TEACHING GENERALIZED ATTENDING TO NAME TO CHILDREN WITH AUTISM SPECTRUM DISORDER USING A POINT-OF-VIEW VIDEO MODEL

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ABSTRACT

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Social and communicative deficits are one of the hallmark traits of autism spectrum disorder (ASD). One of the deficits associated with ASD is attending to a social partner in response to name. Responding to name is important for safety and social reasons. Though responding to name is seen as incredibly important and is often one of the first skills targeted in a child's program, current strategies focus on teaching this response at an instructional table and do not promote generalization to a more natural environment. Video modeling has been demonstrated to be an efficient and least intrusive method of prompting for children with ASD because it limits the number of stimuli in the environment. Point-of-view video modeling further limits the number or stimuli and may prove to be effective in teaching the discrete skill of attending to an adult in response to name. A multiple probe design was utilized to determine the efficacy of using a point-of-view video modeling to teach three young children with ASD to respond to their name. Due to the COVID-19, the current study was terminated before the experiment could be completed. Of the collected data, there is some evidence to support the use of point-of-view video models as a method for teaching attending in response to name to children with ASD.

Keywords: autism, attending, video modeling, point-of-view video modeling, multiple probe design

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INTRODUCTION

Autism spectrum disorder (ASD) is characterized by deficits in social communication and repetitive patterns of behavior (American Psychiatric Association, 2013). Children with ASD demonstrate delays in pivotal social and communicative skills, such as attending to a social partner in response to the child's name being called, as early as 12 months of age (Nadig et al., 2007). Left untreated, these deficits worsen over time and can lead to social isolation and lower quality of life (Mazurek, 2013). In addition, and of specific relevance to attending to a social partner when called, some social deficits can profoundly impact the safety and well-being of a child with ASD (Conine, Vollmer, & Bolívar, 2019; Summers, Tarbox, Findel-Pyles, Wilke, Bergstorm, & Williams, 2011; Fisher & Taylor, 2016; Gunby, Carr, & Leblanc, 2018). Children with ASD and other disabilities are two to three times more likely to be injured severely enough to need medical attention than their peers without disabilities (Lee, Harrington, Chang, & Connors, 2008; Shi et al., 2015) and children with ASD are at an increased risk for peer victimization (Fisher & Taylor, 2016). In addition, recent literature has focused on teaching children with ASD to protect themselves in potentially dangerous situations such as stranger safety in the home and abduction-prevention skills (Summers et al., 2011; Fisher, Burke, & Griffin, 2013; Gunby, Carr, & Leblanc, 2018). These studies demonstrate that we can use behavioral technology to teach individuals with ASD social safety skills. However, many of these studies rely on the participant gaining skills in interacting with another person, and thus early social safety skills (e.g. responding to name, making eye contact, and attending to a social partner) are likely already in the participants repertoire. To the authors knowledge there are currently no studies investigating socially significant methods of teaching these foundational social safety skills.

Attending to a social partner when one's name is called is often discussed and described as a social skill within the ASD intervention literature (Carbone, O'Brien, Sweeney-Kerwin, & Albert, 2013; Fonger & Mallot, 2018; Conine et al., 2019). It is often taught in a discrete trial format wherein a child sits across the table from an instructor (Carbone et al., 2013; Cook, Rapp, Mann, McHugh, Burji, & Nuta, 2017; Fonger & Mallot, 2018; Conine et al., 2019). Attending in response to one's name under such a paradigm is hypothesized to improve learner readiness and increase overall social interaction (Carbone et al., 2013). Attending in response to one's name may therefore be considered taught and mastered once a child reliably looks at an instructor thereby signaling readiness for another trial or when the instructor speaks to the child during a social interaction. However, to the author's knowledge, data generalizing this skill to the natural environment do not exist. Failing to reliably respond to one's name when called outside of a discrete trial setting, combined with an increased likelihood to exhibit challenging behaviors such as eloping, puts a child with ASD at risk for death or injury via traffic accidents, poisoning by accidental consumption, or drowning (Anderson et al., 2012). As such, attending in response to one's name must also be taught across a variety of settings and with loosened control over the environment. To date, we are aware of no research that has documented explicit procedures for teaching the essential safety skill of attending response to one's name being called to young children with ASD.

Further review of the literature on instructional methods for attending in response to one's name yields interventions consisting of shaping eye contact by providing reinforcement for approximations until a child makes direct eye contact, offering differential reinforcement during mand training, and the use of complex computer systems to shape attending (Carbone et al.,

2013; Fonger & Malott, 2018; Zheng et al., 2017). In all cases, the child with ASD is taught to attend toward social partners in controlled environments.

