USE OF AN IPAD APPLICATION AS FUNCTIONAL COMMUNICATION FOR A FIVE-YEAR-OLD PRESCHOOL STUDENT WITH AUTISM SPECTRUM DISORDER

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Abstract: The use of a functional communication device has proven to be successful for individuals with developmental delays and autism spectrum disorder (ASD). In this study, an iPad application titled "Go Talk Now Free" was evaluated as functional communication for a five-year-old boy diagnosed with ASD. An additional purpose with the replicate and extend the previous research on this topic. A model, lead, test intervention strategy was also employed.. Finally, an independent evaluation was implemented to assess our participant's acquisition and usage of the iPad application to make independent requests with this devise and app. This results showed that the participant increased his use and knowledge of making independent requests during his special education "choose time." Consequently, this increase in independent requests demonstrates the functional use of the iPad application "Go Talk Now Free" as a communication strategy for young child with ASD.

Key Words: ASD, ABA single case research design, maintenance of treatment effects, Go Talk Now Free App, iPad, communication, action research,

Introduction

Communication through language is a critical stage of development for any child. As a baby matures during its first years of life, parents and caretakers eagerly await receptive and expressive communication with the young person. Eye contact and babble turn to words and eventually a repertoire of language for the child. Language develops most rapidly at late infancy and, by age three, the child's mind has the capacity to hold thousands of words (Snow & Hoefnagel, 1978). Parents often look forward to knowing more about their child's personality and responding to their needs. In fact, a parent's consistent response to their child is imperative to the child's development (Landry, Swank, Smith, Assel, & Vellet, 2001). Research has proven that parents help their children develop language through reading and using as much language as possible with their child (Whitehurst, Falcro, Lonigan, Fischel, DeBaryshe, Valdez-Menchaca, & Caulfield, 1988). Also, through out childhood, language is refined as pragmatics and communication skills are acquired and practiced. However, this standard sequence of language development is different for a child with a developmental delay. One of the first signs that the

child is not properly developing is delay in language. This delay can have a large impact on how the child functions socially and in academic areas such as reading (Scarborough & Dobrich, 1989). Furthermore, difficulty communicating creates social difficulties for the child as they struggle relating to other people.

Autism has been associated with having a great effect the social development of a young child. One defining characteristic of ASD is a delay in language development (Heward, 2012). According to research done over communication behaviors in autism and developmental language delay, "Autistic children were less able than other children to respond correctly to language or gestures used to direct their attention, used attention directing (pointing, showing) less frequently, and produced more echolalic speech when making requests"(Landry & Loveland 1988). Additionally, individuals diagnosed with ASD also struggle with proper social development.

Review of Literature

Previous research and studies looking at different ways for those with ASD to communicate have shown that through Functional Communication Training, or FCT, a person with ASD can greatly benefit from various communication aides (Armstrong, McLaughlin, Neyman, & Clark, 2013; Talkington, McLaughlin, Derby, & Clark, 2012; Wasson, McLaughlin, Derby, & Clark 2013). A FCT system that has proven to be widely successful for children has been the Picture Exchange Communication System (PECs). In this system, a child is provided with small pictures representing words, phrases, and items they may desire (Mirenda, 2001, 2003). Each picture can be handed to a receiving person in exchange for access to the item or acknowledgement of what the person is trying to communicate. A great deal of research has reported that long-term use of the PECs system with preschool age children often results in speech (Bondy & Frost 1994l Miller, Light, & Schlosser, 2006).

Model, lead, and test (MLT) error correction consists of the teacher or trainer, modeling the correct response, next the student and teacher correctly respond together, and finally the teacher requires the student to independently say or do the correct response. If the student performs correctly, the teacher then moves to another task or problem. If the student responds incorrectly, the model, lead, and test error correction procedure is again employed. These error correction procedures continue until the student correctly can complete the task. Often, the student has to complete the problem so many times correctly in succession before a new problem or task is presented (Peterson, McLaughlin, Weber, & Anderson, 2008). Also, employing the model, lead, and test error correction is a very important component of Direct Instruction (DI) curricula (Marchand-Martella, Slocum, & Martella, 2004).

