved words that were being communicated back and forth. For question nine on the survey “In what ways have you seen changes in the student’s social development since they started using the “LAMP Words for Life” communication system?” the speech teacher answered “eye contact has increased significantly, increase in joint reference acknowledgement of the other person, looks to other person for response”. The other teacher aid in the room answered “LAMP has allowed him to participate in group activities, where we can ask questions that he can choose his answer from LAMP words choices. Also allows him to express himself.” The student’s parent answered “The student’s social development got better. His communication got better and we are able to understand his needs.” The perception that the students social development has improved since he began using LAMP is because the people around the student have a better understanding of what the student is trying to communicate, and he is happy that they understand. LAMP has provided the people in the student’s life a peek into the student’s unique world, and he is happy to make connections through words that people can understand.

By utilizing LAMP, the student is able to socialize with others around him when in the past, he didn’t have a functional form of communication. For question eight on the survey “Can you briefly describe how the student responds to social stimuli in the environment?” the speech teacher answered by writing “...If he is motivated he responds first nonverbally but often can be

prompted to use LAMP Words for Life”. The other teacher aid in the room answered this question by writing “the student will walk to where he wants to go and get what he wants when he sees something”. The student’s parent answered this question by writing “when he wants something he will come to you and prompt your hand”. In the sixth week of data collection, the student began using the device more for requesting things of people. For example, one morning the student wanted me to put his green coat away for him so he used his device to say “green”, “go”, and “help”. He was also requesting things while riding the bike in the hallway like “go” “stop” and “turn” depending on what he wanted to do.

Following is a graph that displays the data collected for social initiation attempts throughout the six weeks of data collection (Figure 1.2). This graph displays data obtained for social initiation through tracking the behavior using interval recording forms as well as data obtained through field note observations. Both types of data show that the behavior essentially remained constant throughout the six weeks of data collection. However, the surveys revealed a lot about what the study participants thought about how LAMP is influencing the student’s social development. Some of the most valuable data came from these surveys. For question three “How often do you witness the student initiating social interaction?” the other teacher aid in the classroom originally answered “a few times a week” and changed his answer to “a few times a day”. For questions 11-15, a Likert scale was provided with the options “strongly agree”, “agree”, “neutral”, disagree” and “strongly disagree”. Every participant in the survey answered either “agree” or “strongly agree” for the following statements “The student has improved in the area of social development since he began using the “LAMP Words for Life” communication system”, “The student is more attentive while using the “LAMP Words for Life” communication

system”, and “Since the student is learning new ways to communicate, social behaviors are emerging”.



*Figure 2.* Social initiation attempts recorded from the interval recording sheet (blue) and field note observations (red). This figure illustrates how many times the student initiated social interaction with a person over the six weeks of data collection.

### **Communication Occurs Mostly When There is a Highly Motivating Reason to Use Communication**

Throughout the data collection, I recorded when the student communicated either nonverbally or through LAMP. After analyzing the data that was collected it was apparent that communication was correlated with the student’s motivation level. This is referring to whether the student had a clear motivation to communicate a need or want. When the motivation level was high, there were signs of communication or socialization with peers and adults. This included smiling and laughing with peers, positioning himself closer to people, and eye contact. For question five on the survey, participants were asked to identify behaviors they regularly see

the student exhibiting. The student's speech teacher commented on the behavior "concentration on activities"; she said "intense when motivated" indicating his concentration is heightened when the student is motivated in an activity or social situation. For the same question, the student's parent answered that concentration on activities is "rare, except (when) playing. This makes sense because for this student, playing is a highly motivating activity. For question four "Which best describes the student's focus during a preferred activity?" the student's speech teacher originally answered "slightly focused" and changed her answer after six weeks to "very focused". For the same question, the assistant teacher answered "considerably focused".

Nonverbal communication was observed during sensory activities that were highly motivating for the student. For example, during music therapy the teacher gave the student an opportunity to let the student strum on her guitar and the student was smiling from ear to ear at all of his peers when it was time for his turn. He also began walking towards the group when he was originally positioned away from the group. The music therapy teacher let the student choose an instrument, which caught the student's attention and he made eye contact with her. At one point she played a spinning game with the student to the tune of "ring-around-the-rosie" where she spins the student fast by holding their arms, and their feet come off of the ground. The student laughed and smiled and made eye contact with her the whole time. In this instance, there were highly motivating reasons to attempt to communicate. By making eye contact, moving closer, and smiling, the student was communicating his enjoyment with the activity. He was trying to tell us "this is fun!" If the student was uninterested, these behaviors would not have been observed because there was an absence of a motivator.