Carbone and colleagues (2013) taught children with ASD to engage in eye contact with social partners in order to obtain preferred items. Although the researchers did not call the child's name, they did deliver reinforcement when eye contact occurred during the course of mand training and withheld reinforcement if eye contact did not occur. The intervention did not involve the specific response of attending in response to one's name, and likely brought eye contact under motivative control (i.e., eye contact as a mand), yet the researchers demonstrated the importance of embedding explicit reinforcement within the process of teaching children with ASD to orient eye gaze toward a social partner. These outcomes suggest it might be easier to teach attending in response to one's name if conditions are arranged in such a manner that it is beneficial to the learner with ASD to do so.

Fonger and Malott (2018) taught three preschool-age children with ASD to attend to adults by making eye contact while sitting at an instructional table by removing a preferred toy the child was playing with, calling the child's name, and shaping the child's gaze by reinforcing the gaze when it oriented toward certain parts of the adult's body. Prior to implementation two out of the three participants either never made or made eye contact in less than 20% or instances in which their name was called. The third participant would make eye contact in response to their name being called in less than 50% of instances. All three participants demonstrated sustained eye contact for 3 s at the following completion of the intervention. Although ultimately successful in shaping the children's gaze, it took the researchers six months to teach sustained eye gaze in a highly controlled environment and one-to-one instructional ratio. Similar to Carbone et al. (2013), the children's eye contact in the Fonger and Malott investigation may have

been under motivative control as instructors returned preferred toys following eye gaze. It cannot be assumed that such a response will automatically transfer to more natural conditions, such as calling a child from a distance on a busy playground.

Zheng and colleagues (2017) incorporated sophisticated technology to carefully teach eye gaze in response to name to children with ASD. The researchers designed and utilized a computer system called the Autonomous Social Orientation Training System (ASOTS). The system was a series of five computer monitors placed around the child and an apparatus to track the child's orienting behavior. One of the monitors would project a face calling the participants name. If the participant did not turn in response to their name being called, an image of a red ball with a corresponding "bounce" sound effect would appear on the same monitor from which the participants name originated in an attempt to draw the participant's attention to that monitor. If the participant did turn to the correct monitor in response to their name being called, a face appeared on the monitor that delivered social praise followed by a firework animation. The researchers were able to teach the participants to look at the correct monitor within seven trials on average, demonstrating that the use of technology may be an effective method for teaching attending-related skills. However, the system utilized in this procedure may not be cost effective for clinicians developing programs for individuals with ASD. In addition, generalization of the eye contact response to other voices and settings was not examined.

It is clear that additional research is needed to identify methods for teaching children with ASD to respond to their name in a paradigm that simulates real-life scenarios under which the behavior is most important, such as stopping in the middle of running in another direction. An intervention with extensive support for teaching contextually specific skills to children with ASD is video modeling (Lee, 2015). A video model is a video recording depicting an individual

completing a behavior that serves as a model for the viewer to imitate. The video model can include an environmental event or change that occurs prior to the behavior in the model, the behavior, and the consequence associated with the behavior. Typically, video models can be displayed from two perspectives. The first perspective allows the viewer to watch someone else complete the behavior. The second perspective, point-of-view, displays the behavior as if the viewer were also the respondent in the video model (Lee). Key benefits to video modeling include allowing the researcher to highlight very specific elements of the environment and allowing the target behavior to be controlled by naturally occurring stimuli, rather than more intrusive prompts (Bellini & Akullian, 2007). Another benefit is that video models can be made in the natural environment and can be readily available on an iPad, computer or any smartphone (Lee). Models can also be made to generalize across settings and skills or be individualized to the participant (Lee). The combination of the benefits listed above may support video modeling as an effective and efficient method for teaching attending to a social partner in response to name.

Point-of-view video modeling may be particularly relevant for teaching attending in response to one's name because it allows for a simulation of what the learner will experience and further reduces the number of stimuli in the on-screen environment (Lee, 2015). In point-of-view video modeling, the participant watches a scene that takes place from the perspective of the respondent. Point-of-view video modeling can be thought of as similar to augmented reality or first player perspective in video games. The idea is that the observer experiences the observed events as if he or she were engaging in the actual behavior. Recent research examines the use of video models to teach both play and social skills.

Scheflen and colleagues (2012) utilized several point-of-view video models to teach four children ages 3-5 years old play and associated social skills in a sequence that mimics development in neurotypical children. The researchers were investigating if the video models would teach participants appropriate play skills, if the skills would generalize across materials and settings, and if the language incorporated into the videos would also generalize across settings as well. Prior to intervention, the participants were observed to have play levels below their same-age peers without ASD. Participants watched video models of hands manipulating toys accompanied by scripted language. The results of the studies indicated that participants could learn play skills and generalize to untaught settings from the point-of view video model. However, language did not generalize for all participants. In addition, the researchers did not assess for maintenance of the skills over time (Scheflen, Freeman, & Paparella, 2012).

