USE OF GENERALIZATION-PROMOTION STRATEGIES AND VIDEO MODELING TO INCREASE SOCIAL SKILLS ACQUISITION FOR YOUNG CHILDREN WITH AUTISM

A Dissertation
Submitted to
the Temple University Graduate Board

In Partial Fulfillment
of the Requirements for the Degree
DOCTOR OF PHILOSOPHY

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May 2023

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ABSTRACT

Many children with autism spectrum disorder (ASD) have difficulty with developing and generalizing the social skills necessary for long term success. Social skills deficits can often lead to shortcomings in other areas, and can hinder a child's potential for future independence. Currently, many studies addressing this issue use a *train and hope* approach to implementation, which does not always produce generalized outcomes. The study sought to determine how video modeling (VM) in conjunction with generalization-promotion strategies can be used to increase social skills acquisition for children with ASD. In this study, the use of generalization-promotion strategies and video modeling to increase social skills acquisition of children with ASD was evaluated by using a multiple baseline across behaviors design. Four students with ASD attending a public school and 11 neurotypical peers, all 8-10 years-old, participated in the study. Three behaviors were targeted based on results from the Autism Social Skills Profile (Bellini, 2006) completed by participants' parents/guardians. The three behaviors targeted were joining an activity, obtaining attention and taking turns. The following elements of the study were evaluated: the success of the video modeling intervention alone and the success of the video modeling intervention with the addition of generalization-promotion strategies, along with the procedural fidelity of the intervention and the social validity of the outcomes. The results of the study suggested video modeling alone produced increases in the training setting, but this result did not generalize to the new setting. Explicit intervention was required to produce generalization. Therefore, video modeling and generalization-promotion supported children with ASD in generalizing their use of learned social skills. Throughout each

phase of the study, there was a high level of procedural fidelity, and parents/guardians' and data collectors' social validity survey responses suggested the interventions and outcomes were socially significant to the participants. Maintenance data suggested that participants were able to maintain the learned skills following the completion of the intervention. There were limitations to this research design, resulting in recommendations for future research.

ACKNOWLEDGEMENTS

Temple University has been a staple in my academic career since I began my undergraduate studies in 2009. The support, challenges and experiences this university has afforded me since then are immeasurable, and I cannot imagine being where I am today in my professional or academic careers without having had over a decade of learning at this institution. To Ken Thurman, although our time together was cut short during my doctoral studies, I appreciate you encouraging me to apply to the PhD program and supporting me as I began my journey. To Matt Tincani, thank you for your guidance and support during our weekly meetings, and for keeping me on track throughout the dissertation writing process. To Jason Travers, thank you for helping me narrow down my research topic and begin writing my literature review, and for providing insightful feedback along the way. Thank you Art Dowdy, for allowing me to share my professional and academic experiences as your teaching apprentice, and for supporting me through this process. To Donald Hantula, thank you for providing a new perspective on my research and supporting me in the final stages of my dissertation. As my many years as a Temple University student comes to an end, I appreciate and am grateful for all of the faculty and staff that I have worked with along the way – your expertise, guidance and support have led me to where I am today, and where I will be in the future.

To my family, it's difficult to choose just one or a few of you because we've all experienced so much love and loss together, and yet you've all rallied around me in support of me becoming the first PhD in the family. You have all shown me what it means to be strong and determined, and to persevere through all of the challenges that life brings my way. To my mom specifically, you've shown me what it means to work hard

and to go after the things that I deserve in life, just like you did. Even when I've made mistakes or felt like giving up, you've always shown me that I am enough and that I have what it takes to do or be whatever I want; that my life is what I make of it and that everything happens for a reason.

To my husband Daniel, even though you joined me about a year into my journey towards my PhD, it feels like you've been with me the whole time. You've been there to encourage me and support me, through long nights and weekends of researching and writing, and brought back the determination in me that I thought I had lost. You and our future together have been my inspiration over the last few years, and this accomplishment is just one of many that I hope to share with you.

