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Teaching Echoics to a Student with Autism: Video Model vs Live Model

Dana Waddell
Western Michigan University, danamw22@gmail.com

Effectiveness of Teaching Echoic Sounds to a Child with Autism:

Live Model vs Video Model

Dana Waddell

Western Michigan University

Learning a language is not always an easy task for all children. Typically, language is a skill that comes naturally very young in a child's life, but for children with autism, the path to learning language is very different. The first stages of learning language involve many skills, one of which are called "echoic skills," because the child directly echoes a sound a person elicits. This is fundamental to learning language, especially in children with autism. The field of behavior analysis has conducted great amounts of research on this topic and has found that using technology in therapy sessions can be beneficial for the child's language skills. In this study, the effects of using a live model for an echoic response or a video model for an echoic response will be examined. This study used a single subject design and took place over 22 weeks. The purpose of this study is to find out whether a video model is more effective than using a live model to evoke echoic responses.

Keywords:

Echoic, children, autism

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Introduction

The inability to communicate through speech can result in various problem behaviors since this is the main form of communication. The following research studies give insight to previous experiments conducted with either echoic procedures, language procedures, or the involvement of technology in therapy.

Which echoic teaching procedures are the most effective for a child with ASD and other developmental delays? The following study titled, *An Assessment of Three Procedures to Teach Echoic Responding*, was conducted to learn more information on this topic. There were six participants aged 7 to 17 and the study took place five times a week in a classroom and used within-subjects and alternating-treatments design. This was used to compare effects of VIT (vocal imitation training), SSP (stimulus-stimulus pairing), and MM (mand-mand procedure). Before and after teaching, functional analysis probes were conducted for echoic responses. The results of this study found that assessment protocol was able to identify effective echoic teaching procedures for 5 of the 6 children. Not one procedure in particular was the most effective and it varied depending on the participant. In conclusion, there was a varied amount of effectiveness of the teaching procedures depending on the participant which does not line with previous research. This matters to my study because it is important to understand different echoic teaching procedures before starting my project.

In the study titled, *The Effects of an Auditory Matching iPad App on Three Preschoolers' Echoic and Listener Response*, conducted by Lin Du, Jeanne Speckman, Megan Medina, Michelle Cole-Hatchard, an experiment was conducted to learn about the effects of an auditory match-to-sample protocol with an iPad on three preschoolers with disabilities have on their language skills. Participants needed to reach 90% for two consecutive sessions or 100% for one session, before moving to the next phase. IOA between the teacher and the independent

observer collecting data were also measured. Auditory matching protocol did improve children's pronunciation and their listener responses which is consistent with previous research. This study expands my knowledge on the topic of auditory matching and it demonstrates the effectiveness of generalized auditory matching of words.

One study was conducted to learn how effective behavioral procedures are that attempt to increase complexity of echoics in children with autism or developmental delays. This study was titled, *Use of Chaining to Increase Complexity of Echoics in Children with Autism,* by Jonathan Tarbox, Wendy Madrid, Barbara Aguilar, Wendy Jacobo, and Averil Schiff. Correct responses were recorded if the child emitted a correct response, and an incorrect response was determined by a lack of responding within the five seconds or an incorrectly emitted response. While the chaining sessions took place, which broke up syllables, one echoic was presented in three sequential trials, and reinforcement was immediately delivered if the target sound was made within five seconds of it being presented. Chaining procedures increased the complexity of words the children emitted. This article is important to my study because once my child has mastered all basic one-syllable sounds, I will need to implement procedures with more than one syllable.

The following study titled, *Comparison of therapist implemented and iPad assisted interventions for children with autism,* by Allyson Lee, Russell Lang, Katy Davenport, Melissa Moore, Mandy Rispoli, Larah van der Meer, Amarie Carnett, Tracy Raulston, Amy Tostanoski & Clare Chung examined how effective in-person models compared to an iPad model for behavior therapy sessions with children with autism. The participants of this study were two boys with autism, one was four years old and the other was 2 years old. They were both already receiving services at an autism clinic before participating in this study. The data was collected

on the amount of correct responses emitted by the child and interobserver agreement. The study did not produce significant results. This research is significant because it gives me a better understanding of sessions that compare an iPad and a therapist assisted session.