Tetreault and Lerman (2010) sought to teach three children aged 4-8 years old to initiate and maintain social interactions using a point of view video model. Prior to intervention, participants could mimic 3-4-word utterances but exhibited minimal social interaction skills. The point-of-view video models used for intervention included scripted opportunities for the participants to initiate or maintain social interactions. There were three scripts in all and covered the areas of getting someone's attention, asking for help, and sharing a toy. Video model scripts had five exchanges and required the participant to make eye contact as well as converse with a partner. Though the researchers aimed to teach social interactions that participants are likely to encounter in the natural environment, all intervention sessions occurred in separate room outside of the natural environment. Reinforcement was provided for watching the video model as well as engaging in the scripted conversation. One participant had begun to respond solely to one of the interventionists, which the researchers attributed to her pairing that interventionist with

reinforcement and so all reinforcement was removed and just the video model was presented. At the end, all participants required some additional support other than the video model. In addition, the researchers indicated the intervention was more successful at improving and generalizing eye contact than vocal exchanges. This finding may further implicate point-of-view video modeling as an effective strategy for teaching attending in response to one's name using technology.

Both the Scheflen et al. (2012) and Tetreault and Lerman (2010) studies are of particular relevance to the current study as they both highlight strengths and weaknesses of current point-of-view video model research. Tetreault and Lerman (2010) is one of the only studies that examine the effect point-of-view video modeling would have on social skills, but intervention was not conducted in the natural environment and generalization within the study was minimal. In addition, all participants required additional support in the form of prompting, script modifications or the addition of contrived reinforcement. This provides an opportunity for future research of point-of-view video models effect on social skills using reinforcers that may occur in the natural environment as well as a more thorough generalization assessment. Scheflen and colleagues saw an increase in the play levels of their participants following intervention, but maintenance was not addressed in the study. For areas like play and social skills that are common areas of impairment and can result in life-long deficits for individuals with ASD, the maintenance of these skills over time is vital.

In her literature review, Lee (2015) analyzed both the Scheflen et al. (2012) and Tetreault and Lerman (2010) studies as well as other studies to determine the effectiveness of point-of-view video modeling in teaching play and social skills to children with ASD. Her review examined five studies in which researchers aimed to teach both simple and complex social skills as well as play skills. She reviewed several studies with varying levels of success in teaching

using a point-of-view video model, but she offered several critiques of the research which may have led to a variation in results, such as failing to ensure the participants had important prerequisite skills (Lee). Lee stated the importance of prerequisite skills for utilizing a point-of-view video model, including ensuring that the participant can attend to video displayed on a computer screen and is also able to imitate from a video model.

Point-of-view video modeling has empirical support for teaching complex play and social interaction sequences to children with ASD (Lee, 2015). Because of the perspective provided to the observer during point-of-view video modeling, the intervention may be an optimal way to teach attending in response to one's name. In addition, the procedure is relatively simple to organize, easily accessible, portable, and may support generalization to different settings or voices (Lee). Therefore, the purpose of the current study is to examine the efficacy of point-of-view video modeling on teaching young children with ASD to attend to social partners in response to their name being called within the context of events that frequently occur in child development centers (e.g., free play, recess). The following research question will be addressed:

1. Is point-of-view video modeling an effective strategy for teaching children with ASD to respond when their name is called?
2. Can point-of-view video modeling lead to generalization across settings and social partners?

METHOD

Participants

Three children between the ages of 3 and 5-years old who attend an early intensive behavioral intervention (EIBI) center affiliated with a Midwestern university for 30 hours a week participated in the current study. All children had a diagnosis of ASD. Participants were chosen based on the following criteria: (a) they were able to attend to any video for 15 s, (b) they possessed a generalized imitative repertoire as measured by scoring at least 28 out of 32 points in the Motor Imitation Scale (MIS; Stone, Ousley, & Littleford, 1997), and (c) the participant scored less than 40% independent responding when the researcher called their name 10 times in the therapy room setting.

Juniper was a 3-year-old girl who scored a 28 on the MIS and responded for 30% of trials on the pre-test. She had been receiving EIBI treatment for eight months prior at the time of this writing. Harvey was a 5-year old boy who scored a 31 on the MIS and responded for 10% of trials on the pretest. He had been receiving EIBI treatment for 18 months. Archie was a 5-year old boy who scored a 32 on the MIS and responded for 10% of trials on the pre-test. He had been receiving EIBI treatment for 32 months.