In this study, an iPad application titled "Go Talk Now Free" (The Attainment Company, 2012) was evaluated as a form of functional communication. This application is formatted similarly to a traditional PEC request board. All the choices available for the child to select were visible on a single touch screen page on the application. The purpose of this study was to test of the use of the model, lead, test intervention strategy to successfully teach the participant how to make requests. Moreover, this research looked at the success of using the iPad as a functional communication device for the participant in hopes that he can use this particular iPad application as his main form of functional communication.

Methodology

Participant and Setting

The participant for this study was a five-year-old preschool male. He has been receiving services from this school's personnel since he was an infant. His specific diagnosis is Autism Spectrum Disorder. He is considered low functioning and often engages in self-stimulating behaviors such as hand flapping and pinching. Occasionally, the participant will engage in self-injurious behavior. The participant is currently enrolled in afternoon special education preschool four days a week. He spends additional time in the A.S.S.I.S.T. classroom program for children with Autism Spectrum Disorder. A.S.S.I.S.T. stands for Autism: School Support for Inclusion and Systematic Teaching. Here, he receives direct instruction from the special education teacher and student teacher. One day each week, the participant attends A.S.S.I.S.T. for four consecutive hours to meet time requirements designated on his IEP.

This study took place in the participant's special education classroom. After the children enter the classroom and have circle time, they are required to choose activities to do around the classroom. This is called "choose time." Visual supports are also utilized: each activity is displayed as a small picture on a Velcro board. Each student is asked to pick a Velcro picture of the activity that they want, walk to that activity in the classroom, and place the picture on the Velcro strip at the station. For this study, the researcher first watched the participant's typical movement throughout the room during chose time. During baseline, the researcher followed the participant throughout the classroom and asked him what activity he wanted while presenting the chose board on the iPad display. For intervention, model, lead, test was used to show the participant how to request. All parts of this study occurred in 15-minute increments during chose-time.

Materials

The iPad application titled "Go Talk Now Free" was utilized for this study. The researcher used the provided classroom iPad and programmed the application with all of the choices available for the student during chose time. There were 16 available choices on the iPad screen: "I want", book, chalkboard, blocks, house, sensory (table), toys, art, quiet, stamp, paintbrush, magnets, light table, iPad, "ready to work", and play.

Dependent Variables and Measurement

The dependent variable in this study is the amount of requests made by the participant during a 15-minute increment during chose time. Measurement was taken on paper. For the baseline condition and after intervention, independent requests were recorded. An "independent" request was defined as: given the open application and choice board page, the participant selects a choice activity and walks to the chosen activity. Intervention measurement was similar. If the participant walked to the chosen activity throughout the model-lead-test procedure, a tally was marked down on the measurement sheet.

Data Collection and Interobserver Agreement

Data were collected for every trial. There were three baseline data sessions, eight sessions of intervention, and three sessions that went back to baseline. Data was taken for every trial. Interobserver agreement occurred throughout each session. For every request made, an instructional aid or the classroom teacher verified that a request was made and that it was independent. Because all trials occurred during a busy classroom time, asking for verification proved to be an easy task for this study. Interobserver agreement was 100% for the baseline and intervention conditions.

Experimental Design and Conditions

A single subject ABC single case design (Kazdin, 2011; McLaughlin, 1983) was used for this study. Baseline, intervention, and independent conditions occurred in the participant's special education classroom setting. Specifically, following an opening task and circle, the next part of the classroom schedule is designated "choose time". The six students in the classroom were required to pick an activity off a choose board and walk to the activity that they chose. The duration of chose time was 30 minutes total. For this study, a fifteen-minute increment was designated for baseline data, intervention, and return to baseline (independent). Throughout each other fifteen-minute segments, the researcher either sat next to the participant and participated in his play, or sat nearby and watched his interactions with other students or instructional aids. The conditions for the study stayed consistent throughout every session.

