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Developing Conversation Skills for Individuals with Autism Spectrum Disorders

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Abstract

The purpose of this study is to explore and expand the literature on strategies to use to develop conversational skills for individuals with ASD. Children with ASD have difficulties creating and maintaining conversations and to participate in the community and its members, conversational skills are necessary to succeed. This study attempts to answer whether video modeling is an effective strategy alone for teaching social conversation skills; if video modeling is effective for increasing the length of conversation units; if external reinforcers are necessary to maintain social conversation skills; and if participants are able to generalize responses to novel topics during untrained neutral/non-preferred conversational units. There were three participants in this study who ranged from middle to high school students whom attend a private school for children with challenging behaviors. All participants are students enrolled in the Autism Program at their school, whom also have intraverbal skills but have deficits with back and forth conversation. The experiment was conducted using a multiple baseline across participants' design using a video model to increase appropriate body language; staying on topic; responding to questions or comments made by the conversation partner; and changing topics when the conversation partner is uninterested. The results from this study do not support video modeling being an effective strategy alone. The results are inconclusive due to gaps in data and the studying having not been completed.

Intraverbals and Conversation Skills for Individuals with Autism Spectrum Disorders

Introduction

The Center for Disease Control and Prevention (CDC) has estimated that one out of sixty-eight children have been identified with autism spectrum disorder (ASD; 2017). The CDC states that ASD occurs in all racial, ethnic and socioeconomic groups (2017). One of the defining characteristics for the diagnosis of ASD is persistent deficits in social communication and social interactions (Hall, 2013).

Applied behavior analysis (ABA) is a science that looks to both understand and improve human behavior (Cooper, Heron & Heward, 2007). Applied behavior analysts look at objectively defined behaviors that are of social significance and aim to improve the behaviors while also maintaining relationships between their intervention and the behavioral changes (Cooper et al., 2007). The National Standards for Autism (NAC) identify their approved evidence based practices to be from the behavioral literature (2009). Applied behavior analytic components are fundamental to the evidence based practices used for the ASD population (NAC, 2009). Principles of ABA can be used to teach individuals with ASD new skills. Skill acquisition targets a variety of aspects, including reduction in problem behaviors through intervention, teaching replacement behaviors for problem behaviors, as well as new academic and functional skills.

Autism Spectrum Disorders

The American Psychiatric Association's Diagnostic and Statistical Manual's (DSM) most recent publication is the fifth edition that provides criteria for diagnosing ASD. The diagnostic criteria for ASD includes two major areas that are listed subsequently. The first major category, "Persistent difficulties in social communication

and social interaction across contexts, not accounted for by general developmental delays" (American Psychiatric Association, 2013). The second category is "Restricted, repetitive patterns of behavior, interests or activities" (American Psychiatric Association, 2013).

Individuals with ASD have difficulty with social-emotional reciprocity meaning that they can have difficulty approaching social situations as well as creating back and forth conversations and have an absence of interest in others (American Psychiatric Association, 2013). They lack initiation of social interactions and social interactions in general, as well as deficits in non-verbal communication used for social interactions (American Psychiatric Association, 2013). Individuals with ASD have difficulty creating and maintaining relationships with others as well as adapting their behaviors to different environments (American Psychiatric Association, 2013). Restrictive and repetitive behaviors are also common among individuals with ASD, including repetitive speech, motor movements or fixation on objects/interests (American Psychiatric Association, 2013). Individuals with ASD may have an excessive adherence to routines or behavior, while being resistant to changes (American Psychiatric Association, 2013). Lastly, individuals with ASD may be either hyper- or hypo- reactive to sensory input (American Psychiatric Association, 2013).

Behavior Analysis & Verbal Behavior

Behavior analysis consists of three major theoretical areas: behaviorism, experimental analysis of behavior (EAB), and applied behavior analysis (ABA; Cooper et al., 2007). Behaviorism is the philosophy of the science of behavior whose key points is that "what people do can be understood" (Cooper et al., 2007, p. 15). EAB is the basic

area of research for behaviorism, while ABA develops a technology for improving

targeted behaviors (Cooper et al., 2007). Applied behavior analysis is a science dedicated

to both understanding and improving human behavior that focuses on objectively defined

behaviors that are of social significance (Cooper et al., 2007). Behaviorism, EAB and

ABA are three of four interrelated domains of behavior analytic science and professional

practices; the fourth domain is "practice guided by behavior analysis" (Cooper et al.,

2007). ABA and practice guided by behavior analysis are the two domains that include

the application of behavior analysis. Practice guided by behavior analysis include

practitioners, who design, implement and evaluate behavior change tactics for socially

significant behaviors, based off fundamental principles of behavior; Cooper et al. (2001)

provide examples of what this may look like including providing in-home treatment to

individuals with ASD (p. 20). Cooper et al. (2001) highlights that ABA has contributed to

a variety of areas that find human behavior important, including: education, and language

acquisition which are two important topics for this paper (p. 22).

Individuals with ASD have been categorized by the American Psychiatric

Association (2013) to have difficulties in social communication and interactions as well

as creating back and forth conversation; these areas of difficulties can be encompassed by

the area of verbal behavior. Behaviors whose reinforcement is mediated by another

person and is concerned with the function of language, meaning the effect a speaker has

on the listener is known as verbal behavior (Greer & Ross, 2008). Verbal behavior falls

under the subcategory within applied behavior analysis (ABA) known as verbal behavior

analysis (Greer & Ross, 2008). Verbal behavior analysis is based on B.F. Skinner's 1957

work, *Verbal Behavior*, which includes accounts for function of language or as Greer &

Ross (2008) summarize, "the effect that a speaker has on a listener" (p. 2). This field

looks at identifying, researching and discovering new instructional procedures to expand

functional verbal repertoires when they are missing (Greer & Ross, 2008). For

individuals with language deficits, a purpose of verbal behavior is to become verbal.

Verbal may be a term commonly used to mean 'vocal,' however, although that is a

component of verbal behavior, verbal refers to a verbal function, without regard to the

response form; a verbal response form could be vocal, gestural, pictoral or electronically

produced (Greer & Ross, 2008, p. 304). To be verbal, includes "any topography that

results in a verbal function" (Greer & Ross, 2008). To then differentiate between 'verbal,'

and 'vocal,' vocal verbal behavior refers to only motor speech forms (Greer & Ross,

2008, p. 304). The properties that vocal verbal behavior take on allow more advanced

verbal functions to be more accessible for individuals (Greer & Ross, 2008, p. 11). Vocal

behavior is a part of verbal behavior, however, not all verbal behavior is vocal. Within

the field of verbal behavior, Skinner (1957) had identified six speaker verbal operants

throughout his research, which include; echoics, mands, tacts, intraverbals/sequelics,

autoclitics and textual responding.

There are two roles taken on when engaging in verbal behavior, the role of the

listener and the role of the speaker. The speaker generally refers to someone who can

"govern or direct the behavior of others using various topographies of verbal behavior or

language as a tool" (Greer & Ross, p. 11). Since verbal behavior analysis studies and

applies verbal functions, there is also a listener role which is "someone who is affected by

the verbal behavior of others" (Greer & Ross, p. 11). Greer and Ross (2008) explain that

within verbal behavior analysis, "verbal functions for governing the behavior of others as

a speaker, and for those being directed or governed by the verbal behaviors of others as a listener" (p. 11). These roles are important to understanding the following six verbal functions that will be explained below.

The first verbal function are echoics; which can be defined as vocal verbal operants under the control of verbal stimuli that have point-to-point correspondence, an example of an echoic would be a parent saying, "apple," and the child responding with, "apple" (Greer & Ross, 2008). A mand is when there is a "condition of deprivation or annoying conditions that result in speaking in the presence of a listener who will mediate the situation", for example, a student who needs the bathroom requests for permission (Greer & Ross, 2008, p. 4). A "verbal operant under the control of a prior controlling stimulus" is known as a tact (Greer & Ross, 2008, p.4). Essentially, a tact is a label, an example of this would be if someone has a dog pass them and say, "Look, a dog," they are simply labeling what it is and that it is in the persons' environment. Verbal operants under the control of verbal stimuli that do not echo what the speaker said, rather, they correspond with the controlling verbal stimulus and can occur as exchanges between two speakers (Greer & Ross, 2008). An example of an intraverbal or sequelic would be one person asking the time, and the second person responding with the appropriate time. An autoclitic can be defined as, "see-say or hear-say responses". Verbal behavior that modifies the effects of elementary verbal operants (mands, tacts, echoics, and intraverbals) on a listener," it narrows the effect of verbal behavior and acts to minimize aversive reactions from a listener (Greer & Ross, 2008, p.4). An example of an autoclitic would be a child saying, "I want the *blue* cup, *please,*" and the child is handed the blue cup instead of the purple one. The phrase specifies what kind of cup (blue) but also uses

the word 'please' to make it a less aversive request. The last speaker verbal function is

textual responding, defined as "verbal behavior under the control of printed words," or

"see-print-say" responses meaning if a student sees the word "dog," they say the word,

"dog" (Greer & Ross, 2008, p.4).

Intraverbals, Sequelics & Conversational Units

Greer & Ross (2008) refers to Skinner (1957) and his definition of an intraverbal

as "verbal operants that are controlled by verbal antecedents but do not have point-to

point correspondence with their controlling stimulus" (p.182). Greer & Ross further

define an intraverbal between individuals as a sequelic (2008). A sequelic occurs when a

speaker says something to a listener is the speaker is then reinforced by the listeners'

verbal response (Greer & Ross, 2008). Examples of intraverbal operants can include

small talk, conversation, counting, addition and fill-in responses on exams (Cihon, 2007).

Greer & Ross (2008) states that by having complex intraverbal skills, it allows people to

learn about other people, what is going on in their environment, experiences others are

having and what will be happening later on as well as provide people to have a means for

empathy and taking on other perspectives (Greer & Ross, 2008).

An advanced intraverbal repertoire is the conversational unit which is defined by

Greer & Ross (2008) as "social exchanges during which two individuals rotate both

speaker and listener functions" (p. 184). The conversational unit allows individuals to

function as both speakers and listeners during intraverbal exchanges (Greer & Ross,

2008, p. 183). But if the individual is not reinforced by what the other has to say, the

exchange ends and a conversational unit is not created; a conversational unit requires that

the first speaker continues the interaction by seeking out another verbal response (Greer

& Ross, 2008). Essentially, the individual is not only reinforced as a speaker by the mediation of the listener, but also emits the responses that lead to accessing reinforcement from listening (Greer & Ross, 2008). Greer and Ross emphasize the fact that if the social listener repertoire is missing that it needs to be taught so that the individual can "acquire the reinforcing effects of listening" (2008, p. 186).

Importance

Children with ASD have difficulties creating and maintaining conversations and to participate in the community and its members, conversational skills are necessary to succeed. Sundberg & Michael (2001) highlight the importance of teaching a child to react appropriately to verbal stimuli given by speakers as well as appropriately behaving as a speaker. To be both a listener and a speaker is especially important to children with ASD who may not have had extensive exposure to verbal stimuli as a typically developing child may have (Sundberg & Michael, 2001). For children with ASD, it may be a necessity to directly teach intraverbal repertoires because it cannot be assumed that the development of an intraverbal repertoire will occur naturally even with prerequisite skills (Sundberg & Michael, 2001). Goals to be able to develop conversation skills including maintaining a conversation becomes increasingly important as the individual becomes older as they become more independent in social situations including employment, higher education the community and independent living settings (Nuernberger, Ringdahl, Vargo, Crumpecker & Gunnarsson, 2012).

Research Questions

1. Is video modeling alone an effective strategy for teaching social conversation deficits to individuals with ASD?

2. Is video modeling effective for increasing the length of conversational units in students with ASD when engaging in neutral or non-preferred topics?

3. Are external reinforcers necessary to maintain social conversation for individuals with ASD?

4. Are students with ASD able to generalize responses to novel topics during untrained neutral/ non-preferred conversational units?

Literature Review

This review of literature will examine the different types of instruction used to teach children with ASD conversational skills or intraverbals. These articles were categorized into behavior skills training, script fading, video and in vivo modeling, self-management and prompting with cues-pause-point.

Behavior Skills Training

Behavior Skills Training (BST) is a teaching package, which have specific steps for general implementation of the package including: instructions, modeling, role play, and feedback (Beaulieu, Hanley & Santiago, 2013). The participant, or person receiving training on a skill using BST must have all pre-requisite skills for the skill being taught (Fazal, 2015). To expand on the specific steps that are part of BST the first is instructions; instructions include a description of the skill, its importance and examples and non-examples of when to use the skill (Fazal, 2015). Modeling is the next step in BST and it is showing your participant how to perform the skill. The third step to implementing BST is rehearsal, or providing practice opportunities to learn the skill. The last step to implementing BST is providing feedback to the participant where the trainer also provides positive feedback for correct responding and corrective feedback for incorrect responses (Fazal, 2015). Below are four studies that have used BST to teach varying conversation skills to individuals with a disability.

Beaulieu et al. (2013) conducted a study to teach conversational skills to a 21-year old male with a learning disability in an office on his university campus. The authors used a multiple baselines design across behaviors to evaluate the effects of peer-mediated BST with 20 min sessions to gain skills to maintain conversation. To compare the

participants' conversational skills, the authors collected data on the conversational skills

of three undergraduate psychology students with no diagnoses nor concerns about their

social conversational repertoires (Beaulieu et al., 2013). This study looks at the

participant both as a listener, the rate of questioning and rated the content specificity of

responses. The authors also collected data on dependent variables that were not directly

targeted with the BST intervention, including speaking (by minute) and positive feedback

(rate per minute) throughout all sessions (Beaulieu et al., 2013). Authors also video

recorded sessions which allowed for visual feedback post conversation instead of

interrupting the participants' conversation while it was occurring, which was

systematically faded throughout treatment (Beaulieu et al., 2013). This study also

included a homework component that was not included in data collection but required the

participant to practice his skills with peers outside of sessions that the participant self-

reported results of (Beaulieu et al., 2013). Although the homework component can be

seen as a limitation for how quickly the conversational skills were acquired by the

participant, authors saw a direct increase in correct responding once BST was introduced

and it allowed for quicker generalization of the skills taught in the sessions by allowing

for novel conversation partners in a naturalized setting (Beaulieu et al., 2013). The

difficulty with the use of the homework component is that these conversations were not

recorded or seen by the researchers which does not allow them to see which skills were

improved upon in those conversations. The student used in this study graduated out of the

university, therefore no long-term maintenance data was collected (Beaulieu et al., 2013).