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CHAPTER 1: STATEMENT OF PROBLEM

Communicating and interacting effectively are lifelong objectives for children with autism spectrum disorder (ASD), and successful acquisition of social skills contributes to success in other critical areas of development (Lee, 2015). Children with ASD rely on special education services to address their learning needs. ASD is a developmental disability that is characterized by significant deficits in social interactions, speech and non-verbal communication and restricted, repetitive patterns of behavior (American Psychiatric Association [APA], 2013). The social communication and social interaction deficits of children with ASD encompass social-emotional reciprocity, non-verbal communication and developing, maintaining and understanding relationships (APA, 2013). Although social skills deficits are a prevalent characteristic of individuals with ASD, there is no single cause or explanation for why children with ASD experience significant social delays (Cotugno, 2009).

Social skills deficits from a young age can continue to evolve into other detrimental outcomes. These adverse outcomes include "poor academic achievement, social failure and peer rejection, anxiety, depression, substance abuse and other forms of psychopathology" (Bellini et al., 2007, p. 153). A lack of social skills can also contribute to social isolation as the result of a child being unable to establish meaningful social relationships throughout life (Bellini et al.). Children with ASD who have significant social skills deficits are also less likely to initiate verbalizations and may not ask questions, offer information, or comment spontaneously (Taylor & Levin, 1998).

Reading, writing and problem solving prepare young children to become independent adults (St. John et al., 2018). However, poor social and communication skills

can lead to a decrease in academic achievement (Winchell et al., 2018). Children with social skills deficits are less likely to participate in classroom activities and are more likely to perform poorly on assessments (Buhs & Ladd, 2001). Adolescents with ASD and poor social adjustment are also at an increased risk for dropping out of school and becoming delinquent (Parker & Asher, 1987). Poor academic achievement can also lead to problems that persist in adulthood, including navigating employment (Sperry & Mesibov, 2005).

Winchell et al. (2018) found that, despite inclusive education initiatives, children with ASD engage in limited social interactions with peers and have fewer established friendships than typically developing children. Individuals with ASD tend to spend more time engaging in solitary activities than in cooperative activities (Winchell et al., 2018). This hinders academic, social and emotional learning, as children with ASD learn from the influences of their peers (Yeo & Teng, 2015). The difficulty learning how to make and maintain relationships and friendships with their peers can also make children with ASD susceptible to bullying (Winchell et al., 2018). Adverse peer experiences also have important implications for emotional development (Herd & Spoon, 2021). Peer rejection can lead to an increase in aggression, self-injurious behaviors, anxiety and depression (Winchell et al., 2018). These heightened, negative emotions are difficult to regulate and can result in additional maladaptive outcomes (Guyer et al., 2014; Rubin et al., 2006).

The National Autistic Society reported that adolescents with ASD, specifically those who have been bullied by peers, suffer from low self-esteem, as well as experience negative impacts on their mental health (Winchell et al., 2018). Emotional dysregulation caused by comprehension difficulties and cognitive inflexibility for individuals with ASD

is higher compared to their typically developing peers, leading to severe stress, hypersensitivity and fluctuations in daily functioning (Hemmings & Bouras, 2016). According to Ressel et al. (2020), social difficulties and maladaptive coping styles may indicate greater risk for substance abuse.

Improving Social Skills for Children with ASD

Social skills promote social, emotional and cognitive development for young children (Bellini et al., 2007). Hwang and Hughes (2000) reviewed 16 studies of social skills programs for young children with ASD. They found social skills interventions for children with ASD show "considerable promise for increasing social and communicative skills" (p. 340). Children with ASD who have developed communication skills have experienced better outcomes later in life (Hansen et al., 2017). For example, research suggests that children with intact functioning in social communication and social skills have better overall outcomes across skills, particularly academic skills (Hansen et al.). Social skills development can also lead to improvements in other areas, such as communication with adults and peers, pro-social behaviors and cooperative and functional play (Jung & Sainato, 2013). Social skills allow children with ASD to build meaningful friendships with peers (Jordan, 2003). Social skills support the positive development of relationships with family members and peers (Badiah, 2018). Individuals with ASD who have strong social skills are more likely to be accepted by peers, establish friendships and maintain strong relationships with their parents. Social skills can lead to increased social play, which is the "context for learning about intimacy, trust, negotiation and compromise, concepts and skills that are vital to forming and maintaining friendships" (Jordan, 2003, p. 351). Relationships can provide children with ASD

increased social and other learning opportunities based on increased acceptance from typically developing peers (Jordan, 2003).