To learn about a study focusing on instructional methods, one study stands out titled, *Teaching Language Skills to Preschool Students with Developmental Delays and Autism Spectrum Disorder Using Language for Learning*, by Margaret M. Flores, Kelly B. Schweck, Vanessa Hinton. Many students with developmental disabilities do not always have proper instructional methods, but Direct Instruction (DI) can be much more beneficial in teaching language skills. Four participants who were four years of age with developmental delays or autism spectrum disorder. Data was collected on responses emitted by each child, marking responses as correct if the child emitted the same behavior that was being displayed. The conclusion of this experiment is that this procedure was effective, and it aligns with previous data. This article is significant to my research because it involves teaching language skills to children on the spectrum or with a developmental delay.

The final study was titled *Preschool language variation, growth and predictors in children on the autism spectrum,* by Susan Ellis Willer and Sara T. Kover. The purpose of this study was to predict the language development of children with autism spectrum disorder, this is important because children with ASD have a wide range of language abilities and it is helpful to understand how each child's language is developing. Language ability could also be a predictor in the severity of a child's ASD. Language production at Level 1 was predicted by cognition, social skills and maternal education. Around half of the Low Language children obtained cognitive scores that fell in the intellectual disabilities range and none of the High Language children had cognitive composite scores that fell outside of the typical range. This study

concludes that it is possible to predict language growth for children with ASD, which is consistent with previous research. This is very important for my personal research because it is crucial to understand the long-term effects of teaching echoic sounds to a child with autism. It provides me with information to consider for my research paper that will give more background to autism and its correlation to language development.

Methods

Participants

The participant for this project was a two-year-old boy diagnosed with autism spectrum disorder (ASD). He was enrolled in an Early Childhood Special Education classroom. The participant attended school for 15 hours per week and his classroom consisted of five other children ages three-to-five diagnosed with autism. The setting of this particular study was in his school, but in a separate room with no other children present. In this room there was a table, chairs, reinforcers and procedure materials.

Setting & Materials

The procedure materials included an iPad with videos of another researcher who was recorded making the target sounds. The data collection materials included paper data sheets, a clipboard, and a pencil and the data collection method involved paper data sheets and excel graphs. Program materials included my laptop in order to track progress through graphing. The child's reinforcers were a variety of edibles, toys, and iPad videos.

Dependent Variable

The dependent variables in this study are the amount of echoic responses emitted by the participant. Data was collected on the amount of correct echoic responses and the amount of problem behavior during each session. Problem behavior included flopping, eloping, standing

and crying/whining. Data was also collected on spontaneous vocalizations and imitation vocalizations from YouTube videos.

Independent Variable

The independent variables were the discriminative stimulus provided (echoic target sound) and prompt level. The participant was provided with three vocal prompts.

Intervention

Baseline data was collected based off of a variety of basic one-syllable sounds, and we collected one session of baseline. During intervention sessions, one session of live-model and one session of video-model trials were conducted. When the participant reached 80% or higher on three consecutive sessions, he was phase changed to the next target. Correct trials were defined by an approximation sound or correct sound made by the participant on the first, second, or third prompt. Incorrect trials included no echoic response made by the child, or an incorrect sound emitted by the child. Differential reinforcement was used depending on the response made by the participant on the first, second, or third prompt. If the participant emitted a sound closely related or exactly matching the S^D on the first prompt, the participant was reinforced with highly preferred tangible and edible reinforcers. If the participant emitted a sound closely related to or exactly matching the S^D on the second prompt, he received a highly preferred tangible reinforcer. If the participant emitted a sound closely related to or exactly matching the S^D on the third prompt, then he received a tangible reinforcer that is not a highly-preferred item. Lastly, if he did not emit an accurate sound on either of the three prompt levels, the trial was marked incorrect and an extra learning opportunity was provided such as a high five, wave, or clap.

Results

The goal was to learn whether a live model or video model was more effective in teaching echoic targets. The participant had spontaneous vocalizations, which were not under stimulus control, prior to the start of this project. This study showed that the live model was more effective in teaching echoic procedures. The independent variables in this study are the type of model provided, which is either a live model or video model. By the end of the study, the participant had learned eight echoic target sounds. The following graphs were calculated based on session total rather than target total. For the video model condition, the participant phase changed on one target sound after session nine and sessions ended with the video model after session fourteen. For the live model condition, he phase changed on 6 target sounds and sessions were conducted after the video model condition stopped.