Authors also noted that one of their operational definitions could be seen as subjective

with the use of the word "excess" within the definition of content specificity and best

practice to measuring content specificity is necessary (Beaulieu et al., 2013). Lastly, authors suggest that a multiple probe design to reduce time and resources used for implementing BST (Beaulieu et al., 2013).

Hood, Luczynski & Mitteer (2017) conducted a study to teach greeting and conversation skills to one child and two adolescents with ASD in a university-based clinic. They used a concurrent multiple baseline design across responses for skill acquisition while also embedding reversals as a maintenance procedure (Hood et al., 2017). The authors used the design to measure the impact of BST on 16 targeted greeting and conversation skills across participants (Hood et al., 2017). The targeted skills were found to be deficit areas in conversation by both direct and indirect assessment. The BST incorporated trial-based teaching, differential reinforcement, textual prompts and non-contingent reinforcement. The intervention package was successful in teaching the multiple conversation skills, which were the generalized across conversation partners as well as settings and were maintained over time (Hood et al., 2017). The authors state that their study establishes skills that are important during initial interaction with an unfamiliar person, but there should be more complex skills taught to establish relationships (Hoot et al., 2017).

Nuernberger et al. (2012) conducting a study to teach vocal and non-vocal conversation skills to three young adults with a primary diagnosis of ASD or Asperger's syndrome in a comprehensive rehabilitation facility that provides vocational, transitional, and behavioral services to individuals with developmental and/or physical disabilities. They used a multiple-baseline design across participants design to evaluate the use of a BST package taught through task analysis on both physical and vocal aspects of

conversation (e.g.,proximity to partner, looking at the person, asking questions, etc.). The study showed that the use of the BST, in situation training and use of reinforcement was effective for all three participants. The authors stated that their study was successful in generalizing conversation skills to their natural environments because in situation training was included as well as training in the natural setting (Nuernberger et al., 2012).

Peters & Thompson (2015) conducted a study to teach children with ASD to respond in conversation based on their listeners' behavior in a clinic for children with ASD. It should be noted that if the participants were to be diagnosed with the use of the DSM-5, all three participants would fall under the ASD diagnosis, however, a participant is written to be diagnosed with PDD-NOS, diagnosed prior to the DSM-5. Within this study there were three experiments, that used BST to teach multiple responses to engage or reengage an uninterested listener (Peters & Thompson, 2015). Throughout the three experiments a token system that had already been in place was used throughout the sessions. The first experiment had participants identify (tact) whether the listener was interested or not and then ask questions to their listener. The second experiment had participants ask questions and potentially change the topic, while the third experiments' purpose was to test participant responding under extinction and to teach participants to give other taught responses if their first attempt is unsuccessful (Peters & Thompson, 2015). Results prove that the combination of all three experiments are effective with adult experimenters, however, it would be an important study to extend this practice of skills with peers (Peters & Thompson, 2015).

BST was used to teach various conversation skills to many different individuals of different ages, ranging from elementary to university age students, with varying abilities

and skill deficits, all of whom were diagnosed to have a disability. Beaulieu et al. (2013) allows the use of BST to extend the results from learning disabilities to individuals identified to be on the autism spectrum when looking at the other studies (Hood et al., 2017; Nuernberger et al., 2012; Peters & Thompson, 2015). All of the studies show that BST can be used on a variety of verbal conversational behaviors as each study targeted different skills and included different definitions for what an appropriate response would be along with varying topographies of the responses. Interestingly, Peters & Thompson's research also focused on re-engaging an uninterested listener which was also evaluated by other authors studies (Hood et al., 2017; Beaulieu et al., 2013), but not overtly assessed by Nuernberger et al. research (2012). All but Beaulieu et al. (2013) incorporate the acquisition of non-verbal conversational skills (e.g. gestures, eye contact, proximity); allowing generalization that non-verbal social conversational skills can be taught using BST to individuals with ASD.

Authors collected data for their research using both multiple baseline designs both across participants (Peters & Thompson, 2015; Nuernberger et al., 2012) and responses/ behaviors (Hood et al., 2017; Beaulieu et al., 2013) which seems to provide experimental control for the evaluated components of BST. Peters & Thompson (2015) also used probes throughout their research before beginning training and after meeting criteria for training for each skill which further allowed for experimental control to be obtained. The articles evaluated within this section had many skill sets that overlapped between studies and between different age groups and it can be hypothesized that BST is an effective method used for many individuals within the ASD community and for future research.

Script Fading

Script-fading procedures have been used for children with ASD to increase communication skills (Sarokoff, Taylor & Poulson, 2001). It is where a script is created to facilitate a conversation between individuals and was systematically faded from the end to the beginning of the script (Krantz & McClannahan, 1993). This approach was developed to help people with ASD identify and apply scripts to relevant social situations because it may be a difficult task since a characteristic of ASD is to have "persistent difficulty in social communication and social interaction" and requires both social information and understanding of cultural norms (American Psychiatric Association, 2013). Script fading is an approach originally based off research conducted by Goldstein and Cisar (1992) who used preschool-age children with ASD role-specific dialogues in sociodramatic play situations. The pre-school-age participants were given descriptions of their role and their teacher prompted and modeled role-appropriate behavior and speech (Krantz & McClannahan, 1993). The following three studies use script fading to teach conversation skills to students with ASD. All three studies appear to be have an impact on behavior in some way.

A study by Sarokoff, Taylor & Poulson (2001) used the script fading approach with embedded textual stimuli to teach two children with ASD to engage in conversational exchanges at a day education and treatment center for children with ASD. A multiple baseline across stimuli was used to assess the effects of script fading with embedded text to see if an increase of conversation statements between participants would occur (Sarokoff et al., 2001). The results show that when the script fading occurred and supplementary text was faded, participants were able to maintain conversation statements in the presence of the stimuli. The number of scripted statements

were much higher than unscripted responses, however, there was an increase in unscripted responding.

Charlop-Christy and Kelso (2003) conducted a study to assess the effectiveness of a cue card/ written script conversation for three verbal children with ASD at an after-school program. They used a multiple baseline design across subjects design to assess the program including phases for baseline, cue cards, testing and generalization probes. Once the cue cards were introduced during the intervention phase, the participants quickly met mastery criterion and continued to meet criterion once the cue cards were removed. The cue cards were only removed after two sessions of 100% correct responding and then were tested (Charlop-Christy & Kelso, 2003). In addition, the generalization probes used untrained topics, conversation partners and settings to which the participants remained successful. Looking at the visual analysis of the results, for one of the participants, generalization probes used for novel conversation partner was recorded to have a higher number of correct responses than it was with untrained topics (Charlop-Christy & Kelso, 2003). Others participants continued to have consistently high correct responses for both generalization of topics and across conversation partners. They also had 100% correct responding within teaching, testing and generalization probes remained significantly higher than responding during baseline procedures (Charlop-Christy & Kelso, 2003).

Ganz, Kaylor, Bourgeois & Hadden (2008) conducted a study using social scripts paired with visual cues to teach verbal communication skills to three students with ASD at a private school for children with ASD and cognitive impairments. They used a multiple baseline across (3) activities design with embedded withdrawal through 5-min sessions to measure the impact of scripts and picture cues on scripted and unscripted

responses (Ganz et al., 2008). Prior to intervention, participants were taught his/her script to mastery, so that they did not need support to read their script. Scripts were systematically faded over three steps; starting with the last half of the script being removed, then all but the first word and picture of the script were removed, and lastly, returning to baseline, where there were no scripts or pictures presented to the participant (Ganz et al., 2008)

Results from this study displayed that the use of scripts and picture prompts can provide a decrease in perseverative speech, and an increase in communicative speech, however, many were scripted, and many of the unscripted responses were not contextually appropriate or repetitive (Ganz et al., 2008).

The authors make note of the limitations in their study, including what they find to be a major limitation, which is the length of time the intervention was implemented, which may have hindered their ability to generalize and maintain the use of scripted statements once removed (Ganz et al., 2008). Authors believe the scripts may have been removed too quickly and future research should allow for more exposure to the scripts and to use a more gradual removal of the scripts (Ganz et al., 2008). Authors note that the length of the study should be extended potentially to two school years to figure out how students react to breaks or exposure to the visuals for a longer amount of time (Ganz et al., 2008). They suggest that future research should collect data on the contextual appropriateness of the scripted and unscripted statements (Ganz et al., 2008). Lastly, it is suggested that future research would give more strength to the study by adding generalization and long-term maintenance data (Ganz et al., 2008).

All three articles mentioned within this section used children diagnosed with ASD using a multiple baseline approach to systematically fade out scripts to have participants engage in intraverbal exchanges with the ultimate outcome of acquiring unscripted intraverbal responses within conversations. Sarokoff et al. (2001) used physical stimuli and scripts to facilitate conversation between individuals fading out 25% of the scripted prompts after participants were able to utilize their current script across two sessions (then 50%, then 75%, only the physical stimuli was left). Charlop-Christy & Kelso (2003) used multiple baseline across subjects but also utilized probes to assess generalization of targeted conversation skills to situations other than those trained by experimenters. Ganz et al. (2008) used multiple baseline across activities design while also embedding withdrawals to their intervention phase. Ganz et al. (2008) also incorporated picture cues with scripts. For all studies the cue cards/ written scripts were not introduced until the treatment condition (Sarokoff et al., 2001; Charlop-Christy & Kelso, 2003; Ganz et al., 2008). Charlop-Christy & Kelso utilized verbal prompting for participants to use the cue-cards with the experimenter as the conversation partner, Ganz et al. (2008) used a third person to hold up scripted cue cards behind the participants partner, while Sarokoff's study had the two students sitting across with one another with the script and visual stimuli (preferred object/edible) and no prompting from experimenters available during teaching of the cue card/ written script conversation program (2003). All three sets of authors took different approaches to presenting the scripts. The procedures for removing of cue cards/scripts for Charlop-Christy's (2003) research was not systematically faded in the same progression as Sarokoff's (2001). Reinforcement for completing conversations was used in both Sarokoff et al. (2001) and

Charlop-Christy & Kelso (2003) studies, which is noted to be a limitation of the studies and should be further researched if reinforcement is necessary for the acquisition of these skills, while the Ganz et al. (2008) research provides no information about reinforcement. Sarokoff et al. (2001) tracks data of the number responses used from the script were used even when the script was faded along with another data path recognizing the number of "unscripted" or original statements were created within the conversation (p.83). Ganz et al. (2008) collected data on scripted and unscripted responding as well as perseverative responding. Charlop-Christy & Kelso did not track whether responding when cue cards or scripts were removed but they provided novel conversation topics to participants which maintained high amounts of correct responding, allowing for a measure of generalization.

These articles provide information suggesting that the script-fading procedure may be effective for some individuals with ASD. There are high amounts of scripted responses recorded, even when scripts are removed, lacking variation in responding for these participants. Unscripted, varied, contextually appropriate responses should be a goal of increased conversational skills. Script fading also requires individuals to have reading as a pre-requisite to be successful, which can eliminate some populations of individuals from using this approach.

Self-Management

Self-management allows for independence for individuals instead of relying on prompts or other interventions, by allowing the individual to self-regulate their behaviors. Self-management also allows for generalization and maintenance of targeted social skill areas (Koegel, Park & Koegel, 2013).By having self-regulation skills for social

conversation, it may allow them to further master their skill sets by peer modeling as well as feedback (Koegel, Frea & Surratt, 1994). Having self-management and self-regulation skills, participants can be active in their learning of new skills. Three articles are discussed in this section that target individuals with ASD, conversation skills and utilize self-management or self-management and another strategy.

The following article uses the self-management strategy to teach social responsivity in multiple settings. Koegel, Koegel, Hurley & Frea (1992) conducted a study to assess whether self-management could be used to produce extended improvement in responsiveness to verbal initiations from other in multiple settings without the presence of a treatment provider for four children with ASD. Authors chose to utilize a multiple baseline across settings and subjects design to measure if self-management strategies to decrease individualized disruptive behaviors and increase appropriate behaviors of question answering could be taught and faded in a clinic could be used in the community, home and school settings (Koegel et al., 1992). Baseline measures showed low levels of appropriate responding to others questions for all settings, once self-management procedures were initiated, all four participants showed relatively rapid improvement (Koegel et al., 1992). Once the self-management procedures were introduced intro each setting, high rates of appropriate responses to others questions occurred (Koegel et al., 1992). Koegel et al. (1992) also collected data on the accuracy of self-recording for the participants and generally the participants had relatively high levels of accuracy of self-recording, with increased percentages of accuracy as sessions progressed.

Results show that self-management can be used to teach social responsivity, allowing the individual to be more independent and allowed for decreasing disruptive behaviors (Koegel et al., 1993). A limitation of this article is that the self-monitoring device was not faded (Koegel et al., 1993). Authors note that further research should investigate how to fade self-management materials and reinforcement role of the adult (Koegel et al., 1993).

Koegel et al. (2013) tested to see if individuals with ASD could utilize the self-management approach to learn social conversation skills. They conducted research to assess whether self-management procedures could improve sustained reciprocal social conversation in children with ASD by targeting both on-topic responsiveness, elaboration of responses and on-topic question-asking and whether these skills could be maintained and generalized across time and new conversation partners (Koegel et al., 2013). The participants self-managed during conversation using a graphic organizer that they were able to check off points when completed each necessary part. Authors used a multiple baseline design across participants to assess the effects of the self-management intervention on conversation skills with an adult conversation partner. The sessions for the studies were all conducted in the childrens homes. The data from the study suggests that there was an increase in elaborated responses and reciprocal question-asking during conversation once the interventions were implemented.