During the student's occupational therapy session he made eye contact at various times that indicated he wanted something. For example, he made eye contact with the teacher when she

took away his toy, indicating he wanted it back. Eye contact was made again when the student was playing with green silly putty. During the student's speech therapy session, he made eye contact with the speech teacher four times because he was trying to take a green toy out of her hand. He also made eye contact when the teacher was rubbing his back. In the classroom, the student made eye contact three times while playing a card game with the class. Eye contact was made seven times while the student was dancing and playing a card game the classroom. The student was also recorded following a peer and using nonverbal communication, such as pulling and grabbing the student, in order to retrieve a toy that the peer had taken away from him.

Eye contact was made in response to his engagement with the activity. By making eye contact, the student was communicating his enjoyment and by indicating his enjoyment, he knew the teachers would understand that he wanted "more" of the activity. Eye contact was made in these situations as a way to communicate nonverbally that he wanted something that was motivating for him.

The student utilized LAMP when motivated in order to communicate. The student used communication when he wants or needs something. This created many opportunities to prompt the student to use vocabulary on the LAMP device that could help him to communicate his needs and wants more productively. While riding a bike, the student used LAMP purposefully to say "stop" "go" and "turn". I would stand in front of him and stop him from riding his bike and present him with LAMP. In order to keep going the student would have to indicate what he wanted to do. Riding his bike was a very motivating activity for him which in turn motivated him to communicate in some way through LAMP that he wanted to keep going. He also used LAMP during his occupational therapy session to tell us the word "go". The reason the student communicated "go" was because he wanted a car to "go" during a game that he was playing.

Seeing the car “go” was fun for the student, so he used his communication device in order to enjoy watching the car “go”. In the fourth week, we saw the student use LAMP purposefully and spontaneously for one of the first times since he started using the device. During speech therapy, the student took a ball out of the teachers hand without being prompted and then independently said the word “play” while making eye contact with the teacher. For question six on the survey, “Can you briefly describe the ways in which the student interacts with others?” the speech teacher changed her answer after the six weeks of data collection from “nonverbally, pushing, pulling, crying, vocalizing” to “uses device still learning specific vocabulary to get what he wants but understands device will get him what he wants”. The classroom teacher also changed their answer from “the student will hold your hand or arm to pull you to what they need or want” to “When shown the device, he will occasionally point to what he wants”.

### **Communication Attempts Occur More When the Student is Feeling Strong Emotions**

Throughout the six weeks of data collection, it was recorded through observations, surveys, and behavioral data when the student attempted to communicate. This happened more when the student was feeling a strong emotion, such as anger or frustration. While having a tantrum in occupational therapy, the student made eye contact 18 times. Similarly, during the student’s speech therapy session, he became upset because one of his toys were taken away. The student tried to communicate using LAMP by requesting the toy in different ways like “go” “more” and “that”. He made eye contact six times and hopped in the teachers lap. This way of communicating is novel to the student and he has not yet mastered its usage. When he wants to communicate something, he first needs to think about what he wants to say, think about where that word is on his device, press the button, and then follow the rest of the motor pattern. That is a lot of steps to remember in order to say something. When the student is upset, he will often

times struggle to say what he wants because he wants to be understood right away. That is why quick and familiar words were attempted on the communication device when he was angry at the speech teacher. When that didn't work, he resorted to his nonverbal behaviors to indicate his anger, hopping in her lap. Another time, the student became angry when I had to take his puzzle away from him and he made eye contact with me. This was because he was trying to communicate that he didn't like that I took something away from him. This also happened when he didn't want to eat his breakfast, and I observed him making eye contact four times. Another time, the student became angry with me and shook me while making eye contact four times. In the survey for question 8 "Can you briefly describe how the student responds to social stimuli in the environment?" the student's parent responded "when you say the word "No" or shout the student gets upset and closes my mouth." The student's teacher answered "the student will smile and be giddy when they are happy. When upset, the student will fall to the ground and cry or run to a quiet area set up in the classroom".

Although much of these examples derived from negative emotions, there were a few scenarios where positive emotions elicited a communication attempt. For example, I observed the student smiling and laughing during speech therapy so he said "hug" with LAMP and hugged the speech teacher. Another time, the speech teacher was tickling him so he made eye contact and smiled.

### **The Environment Has an Effect on the Student's Social Development**

Throughout the data collection I recorded how the student interacted in different environments. Data was recorded in many different places including the student's classroom, the speech therapy room, the occupational therapy room, the music therapy room, gym class, and the library. Each of these places is a different environment for the student. Environment includes not

only the layout of the room but the people present in the room, the noise level in the room, the organization in the room, and the presence of structure or routine for that room. All of these things had an effect on the student's social development. For example, during speech therapy, the rest of the class began laughing at something and the student noticed everyone laughing so he began to laugh too while making eye contact with a peer. Another time, the speech teacher said "yay!" and the student responded by laughing. In both of these cases, the student adjusted himself to the type of emotion he was feeling in the environment. During music therapy the student was playing an instrument, and when the music became louder, he played his instrument louder and faster as well, in order to keep up with the other students.