All participants had received prior training in response to name. The protocol was standard for this clinic and involved several objectives preparing the learner to be successful during discrete trial training. The learning objectives began with teaching eye contact in extremely close proximity and varied in setting from structured (e.g., the instructional table) to unstructured (e.g., on the floor).

Settings

Sessions occurred in three settings: the therapy room, general education classroom, and playground. The intervention was implemented in the three settings for each participant in the same order. Each session was conducted during a time when the setting was "busy". Busy was defined as any time in which four additional people were present in the room and one additional voice could be heard from inside the room. Busy did not include instances in which the participant and researcher were alone in the setting or instances in which there was a designated time for children to sleep. A "busy" setting was selected because most of the research surrounding teaching a child to attend to a speaker or make eye contact in response to name was conducted at a table in a quiet and controlled setting (Carbone et al., 2013; Fonger & Malott, 2018; Zheng et al., 2017), yet it is more important from a safety perspective that children perform this response in busy environments.

Therapy room. The therapy room was an EIBI clinic room housed within a private preschool program. The therapy room included eight learners, eight behavior technicians and a Board Certified Behavior Analyst (BCBA). The room had eight stations placed in different areas for one on one work. Each station included a small learner chair, a blue table, an adult swivel chair, and a three-tiered wheeled cart which contained teaching materials and potential reinforcers for the learner assigned to the station. Also in the therapy room, was a designated play area, which contained a carpet, chairs, books and a toy shelf filled with toys. Sessions were conducted during individual goal time, where each child in the clinic was working with their one-on-one behavior technician.

General education classroom. The general education classrooms were located in the same private preschool programs that housed the EIBI clinic. Prior to the beginning of the

current study, each EIBI clinic's BCBA assigned each participant to a general education classroom, based on chronological age, and the child visited that room for a period of time during the treatment day as part of their regular therapy. There were two classrooms that participants could be placed in: one had approximately fifteen 3-year-olds with at least four teachers and the other had approximately fifteen 4-year-olds with at least three teachers. Each classroom had several stations including block building, pretend play, snack, arts and crafts, puzzles and small toys, and an area with a couch, a bench and some books. Sessions were conducted in the general education classroom setting when children were participating in free play time and were able to navigate from area to area of the room without redirection by an adult.

Playground. The playground setting was adjacent to the building where the two other settings were located. The playground included a large fenced in open area and a play structure with different climbing apparatuses and slides. Multiple classrooms could be on the playground at the same time, meaning eight to 30 people could be in the area during a session. At the time sessions were conducted, the learners from the EIBI clinic, their behavior technicians, the children from the general education classroom and their teachers were all present on the playground.

Materials

Video models were recorded on an iPad from the point-of-view of the model, meaning the viewer could see the desired response as if they were the respondent in the video model. Each model included hands engaging with a toy in the play area of the treatment room, an area of the general education room, or the playground, followed by the sound of a social partner calling the child's name off screen. The video model then panned to and focused on the face of the social

partner who provided reinforcement tailored to the observing child's current preferences. For example, if a participants highest ranking preferred activity (see below) was playing chase, the social partner in the video would deliver reinforcement by saying, "Let's play chase! I'm going to get you!" Juniper and Harvey each had three video models depicting highly preferred social activities, Archie had three video models depicting highly preferred social activities and two video depicting highly preferred toys. Video models were approximately 8 s in length and were randomly rotated each trial. Additional materials were a pen and paper data sheet.

Measurement of the Dependent Variable

The dependent variable was the number of correct independent instances out of five trials of attending to the social partner following the participant's name being called. To be scored as correct, an instance of attending was defined as the student stopping any activity, and orienting head and eye gaze orienting towards the social partner's face for more than 1 s within 2 s of the social partner calling the participant's name. The latency between calling the participants name and their response was chosen based from prior responding to name research and because in a true safety situation, participants would need to respond quickly. If the participant did not make a response within the 2 s or if the participant responded in any way other than orienting their head and eye gaze toward the social partner, the trial was scored as incorrect. Five trials were completed for each session, beginning when the participant's name was called for probe sessions or when the video model was displayed prior to the participant's name being called for intervention sessions. The trial ended after the preferred item had been provided or the participant did not look at the social partner for more than 2 s. The result was reported as the number correct out of five trials.