Baseline.   Baseline data were taken over three sessions in the special education classroom choose time. For baseline, the participant was allowed to take part in whatever activity he chose. However, before moving to another choice in the classroom, he was presented with the choose board page on the iPad "Go Talk Now Free" and the vocal question "What do you want?" This phase lasted for three sessions.

Model, lead, and test.   The model, lead, test (MLT) intervention procedure spanned over eight sessions during chose time. This intervention was similar to baseline in that it required the researcher to follow the participant throughout the classroom and present the open iPad application "Go Talk Now Free" with the choose time choices available. The first part of the MLT procedure required the researcher to verbalize the choice and provide hand-over-hand prompting to finger tap the activity on the iPad. After making a choice, the researcher guided the participant to the activity that they chose. This lead was a holding the participant's hand and a verbal reiteration of which activity the participant was going to.

Independent.   After eight sessions of MLT intervention, the researcher returned to baseline conditions. This meant that no physical or verbal prompting was provided when presenting the participant with the iPad choose board. The only guidance the participant received was the verbal question: "What do you want?" with the iPad presented and visible to the participant. This condition was in effect for three sessions and ended with the completion of the first author's student teaching.

Findings

Baseline

Baseline data were taken over three fifteen-minute session during the participant's choose time in his special education classroom (See Figure 1). The mean amount of requests for baseline was 3.0 (range 2 to 4 requests).

Model, Lead, and Test

Model, lead, test increased the participant's usage of the iPad choose board. Figure 1 shows the increase of independent requests made during the MLT intervention sessions. The mean amount of requests made by the participant through sessions 4-11 (8 sessions total) was 4.78 requests (range 2 to 8 requests).

Independent Requests

Three sessions for the independent or baseline 2 conditions indicated a further increase in independent requests using the iPad. The mean amount of requests made during these sessions was 8.0 with a range of 7 to 9.
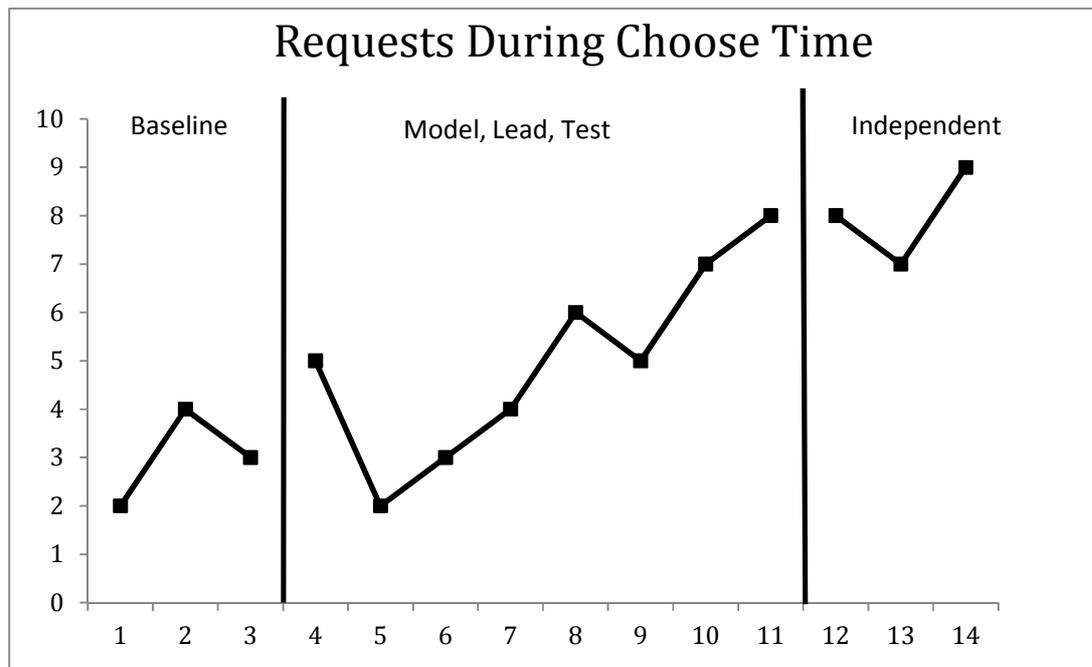

Figure 1. The number of requests per 10 opportunities for each session during baseline, model lead and test, and independent requests.