McConnell (2002) proposed five general categories for social skills strategies and interventions for children with ASD. These categories are *ecological variations, collateral skills interventions, child-specific interventions, peer-mediated interventions* and *comprehensive interventions*. These general categories provide a foundation for more specific and intensive social skills interventions for children with ASD. Ecological variations involve manipulating or arranging the features of the physical or social environment to promote social interactions. In many studies, this type of intervention is demonstrated through access to typically developing peers. Schmidt et al. (2017) altered the environments of three participants with ASD and pica, by removing pica items typically found in various settings and teaching alternate, more prosocial behaviors. In inclusive education contexts, typically developing peers can be considered part of the ecological variations that can be strategically arranged to support social skills for students with ASD. Typically developing peers are more likely to "emit high rates of social initiations, respond to higher proportions of initiations from others, and sustain longer social interactions following initiations" (McConnell, 2002, p. 360). If typically developing peers are more accessible to children with ASD, then social interactions are more likely to increase. However, mere exposure or proximity to typically developing peers is not sufficient for producing social interactions; more intensive intervention is needed (McConnell).

Collateral skills interventions refer to instances when a child with ASD demonstrates increased social interactions as a function of training in other skills. These

types of interventions result in increased “social participating or play, academic responses, or sociodramatic play” (McConnell, p. 360). Similarly to ecological variations, collateral skills interventions often result in increases in social interactions by providing access to typically developing peers. Koegel et al. (2012) used a collateral skills intervention when they included participants with ASD in activities of interest, which resulted in unprompted social engagement and verbal initiations with peers. McConnell (2002) suggested that, like ecological variations, collateral skills interventions be used in conjunction with more comprehensive interventions.

Child-specific interventions are implemented to address the skill, frequency or quality of the social behaviors of children with ASD. McConnell (2002) described the steps of child-specific interventions as:

> (a) general instructional interventions to increase knowledge and improve social problem solving (including social stories), (b) high-density reinforcement to “prime” social responding, (c) social skills training, (d) adult-mediated prompting and reinforcement, and (e) various generalization promotion techniques (particularly self-monitoring). (p.361)

Child-specific interventions can increase social interactions for children with ASD; however, they have limited potential to produce sustainable, high-quality outcomes past social initiations (McConnell, 2002).

Peer-Mediated Interventions

Peer-mediated interventions (PMI) have an extensive empirical base. Outcomes of PMI include demonstrating increased communication between children with ASD and their typically developing peers (Goldstein & Ferrell, 1987; Goldstein & Wickstrom, 1986) and promoting verbal labeling of objects and reciprocal interactions by children with autism (McGee et al., 1992). PMI also lead to increased augmentative and

alternative communication (AAC) and interactions between young children with autism and their neurotypical peers (Garrison-Harrell et al., 1997). PMIs are characterized by the social responsiveness of children with ASD to their peers, which allows practitioners to implement social skills interventions with peers as facilitators. PMI procedures have also been shown to increase generalization and maintenance of behaviors. However, McConnell (2002) recognized that, despite the benefits of PMI it is difficult to sustain this strategy due to the constant need for "trained" peers. Simpson and Bui (2016) conducted a study on initiations and responses of young children with ASD using a peer-mediated intervention. The neurotypical peers indicated that they enjoyed the experience and wanted their buddies to be happy. They also noted that the participants with ASD were able to help them with their own reading at times and that they felt like they had developed meaningful friendships with these individuals.