Koegel et al. (2013) used a self-management system where participants gained "conversation points" that gained them access to reinforcement once enough points were gained. To have appropriate conversation, participants had to answer questions or make an on-topic comment, elaborate on their own response or ask an on-topic question to their

conversation partner on a common, age-appropriate topic for the participant. As participants acquired skills, the self-management system was systematically faded out to see if skills were maintained and generalized. Once the intervention was implemented, there was almost an immediate increase in correct responding from each participant and two of the three participants participated in a one-year follow up in which although the self-managed responses were not as strong, were much stronger than they were prior to intervention.

Future research should look to strengthen generalized responses for unprompted question asking and elaborated responses. Authors suggest that a visual framework may have been a good supplement to self-management so participants did not rely on prompts (Koegel et al., 2013). This field could also benefit from more research on individuals with ASD and target question-asking, commenting and initiations as well as social communication in general (Koegel et al., 2013).

The following research combines video modeling and self-management. This article has been categorized in the self-management section of this paper because its end goal is to have the participants manage their own compliment-giving behaviors, while using video modeling as an aid to get participants to self-manage their behavior. Apple, Billingsley & Schwartz (2005) conducted a study comprised of two experiments; comparing the effects of video modeling used alone and video modeling with self-management to increase compliment-giving behaviors for children with high-functioning ASD. The authors used video modeling and self-management to increase compliment-giving behaviors of three preschool aged children with ASD at their school during free-play time (Apple et al., 2005). The first experiment allowed authors to demonstrate the

effectiveness of video-modeling on its own and provide a comparison once the second experiment had been conducted to see if self-management increased or decreased the frequency of target behaviors.

For experiment two, self-management devices were used to track compliment-giving behavior for all participants. Apple et al. (2005) used a multiple baseline across participants design to evaluate frequency of compliment-giving behaviors for video modeling + self-management. There was a teaching phase conducted that allowed viewing of the video model and taught participants how to self-manage; this phase continued until no modeling was necessary to give compliments (Apple et al., 2005). Once the teaching phase was complete a self-management phase was introduced for students to perform target behaviors in their classroom, where prompts but no models could occur for participants and participants could be reminded to check their self-management devices (Apple et al., 2005). Results show that in the self-management phase show that prompts were still necessary at the beginning to meet the number of compliments necessary, however, stable responding occurred for all three participants. The results indicate acquisition of compliment giving behaviors were higher once video modeling and self-management were combined and increased independence (Apple et al., 2005).

Authors suggest further research on teaching social initiations using self-management as well as generalizing the self-management system to other settings, or the fading and removal of the self-management system (Apple et al., 2005).

Koegel et al. (2013) use self-management to teach social conversation skills and also are able to fade out this tool, while Apple et al. (2005) does not attempt to fade out

the participants' self-management systems, but make it a note of something future

research should attempt. Koegel et al. (1993) also fades out the self-management system,

except for the self-management device. All three articles tackle different social skills,

where Koegel et al. (1993) targets social responsivity, Apple et al. (2005) targets a

reciprocal skill, Koegel et al. (2013) targets more functional social conversational skills,

meaning this approach can be generalized to multiple skill sets for individuals with ASD.

All articles utilize reinforcers to teach self-management, Apple et al. (2005) does not fade

out reinforcers during the self-management phase, while Koegel et al. (2013) fades out

reinforcers as the last part of removing the self-management system and Koegel et al.

(1993) thins fixed ratio reinforcement. When the self-management system is faded for

Koegel et al. (2013), there is potential that the generalization and follow-up data have

lower percents of responding because of the removal of reinforcement.

Prompting and Cues-Pause-Point

In prior research, there has been work done by Invarsson and Hollobaugh (2011)

to compare the efficiency of using both picture and vocal prompts to establish

intraverbals in the form of question answering for three boys with ASD. While both

picture and verbal prompting were effective ways to allow for question answering,

picture prompting was quicker in producing mastery for these skills. Another strategy

known as cues-pause-point was used to see if echolalic responses could be replaced with

stimulus specific responses (McMorrow, Fox, Faw & Bittle, 1987).

The cues-pause-point (CPP) procedure was used by McMorrow et al. (1987) to

eliminate echoics for individuals with ASD. They used a trainer who would hold up their

index finger midway between the subject and himself when silence was desired, would

move the finger to touch the correct cue after asking the question and used response

identification training prompts and then the pictures/cues were covered up. The question

was then restated and touched the covered-up cue when a response was desired

(McMorrow et al., 1987). The following study is a replication of Foxx's prior work, also

incorporating uncovered and covered picture phases.

Foxx, Schrek, Garito, Smith, & Weisenberger (2004) conducted a study to

evaluate the direct and generalized effects of cues-pause-point language training

procedures on immediate echolalia and correct responding for two children with ASD.

Authors used a multiple baseline across picture sets design to measure the percent of

echolalic responses and correct responses on three trained question sets (Foxx et al.,

2004). Prior to any data collection, participants were taught to verbally label picture cards

correctly, once mastery criterion was reached, baseline was introduced and then training

of cues-pause-point procedures were taught (Foxx et al., 2004). The first intervention

phase trained the participant to remain silent before, during, and briefly after being

presented questions and then to label one of the pictures; the next condition was similar

except now pictures were covered; the third phase included no pictures and no prompts;

then implemented another baseline measure that removed the pictures and only had

questions asked by the trainer, lastly, generalization and maintenance measures were

taken in new settings with the original and a new trainer. According to the authors results,

this program rapidly replaced echolalic responses with correct responses (Foxx et

al.,2004).

This procedure incorporated wait time and differential reinforcement. The

following study incorporated the cues-point-pause procedure along with prompting to

evaluate the effectiveness of the different strategies separately and together. Kodak,

Fuchtman & Paden (2012) conducted research to compare the effectiveness of three

procedures; echoic and tact prompting plus error correction and cues-point-pause

procedure to increase intraverbals in two children with ASD in a hospital-based Early

Intervention program. The authors evaluated the effectiveness of each intervention by

creating an adapted alternating treatments design within a nonconcurrent multiple

baseline design, measuring correct, unprompted responses and echoics. To ensure that

participants did not acquire target intraverbals between treatments, there were probes

conducted to ensure tacting could occur on pictures (Kodak et al., 2012). Echoics and

tact prompts were taught prior to intervention to teach at least 10 intraverbals, which took

extended time to train due to echoic behaviors of both participants (Kodak et al., 2012).

Results showed that the most effective training procedure was the echoic prompt plus

error correction.

On the while it was hypothesized by authors that the cues-pause-point (CPP) procedure

may be advantageous, the echoic prompt plus error correction procedure was most

effective (Kodak et al., 2012). The experimenter used progressive time delay and used

error correction until there was a correct unprompted response emitted prior to the

prompt or until the trial was repeated five times (Kodak et al., 2012). The repeated error-

correction component may have allowed this treatment phase for the participants to be

more effective due to additional opportunities to access the correct responses (Kodak et

al., 2012). Ultimately, CPP caused a reduction in correct responding while the echoics

and error correction treatment had the largest increase in unprompted correct responses.

McMorrow et al. (1987) developed the CPP approach while Foxx et al. (2004) replicated McMorrow and his own work; using CPP to replace echoic responding. They have found this approach effective in the past to have individuals with ASD move away from echoic responding, however, Kodak et al. (2012) used alternating treatments to see if there were other procedures that would be more effective to establish intraverbal repertoires, and with Kodak's research, results show that echoic prompt plus error correction was the most effective approach to train intraverbal responses. This approach has been used to remove echoic responding, however, it does not seem as though it will be a strategy used in the future, as there has been literature showing there are more effective approaches.

Video Modeling

Modeling is a practice used to show learners exactly how to do something. It gives them a visual example of what the expectation or the skill is (Charlop-Christy, Le & Freeman, 2001). There are multiple types of modeling, including: in vivo modeling, video modeling, and video-self modeling. In-vivo modeling consists of participants seeing the skill/behavior modeled live, in front of them, while video modeling is where an individual is presented with a pre-recorded video of models performing the skill or target behavior (Charlop-Christy et al., 2001). Video-self modeling is a type of video modeling where the individual learning the behavior is incorporated as a video-taped model (Sherer, Pierce, Paredes, Kisacky, Ingersoll & Screibman, 2001). Below are a variety of articles that conduct studies using at least one type of modeling described above, as well as articles that use the incorporation of another intervention with video

modeling. The first article uses video modeling for individuals with ASD to engage in social initiations and reciprocal play.

Nikopoulos & Keenan (2004) used video modeling to increase social initiation and play behavior for three children (between ages 7-9) with ASD in therapy rooms of a facility. Authors used a multiple baseline across subjects' design to measure the participants' latency of social initiation and mean time engaged in reciprocal play after watching a video model using the participants' same age peers (Nikopoulos & Keenan, 2004). The models used the same toys in the video that were available to participants in each session. If mastery criterion were not met after a predetermined number of consecutive sessions, authors created another condition to which the target behaviors were simplified (Nikopoulos & Keenan, 2004). To see if participants could generalize target behaviors to objects other than the ones used in the video model, experimenters removed the toy used in the video model, the session was then extended removing all but one toy to see if social initiations or reciprocal play would occur (Nikopoulos & Keenan, 2004). According to the results of this study, all participants had enhanced social initiations and reciprocal play skills, which were maintained in follow-up conditions (Nikopoulos & Keenan, 2004).

Authors identified a limitation of their study was the presentation or removal of toys in one of the intervention conditions, to which authors provide a solution in future research (Nikopoulos & Keenan, 2004). For future research, they suggest having an initial baseline condition where all toys are present, and another where all but one of the toys are removed to see if any instances of social initiation or reciprocal play occur (Nikopoulos & Keenan, 2004). While this article does not explicitly teach conversational

skills, it uses video modeling to engage in social initiations and in simple intraverbal operants and reciprocal interactions between listener and speaker roles.

Charlop & Milstein (1989) assessed the effects of video modeling on acquisition and generalization of conversational skills with individuals with ASD who had a history of failing to generalize newly acquired speech skills at an after-school program for individuals with ASD. Authors utilized a multiple baseline across children for two conversations and used a multiple probe across conversation for generalization measures (Charlop & Milstein, 1989). They used the multiple baseline across children to measure the impact of video modeling on correct responses on verbal conversations that included contextually appropriate statements and a question (Charlop & Milstein, 1989). Generalization probes were taken outside of the testing room used for baseline and intervention measures and untrained topics of conversation were used (Charlop & Milstein, 1989). Probes included conversants other than ones used in intervention to generalize skills across persons (Charlop & Milstein, 1989). The results show that all participants acquired conversational speech after implementing video modeling and were able to generalize these skills in all probes (Charlop & Milstein, 1989).

Results from the Charlop & Milstein (1989) note that for future research, generalization to typically developing peers should be tested, as well as measuring duration of conversational speech—opposed to the predetermined length used. Charlop & Milstein (1989) also suggest an exploration for methods for increased responses variation within video modeling should be tried to expand conversational skills.

The following is an article that compares the effectiveness of video modeling versus in vivo modeling for skill acquisition for individuals with ASD. The study by

Charlop-Christy, Le & Freeman (2001), explored and compared the effectiveness of

video modeling versus in vivo modeling for teaching developmental skills to five

children with ASD at an after-school behavior therapy program for children with ASD. A

multiple baseline design across and within children was used within each modeling

condition across the two tasks used, which task was assigned to each condition was

random for each participant (Charlop-Christy et al., 2001). The five children used all

worked on different skill sets, one of the participants focused on conversational skills.

The difficulty of each task was held as constantly as possible so that a behavior taught in

one condition could not be more difficult than the second task taught with a different

treatment and different models were used (Charlop-Christy, et al. 2001). Although all

participants were not targeting conversation skills, one participant did which looked at

spontaneous greetings and oral comprehension skills, while some others that targeted

social skills included conversational speech, cooperative play and social play (Charlop-

Christy et al., 2001). All students came to acquiring skills in less trials when using video

modeling, compared to in vivo modeling.

This article gives an interesting perspective into effective modeling. Both video

and in-vivo modeling are effective measures to have participants acquire new skills, but

video modeling led to quicker acquisition of skills for children with ASD in this study.

Although all participants were not targeting conversation skills, one participant did which

looked at spontaneous greetings and oral comprehension skills, while some others that

targeted social skills included conversational speech, cooperative play and social play

(Charlop-Christy et al., 2001). It is unclear what component of video versus in vivo

modeling was more effective for the acquisition of skills but a possible explanation

would be that video modeling may function as an external reinforcer but some modeling stimuli can gain a high saliency as they are intrinsically reinforcing to individuals as highlighted by Puca & Schmalt (1999) (Charlop-Christy et al., 2001). It can depend on the individual and what reinforces them. Which may be why one participant acquired skills with the same amount of sessions in each treatment; both modeling stimuli could have been equally as reinforcing. It is known that individuals on the autism spectrum can become preoccupied with aspects of videos where they rewatch parts repeatedly and are palilalic, repeating phrases heard at an earlier time but are not heard directly before saying them (that would be echolalic). Since individuals with ASD have this capability to have repetitive behavior, the video modeling may function to be automatically reinforcing (Charlop-Christy et al., 2001). The authors also highlight that video modeling may have generally been more effective or superior in acquisition of skills for the participants within their study because of the social deficits of children with ASD, prior research has suggested by Rimland (1968) as well as Schreibman, Koegel & Koegel (1989) that children with ASD tend to "relate better to objects than to people or that they treat people as objects (Charlop-Christy et al., 2001, p. 550).

Overall, all participants generalized the target skills within the study and suggest that generalization can be achieved through video modeling and may have generalized because the procedure "provides more facilitators of generalization," (Charlop-Christy et al., 2001, p. 550).

This next article incorporates using Social Story formatted narration in a video model. Scattone (2008) conducted a study combing the use of Social Stories with video modeling to enhance conversation skills for a child with Asperger's disorder at a medical

center. The author utilized a multiple baseline across behaviors design to increase three

target conversation skills by measuring the occurrence of targeted skills during

observations (Scattone, 2008). Scattone targeted eye contact, smiling and initiations,

which were put into Carol Gray's Social Stories format (2008). Once a script was created,

the author then turned the Social Story into a video model that the participant then

watched and was asked comprehension questions, before moving into a 5-min session to

practice the skills taught in the video (Scattone, 2008). All three target behaviors

occurred at very low percentages during baseline, which all increased once intervention

was implemented, suggesting that Social Stories presented as a video model was an

effective way to teach conversational skills. Scattone (2008) also observed the

participant in a school setting for post-intervention data; the percent of occurrence was

decreased from intervention, however still higher than baseline. This suggested the

participant was able to generalize the skills taught during the intervention, although, this

should be interpreted with caution, since it was only one observation of the participant

(Scattone, 2008).