Interobserver Agreement

The researcher served as the implementer and was the primary data collector and a graduate student at the EIBI site served as the second observer to score interobserver agreement (IOA) which was scored using video recording of sessions. The graduate student was trained by the researcher on how to collect data using the following procedures. The second observer and the researcher practiced coding responses on videos not selected for the IOA sample and compared scores. Once the agreement between the primary and secondary observers for the training session was 90% or higher, the primary observer was able to implement sessions independently. The second observer scored 30% of all sessions across all settings and participants. Sessions we randomly selected using a random number generator. Point-to point correspondence was used to determine IOA (Ledford & Gast, 2018). Agreements were scored if both observers scored the same trial as an instance or non-instance of attending to an adult in response to name. Disagreements were scored if one observer scored an instance of attending to an adult in response to name and the other scored it as not occurring, or vice versa. Percentage of IOA was calculated by dividing the number of agreements by the number of agreements plus the number of disagreements and multiplying the quotient by 100 to yield a percentage (Ledford & Gast, 2018). Mean IOA for the current study was 95% (range 80-100%).

Experimental Design

A multiple probe design across participants was used to determine the efficacy of teaching attending to an adult in response to name using a point-of-view video model because the design exposed participants to the intervention using a systematic process (Ledford & Gast, 2018). Probe sessions were conducted for all participants in each setting to establish a level of performance prior to the first participant transitioning to intervention in the first setting. The first

participant was then introduced to the intervention procedures. For successive participants the criteria to introduce them to intervention procedures was three sessions of performance above baseline for the participant preceding them. Five probe sessions were conducted for each participant prior to transitioning into intervention.

The multiple probe design was also selected because it allowed the researcher to evaluate the efficacy of a skill that is likely to be non-reversible once learned across several settings. In addition, it was not expected that baseline levels of the target behavior would change and therefore did not require continuous measurement. Probes were selected to obtain a consistent but periodic assessment of attending to an adult in response to name prior to the intervention condition (Ledford & Gast, 2018).

Procedures

Preference assessment. Potential reinforcers were established by conducting a range of preference assessments on social activities and toys. Items found to be potentially highly reinforcing were included in video models in which following the response the social partner presented a social activity by inviting the child to play. Potentially reinforcing items were added to video models to possibly increase motivation to attend to a social partner calling the participants name by orienting head and eye gaze. If performance levels decreased preferences were re-assessed and new video models were made including the new items.

General Procedures. Sessions in each condition consisted of five trials in a single setting. The procedure for running a session was similar in baseline and in intervention, with a few exceptions described below. The researcher, referred to from now on as the implementer, served as the social partner in all conditions.

In each condition, participants were told by the implementer to go to the play area and allowed to move freely about the area. The participant was only redirected or physically prompted if they approached another teaching station. The implementer moved out of the participant's line of sight and stood approximately 10 ft behind the child. The implementer called the participant's name and silently counted to 2 s. Reinforcement was provided if the child attended to the social partner in all conditions for the therapy room setting. No reinforcement was provided outside of intervention in the general education classroom or on the playground in order to mimic a safety situation. Sessions occurred at least twice a day lasting no longer than 7 mins with at least 1 hour in between. Intertrial interval was no longer than 1 min. Sessions were terminated if severe challenging behavior occurred (e.g. aggression towards adults or other children in the setting, or self-injurious behaviors) for the safety and protection of the participant and children in the room.

Baseline. Baseline sessions were conducted for each participant in the therapy room setting until a constant trend was established in order to determine baseline level of responding prior to introduction to an intervention session. Two probes were conducted in the two other settings to ensure that the behavior was not occurring in those settings. Baseline sessions were conducted using the general procedures. In the therapy room setting, if the participant oriented their head and eye gaze toward the researcher in response to their name within the required 2s, the researcher offered an opportunity to engage in the social interaction. For example, if the child selected a high five, the social partner would say, "Hi, give me a high five!". If the child looked after 2 s or if the child did not look, no attention was provided. In the general education room or on the playground, if the child emitted the correct response, the implementor would give a direction (e.g., "Wait for me." or "Come here."). The direction was given in order to mimic a

safety scenario. If the participate did respond or did not respond correctly, the direction was not given, and a new trial was initiated. No additional attention or potential reinforcers were provided during the baseline condition.

Intervention. As each participant entered intervention, training was administered first in the therapy room. When a participant correctly responded for four out of five trials for two consecutive sessions or correctly responded five out of five trials in one session, the video model was faded as described below.

Intervention sessions were implemented using the following procedures: the researcher showed the video model prior to instructing the child to go to the play area. If the implementer observed the participant looking away from the video for 4 or more seconds, the video was ended, the implementer said, "Let's watch it again," re-presented the video, and played it from the beginning. The procedure was repeated until the participant watched the entire video. Then, the implementer removed the video model, instructed the child to go to the play area, and immediately moved behind the child to complete the trial as described in the general procedures. Reinforcement was provided when the participant oriented his or her head and eye gaze toward the researcher within 2 s of his or her name being called. Reinforcement was withheld when the participant did not orient head and eye gaze toward the researcher.