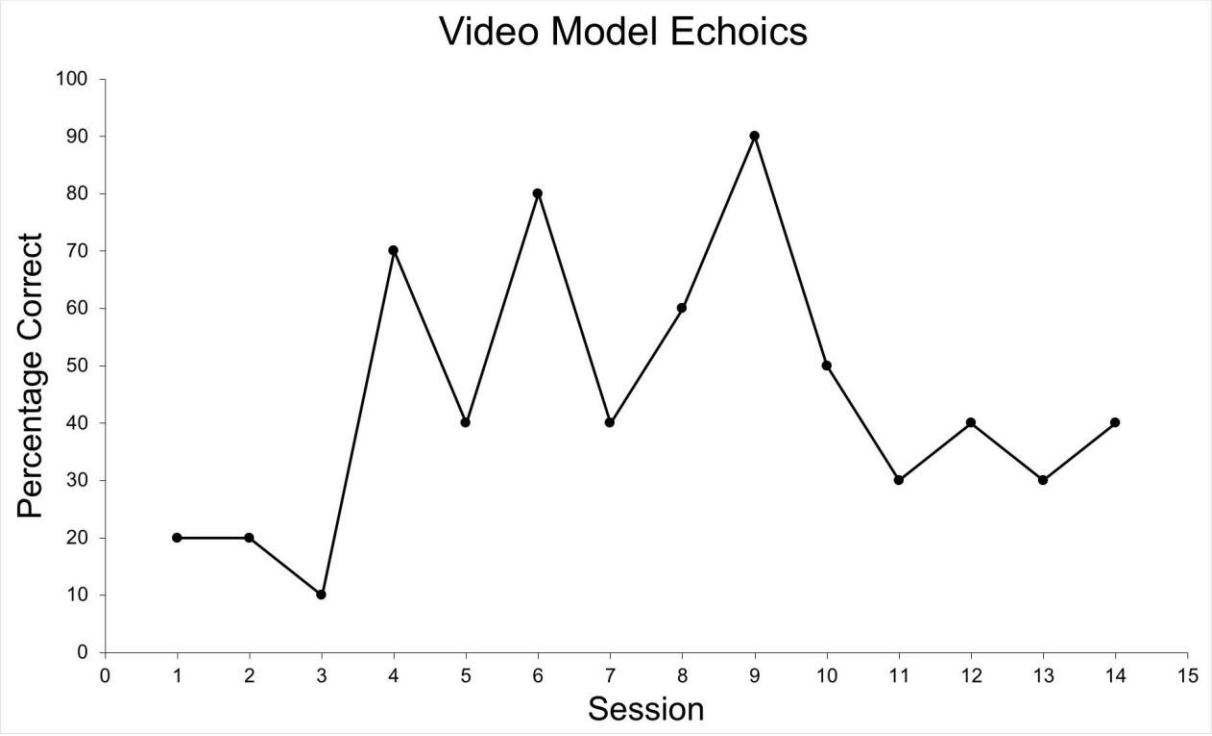

Figure 1: The Video Model data for participant through session 14.