The author had parental buy-in, and throughout the study, parents were to show

the video model to the participant each night, which the mother reported was difficult

because the participant was uninterested in viewing the video; Scattone suggests for

future research, to have multiple video modeled Stories with similar content to help

maintain interest or to add a reinforcement to assist with compliance (2008). A limitation

of this study is that the two components of this study were not systematically introduced,

to which the author admits it is impossible to determine which individual component of

the study were effective to increase target behaviors (Scattone, 2008). Lastly, Scattone

(2008) suggests having multiple participants and to conduct research in a multiple baseline across participants' design.

The next article compares self-video modeling to video modeling. Sherer et al. (2001) conducted a study to evaluate if using video produces rapid skill acquisition for children with ASD, while also comparing the effectiveness of self versus other as a model for five children with ASD in home and laboratory settings. The authors utilized both multiple baseline and alternating treatments design to evaluate the effectiveness of video-self modeling versus video-other modeling on twenty questions about the participants home and school life (Sherer et al., 2001). All twenty questions were assessed during baseline, after baseline the twenty questions were then dedicated to three conditions; four questions were used as generalization probes, eight were used for the self-video modeling, and the last eight were used for the other-video modeling (Sherer et al., 2001). The other-video modeling condition utilized peer models while the self-video modeling condition used the participant to create the video model and prompting, reinforcement was used throughout the creation of the videos (Sherer et al., 2001). Daily, the videos viewed by the participant alternated between self and other, based on what video they watched corresponded to what questions they would be asked during that session (Sherer et al., 2001).

Results from this study were variable between subjects, where two participants quickly reached acquisition of skills in both self and other video modeling conditions, while one reached acquisition at a slower pace, and the final two participants failed to meet acquisition in either condition (Sherer et al., 2001). The participant who reached acquisition most quickly was able to meet mastery after five sessions for "other," and six

sessions for "self," the other participant who reached mastery in both conditions was able to meet criterion for "self" after two sessions, and "other" after 14 sessions (Sherer, et al., 2001). The only other participant who was able to meet mastery criterion mastered the questions in the "other" phase after seven sessions (Sherer, et al., 2001). The results show that the video-modeling approach is only effective for some children with ASD (Sherer, et al., 2001). Overall, this study indicates both other and self as models are equally as effective.

A consideration for future research would be to conduct a study with other and self models with other populations, as the authors have hypothesized that children with ASD may be less sensitive to the discrimination between self versus other in comparison to other populations (Sherer, et al., 2001). Authors suggest future research to focus on operationalizing visual processing abilities of individuals with ASD and how that may impact their learning with video or visual stimuli (Sherer, et al., 2001).

The following article uses video modeling in a different way, this time attempting to increase the variation of responding for individuals with ASD. Charlop, Gilmore & Chang (2008) conducted a study to assess the effects of video modeling on the acquisition and generalization of variation in conversational speech for two boys with ASD who attended an after-school behavioral treatment program at which this study occurred. A multiple baseline across participants and within participants' design was used to systematically assess the effects of video modeling by creating multiple video models on the same conversational topic to provide multiple exemplars of varied responses may be (Charlop et al., 2008). During intervention, participants were shown three versions of

a conversation on the same topic and then prompted to have a conversation on the same topic (Charlop et al., 2008).

Results display an increase in variation in conversational responses for both participants within conversations once video modeling was introduced, and generalization occurred across probe conditions for untrained conversations (Charlop et al., 2008). There was also an increase in question asking behaviors as well as variation in question asking (Charlop et al., 2008).

Authors suggest that there are limitations in their research that may be useful to consider in future research, such as modifying video modeling to enhance its effects; discovering a way to have stronger generalization effects; and replicating this study since it only included two participants.

Process of Video Modeling. Video modeling has been used to teach a variety of social and conversational skills to individuals in the ASD community. Authors have tackled social initiations and play with generalizing from the video; generalization of conversation skills of statement and question asking across people, setting and topics; the effectiveness and rapid acquisition skills through video versus in vivo modeling; using Social Stories and creating them into video models to teach acquisition of verbal and nonverbal conversation skills; effectiveness of self versus other as model for conversation skills; and increased conversational variation through video modeling(Nikcopoulos & Keenan, 2004; Charlop & Milstein, 1989; Charlop-Christy et al., 2001; Scattone, 2008; Sherer et al., 2001; Charlop et al., 2008). Through the literature reviewed, there is room for improvement of this strategy. Some of the data in the studies reviewed have been inconclusive, and generally, video modeling needs more research conducted. Individuals

in the ASD community have difficulties with intraverbal skill sets that are a part of verbal

behavior and verbal behavior analysis and should be further explored.

The National Professional Development Center on Autism Spectrum Disorders (NPDC)

highlights ten steps for implementing video modeling for learners with ASD (2010). The

first step highlighted is selecting a target behavior for teaching which must be clearly

described for accurate data collection throughout the study to monitor the increase in

responding (NPDC, 2010). For this study, there have been four target behaviors identified

(i.e., changing the topic when conversation partner is uninterested, responding to

questions or comments made by the conversation partner, staying on topic, and

appropriate body language).

Once target behaviors are selected and defined in observable terms, the

experimenter must ensure they have the proper equipment to both record the video and

show the video (NPDC, 2010). For this study, a laptop will be used for both purposes,

described in a prior section titled "materials." Once the experimenter has identified how

videos will be recorded and played back, it is essential to plan for the video recording

(NPDC, 2010). The experimenter will need to write a script for what must be said and

displayed in the video (NPDC, 2010). Before instruction through video modeling begins,

baseline data must be collected to see how much of the skill the learner can complete

independently and which cannot to which the author can tailor the video to target the

skills not mastered (NPDC, 2010).

When baseline is completed, videos can be made to tend to the skill deficits of

the participant. Video modeling will be used in this study with two models role-playing,

displaying the target skills for the participant. For example, the video will include

information about all four target behaviors (staying on topic, responding to questions or

comments, knowing their conversation partner is uninterested and changing the topic, and

having appropriate body language). The adult models will demonstrate these skills within

a conversation and there will be a narrator explaining these behaviors. Once the video is

recorded with high-quality performances of the models, the experimenter must edit the

videos to rid of any errors as well as provide voice-overs or a narrative to explain to the

participant what the models are role-playing in the videos (NPDC, 2010).

The next step to video modeling provided by the NPDC (2010) is to arrange the

environment for the participant to watch the video and learn the target skills. The

participant will watch the video in a separate room from where his peers are learning to

ensure there are no distractions by peers or by other activities that are ongoing in the

classroom. The experimenter will also be in this classroom to play the video and provide

the necessary verbal prompts to keep the attention of the participant on the video. Once

the environment has been arranged, the next step is to then show the video to the

participant (NPDC, 2010). The participant will be shown the video one time before they

are expected to use the skill.

After the videos are watched, the experimenter must then monitor the progress of

the participant to determine the effectiveness of the intervention (NPDC, 2010). This will

be done by collecting data on the number of opportunities given to perform the target

skill within the conversation and how many times out of the opportunities does the target

skill happen. With the use of video recording of each conversation post-viewing the video

model, data collection does not need to be completed live. As data collection is ongoing

throughout the learning process, a step the NPDC (2010) highlights is that there must be

progress monitoring to determine whether changes to the video modeling must occur to improve the participants learning progress. Lastly, the video must be faded to allow for independent use of the target skills to improve conversation skills of the participant (NPDC, 2010). In this study, subsequent participants will be introduced to video modeling after the first participant has had at least three intervention sessions and has demonstrated a stable level of responding or an increasing trend. Once the student has met mastery criteria for a minimum of three sessions, the video modeling will be removed and maintenance data will be taken.

Limitations

   Throughout the research, authors have highlighted some limitations of their work. A major limitation within the work has been what is maintaining conversation. Sarokoff et al. has mentioned that there were snacks and games used non-contingently during baseline and used contingently within intervention treatments (2001). Hood et al. (2017), and Nuernberger et al. (2012), also mentioned that they used reinforcers throughout their research and had concerns of whether BST would be effective alone when the natural contingencies of having conversation with others was not enough to maintain the conversation nor reinforcing enough to influence conversational responding in the future. Charlop-Kristy & Kelso (2003) also highlights that the conversations may have been maintained because the topics used were of interest to the participants.

   A limitation within a few of the studies used is whether a specific component was very influential to success and identifying which component may have led to the treatment effects (Nuernberger et al., 2012; Scattone, 2008). Nuernberger et al. (2012)

use a behavioral skills training package in which there are multiple components that

contribute to learning the target skills, identifying which was most influential to

responding may allow further development on those components in BST. Beaulieu et al.

(2013) included a component where the participant was required to complete 'homework'

assignments in which they practiced the skill taught in the last session in the natural

environment. The data was not recorded by Beaulieu, Hanley & Santiago due to the

homework being completed outside of the experiments setting and was not systematically

recorded, nor were any probing trials before the next session completed (2013).

Although not listed by authors, it can be inferred that due to the multiple components of

BST, it is a limitation of all BST studies used in this literature review. Kodak et al.

(2012), also mentioned the limitation that too many components were manipulated at

once during the alternating treatment design used for CPP, echoics, and tact training

(prompt delay and type of prompt) that the specific mechanisms of the treatment that may

have led to learning could not be determined from this study. Scattone (2008) mentions

that the two components of her study were not introduced systematically and is

impossible to decipher what caused correct responding. Nikopoulos & Keenan (2004)

also manipulated too many components in one of their intervention phases that were not

tested separately in baseline, therefore some of their results are inconclusive as to

whether some results would have occurred if they had been tested in a baseline condition.

Authors mention the use of other procedures in combination with their strategies

to strengthen skills and overall treatment, which is a limitation of their work, but also an

avenue for future research. In combination with self-management strategies, Koegel et al.

wonder the effectiveness of adding a visual framework to reduce the use of prompts

(2013). Nuernberger et al. (2012) mentions how the use of videotaping conversations of participants in the absence of the experimenters may be useful for evaluating deficits and more individualized instruction.

Future Research

Research should be continued in the field of disabilities, specifically within the community of ASD, as it is a growing population and there is a need for evidence based practices for this area to be implemented by service providers and caregivers. It is a criterion within the DSM-5 to be diagnosed with ASD that there is a deficit in communication skills used for social interactions; creating and maintaining relationships and adapting their behaviors to different environments (American Psychiatric Association, 2013; Carpenter, 2013). By further researching social conversational skills and intraverbal repertoires, service providers, including behavior analysts, will be able to deliver socially valid evidence based practices that will help individuals with ASD to be independent in at school, social interactions in the community, within the job setting, living situations and continuing education programs. Research appears to have been conducted with younger populations within the ASD community, ranging from toddlers to university aged students. While this is important because the effectiveness of interventions for younger communities allows them to learn these skills younger and assimilate to social repertoires similar to their same aged peers. There is not much data for older participants, however there are older individuals in the ASD community who never received instruction on how to have appropriate conversation and social interactions. If the research is done with only younger children, it is useful for the current and future youth, but it is necessary to evaluate whether these practices can be effective

for older individuals who are not school-aged that may still need social conversational

repertoires.

The authors discuss that there needs to be a development of programs for social

repertoires that have reinforcers that are naturally occurring and are able to withstand

periodic extinction (Peters & Thompson, 2015). This is major in the sense that authors

have used reinforcement or preferred topics to have students engage in conversation with

others and to develop conversation skills (Hood et al., 2017; Sarokoff et al., 2003;

Charlop-Kristy & Kelso, 2003; Nuernberger et al., 2012). Hood et al. (2017) mentioned

that it may be useful to have extended delays to the programmed reinforcement, if used

and that the use of socially acceptable reinforcement could be used or potentially

integrating self-management procedures. Research now needs to consider maintaining

these skills that do not have external reinforcement, rather just naturally occurring

reinforcement contingencies, by interaction with others or being able to talk about a

topic. It should be considered that when these conversation skills are developed, can they

be generalized to topics that are non-preferred or are not as socially reinforcing.

A set of limitations had concern for future research was about the complexity of

the skills taught. Hood et al. (2017) highlight the fact that they want individuals to be able

to establish long-term relationships and their research only highlights conversations with

new people and that they provide the fundamental starting skills for those relationships

but not maintaining them. Evaluating procedures to teach individuals to identify

common interests with others and using those topics of interest in future conversation

with the same partner would be useful in continuing relationships (Hood et al., 2017). It

would be a useful evaluation to know the conversation patterns of the same age

neurotypical peers of the participants used in research to be able to compare the

progression of conversation between the groups (Koegel et al., 2013). Koegel et al.

(2013) mentions that their work would benefit by having their self-management strategies

should be generalized to peers and other settings as well as developing quality

relationships with their peers. Ganz et al. (2008) also mentioned that future research

should be longer for occur for script and picture fading to increase the potential

generalization and maintenance of the strategy. Regarding generalization Hood et al.

(2017) mentions there should be an evaluation of whether providing multiple examples of

appropriate responses only lets participants acquire those responses. Charlop et al. (2008)

highlights a need to discover strategies to strengthen generalization effects of skills taught

through video modeling.

Summary

There have been a variety of approaches used in research to evaluate what

effective approaches for teaching intraverbal and social conversation skills including

behavior skills training (BST), self-management; video, self, and in vivo modeling;

prompting and cue-pause-point; and script fading. Each of the studies reviewed have

been effective within the authors studies. There has been generalization and maintenance

demonstrated within each of the studies, however there is a need for further research to be

done within each type of strategy used to strengthen effectiveness and due to the

limitations of each study to allow for individuals with ASD to be successful in social

opportunities.