The student displayed more acts of social initiation and was more focused when in structured environments. During free play in gym class, socialization wasn't observed for the whole 20 minute field note observation. This was different than the times I had observed the student while he was in speech therapy, which is a more structured environment that uses routines. The student is more focused and uses LAMP more when activities are structured. This is because many students with autism crave routine and structure throughout their day. When presented with a routine, the student feels more comfortable in the environment because the sequence of activities and the procedures are expected. This sets a condition for learning and growth, especially in the area of social development since much of the student's day is consumed with learning to communicate.



### **Chapter 5: Conclusions and Implications**

Although this research study was based on only six weeks of data collection, the findings will still provide clear evidence for the focus student's literacy learning as well as for other students alike. Through analyzing the field note observations and my personal reflections, teacher surveys, and behavioral data I was able to see how the Language Acquisition through Motor Planning (LAMP) Words for Life communication device influenced the focus student's social development.

Through my research, I have concluded that LAMP is well worth investigating as a positive device for assisting students with autism who typically experience communication delays with their social development. For this student, it has opened up the doors to communicating with others when he didn't have that opportunity before. His way of communicating was not functional, and with LAMP he can now socialize with others in a way both parties can comprehend.

I have also concluded that communication derives from a want or need to socialize. The situations where the student was observed using LAMP required social output. For example, the student needed to use his device to tell the teacher what he wanted or needed at specific moments. I will remind you of one time when the student said "go" with his device indicating that he wanted the teacher to rub his back more. I will also remind you of another time when the student said "more" when he wanted more of the silly putty they were playing with during OT. Oftentimes when the student communicated it was because he wanted or needed something.

For this child, learning a new way to communicate required consistency and routine from the natural communication partners. In other words, the people who primarily used the LAMP

communication device with the student needed to do so in a consistent manner and in a familiar routine environment in order for the child to learn how to communicate in this way. The student's speech teacher was a good example of a natural communication partner for this student. She explicitly taught the student how to use the device through sensory, reading, and play activities. She was consistent in her modeling of the device for the student and her classroom was structured in a way that was conducive to learning this new device. The speech teacher was able to elicit the most social behaviors in a natural way than any of the other participants in the study.

### **Implications**

Sound implications for this student as well as educators and professionals who work with similar students were produced from the findings. Educators should know that all children with autism spectrum disorder should be provided with the essential tools, strategies, or technology needed to be able to communicate as well as have interventions that address functional communication (Cafiero & Meyer, 2008). When students with autism are provided with the essential tools needed to communicate, there is more opportunity to grow in all areas of development.

Teachers and other professionals should educate themselves on the student's specific communication device and support them whenever possible throughout the day. Limited competence with a student's specific communication device can hinder that student's ability to grow in the area of social development. One way teachers or professionals could educate themselves is to get in touch with their district's learning support services department in order to gather resources on the particular communication device. The building speech pathologist could

also provide information on the device or trainings involving the particular communication device. They could also share the name of someone who deals directly with assistive technology for the district.

Teachers should manipulate the communication device in ways where it allows the student to socialize with others around them. One way to do this would be to use a hierarchy of prompting when using the device with the child that guides the students towards social interactions. For example, using the device to say “hi” to the student, and prompting him to say “hi” back.

Teachers and professionals need to use the specific interests of the students they are working with in the context of teaching communication in order to effectively engage the student in their learning. For example, the student in this research study loved the color red. To motivate him to use his device and communicate, the teachers would provide him with red toys and begin a conversation using the student’s device to encourage him to communicate back.

The environment, especially for students with autism, needs to be structured and based on routine in order to create a condition for learning. When there is structure and routine, students know what to expect and when to expect it and they are familiar and comfortable in the environment. This provides an environment that is easier to learn in.

### **Limitations**

About three months before I began collecting data for this research study, the student had already begun using the communication device LAMP. Because of this, one limitation of my research study was that I wasn’t able to state a baseline for my data. The student had already begun learning the device, so when I began collecting data he may have been at a standstill or

plateauing in his learning of the communication device. Another limitation of this study was that data was only collected in the school setting. The student's parents are also natural communication partners with the student, but unfortunately the data could not reflect any type of social interaction that happened outside of school since data collection was only permitted during school.

### **Research Suggestions**

Based on the results from my research, I believe that further research can be done to get a better picture of how the Language Acquisition through Motor Planning communication device can influence a student's social development. If this research study was reproduced, it would be beneficial to start collecting behavioral data (such as eye contact and social initiation) before the device is introduced to the student.

### **Overall Significance**

The findings in this research study have provided insight regarding the social gains this child has made in a few weeks when given the opportunity to communicate functionally. Language Acquisition through Motor Planning meet students' needs by specifically implementing visual features and structure. Communication is vital for students with autism spectrum disorder and it is essential to have communication aids available for these students if needed. The findings presented in this research can serve to educate and inform special education professionals who use this type of alternative and augmentative communication device so they can better implement its usage across all settings.

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