Comprehensive interventions incorporate two or more of the aforementioned strategies to increase the social skills of children with ASD. McConnell suggests that most of these categories are not successful by themselves and, therefore, would be more likely to increase the social skills of children with ASD if they were implemented alongside of additional interventions. Comprehensive interventions provide a more sufficient approach to addressing social deficits; however, they can be more challenging to produce.

Video Modeling (VM)

Video modeling is an intervention strategy that encompasses all of McConnell's five categories for addressing social skills deficits and can help to alleviate some of the limitations of each. VM is an evidence-based intervention strategy which demonstrates

desired behaviors using video representation (Bellini et al., 2007; Cardon et al., 2019). The concept of modeling, or observational learning, was first introduced by Bandura (1969). Modeling can be defined as someone demonstrating a desired behavior that can be replicated by the learner (Cardon et al., 2019). Bandura's (1969) social learning theory suggests that individuals do not have to directly experience a response consequence to learn a behavior. If an individual observes others' behavior and its consequences for them, they will learn whether that behavior is appropriate or not.

VM research spanning more than 20 years indicate successful social skills outcomes for children with ASD (Cardon et al., 2019). VM involves the child watching a video demonstration of the desired behavior(s) and then utilizing what was learned in the video to perform the modeled behavior (Bellini et al., 2007). VM can be used with peers, siblings, adults or self as the model. After viewing the VM as many times as needed, the target child is provided opportunities to imitate and practice the desired behavior (Hine & Wolery, 2006).

There are different types of video-based instruction (VBI) including self-modeling, video-prompting (VP), point of view (POV) and video feedback. VM can include many components, but Jeffrey F. Hine and Mark Wolery (2006) noted that VMs generally involve (1) edited images of appropriate behavior, (2) repetition or multiple exemplars, (3) practice sessions, (4) assessment of generalization and (5) reviewing of VMs, if needed.

Video Self-Modeling. Self-modeling is when the target child observes him/herself on video performing a task or engaging in a skill (Marcus & Wilder, 2009). The video is created by having the target child engage in certain behaviors at appropriate

times or in response to appropriate stimuli. Self-modelling is useful in teaching children with autism an array of skills, including spontaneous requesting and initiating interactions with peers (Bellini et al., 2007). It aligns with Bandura's (1969) belief that children are more attentive when it comes to observing someone similar to themselves

Video-Prompting (VP). VP is different from traditional VM because the target behavior or skill is broken into and recorded in steps (Mechling et al., 2014). Video prompting (VP) is either created with the target child or another individual performing the target behavior or skill. It is more of a task analysis to scaffold the learning of a targeted skill or behavior (Mason et al, 2013). The child then watches the video, performs one step at a time, and continues this process until all of the steps have been performed (Mechling et al., 2014). VP has been shown to increase functional, daily living skills, including setting a table, cooking and laundry (Mechling et al., 2014).

Point of View VM. Point of view (POV) modeling is especially useful when targeting behaviors that involve specific hand motions, materials or other individuals. This is because it gives the viewer a first-person perspective of what he/she would see when performing the desired behavior (Lee, 2015). POV modeling eliminates the need for training and editing tapes, in addition to deciding which models to use (e.g. peers or adults) to produce the most effective results (Hine & Wolery, 2006).

Video Feedback. Video feedback involves recording the target child performing the desired behavior and then reviewing the recording with the child (Maione & Mirenda, 2006). The child then evaluates his/her own behavior and, therefore, becomes self-reflective about his/her own behavior. although there are few studies that incorporate video feedback, Maione and Mirenda suggested that the ideas behind video-based

treatments and the many components that can be implemented with each have demonstrated that they are ideal for working with children with ASD.

Benefits of Traditional VM

Traditional VM acknowledges the visual preferences of children with autism, as well as the direct, uninterrupted instruction needed to engage these individuals in the learning of behaviors and/or skills (Mason et al., 2013). Educators have increased access to technology for implementation and can use a VM for multiple students (Lee, 2015). Research has indicated that traditional VM allows children with ASD to learn and generalize skills more quickly than other evidence-based practices (Cardon et al., 2019). In terms of traditional VM in comparison to in vivo modeling, Hine and Wolery (2006) and Charlop-Christy (2000) highlight several advantages of traditional VM, including (1) more time and cost effective, (2) use of more naturalistic settings, (3) increased control over the VM, (4) repetition of the model without the person modeling being present and (5) using the same videotapes with multiple individuals.