Methods

Participants and Selection Criteria

The target population of participants for this study were students with ASD whom demonstrate intraverbal skills but have deficits with back and forth conversation. The criteria necessary to be selected for this study included the following: (a) a diagnosis of ASD; (b) receive special education services under IDEA; (c) had an intraverbal repertoire including the ability to respond to basic 'WH' questions and preferred topics; (d) had deficits in more complex conversation skills, including difficulties staying on topic, inappropriate body language, picking up on nonverbal cues that their conversation partner is uninterested, and difficulties responding to questions asked by conversation partners/making reciprocal comments that add value to the conversation; (e) had parental consent; and (f) had student assent. This study also used staff participants who had met the following criteria: (a) be the classroom teacher or paraprofessional for the selected student; (b) were aware of the skill deficits of the participant, however, will not be aware of the specific target skills of this study; and (c) were willing to sign a consent form to participate in this study.

All three participants attended the same private therapeutic day school for students with challenging behaviors and were enrolled in the school's middle-high school Autism Program.

Andy. Andy (pseudonyms used throughout) was a 14 year-old Caucasian boy He was academically below grade level, and did not socially interact with his peers well. He preferred to engage in conversations with adult staff and continue conversation on topics that he preferred.

Al. Al was a 19-year-old boy. He was academically below grade level and typically responds to questions with repetitive phrases that do not necessarily answer the question he was asked. He attempted to stay on topic but would often repeat words back from the question or comment made in a different order. He also stared at women inappropriately, at both chest level, down to their feet.

Huck. Huck was a 16-year-old boy. Huck was very schedule oriented, and memorized information with ease. He had difficulty completing tasks or answering questions he did not like. He chose not to answer a question if he did not have an answer. Huck also had a vivid imagination where he pretended to be characters from movies and mimicked their quotes, as well as assigned character roles to staff members.

Setting

The study was conducted at a local private school for children with challenging behaviors in Harrisonburg, Virginia. The school is part of the JMU private school partnership ABA Clinic. This study occurred in multiple locations within the school, including a conference room, empty offices of staff, the school's room that is intended to be a model of an apartment, an empty classroom, an extra room used for vocational training.

Experimenter

This study was conducted by a full time, second year graduate student enrolled in the Masters of Education in Special Education program and Behavior Specialist Concentration at James Madison University, in Harrisonburg, Virginia. The experimenter was completing the coursework to become a Board Certified Behavior Analyst (BCBA). She had over four years of experience working with students with ASD and other

disabilities. She held a Masters of Art in Teaching (M.A.T.) and completed the

coursework for the Special Education Adapted Curriculum license. Dr. Keri Bethune,

Ph.-D, the behavior specialist concentration advisor, supervisor and BCBA-D, oversaw

the study in its entirety. In addition, three James Madison University 2nd year graduate

students, Rachel Rolando, Hollie Rhodes, and Beth Hassler, in the same Masters of

Education program served as both adult video models and data collectors for the study.

Data Collection

     Dependent variables. There were four dependent variables within this study.

The first target behavior was identified as changing topics when the conversation partner

is uninterested, defined as any time that the participant identifies the partner as

uninterested and changes the topic of conversation in attempt to reengage the partner

after the conversation partner has expressed any of the following behaviors that have

been adapted and modified from Peters & Thompson (2015): a) eye contact is moved

away from the participant and diverted to other parts of the room, b) listener faces their

body away from the participant, c) leans their head on their hand, d) audibly yawns or

takes a deep breath, e) "raises eyebrows and widened eyes without smiling or eye

contact" (p. 547), or (f) the conversation partner does not respond for three seconds or

more. For the first target behavior, frequency data were collected on the number of

opportunities the participant had to reengage the conversation partner *and* the number of

times that the participant attempts to reengage the conversation. The use of the term

'attempts' is important because they may be using appropriate strategies to reengage but

the conversation partner may not always respond to these attempts. The second target

behavior was staying on topic. When the conversation partner did not display any of the

"uninterested" behaviors, the participant should have continued the conversation on the topic given to them except when: (a) the conversation topic has been exhausted, defined as any time neither conversation partner has anything new to say about the predetermined topic; or (b) the conversation partner changes the topic. Duration data of this behavior were collected to see how long the participant was able to stay on topic and how this duration increased, or did not increase, throughout the intervention. Both the duration of the total time the participant verbally speaks on topic was collected, as well as the duration of the conversation that were not on topic. Percent of duration on topic were then calculated. The third target behavior was responding to questions or comments made by the conversation partner. This was counted when the participants' conversation partner asked him a question and the participant answered the partners question within 4s of the question being asked or when the participant made a comment or question based off of something the conversation partner said. This behavior was measured using the number of opportunities the participant had to respond to questions or comments *and* how many times the participant responded to the questions or comments. The last target behavior was appropriate body language. Appropriate body language was counted when the participant was within 3 ft of his conversation partner and maintained his eye contact anywhere above shoulder level of his conversation partner and did not look away from the conversation partner for more than 3s. Frequency data were taken on appropriate body language for the number of times that appropriate body language is violated, hoping to see a decrease in responding over time. An unforeseen confounding variable that data in which data were collected, noncompliance or the refusal to participate in sessions. All

participants agreed to be in the study, but would refuse to come and participate on some days. These occurrences were tracked throughout.

Interobserver reliability. To assess the reliability of the experimenters' data collection, interobserver agreement (IOA) was assessed throughout the study. An interobserver agreement is the degree to which two or more observers report the same observed values after measuring the same events (Cooper, Heron & Heward, 2007). IOA was conducted after sessions, as the sessions were recorded and easier, more accurate way to take data on after sessions. Consistently high IOA increases the likelihood that the target behavior was defined clearly and unambiguously, while also confirming that the measurement code and system was not too difficult (Cooper, Heron & Heward, 2007). IOA was conducted on a minimum of 33% of the total sessions, across phases with a minimum of 80% agreement considered acceptable. If the agreement dropped below 80%, the data collectors discuss the discrepancies and resolve disagreements. Agreement did drop below 80% for one of the individuals behavior due to small frequencies when calculating percent occurrence. The dependent variable with the most disagreement was one which was calculated with percent occurrence; both observers agreed on how many times the behavior did occur, but there was a discrepancy in how many opportunities were presented. Since the number of opportunities were small, the difference in percentages were larger; both agreed the behavior occurred once, but one observed three opportunities, while the other observed two, creating a large difference in percentages.

Fidelity. A procedural fidelity checklist was created to determine whether the researcher implemented sessions with fidelity. The same checklist was used in both

baseline and intervention. The fidelity checklist was used for each student once in

baseline and once in intervention. The second observer whom calculated IOA, was also

who filled out the fidelity checklists. The data sheet for fidelity is displayed in Appendix

A.

The second observer reported on at least two baseline sessions and at least one

intervention session for each participant. Al's sessions had fidelity reported on two

baseline and two intervention, to which the experimenter completed sessions with 100%

fidelity. For Huck's sessions, fidelity data had been taken for two baseline sessions and

one intervention, to which the second observer reported 100% fidelity. As for Andy, two

baseline sessions had fidelity data taken, and no intervention sessions, since he did not

receive intervention. For the sessions fidelity data were taken on Andy, fidelity measured

100%.

To ensure fidelity throughout baseline and implementation phases, the

experimenter provided a predetermined number of opportunities for the participant to

engage in target behaviors of the study. To count as a session the total length of the

conversation component of the session must be at least 1 min 10s long. If the participant

stayed on topic, the experimenter continued the conversation, however, if the participant

did not stay on topic, the experimenter verbally reminded the participant of the topic of

conversation, unless it follows the natural progression of a conversation. When

attempting to have the participant respond to questions or comments made by the

experimenter, the experimenter gave at least five opportunities to respond to statements

or questions. If the participant correctly responded, the conversation continued, if they

did not respond, responded inappropriately or incorrectly, the experimenter moved on to

the next statement. When assessing body language, no specific opportunities were provided to the participant, however, if there were minor body language violations (where gaze is, leaning over to look, staring) they were ignored. If there were major body languages violations, meaning any attempts to physically engage with the experimenter, or any attempts to touch oneself inappropriately (touching own genitals), the participant was vocally redirected. When the participant engaged in body language violations that are to be vocally redirected, they are to be redirected as soon as the experimenter has noticed them, and if the behavior was not terminated, the vocal prompt was presented again. The session was terminated if the experimenter deemed the session unsafe (including continuation of behaviors that need vocal redirection after two vocal prompts).

Social Validity. Both prior to and post implementation, there was a teacher survey conducted evaluating social validity of this study. This survey is displayed in Appendix B. Questions were targeted to evaluate whether the teacher found conversation skills important to all individuals, whether they thought that conversation skills are difficult for individuals with ASD, if they thought their student had difficulty with conversation skills; had difficulty talking about neutral topics, and if they believed their student could have conversations without external reinforcement. The survey also included a comments section that the teacher could write anything else in regard to conversation skills and the student participant.

Materials

This study used video modeling as the intervention to change the dependent variables identified for this study. The primary material for this study was the video model. Throughout this study there were two adult models who were on the video that the

participants watched to learn conversation skills. The adult models within the videos demonstrated the skills highlighted as the dependent variables. There was one video model that was put together that separated and explained each of the four skills being taught to the participant with examples and non-examples of the behaviors targeted by the intervention. Throughout the segments of the video model the voiceover explained who would be demonstrating each of the skills, this way the participant knew who to look at for the example.

The first skill the video model demonstrated was staying on topic. Staying on topic was demonstrated by the model directly responding to what the conversation partner has said and not changing the topic randomly. After this segment of the video was shown, the voiceover praises the on topic aspects. Then it switches to a non-example, where one of the adult models changes the topic completely on their conversation partner. The voiceover explains why it isn't appropriate to do that to the person you are talking to, and shows the example segment again.

The next skill targeted in the video model is appropriate body language. Appropriate body language was explained by voiceover, and a video of the adult models maintaining appropriate body language was shown. Once the segment ended, the voiceover praises the adult models on the appropriate body language, and explains the next segment is a non-example. The next segment shows the adult models looking all over—away from their conversation partner or at the conversation partners—however, not the face or above the neck. The voiceover explains why this may not be appropriate or distracting to their conversation partner, and then the example of appropriate body language is shown again.

The next segment of the video model explains how to tell if your conversation partner is disinterested with nonverbal cues and how to reengage them. To demonstrate this, one of the models becoming uninterested in the topic that their conversation partner is talking about and the voiceovers highlighted the non-verbal cues to suggest the conversation partner is uninterested and how to reengage the conversation partner. After it was shown, a voiceover was heard explaining that the next clip would display a non-example of the skill; one of the models becoming disinterested and the other model continuing to talk. The voiceover explains why one should not do this in conversation and then displays the example segment again.

Lastly, the video model displayed segments of both examples and non-examples of responding to the questions or comments made by the conversation partner. The video highlighted questions being asked to the conversation partner, the conversation partner would respond to the question and provide a comment or question in response. The non-example displayed the adult model not responding to the other verbally, making faces, and shrugging. The voiceover highlighted these incidences after the segment and then displayed the example segment again.

The videos were recorded on a MacBook Air. The MacBook Air was also used to edit and record voiceovers for the videos, using an application on the device, iMovie. During the implementation of video-modeling, participants viewed the videos on a MacBook Air.

Experimental Design

A multiple baseline across participants design was used throughout this study. Multiple baseline designs encompass the measurement of behavior under more than one

baseline condition and have staggered introduction to treatment to see if behavior changes only when treatment is introduced (Saville, 2008). Multiple baseline designs display experimental control when there are changes in behavior only when there is introduction to treatment (Saville, 2008). By using multiple baseline across participants, meaning the introduction to treatment to each participant is staggered, stable responding in baseline is maintained until introduction to treatment to ensure there has not been learning of the target behaviors from participant to participant (Johnston & Pennypacker, 2009). When using multiple baseline design across participants, the same target behaviors are used for each participant as well as the intervention being conducted in the same setting (Johnston & Pennypacker, 2009).

Procedures

Preference Assessment. Throughout this study, topics that were neutral or non-preferred were used to create conversation. The staff personnel that work with the participants will be asked to fill out the Reinforcement Assessment for Individuals with Severe Disabilities (RAISD; Appendix C; Fisher, Piazza, Bowman & Amari, 1996). This allowed the experimenter to see what topics may be preferred in conversation and to then avoid these topics when developing the topics for testing.

Baseline. The baseline sessions occurred in a separate room from the participants' peers. The participant, and the experimenter were in the room together for the baseline sessions. The experimenter recorded the session and served as a conversation partner to the participant. Data were collected on the frequency or duration of the four target behaviors defined in the video modeling section as seen in Appendix D. The participant was sitting with their conversation partner and told to have a conversation about a given

topic with that person. Baseline sessions were a minimum of one minute and ten seconds and lasted no more than three minutes. Once a minimum of five data points were collected and a stable trend was established, video-modeling was introduced for the first participant.

Video Modeling. When creating the video model, the experimenter created a script for each skill being taught within the video model. Once it was completed, the experimenter had two IRB approved peers work together to create the video model. The experimenter coached the adult models on what the skill was and why they are going to engage in both example and non-examples of the social conversation skills. Before filming, the adult models practiced with one another. Once they were comfortable, the experimenter started the recording on a MacBook Air. Each skill was separately filmed, allowing the experimenter to edit the videos and have pauses for the experimenter to provide voiceover during the editing process. Once the models performed each skills adequately on the recording, the models left. This left the experimenter to edit each video recording and allow voiceover explaining the skill, showing the skill on video, praising what the models did correctly, and then providing a voiceover before showing a non-example of the skill. After the voiceover of the non-example, the non-example video of the skill was shown, and immediately after, the experimenter explained why it was not correct. Then the example of the skill was shown again to provide comparison. After this was done for one skill, it was continued for the three other skills targeted in the study. Once reviewed by the experimenter, the video model was ready to be shown to participants once baseline was complete.