Conclusion

The use of the iPad application "Go Talk Now Free" as functional communication proved to be successful for the participant. A contributor to his success could have been his familiarity with using the iPad. In a previous study, the participant worked with another student teacher with using the same iPad application as functional communication. However, in this previous study, two different applications were utilized. Additionally, this previous study taught functional iPad communication in different settings. In this current research and study, the researcher's focus

was narrowed to one iPad application ("Go Talk Now Free") and one setting. The first author decided to set up the study in this fashion in hopes that the simplicity would increase the participant's independent use of this application. His previous experience with using the iPad to make requests aided the success of this study (see Dundon, McLaughlin, Neyman, & Clark, 2013).

The present results also provide a replication of the research carried in out in this particular setting (Armstrong et al., 2012; Dundon et al., 2013; Wasson et al., 2013). However, in this case, we were able to develop some independent requests on the part of our participant. Again, employing the iPad as a augmentative or assistive communication device has shown suggested by others (Murray & Olcese, 2011).

Due to the participant's attention and behavior, a few sessions of this study were not recorded because of inaccurate representation of the research. For example, during one session, the participant came to school not feeling well. Earlier in the school day, he had trouble focusing on his direct instruction work and was showing frustration. The participant was unable to participate in his A.S.S.I.S.T. classroom activities because he needed to spend time with activities, such as laying under a weighted blanket on a therapy swing. In the afternoon during choose time in his special education classroom, the participant did not show interest in any other activities in the classroom except engaging in self-stimulating behavior in the house center. The researcher attempted to intervene on this day using the model, lead, test strategy. Often, his stressful morning set up an unsuccessful session time. Instead of following suite with MLT, he became overwhelmed, frustrated, and the researcher decided to forgo this session's data because it was not representative of the participant's skills.

The contribution of model, lead, and test (Marchand et al., 2004; Peterson et al. 2008) for teaching the use of the iPad was difficult to determine. However, additional research may have to take place to determine the efficacy of employing model, lead, and test. However, model, lead and test has been a well documented teaching strategy and making this part of the training when teaching many skills. All of the teaching staff employed MLT in most of their work with the various students in the classroom and have done so when they were first employed.

Suggestions and Recommendations

The next step to continue helping the participant with his iPad communication would be to increase the settings in which he makes requests. The difficulty with this was the limitations of the free application's settings. However, the participant's family saw the need for functional communication using this application and purchased the full application version for their son's personal iPad. After sorting out the logistics of bringing his iPad to school, the participant can now rely on his own iPad as a functional communication device instead of only using the classroom iPad. Additionally, the full version of "Go Talk Now" increases the amount of request pages and capacity to make specific requests. The researcher has begun creating pages for different settings in the participant's school, including his playroom, snack time, and his A.S.S.I.S.T. classroom.

An additional focus for the next phase of this research would be using the same intervention strategy with different individuals. Utilizing the MLT strategy to teach functional iPad

communication across participants could show continuity between other individuals, and consequently provide positive research for this particular iPad application. Informal observations indicated this several students were becoming very proficient in the use of the iPad.

With the added ability to use the participant's personal iPad in the classroom, the researcher plans to continue using the model, lead, and test intervention strategy to teach him how to make independent requests in other settings. Based on the success shown in this study, the researcher hopes that the participant will generalize his knowledge of making independent requests from simply at chose time to requesting throughout the entire school day.

Acknowledgements

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