Traditional VM has also been shown to promote generalization by exposing participants to exemplars across various contexts (Hine & Wolery, 2006). In a recent study by Cardon et al. (2019), generalization of skills was demonstrated through participants' ability to use their new social skills in novel exemplars, well after the study had concluded and reinforcement was no longer being provided. However, McCoy et al. (2016) and Gunning et al. (2019) note the need for additional research to evaluate strategies for promoting generalized outcomes in VM.

Generalization

In their seminal paper, Stokes and Baer (1977) defined generalization as relevant behavior that occurs under different, non-training conditions, including different times, persons, and settings. Stokes and Baer further emphasized the need to actively *program* and plan for generalization, rather than passively expect it as an outcome of specific training procedures. They argued the latter approach, "train and hope", is unlikely to result in generalization for many learners.

Generalization of social skills is important for individuals with ASD because being able to generalize social skills increases social competence, which is a critical component for meaningful interactions, developing friendships and relationships and navigating complex social environments (Rao et al., 2008). For a child with ASD to continue to demonstrate social competence throughout his/her life, social skills must occur across people and settings, as well as in varying circumstances (Gunning et al., 2019). While it is evident that being able to generalize social skills is important, especially for children with ASD who demonstrate core deficits in this area, it is also apparent that programming for and collecting data concerning generalization is limited (Schmidt & Stichter, 2012).

Strategies for Increasing Generalization

After reviewing about 270 Applied Behavior Analysis (ABA) studies concerning generalization, Stokes and Baer (1977) identified 120 studies that explicity addressed generalization methods. As a result, the strategies used to assess or program generalization were dispersed into nine categories: train and hope; sequential modification; introduce to natural maintaining contingencies; train sufficient exemplars;

train loosely; use indiscriminable contingencies; and program common stimuli. Stokes and Baer admit that these categories are not necessarily *a priori*; however, they provide a sufficient basis for classifying the generalization techniques used most frequently in ABA literature.

Train and hope was the most common generalization strategy found in ABA research (Stokes & Baer, 1977). It is evident when a behavior change is elicited as the result of response consequences; however, generalization is noted but not pursued. This generalization can be across responses, setting, experimenter and/or time. Redd and Birnbauer (1969) sought to demonstrate control over the cooperative play of children with intellectual disabilities, by having the same adult provide contingent edible reinforcement during the training phase. However, when different adults were present, who did not participate in the initial training, the children were unable to demonstrate generalization of cooperative play behaviors to the new adults. Stokes and Baer (1977) noted that while train and hope was evident in more than half of the ABA literature, generalization was either not programmed for or not examined.

Sequential modification is implemented when generalization is absent or deficient. If generalization is not adequate, procedures are put in place to ensure the desired behavior changes in each non-generalized condition. These conditions include responses, subjects, settings and/or experimenters. Wahler (1969) found disruptive and oppositional behavior of two children was controlled for in the home using timeout and differential attention strategies. When generalization to the children's school environment was assessed and not evidenced, the timeout and differential attention strategies needed to be implemented there, as well. Stokes and Baer (1977) emphasized the use of

behavior-change programs in every condition where generalization of the target behavior is desired to promote a proactive approach to behavior modification.

Stokes and Baer defined the introduction to natural maintaining contingencies as "the transfer of behavioral control from the teacher-experimenter to stable, natural contingencies that can be trusted to operate in the environment to which the subject will return, or already occupies" (p. 353). Buell et al. (1968) increased the social behavior of a young girl through the use of outdoor play equipment. The use of the outdoor play equipment served as natural reinforcement for social interactions. The strategy of natural maintaining contingencies can result in increased generalization; however, Stokes and Baer (1977) recognized that natural maintaining contingencies are not always available, as well as can sometimes maintain inappropriate behaviors.