Once the participant was ready to be introduced to intervention, the participant was brought to the room the session would be completed in. The participant sat in a seat of their choosing and the experimenter would bring the device with the video model on it to the participant. The experimenter told the participant that they were to watch the video and then they would have a conversation with the experimenter after they had watched the video. The experimenter waited for either a verbal or nonverbal acknowledgement, and then pressed the "play" button on the screen. The experimenter walked away from the participant while he watched the video model. As soon as the video model ended, the experimenter removed the device the video model was displayed on, and pressed start on the iPod and began recording the conversation component of the session.

Test Conversation. After the presentation of the video, the participant had a conversation with the experimenter given a predetermined, neutral topic by the experimenter. This conversation was recorded by video and after the session, the experimenter reviewed the video and took data as described previously and shown in Appendix D.

Generalization. After the test conversation with the experimenter, the participant had another conversation with the identified teacher participant, who does not know what the dependent variables were being measured. These conversations will be recorded by video and observed by the experimenter to see if the participant was able to generalize the information modeled in the videos to the conversations had with the experimenter, to a conversation with a new person.

Maintenance. Once the participant has reached mastery criteria, the video modeling was removed; they will no longer view the videos. The student participant was

engaged in conversation with a teacher participant just like in the generalization phase to see if they are able to maintain mastery criteria. If the student participants behaviors go below mastery, the video will be reintroduced until mastery criteria has been obtained again.

Results

The results for the interobserver agreement are reported below. Then, the results for each research question are presented. Figures are listed on pages 76-78.

Baseline. With a multiple baseline across participants design, each participant had a different amount of baseline sessions. Al had five sessions of baseline before implementing intervention. Huck received eight sessions of baseline before being introduced to intervention. Andy had 11 sessions of baseline, 5 of which were noncompliant.

On all graphs throughout this study there is one data path that is consistent: noncompliance. Noncompliance sessions are displayed by a triangle. Within baseline, Huck was noncompliant for three session; and Andy was noncompliant for five sessions. There are also gaps in data that account for absences. While Al's absences are consecutive in baseline, level, trend, and variability can still be assessed for the baseline sessions he participated in, while Huck and Andy have multiple gaps in baseline sessions, not allowing a conclusive analysis of level, trend, and variability.

On Topic Talk and Attempts to Reengage Conversation Partner. This graph displays data paths for three measures. One measure is consistently displayed throughout all graphs; noncompliance (triangle). The second and third measures on this graph

represent dependent variables; percent occurrence on topic and percent occurrence of the participant attempting to reengage the conversation partner.

The first participant shown on the top graph, Al, is the only participant who does not display noncompliant behaviors at any time throughout the study. During baseline he consistently had high levels of on-topic talk, with no trend, and were stable, averaging 100% of the participated baseline sessions. He consistently did not reengage the conversation partner throughout sessions (0%), displaying low levels of responding, that were stable, with no trend.

The second participant, Huck, engaged in noncompliant behaviors for three sessions of baseline. During sessions he did participate, he displayed high levels of consistent responding for staying on topic throughout the session. On all sessions except one, he had low levels of responding. The last baseline session he engaged the conversation partner 50% of opportunities. From the baseline data, the trend and variability cannot truly be assessed due to the gaps in data.

The third, and last participant, Andy, only received baseline sessions due to the lack of intervention sessions that occurred for the first two participants. AB displayed noncompliant behaviors for five sessions, and participated in six sessions. From the data that was taken on participating sessions Andy was able to stay on topic 100% of the sessions, while never attempting to reengage the conversation partner when opportunities occurred (0%). Due to the gaps in the data, the true level, trend, and variability of the data cannot be determined.

Body Language Violations. There are two data paths on this graph to consider during visual analysis: noncompliance (triangle); and frequency of body language violations (circle).

For the first participant, which will be noticed for all sets of multiple baseline graphs of this study, Al's results for dependent variable of body language violations, Al displays mid-level, variable responding, with an increasing trend as sessions progress. He engages in body language violations ranging from two to eight times throughout the baseline sessions he participated in, and an average of five times per session out of the five baseline sessions he was in attendance for. For Al, this meant looking away from the conversation partner for more than 3s, or below the shoulders of the conversation partner.

Huck displayed noncompliant behaviors resulting in the nonoccurrence of three sessions throughout baseline. For the sessions he did participate in, he consistently did not engage in any body language violations, with a range of 0 and an average of 0 for body language violations. Sessions were low level, stable, and had no trend.

Andy did not participate in five of eleven sessions due to noncompliance (5). There are many gaps in data for Andy, however, based on the data that exists for Andy, he engages in body language violations with a range of 0-7 times in sessions with an average of 4.5 body language violations per session (out of the six participated sessions). It could be argued that his body language violation behavior are mid-level, increasing in trend, and variable, however, gaps in data are inconclusive.

Percent occurrence of responding. There are two data paths on this graph to consider during visual analysis: noncompliance (triangle); and percent occurrence of responding to questions or comments (circle).

As discussed previously, the sessions that Al was absent were not considered when determining results, however give the data a limitation because of the gap in data. Based on the data from the sessions Al was in attendance for, he had a high-level, variable, and decreasing trend throughout his sessions. On average, Al responded to questions and comments made by the experimenter 86.9% of opportunities, ranging from 68.75-100%.

As for Huck, while gaps make it difficult to determine, for the participated baseline sessions, Huck responded to the experimenter at a high level, with an increasing trend, and slight variability. On average, Huck responded 90.2% of the opportunities given throughout a session, ranging from 77.8-96%.

Andy has significant gaps in data as well, with a responding range of 28.4-81.8% and an average of responding 63.2% of opportunities. The data are highly variable, arguably mid level, and decreasing in trend.

Intervention

This study is not complete and inconclusive at this time. Due to time constraints, this study was not completed to its fullest extent. Only two participants will be discussed throughout this section, since only two of the three participants moved on to viewing the video model before engaging in conversation with the experimenter. The first participant has received five intervention sessions, while the second participant has only received one. Al received four intervention sessions before Huck was introduced to intervention, however, due to other extraneous variables described in the limitations section it is unclear whether the changes in responding are due to the intervention or to other extraneous variables.

On Topic Talk and Attempts to Reengage Conversation Partner. Al has completed five sessions of intervention at this time. Although percentages for occurrence of on-topic talk have slightly decreased, the level of Al's responding remains high, with an increasing trend and slight variability. There were no instances of off topic talk for Al during baseline, it was only during intervention that he began talking off topic. While there had been off topic talk, Al still maintained a high level of on topic talk during intervention, the environmental changes for specific sessions may have impacted his off topic comments. Had there not been environmental changes, and uncontrolled extraneous variables, responding on topic may not have decreased for the participant. However, during intervention, the percent occurrence of on topic responding ranges from 87-100%, with an average of 96% of responses on topic.

The second dependent variable tracked on this graph is the percent occurrence of the opportunities given to the participant to attempt to reengage the conversation partner when the conversation partner acts disinterested. Given at least two opportunities in every session, there was only one session where the participant was able to attempt to reengage the conversation partner. Otherwise, the data shows to be low level, no trend, and slightly variable. Within one of the sessions, Al was able to reengage the conversation partner, however, the study was not continued and it cannot be determined whether he would continue to use this skill.

Huck was only introduced to intervention for one session. Although the first participant had not shown a change in level or trend, Huck was introduced to intervention due to time constraints. Within that session, Huck was able to remain on topic 100% of

the time he verbally spoke but did not attempt to reengage the conversation partner when displaying disinterested behaviors.

If this intervention were to continue, and were to be effective for the students, high levels of on topic talking would continue to occur for participants, while an increase in attempting to reengage conversation partners would occur. If ineffective, the on topic talk may continue to occur because baseline responding levels were high as well, and the participants would continue not attempting to reengage the conversation partner when displaying behaviors that show they are disinterested in what the participant is saying.

Body Language Violations. Al's body language violations begin to decrease once intervention is introduced, and continue with a downward trend as sessions progress, however the range of occurrences of violations within intervention are within the range of occurrences of violations within baseline. During intervention the body language violations range from 2-6, averaging 4.4 body language violations throughout intervention. This is not a large decrease in average compared to baseline (avg.= 5), however, if intervention were to continue, there could be continued decrease in body language violations, resulting in more appropriate body language for Al.

Huck does not display any body language violations in baseline and continues to have appropriate body language in the intervention session. Due to his lack of body language violations in baseline, it is assumed this is a skill he has already mastered and the intervention will not change this behavior for this participant.

Responding to Questions and Comments. Al continues to have a high level of responding to questions or comments of the experimenter or conversation partner. At the end of baseline, there is a decreasing trend, which drops during the first intervention point

and then increases, and if the intervention continued, would hope to decrease. The ranges of percent occurrence of responding to the questions or comments of the experimenter are 57.9-86.7% with an average for the sessions of 80.4. Ultimately, this average for Al's behaviors has decreased since baseline (with an avg. of 86.9%).

Huck was only exposed to one session of intervention, to which he responded to 85% of the opportunities to respond to questions or comments of the conversation partner. The average for his baseline responding was 90.2%. His one baseline data point is lower than the average amount he responds, however, the amount of data had at this time does not show whether the video model was effective for him. If data collection continued, to be effective, there would need to be an upward trend of data with consistently high percentages of responding.

If the video model had been continued consistently, with the participant attending to the video, and the percentages increase, it could show that video modeling may be effective for these individuals. However, if the video model had been continued consistently, with participants attending to the video, and percentages stay the same or decrease, video modeling may not be an effective strategy to teach these skills to these individuals.

Interobserver Agreement

The second observer collected interobserver agreement on the number of opportunities the participant has to reengage the experimenter in conversation when the conversation partner is disinterested, and the number of times that the participant attempts to reengage the experimenter. The second observer also collected interobserver agreement on the percent occurrence of the participant staying on topic while talking with

the experimenter. Interobserver agreement was taken on the frequency of appropriate

body language violations; as well as frequency on the number of opportunities that the

participant is given to respond to questions or comments, and the frequency of times that

the participant does respond to questions or comments. IOA was taken for a total of 56%

of the total number sessions the participants participated in across all phases of the study.

Reengaging in Conversation. For the percent occurrence of reengaging in

conversation, 50% of all Al's sessions had a second observer record data. There was an

average of 88.33% with a range of 66-100%. For Al's data, there was a disagreement in

the percent occurrence of reengaging the conversation partner. Both observers agreed on

how many times the participant reengaged the conversation partner, however, the number

of opportunities recorded by each observer differed. Fidelity required at least two

opportunities for the participant to reengage the conversation partner, therefore each

session had a small number of opportunities, leading to a large difference in percentages

calculated for percent occurrence.

Out of the total sessions Huck participated in, 55.55% of sessions had a second

observer calculate IOA. Of the sessions with IOA calculated, there was an average

agreement of 100% and a range of 100%. Of the total sessions Andy participated in,

66.67% of sessions had IOA calculated, with an average agreement of 100% and a range

of 100%.

Staying on Topic. For the percent occurrence of staying on topic, observers

agreed on an average 100% of the sessions. IOA was collected for Al for this behavior

for 50% of participated sessions, with an average of 97.95% agreement and a range of

89.95-100%. For Huck, IOA was taken on 55.55% of participated sessions with an

average agreement between observers of 100% with a range of 100%. For Andy, IOA

was taken on 66.67% of participated sessions with an average of 100% agreement across

all sessions, with a range of 100%.

Body Language. 50% of the sessions participated by Al had IOA calculated for

body language violations. The average agreement between observers for Al's body

language were 96.66%, ranging from 83.33-100%. Huck had IOA calculated for 55.55%

of participated sessions, with an average of 100% agreement and a range of 100%. Andy

had a total of 66.6% of participated sessions calculated for IOA. Of the sessions

calculated, there was an average of 96.42% agreement between observers and a range of

85.71-100%.

Responding to Questions and Comments. For the percent occurrence of

responding to questions and comments, observers agreed on and average of 92.44% of

calculated sessions. IOA was collected for 50% of the participated sessions for Al. The

average agreement of Al's responding to questions or comments behaviors were 92.8%,

with a range of 83.83-96.11%. IOA was collected for 55.55% of participated sessions for

Huck, averaging a 93.95% agreement, with scores ranging from 83.71-100%. 66.67% of

Andy's participated sessions had IOA data collected. The amount of agreement between

observers averaged 90.57%, with a range of 81.62-100% agreement.

Social Validity

Social validity was assessed prior to baseline and after the very last session of the

study for each participant, by their classroom teacher. Each questions was ranked 1-5;

strongly disagree- strongly agree. The results prior to implementation displayed that the

teacher strongly agreed that teaching conversation skills is important for all individuals;

conversation skills are difficult for students with ASD; and indicated that she would like her students to be able to have conversations with her and others. Post implementation her responses displayed that she still agreed with her original responses.

For Al, pre-implementation, his teacher indicated that she agreed (rating of 4) he had conversation deficits, post implementation this changed to neither agree or disagree (rating of 3). Al's teacher initially indicated that she strongly agreed (rating of 5) that he had difficulty talking about neutral topics, and this dropped to neither agree or disagree. Prior to implementation she indicated that she thought Al would be able to have conversations without reinforcement, after this was changed to neither agree or disagree. For post implementation, two additional statements were added: I think the student has increased his ability to engage in social conversation; I think video modeling has been effective in helping the student. Both of these were rated neither agree or disagree.

As for Huck, his teacher agreed initially that he had conversation deficits, post implementation, it was indicated that she neither agreed or disagreed. Initially Huck's teacher strongly believed he had difficulty talking about neutral topics; after she indicated she neither agreed or disagreed. She indicated she disagreed that Huck could have conversation without external reinforcement, post implementation she neither agreed or disagreed. With the additional two statements rating whether Huck has improved with conversation and whether video modeling was helpful, she indicated she neither agreed or disagreed.

Lastly, for Andy, his teacher rated that she agreed that he had conversation deficits and had difficulty talking about neutral topics, after the study, those scores moved to neither agree or disagree. His teacher ranked that she neither agreed or

disagreed that he could have conversations without external reinforcement. As for the last

statements about whether his ability to engage in social conversation has increased, or

that video modeling had been effective was ranked neither agree or disagree.

Discussion

The purpose of this study was to evaluate whether the use of video modeling would be an effective program by itself to teach individuals with ASD to engage in social conversation about neutral topics.