To reduce dependency on the video model, the video was slowly faded by reducing the number of trials before which the video was shown. When intervention began, the participant saw the video model prior to each trial. Criterion to reduce the number of times the video model was shown was one session at five out of five trials of correct responding or two consecutive sessions at four out of five trials correct responding. Once the participant met the criterion to begin video fading, the video model was then only shown every other trial, then before the 1st

and 3rd trial only, the 1st trial only, and then the model was completely removed. Once the video was completely removed, the participant's responding was assessed for mastery. Mastery criterion was established as four out of five instances of correct independent responding on two sessions.

Generalization. Once the participant met mastery criteria in the therapy room setting, probes were conducted again in the general education room and in the playground setting. If mastery criterion was met for these two areas, the participant moved into generalization across other people as described below. If the participant did not meet mastery criteria in one or both additional settings, the intervention procedure was repeated in each setting until the participant met mastery criterion in all three settings.

Generalization across people was also conducted in each setting for each participant following the return to probe sessions for each setting. The generalization procedures were conducted the same as the baseline sessions except for who was calling the participant's name. For the therapy room, the generalization person was the BCBA. For the general education classroom, the generalization person was a general education teacher. For the playground setting, the generalization person was a behavior technician for the EIBI setting. Each generalization person was coached by the researcher on where to stand and exactly what to say.

Maintenance. Once the participant met the mastery criterion in all settings, maintenance probes began. Maintenance probes were identical to baseline procedures and were conducted every other day for the first week after the participant met mastery criteria in all three settings. Following the first week, maintenance probes were conducted once per week for two additional weeks.

Error correction. Error correction procedures were only implemented if a participant was not making gains in intervention. Error correction consisted of the implementer interrupting the participants play, saying "You need to look at people when they call your name.", and redirecting the participant back to their workstation to engage in a simple work task (e.g. a puzzle or stringing beads). After the task was complete, the video model was shown again, and a new trial was initiated.

Procedural Integrity

The researcher served as the implementer for all participants and all sessions. Sessions were recorded using a GoPro Hero 4 and uploaded to a password protected server for later review. A graduate student at the EIBI site was trained by the researcher to code for procedural integrity (PI). PI was calculated for 30% of overall sessions for both baseline and intervention. Mean procedural integrity for the current study was 96% (range 80-100%).

RESULTS

Due to the spread of the COVID-19 to the United States, all human subject research was suspended by the University affiliated with the EIBI center in the current study. The results discussed below are results that were obtained prior to this closure and are incomplete. Figure 1 depicts the number of correct attending responses during baseline, intervention, and video model fading for Juniper, Harvey, and Archie.

During baseline, Juniper consistently demonstrated low rates of attending responses (*M* = 0.17, range 0-1). Following the first session of intervention in the therapy room, Juniper's correct attending responses increased to five responses. During fading of the video model, she maintained a higher rate of responding. In the first session of video fading, she made a correct attending response four out five trials. For the remaining three video fading sessions, she maintained five out of five correct attending responses.

Harvey demonstrated low levels of correct attending responses during baseline *(M* =0.06, range 0-1). He emitted one correct attending response during a baseline session in the treatment room and one correct response during the baseline session on the playground. Following two sessions in which he saw the video model before every trial, he met criteria to begin fading the video model. In the first session of intervention, Harvey emitted three correct attending responses and in the second intervention session he emitted five correct attending responses, meeting criteria to begin video fading. In the only session of video fading he received, Harvey emitted four correct attending responses.

Archie only received baseline sessions due to early termination of the current study. He emitted very low levels of correct attending responses during baseline sessions (*M* =.04, range 0-1) in all three settings.

DISCUSSION

The first purpose of the current study was to determine if point-of-view video modeling could be an effective strategy for teaching children with ASD to attend to an adult in response to name. Due to the early termination of the study, this question cannot be answered in its entirety. Though no functional relation can be demonstrated, the results that were collected may have implications for how teaching attending in response to name is successfully taught. The second purpose of the study was to determine if using a point-of-view video model could create a generalized attending to adults in response to name repertoire in children with ASD. The study was terminated before generalization to other settings and social partners could be systematically addressed. Therefore, this question cannot be answered currently, and further research must be done to investigate the extent to which utilizing a point-of-view video model could promote generalization to other settings and social partners.