Training sufficient exemplars is programmed by the training of an adequate number of responses and conditions (Stokes & Baer, 1977). This strategy has largely been implemented across experimenters and has yielded positive results. In their study, Baer et al. (1967) reinforced the imitation of motor movements with children with intellectual disabilities. The researchers noted that, as long as the participants were being reinforced following imitation, they would continue to perform imitations without training or reinforcement. Stokes and Baer (1977) acknowledged that the number and diversity of sufficient exemplars still warrants further research, but that this strategy is a crucial component to increasing generalization.

At the time of Stokes and Baer's (1977) review, train loosely was supported by very little ABA research. Researchers typically want to maintain control and restrictions over their procedures to interpret and analyze their results with ease. However, Train

Loosely encourages more loose and variable conditions, as a way to contribute to wider generalization. Shroeder and Baer (1972) taught children with intellectual disabilities vocal imitation skills by (1) continuous training on specific vocal skills and (2) concurrent training of a greater range of vocal skills. This study revealed that greater generalization of vocal skills was evident when less restrictions were placed on which vocal skills were being taught. The significance behind Train Loosely is, therefore, that increased control and restriction could be minimizing generalization opportunities.

Indiscriminable contingencies, comparable to intermittent schedules, are used to reinforce desired target behaviors more sporadically (Stokes & Baer, 1977). If an intermittent schedule of reinforcement is extended to various settings, then the participant will not be able to discriminate in which settings reinforcement will or will not occur. This unpredictability makes generalization more likely to occur. Broden et al. (1970) conducted their study in a classroom of culturally disadvantaged students. When one student was getting positive teacher attention for academic work, another peer began to seek that same attention by exhibiting increased on-task behavior. Stokes and Baer (1977) concluded that an unpredictable schedule of reinforcement can serve to modify targeted behaviors, as well as generalize these behaviors to other conditions.

Programming common stimuli is defined as ensuring that the same or similar stimuli will be present in both the training and generalization conditions. For children in school, peers would serve as an appropriate, common stimuli between training and generalization. Walker and Buckley (1968) programmed common stimuli in their study when they used the same academic materials in participants' remedial classroom (experimental) and their regular classroom to generalize social and academic classroom

behavior. Stokes and Baer (1977) asserted that, if common stimuli are selected carefully and implemented in training and generalization conditions, then generalization can be successfully programmed.

Mediated generalization is "establishing a response as part of the new learning that is likely to be utilized in other problems as well, and will constitute sufficient commonality between the original learning and the new problem to result in generalization" (Stokes & Baer, 1977, p. 361). The most common mediator is language, and the most frequently mediated procedures are self-management and self-control. Broden (1971) evaluated the effects of self-recording of study behaviors, as well as teacher praise, on the improved and generalized study habits of an eighth-grade girl. The participant's study behavior maintained at a high-level for three weeks following the introduction of self-recording procedures. While self-mediating generalization has potential, Stokes and Baer (1977) deemed that its practicality in utilization still needs to be assessed.

Train "To Generalize" is used very infrequently in ABA literature, primarily because behaviorists see generalization as an outcome of behavior-change, rather than as a behavior itself. Stokes and Baer (1977) defined Train "To Generalize" as being considered a response itself so, therefore, a reinforcement contingency can be placed on it. For example, teachers often Train "To Generalize" when they teach students a general principle and encourage them to "see" another example as "the same thing" (Stokes & Baer, 1977). Although this method, as well as a similar method referred to as the systematic use of instructions to facilitate generalization, may seem obvious and

forthright, Stokes and Baer (1977) suggested that knowing about the ultimate goal of generalization could lead to increased generalization.