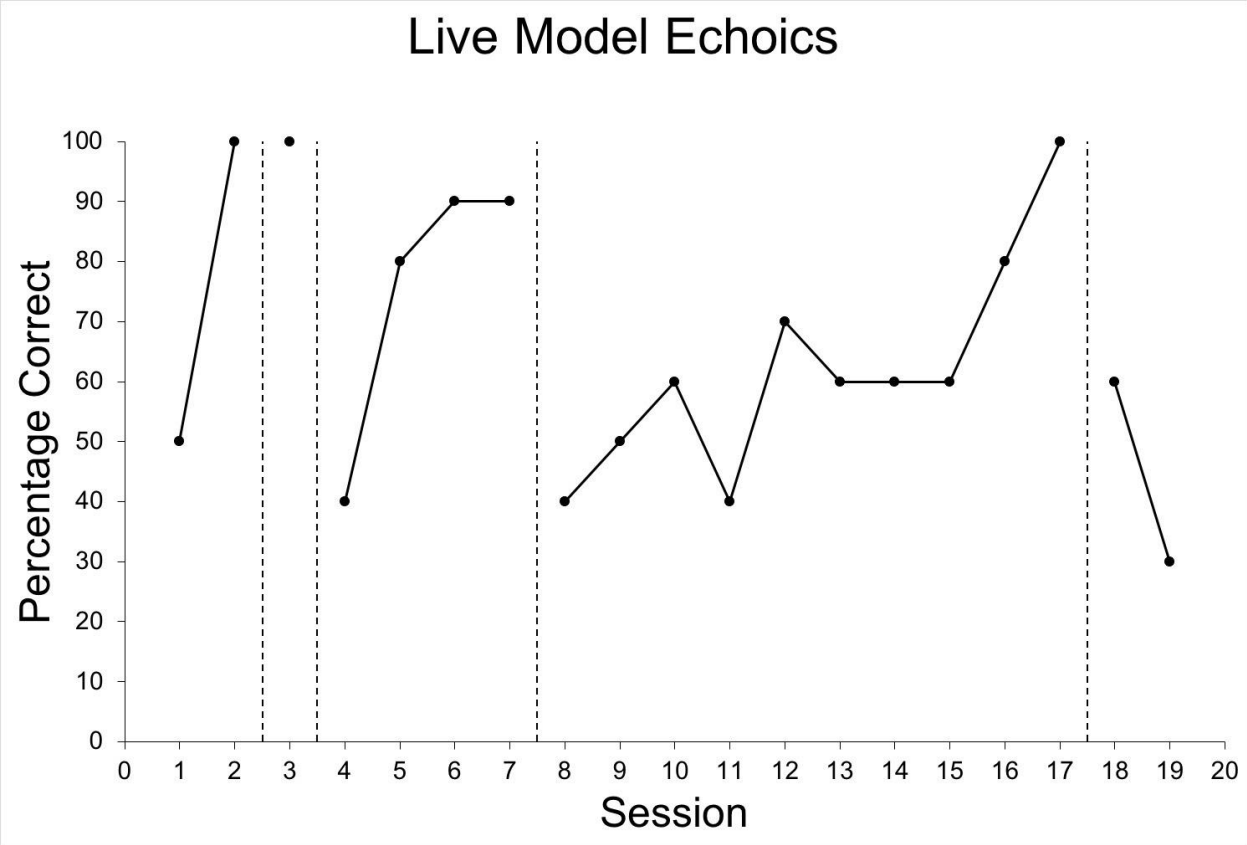

Figure 2: The Live Model data for participant through session 19.

Discussion

When beginning this study, it was hypothesized that teaching echoic sounds would be more effective with an iPad (Video Model) rather than in person (Live Model). Yet, the live model was more effective in teaching echoic sounds with the participant.

The video model was completely removed from the study because the participant had only phase changed on one target sound compared to the four target sounds the participant was able to phase change on with the live model. This research led to the result of the live model being more effective than a video model when teaching echoic sounds. With the participant, it was easier to maintain instructional control with the live model.

This study has connections to previous research because there is usage of technology to teach different sounds or words to children with autism. This fits into existing literature because the usage of technology in behavior analysis is becoming more prevalent.

Confounding variables for this research could include the participant's exposure to the target echoic sounds and the strength of the reinforcers. These variables could have affected the learning process for the participant as well. Limitations for this study include the amount of time allotted to spend with the participant. Another limitation could be the number of participants used for this study. These results showed that live models were more effective than the video models used for this particular participant.

The next steps for this participant include teaching mands and other verbal skills. Future research in the field could be done comparing different amounts of technology used in behavior analysis, or different ways to teach echoic procedures. Potential systematic replications include using technology and a behavior technician to compare effectiveness of teaching echoics or echoic target sounds.

This research demonstrates the effectiveness of a live, in-person model compared to using technology to teach echoic procedures. Future methods could refer to this study to aid the decision of how to teach echoic sounds.