Despite previously mastering attending in response to name in a highly structured setting, all three participants had low baseline levels when assessed in a more naturalistic setting. One hypothesis as to why the baseline levels were low despite previous training is that the mastered responding may be tied to specific settings or people. Low baseline levels on the general education and playground setting support this claim. However, in the treatment room setting, participants emitted a low frequency of responding when away from the table. This indicates that the instructional table may be the setting the response is tied to and not the room as a whole. Attending in response to name is helpful in treatment, as it allows the provider to gain the learner's attention to teach new and more complex skills. However, attending in response to name is more than sitting at a table and looking at an adult to learn something new. It also allows learners to communicate and play with peers and family members.

Busy parking lots, playgrounds, grocery stores, and crossing the street are other contexts in which attending to an adult in response to name is vitally important and consequences for not responding could prove dangerous or fatal. In a potentially dangerous situation, there is no opportunity for error correction or a second try so learners must make the response and make it correctly, the first time. The low baseline levels of the participants in this study in the general education classroom and in the playground settings despite prior training indicate that the traditional structured approach to teaching attending in response to name may not facilitate generalization to a more natural context, and may not protect the learner in a potentially dangerous situation. Therefore, it is vital to ensure that teaching procedures for attending in response to name generalize outside of a highly structured setting and to additional social partners. Teaching or strengthening an attending response in a naturalistic but more controlled setting (e.g., a fenced in preschool playground) may help mitigate risk in potentially dangerous situations. This study was not able to assess treatment effect outside of the therapy room setting but was able to assess attending in response to name away from the instructional table. The increase in responding for both participants following one session of intervention indicates that a point-of-view video model may be effective in strengthening attending in response to name in contexts outside if the instructional setting. Additional research to experimentally evaluate treatment efficacy and generalization outside of the treatment room is warranted.

For both participants that entered intervention, there was an immediate increase in responding. The increase in responding following intervention could be because all participants had prior training on responding to name. The video model may have served as a booster and supported prior teaching. Another potential explanation is that there are elements of the point-of-view video model that are salient for learners which may make it an effective strategy for

teaching social skills, supporting current research with similar findings (Lee, 2015). Regardless of the reason for the increase in responding, the intervention did strengthen responding to five out of five trials and did so quickly, requiring only one session of intervention for Juniper and two for Harvey.

The elements of the point-of-view video model that are believed to be salient for learners in the current study were the length of the video models and the reinforcement included in the video. First, the video models were very short, lasting a maximum of 8 s. This may have minimized the response effort to watch the video for the participant. Second, the depiction of an invitation to join a highly preferred social activity following the desired response in the point-of-view video models is hypothesized to have increased the motivation to emit the correct response. In fact, both participants were observed to smile and giggle in response to the social activity in the video models. These invitations to social activities were selected to mimic interactions that would be likely to occur in a more natural environment. The post-intervention probes were not able to be completed in alternate settings, so further research is needed to analyze the effects of point-of-view video modeling using naturalistic consequences in alternate settings.

During video fading, Juniper was able to maintain a high rate of responding as the video model was faded out, the last session of video fading, she only saw the model prior to the first trial. Likewise, in the only session of video fading Harvey received, in which he saw the video model every other trial, he also maintained a much higher level of responding compared to baseline. He emitted four out of five correct responses. His error occurred when he had been kneeling on the floor and chose to stand up before making the attending response, making the total duration of time to complete the response last longer than the required 2 s. Without the video model presented prior on every trial, participants still emitted the correct attending

response. Few studies in extant literature examine the long-term maintenance of point-of-view video modeling; the current study offers a preliminary framework for fading video modeling while continuing to assess responding.

Though there are some promising results from the data collected, there are limitations that need to be addressed as well. The biggest limitation is that the current study could not be completed and therefore, experimental control is not demonstrated. The third participant never entered intervention and so the study does not demonstrate a functional relationship. While the data collected does have some important implications regarding teaching attending to adults in response to name, without a functional relationship it cannot be determined if the point-of-view video model is solely responsible for the changes in responding. Generalization to other settings and other people was not assessed and so it is impossible to know if the skill was under the control of the treatment room, or if it would have generalized to other settings. Thus, the second goal of the study cannot be answered conclusively. The next limitation is that all participants had received prior response to name training. Should the study have been able to be completed, there would have been no way to determine if the video model taught the skill in the therapy room or if it had served as a booster for previous training. More research would be needed to analyze the efficacy of the point-of-view video model for participants that had not received prior training. A final limitation is the participants recruited were a specific and small population. It is unknown to what extent these procedures would be successful for other age groups or other levels of functioning.