Generalization in Special Education Research

A systematic review by Gunning et al. (2019) found the generalization of social skills of children with ASD was assessed using the generalization parameters redefined by Stokes and Osnes (1989). A total of 57 studies were included from 1977 to 2017 based on their data collection of generalization. The majority of the studies included generalization-promotion strategies, as outlined by Stokes and Baer (1977) and Stokes and Osnes (1989), including "involving familiar individuals in intervention and having various individuals deliver intervention, incorporating children's interests or salient, common stimuli into intervention, carrying out intervention in the natural setting and teaching across various stimuli and responses" (Gunning et al., 2019, p. 193). However, 21 of the 57 studies demonstrated less-successful generalization, meaning that they "(a) failed to demonstrate generalization across all comparative measures or dimensions of generalization, (b) produced partial generalization across all comparisons or (c) produced a combination of complete, partial, and failed generalization across all comparisons" (Gunning et al., 2019, p. 180).

Although generalization has been incorporated into special education research, specifically research on social skills acquisition of children with ASD, additional research is needed on strategies for appropriate implementation. Gunning et al. (2019) concluded that Baer's (1977) "Train and Hope" strategy appeared to be the most often used. Although educators using this strategy *hope* that generalization will occur after training, they do not *plan* accordingly for generalization. Generalization is imperative to the long-

term success of children with ASD and, therefore, requires more attention and meaningful planning in the intervention development and implementation process.

Video Modeling and Generalization

VM is an evidence-based intervention with the potential to promote the generalization of social skills for children with ASD; however, a scan of the VM research literature reveals the need for more studies to evaluate specific strategies for promoting generalized outcomes in VM. For example, Qi et al. (2018) conducted a systematic review of single case research studies to determine if VM interventions improve social communication skills for individuals with ASD. They concluded that, based on What Works Clearinghouse (WWC) guidelines, VM is an evidence-based practice for improving the social skills of individuals with ASD. Although the majority of VM studies in Qi et al.'s review demonstrated moderate to strong effects on targeted outcomes, they combined data from intervention, generalization, and maintenance conditions to determine effect-size estimations. Therefore, it is impossible to determine the effectiveness of specific generalization-promotion strategies used in the studies.

McCoy et al. (2016) reviewed 29 studies, five of which employed a VM intervention. All five of those studies programmed and measured for generalization, as defined by Stokes and Baer (1977); however, only some components of the overall framework were employed in each study. Although generalized outcomes are considered the "gold standard" in behavioral research and the only measure of treatment efficacy, McCoy et al. (2016) noted the insufficient emphasis on meaningful programming and assessing for generalized outcomes in the studies. Furthermore, while improvements in generalized outcomes were noted, they did not report data on generalized outcomes

specifically, nor did they report data on the effectiveness of specific generalization promotion strategies.

In their systematic review of generalization and maintenance outcomes in social skills intervention research, Gunning et al. (2019) analyzed 57 studies (59 experiments) about whether they produced generalization of social skills for preschool-aged children with ASD. According to Gunning et al. (2019), complete generalization referred to a study that "(a) exceeded or were equal to the treatment or normative data or (b) exceeded the baseline data," and partial generalization was coded if generalization was only demonstrated for some participants, settings or responses (p. 177). Of the 59 experiments reviewed in the study, 38 met inclusion criteria for complete or partial generalization. VM was an evidence-based intervention component in 11 of the studies analyzed. Generalization-promotion strategies, including exploiting current functional contingencies, training diversely and incorporating functional mediators, varied amongst these studies, with generalization success rates between 60 and 70%. Gunning et al. suggest that these findings demonstrate progression past the train and hope mentality, towards a more meaningful approach to generality in social skills intervention research. However, they note that, "in general, studies were not designed to control for generalization-promotion variables or to systematically evaluate their effect" (p. 195). Therefore, similar to conclusions of Qi et al. (2018), questions remain about the efficacy of specific strategies for promoting generalized outcomes in VM intervention.

Additional research is needed to understand how VM can be used to promote the generalization of social skills for individuals with ASD. Jones et al. (2014) suggests additional systematic evaluations of generalization should include repeated assessment of

performance under generalized conditions and training conditions "(a) to compare levels of performance under the different stimulus conditions, and (b) to ensure that the skills would be maintained" (p. 38). Generalization should not be something that happens by chance, but rather it should be explicitly promoted and analyzed thoroughly upon the conclusion of a study, to better inform future research and practice. Therefore, future studies of generalization in VM should use experimental designs that allow for the experimental evaluation of the effects of specific generalization strategies, specifically.