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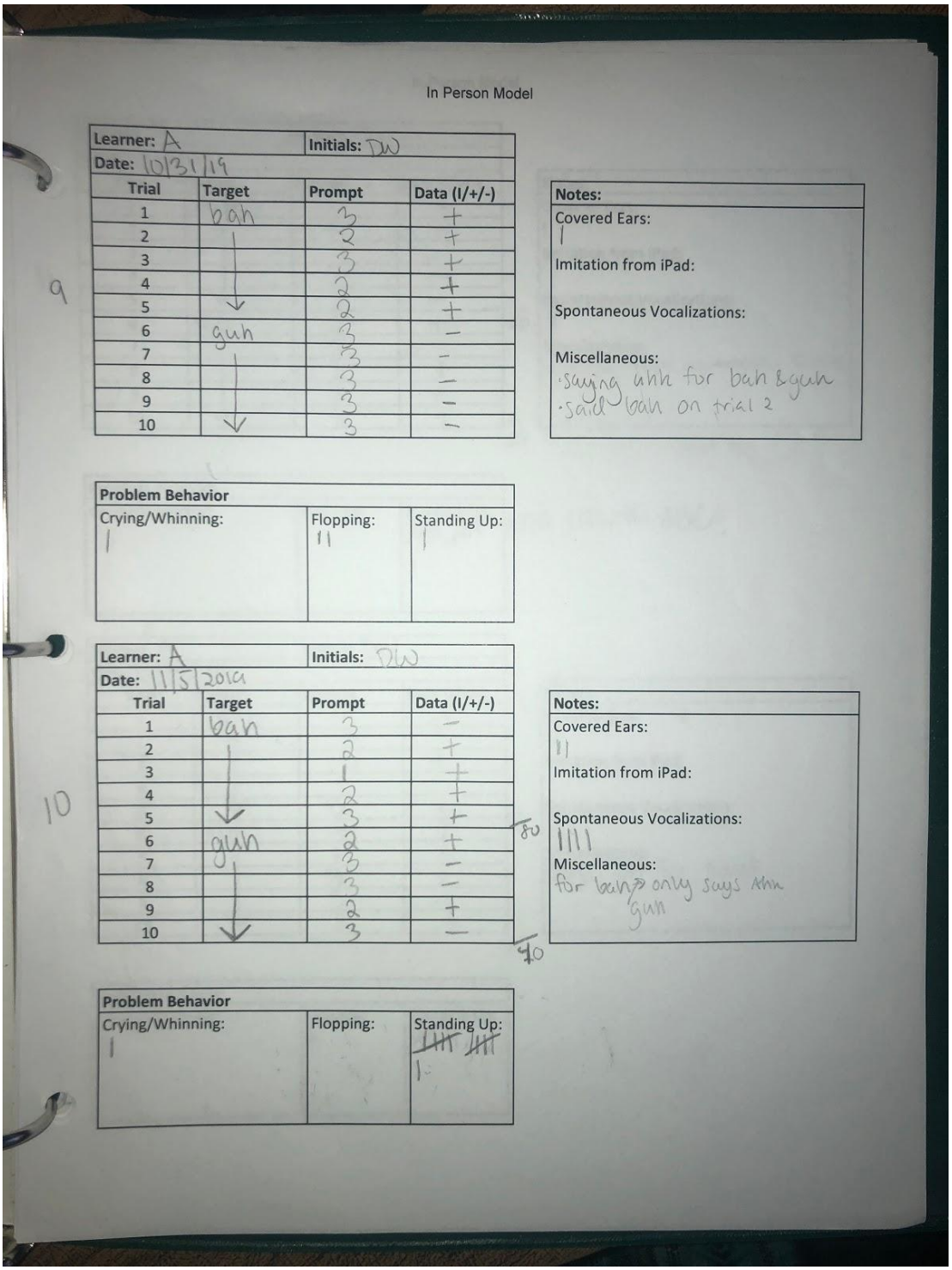
APPENDIX A: DATA SHEETS



In Person Model

Learner: A		Initials: DW	
Date: 10/31/19			
Trial	Target	Prompt	Data (I/+/-)
1	bah	3	+
2	"	2	+
3	"	3	+
4	"	2	+
5	↓	2	+
6	gah	3	−
7	"	3	−
8	"	3	−
9	"	3	−
10	↓	3	−

9

Notes:
Covered Ears: 1
Imitation from iPad:
Spontaneous Vocalizations:
Miscellaneous:
- saying uhh for bah & gah
- said bah on trial 2

Problem Behavior		
Crying/Whinning: 1	Flopping: 11	Standing Up: 1

Learner: A		Initials: DW	
Date: 11/5/2019			
Trial	Target	Prompt	Data (I/+/-)
1	bah	3	−
2	"	2	+
3	"	1	+
4	"	2	+
5	↓	3	+
6	gah	2	+
7	"	3	−
8	"	3	−
9	"	2	+
10	↓	3	−

10

60

70

Notes:
Covered Ears: 11
Imitation from iPad:
Spontaneous Vocalizations: 1111
Miscellaneous:
for bah only says uhh
gah

Problem Behavior		
Crying/Whinning: 1	Flopping:	Standing Up: 1111 1111 1

Figure 1: Data Sheet