From a practical standpoint, it is important to analyze the implications of the participant's behavior change following intervention, especially in terms of children's safety. If the point-of-view video model could be an effective method for teaching this skill, it would be important for

practitioners to consider this method. It should be noted that it only required one session of intervention for both participants to see an increase in responding. Sessions consisted of five trials and lasted no more than 7 mins. It is also possible that point-of-view video modeling is an efficient method for teaching skills and therefore should be considered when programming.

APPENDICES

APPENDIX A:

Procedural Integrity Checklist

Date: Participant ID:

Implementer: Session:

Step	**Y**	**N**	**N/A**
Does the implementer have all necessary materials (e.g. iPad, data sheet, pen, potential reinforcers)?			
Is the setting appropriate (e.g. enough noise, in the correct setting)?			
Does the implementer instruct the participant to "watch a video"?			
If the participant stops looking, does redirection the to the video occur?			
Does the implementer tell the student to "go play" after watching the video model?			
Does the implementer move behind the student?			
Does the implementer call the participant's name in louder than a whisper?			
If the student looks at the implementer, is the potential reinforcer given?			
If the student does not look, does the implementer withhold the potential reinforcer?			
Does the implementer complete five trials in the session?			
Does the implementer terminate the session in the event of severe challenging behavior?			
Total ((# of yes/ # of applicable steps) x 100)			

APPENDIX B:

Results

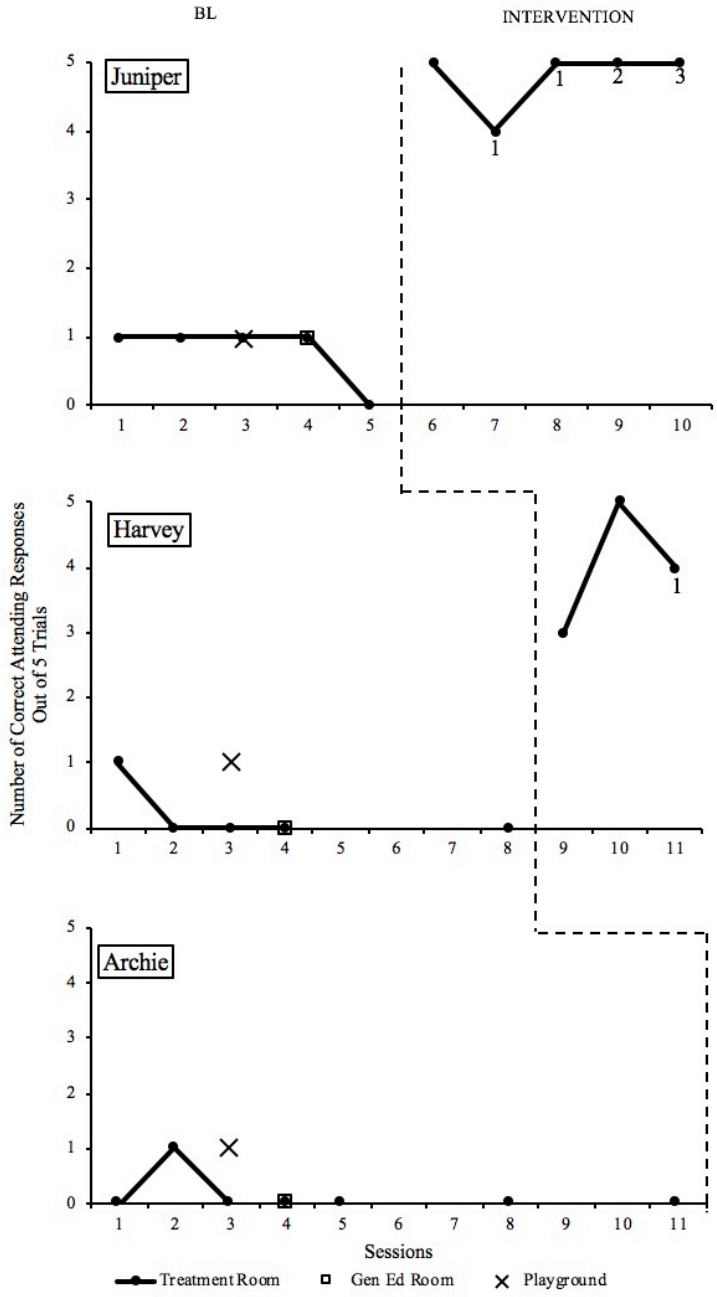

Figure 1. Number of correct attending responses for Juniper, Harvey, and Archie during baseline, intervention, and video fading. Numbers under markers indicate video fading. 1 indicates the participant saw the video every other trial, 2 indicates before the first and third trial, and 3 indicates the video was seen before the first trial only.

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