Research Question 1: Is video modeling an effective strategy alone for teaching social conversation deficits to individuals with ASD? Based on the data from this study, we are unable to determine whether video modeling is a strategy that can stand alone as an effective intervention due to the gaps in data for all three participants throughout the study. With the data collected If this study had continued and students were able to have more time in the intervention condition, data would have been more reliable. However, with the data collected, it does not support that video modeling is effective alone.

With the data from intervention from the first student to go through intervention, with five intervention sessions, the number of body language violations was decreasing, and the percentage of attempts to reengage the conversation partner increased on one data point. The data collected in intervention for the percentage of responses in comparison to the number of opportunities to respond has decreased from baseline. For the percent of conversation that is on topic, the level of the data for baseline is slightly higher than when baseline is introduced. The data collected does not have significant changes in responding for any variables that would point to video modeling for teaching social conversation skills is an effective strategy alone.

There are numerous limitations to this study which are listed in the discussion section and could have contributed to responding in both baseline and intervention.

Research Question 2: Is video modeling effective for increasing the length of conversational units in students with ASD when engaging in neutral or non-preferred topics?

All conversations varied in length throughout the study, however sessions did not drop beneath a total time of one minute and ten seconds. The length of time for each participant in both baseline and intervention for those participants who were able to participate in intervention varied across sessions. Al's total time talking in a session during baseline ranged from 6s-31.71s, averaging 14.6s. When comparing to intervention, Al's total time talking ranged from 19.27s-32.82s, averaging to 24.9s. Huck's total time talking in a session during baseline ranged from 11.79s-26.16s with an average of 15.3 seconds talking. Compared to Huck's intervention session, he talked for a total of 5.7s. For Andy, his total time talking ranged from 4.5s-9s with an average of 7.04s, and intervention was not implemented. For Al, the average length of conversation increased from baseline to intervention, while for Huck, it decreased. Based on the data, it cannot be determined whether the length of time the participant vocally engages in conversation increases due to the video modeling technique.

Research Question 3: Are external reinforcers necessary to maintain social conversation for individuals with ASD? Throughout this study, the only potential reinforcers used were verbal praise at the end of a session and reminding the participant that they are able to go back to the activity or task they had been working on prior to being pulled for the study once the session was over. No specific reinforcers were used throughout this study and it is unclear whether verbal praise at the end of a session and the verbal reminder that once they are done with their session they can return to the

activity or task they were engaged in prior to the session were actually reinforcing. If

reinforcers were used for these students, it may have had an impact on noncompliance,

however this was not tested, but may be something to be researched in the future. After

participants had been brought in and it had been shown video modeling was not effective,

formal reinforcement program for correct responding would be introduced. Preference

assessments would have been conducted to determine what some potential reinforcers

may be used for each participant. However, due to lack of time and sessions completed,

implementing external reinforcers for correct responses and participation were not done.

Research Question 4: Are students with ASD able to generalize responses to novel

topics during untrained neutral/ non-preferred conversational units? For this study,

the intent was for the participant to gain the skills addressed in the video modeling, with

the experimenter as conversation partner. Once mastery was met, to then generalize

these skills to sessions where the participant engaged in conversations with their teachers

and paraprofessionals. Data would have been collected on the same variables as done

throughout this study, to see if the participants were able to generalize the skills to other

people, with new topics. Due to the lack of an effective independent variable, there was

not opportunity to have the participant to participate in generalization sessions.

Limitations and Recommendations for Future Research

      Limitations. There are several limitations to the current study. First, two of the

three participants exhibited noncompliant behaviors, resulting in missed sessions and

gaps in data. Due to this, data is unable to show consistent sessions and maximum

exposure to the intervention. Second, with multiple snow days and participant absences

the sessions were not implemented as frequently as initially planned. Due to the snow

days and absences, there were only two participants who were able to move to

intervention and one receiving only one session of implementation. Since there was not

steady responding and significant progress made by the first participant to move into

intervention, there was not an opportunity to move to generalization or maintenance. For

future research, the study would be conducted a longer period of time and with

participants with better attendance to ensure that generalization across people and topics,

and maintenance is assessed once skills are acquired.

Another limitation of this study is the researcher as therapist. The researcher was

used as the therapist in this study for convenience for the school's staff to ensure they

were not off ratio in classrooms when sessions were occurring. However, even though

participants were familiar and have worked with the researcher prior to this study, they

were not necessarily used to being pulled from their classroom environment, with an

adult they do not interact with on a daily basis. As time went on, they were more

comfortable talking with the researcher, however, this could have impacted the data and

how the participants responded to the researcher over time. It is unclear It is unclear

whether training the classroom teacher or staff who interact with the participants daily, to

lead sessions would have impacted results.

Participants checked 'yes' on student assent forms that both audio and video

recording were allowed for them. However, participants noted that they were nervous

about talking on video. It was necessary to record audio and video be able to collect all of

the data necessary for each session. This may have impacted student behavior within

sessions. While it is necessary and would not be ethical for students not to know when they are being recorded, a more discrete recording method may have been useful.

When the participant who participated in multiple intervention sessions, Al, would watch the video model, he would often put his head down and not look at the video model, and therefore miss content of the video. Al would also try to engage with the researcher while watching the video model, instead of tending to the video model, asking questions to leave and go to different classes, or compliment the researcher. The video was 7 min and 24s, which is may have been too long for the student to engage with the video. The length of the video was determined by the amount of time it took to include instruction and demonstration on the four dependent variables, it was the shortest amount of time the video could be made. The voice recording of how to perform social conversation skills could not occur at the same time the video of appropriate conversation skills were being modeled, making the video much longer than just the modeling of the skill.

The sessions location also varied on availability of space for the day. The school allows students to engage in different opportunities throughout the day that may not be in the classroom. The school also has many meetings and local service providers and public school representatives come in about the students of the school. Sometimes other student's behavior impacted the ability to physically get to the room sessions had been planned to occur in. Other times, participants found certain locations aversive to go to, and alternate options had to be found for the session to occur. For this study, it meant that sessions were not consistently in the same space. While the sessions were always conducted in spaces that were closed off to other students, it meant that some areas had

windows while others did not, varied seating arrangements, items in the room, and varying proximity to the camera. These all could have had an impact on responding within sessions. Specifically, one session with Andy, had been in his classroom that was empty, and picked up a pencil and started doodling while in session, impacting the data for frequency of body language violations. For another session with Al, Al's seat had been positioned in a way he could see out the window that gave view to the front door of the school. During his session, his duration of time speaking on topic was impacted when another student ran out of the building. It also impacted the frequency of body language violations, as he would look at the researcher quickly when responding and returning his gaze out of the window to see what was going on outside.

Another limitation of this study is that when taking duration data on participants on topic behavior, the definition did not take in to consideration whether the statement had to make sense. One of the participants would often make statements that are on topic but would not be intelligible. The experimenter would ask for clarification from the student on what they meant by their statements but did the participant did not fully justify or support their statements further. The participant would often rephrase a question the experimenter had asked and put it into a statement, but the words following often did not correlate from the experimenters' perspective. For future research, the definition of on topic talking should discriminate between on topic statements/questions and on topic statements/questions that do not explain a full thought.

Another limitation of this study was that some of the predicted neutral or nonpreferred topics ended up being topics that some of the participants had been interested in. Having three very different individuals, all with different interests, on topics

that the researcher knew they knew about made it difficult to select topics. This study attempted to include topics that they had been exposed to, but may not have significant interest in. However, just as a conversation progresses, you learn new things about your conversation partner, including interests they had not spoken of in the past. During sessions where the conversation may have been more of interest to the participant could have impacted all four dependent variables of the study. There were also topics that participants ended up having minimal to no exposure to, which could have also impacted the data for those sessions. For example, if the participant had never been to the beach before, they may not have enough experience or knowledge to develop sufficient, on topic statements about the beach.

The four dependent variables, or the skill areas targeted throughout this study are not individualized to each of the participants deficits. They are more general skill deficits that do not impact all of the participants. In the future, skills presented in the video model should be individualized for each participant's specific deficits.

Recommendations for Future Research. If this study were to be replicated, there are a number of implications for practice. First, this study was not completed due to time constraints, school cancelation and student absences. Completing multiple baseline across participants and conducting both generalization and maintenance for all participants. However, if this were to be replicated using a multiple baseline across participants with probes may be a better fit for this study. This way participants who aren't receiving intervention do not have an extended baseline.

If this study to be replicated, future research should provide a shorter video if possible. This may increase the participants engagement with the video model, enabling

them to be exposed to all of the content within the video model. When Al watched the video model, he often put his head down or attempted to talk to the experimenter who had been in the room with him while he watched. If the video had been shorter, the participant may have actively listened and watched the video model, potentially increasing the likelihood he would see what the models were teaching, and allowing him to perform the modeled skills within the intervention sessions.

For future research, sessions should be conducted consistently in the same location, as well as an attempt to make the video recording method less noticeable, in an ethical manner. Participants noted that they had been nervous around the camera, which could have caused reactivity and impacted responding during sessions. If informed of the video and audio recording, but the participant did not see the device recording the session throughout the session, they may have engaged in conversation more naturally. These changes may change the effectiveness of this intervention for individuals with ASD.

Future research should see if video modeling alone could be an effective intervention for individuals with ASD, with the addition of external reinforcers to improve performance.

Finally, the current results of this study are inconclusive. There are gaps in data throughout the entire study, making it difficult to determine whether it is the intervention that is ineffective, the limitations, or the lack of consistency of sessions for the participants. This study shows that video modeling is not an effective strategy to teach social conversation skills to individuals with ASD.

Figure 1: On Topic Talk and Attempts to Reengage Conversation Partner
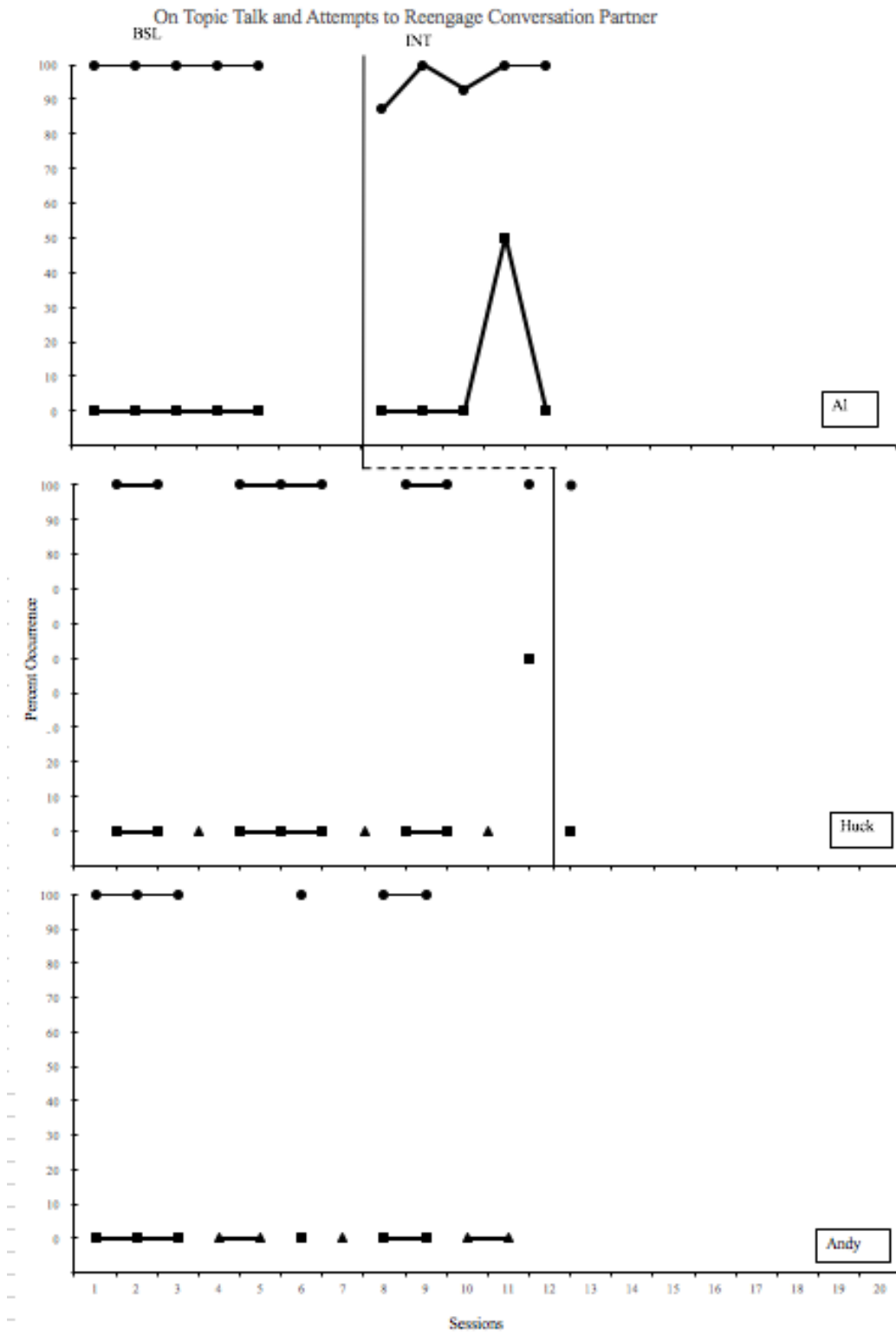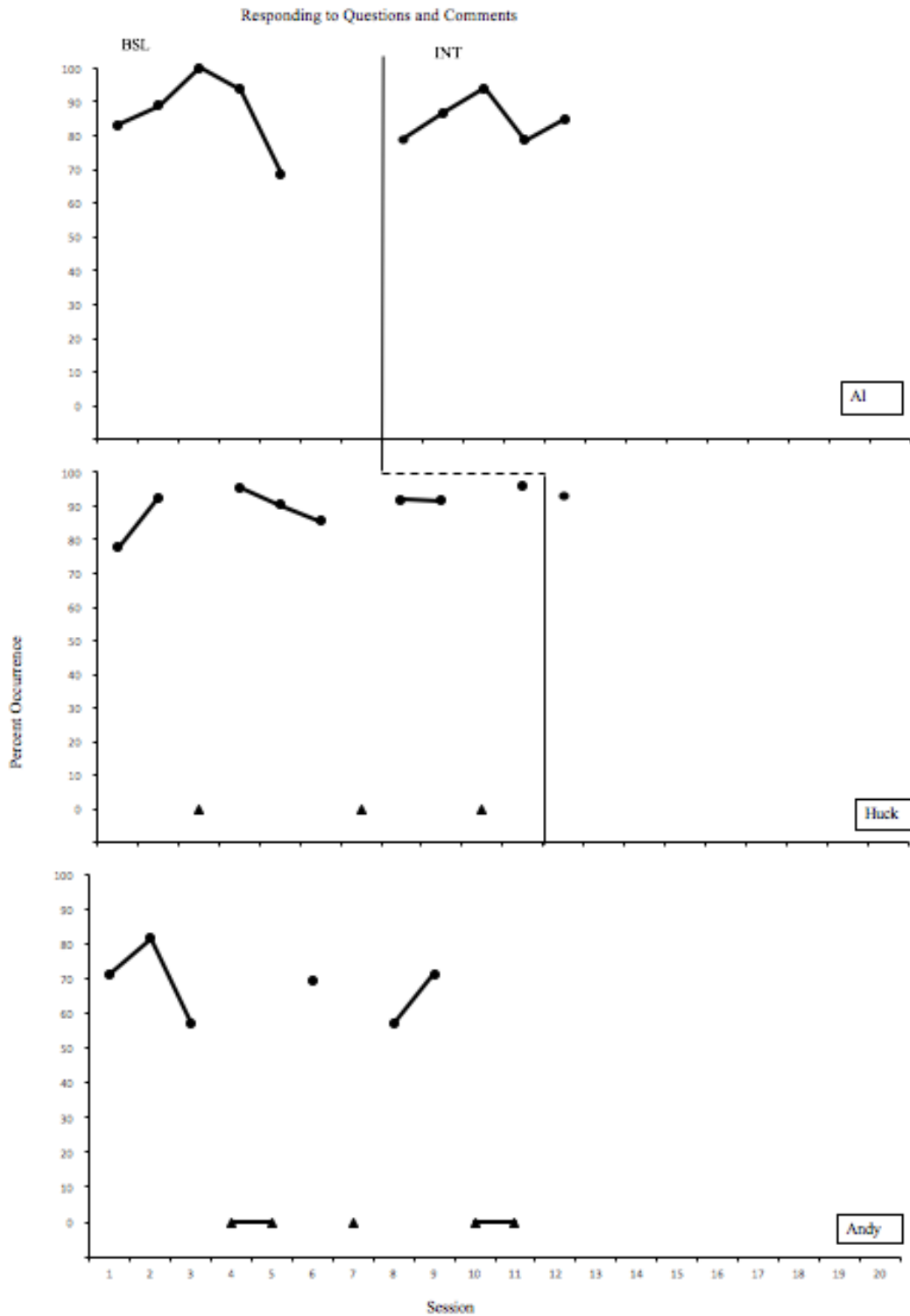

The figure above displays percent occurrence of on topic talk (circles), percent occurrence of reengaging the conversation partner (square), and noncompliance sessions (triangle).

Figure 2: Body Language Violations
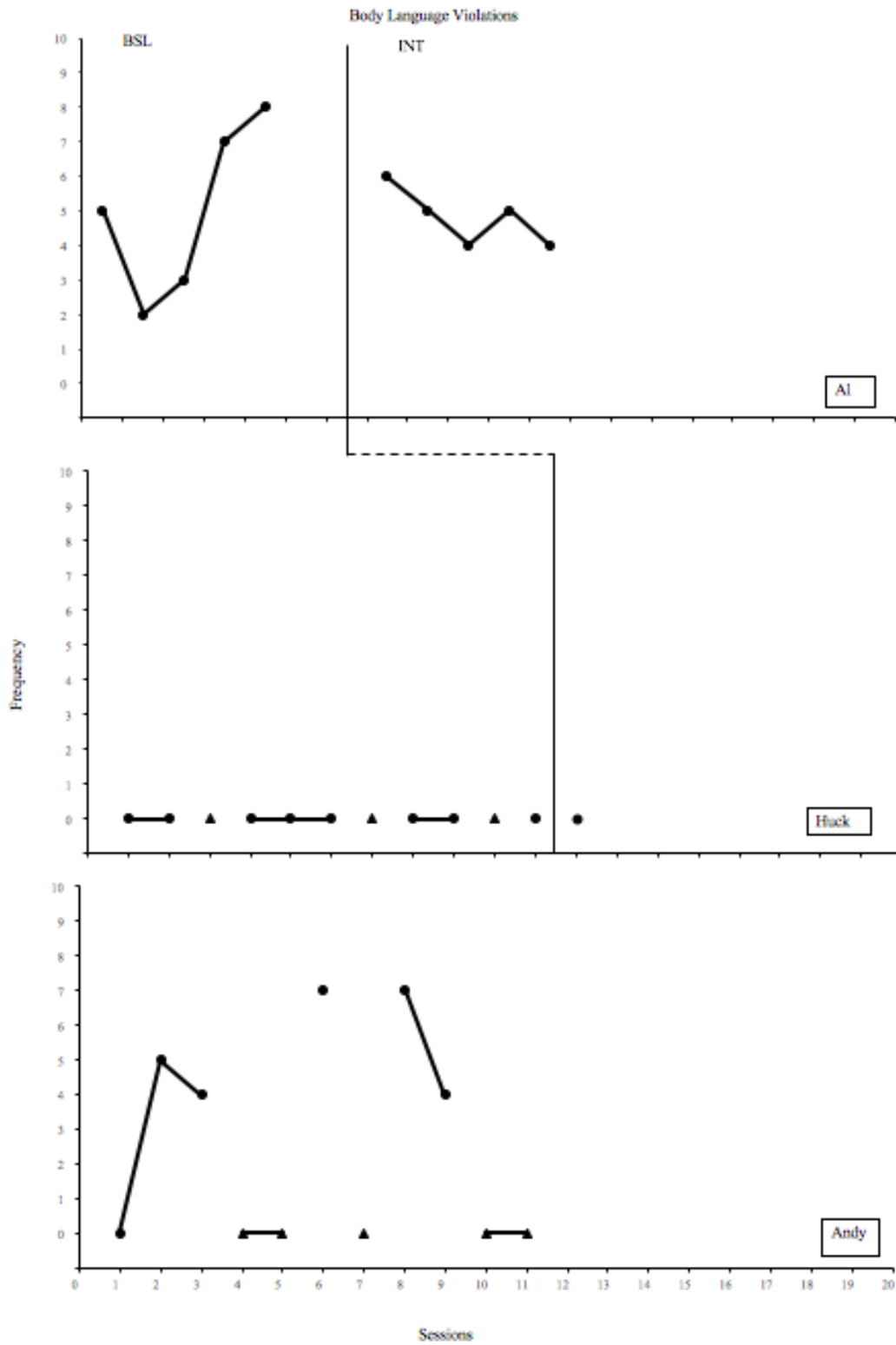
The figure above displays the frequency of body language violations (circle) noncompliance sessions (triangle).

Figure 3: Responding to Questions and Comments

The figure above displays percent occurrence of the participants responding to questions and comments of the conversation partner (circle), and the sessions of noncompliance (triangle).

Appendix A
Fidelity of Implementation

Observer: _____   Participant: _____
                Date:_____

Session	Yes	No	N/A
Was the length of the session at least 1:10 in length?			
Did the experimenter verbally remind the participant of the conversation topic when they had gone off topic within a session?			
Did the experimenter provide at least 5 opportunities to the participant to respond to questions or comments?			
Did the experimenter ignore minor body language violations and/or vocally redirect the participant within the session for major body language violations?			
Did the experimenter provide at least two instances of disinterest as opportunities for the participant to attempt to reengage the experimenter?			

Appendix B
Social Validity Survey

Date: _____   Respondent: _____

Student Name: _____   Relation to child: _____

	1 Strongly Disagree	2	3	4	5 Strongly agree
Teaching conversation skills is important for all individuals					
Conversation skills are difficult for students with ASD					
I would like my students to be able to have conversations with me and others					
I think that student A has conversation deficits					
I think that student A has difficulty talking about neutral topics					
I think that student A can have conversations without external reinforcement					

I think that student A has increased his ability to engage in social conversation.				
I think that video modeling has been effective in helping student A.				
Comments:				

Appendix C
Preference Assessment

Reinforcement Assessment for Individuals with Severe Disabilities (RAISD)

Student's Name: _____

Date: _____

Recorder: _____

The purpose of this structured interview is to get as much specific information as possible from the informants (e.g., teacher, parent, caregiver) as to what they believe would be useful reinforcers for the student. Therefore, this survey asks about categories of stimuli (e.g., visual, auditory, etc.). After the informant has generated a list of preferred stimuli, ask additional probe questions to get more specific information on the student's preferences and the stimulus conditions under which the object or activity is most preferred (e.g., What specific TV shows are his favorite? What does she do when she plays with a mirror? Does she prefer to do this alone or with another person?)

We would like to get some information on _____'s preferences for different items and activities.

1. Some children really enjoy looking at things such as a mirror, bright lights, shiny objects, spinning objects, TV, etc. What are the things you think _____ most likes to watch?

   Response(s) to probe questions:

2. Some children really enjoy different sounds such as listening to music, car sounds, whistles, beeps, sirens, clapping, people singing, etc. What are the things you think _____ most likes to listen to?

   Response(s) to probe questions:

3. Some children really enjoy different smells such as perfume, flowers, coffee, pine trees, etc. What are the things you think _____ most likes to smell?

   Response(s) to probe questions:

4. Some children really enjoy certain food or snacks such as ice cream, pizza, juice, graham crackers, McDonald's hamburgers, etc. What are the things you think _____ most likes to eat?

   Response(s) to probe questions:

Fisher, W. W., Piazza, C. C., Bowman, L. G., & Amari, A. (1996). Integrating caregiver report with a systematic choice assessment. *American Journal on Mental Retardation, 101*, 15–25.

5. Some children really enjoy physical play or movement such as being tickled, wrestling, running, dancing, swinging, being pulled on a scooter board, etc. What activities like this do you think _____ most enjoys?

Response(s) to probe questions:

6. Some children really enjoy touching things of different temperatures, cold things like snow or an ice pack, or warm things like a hand warmer or a cup containing hot tea or coffee. What activities like this do you think _____ most enjoys?

Response(s) to probe questions:

7. Some children really enjoy feeling different sensations such as splashing water in a sink, a vibrator against the skin, or the feel of air blown on the face from a fan. What activities like this do you think _____ most enjoys?

Response(s) to probe questions:

8. Some children really enjoy it when others give them attention such as a hug, a pat on the back, clapping, saying "Good job", etc. What forms of attention do you think _____ most enjoys?

Response(s) to probe questions:

9. Some children really enjoy certain toys or objects such as puzzles, toy cars, balloons, comic books, flashlight, bubbles, etc. What are _____'s favorite toys or objects?

Response(s) to probe questions:

10. What are some other items or activities that _____ really enjoys?

Response(s) to probe questions:

Fisher, W. W., Piazza, C. C., Bowman, L. G., & Amari, A. (1996). Integrating caregiver report with a systematic choice assessment. *American Journal on Mental Retardation, 101*, 15–25.

After completion of the survey, select all the stimuli which could be presented or withdrawn contingent on target behaviors during a session or classroom activity (e.g., a toy could be presented or withdrawn, a walk in the park could not). Write down all of the specific information about each selected stimulus on a 3" x 5" index card (e.g., likes a female adult to read him the 'Three Little Pigs' story.) Then have the informant(s) select the 16 stimuli and rank order them using the cards. Finally, list the ranked stimuli below.

1. _____   9. _____

2. _____   10. _____

3. _____   11. _____

4. _____   12. _____

5. _____   13. _____

6. _____   14. _____

7. _____   15. _____

8. _____   16. _____

Notes:

Fisher, W. W., Piazza, C. C., Bowman, L. G., & Amari, A. (1996). Integrating caregiver report with a systematic choice assessment. *American Journal on Mental Retardation, 101*, 15–25.

Appendix D
Data Collection Tool

Session Number BSL/INT	# of opportunities to reengage	# of times reengaged conversation partner	Seconds Staying on topic	Seconds off topic	# Opportunities to respond to comments and Questions	# re co q

Name of Observer:

Conversation Partner uninterested: defined as any time that the participant identifies the partner as uninterested and changes the topic of conversation in attempt to reengage the partner after the conversation partner has expressed any of the following behaviors that have been adapted and modified from Peters & Thompson (2015):
a) eye contact is moved away from the participant and diverted to other parts of the room, b) listener faces their body away from the participant, c) leans their head on their hand, d) audibly yawns or takes a deep breath, e) "raises eyebrows and widened eyes without smiling or eye contact," (f) the conversation partner does not respond for three seconds or more

Data will be taken on the number of opportunities the participant has, to reengage the conversation partner *and* the number of times that the participant attempts to reengage the conversation. The use of the term 'attempts' is important because they may be using appropriate strategies to reengage but the conversation partner may not always respond to these attempts.

Staying on Topic: the participant must continue the conversation on the topic given to them except when (a) the conversation topic has been exhausted which can be defined as any time neither conversation partner has anything new to say about the predetermined topic or (b) the conversation partner changes the topic. Duration of this behavior can be taken, to see how long the participant is able to stay on topic, as well as the total duration that the participant verbally participates throughout the session.

Responding to Questions and Comments: counted when the participants' conversation partner asks him a question and the participant answers the partners question within 4s of the question being asked or when the participant is able to make a comment or question based off of something the conversation partner has said. This behavior will be measured using the number of opportunities the participant has to respond to questions or comments *and* how many times the participant does respond to questions or comments.

Appropriate Body Language: counted when the participant is within three feet of their conversation partner, maintain their eye contact anywhere above shoulder level of their conversation partner in the direction of the conversation partner, and does not look away from the conversation partner for more than 3 seconds. Frequency data will be taken on the number of body language violations there are throughout the session.

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