Summary and Research Questions

Children with ASD can experience the negative effects of poor social skills development (poor academic achievement, social failure and peer rejection, mental illness and substance abuse), or the benefits of adequate social skills development (communication, relationships, opportunities) with extra support. Strategies to improve social skills development may include ecological variations, collateral skills interventions, child-specific interventions, peer-mediated intervention procedures and comprehensive interventions. VM is an intervention strategy which encompasses all of these strategies. Traditional VM may improve the acquisition and generalization social skills. Generalization occurs when behavior taught in one context occurs under different contexts, including natural conditions. Generalization promotion strategies including train and hope, sequential modification, introduce to natural maintaining contingencies, train sufficient exemplars, train loosely, use indiscriminable contingencies and program common stimuli. Although current research in VM social acquisition research for children with ASD reflects an increasing trend in generalization promotion strategies and generalized outcomes, more purposeful planning is needed to ensure that social skills will

be generalized with VM intervention. Specifically, there is a need for future studies that experimentally isolate the effects of generalization promotion strategies on generalized outcomes for children with ASD who lack appropriate social skills.

Therefore, the purpose of this research is to examine how traditional VM can be used to promote the generalization of social skills of young children with ASD. The following research questions were used to guide this research:

1. What are the effects of VM without generalization promotion strategies on increasing the peer-directed social language performance of children with ASD in a training setting and a generalization setting, where no intervention takes place?
2. What are the effects of adding a generalization-promotion strategy to VM on the peer-directed social language performance of children with ASD in the generalization setting?
3. What are the perceptions of primary consumers (students) and secondary consumers (teachers and parents) on the goals, procedures, and effects of interventions?

CHAPTER 2: LITERATURE REVIEW

ASD is a comprehensive term used to refer to a developmental disability that affects social communication and behavior development (Wiggins et al., 2019). The Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revised (DSM-IV-TR, 1994) originally defined ASD as including subtypes such as autistic disorder, Asperger disorder and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS). However, the more recent DSM-V (APA, 2013) used a singular definition in place of the aforementioned subtypes. The symptoms of ASD usually arise in the early stages of a child's life, between 1 and 3 years of age; however, diagnosis does not usually take place until the age of three or later (Al Shirian & Al Dera, 2015). Although individuals with ASD do not always manifest characteristics in the same way, signs typically include "problem with eye contact, no response to name, defect in joint attention, poor skills in pretend play and imitation, and problems with nonverbal communication" (Al Shirian & Al Dera, 2015, p. 604). Early detection of these symptoms increases the likelihood for referral for early intervention services, which are associated with improved developmental outcomes (Wiggins et al., 2019).

After diagnosis, ASD characteristics can range in severity, from mild to severe (Al Shirian & Al Dera, 2015), and typically include communication difficulties, social interaction challenges and repetitive or stereotypic behaviors (Zhang & Eshghi, 2018). Expressive and receptive language skills, although varying case by case, in addition to gestural communication abilities, are profoundly impacted; however, most children with ASD do, eventually, develop some type of communicative strategies (Spence et al., 2004). Individuals with ASD typically avoid social situations and/or exhibit adverse

social behaviors, as well as experience difficulty with joint attention and social emotional reciprocity (Spence et al., 2004). The varying patterns of restricted interests demonstrated by these individuals are "always unusual either in content or degree of intensity" and are typically compulsive or ritualistic (Spence et al., 2004, p. 187). Spence et al. discuss the need for sameness, as children with ASD tend to rely heavily on routines, as well as experience related issues, such as sensory abnormalities.

According to the Centers for Disease Control and Prevention (2021), 1 in 44 children has been diagnosed with ASD. Recently, inclusion of students with disabilities in general education has increased and has provided individuals with ASD the opportunity to gain knowledge in the general education curriculum and learn academic skills (Costescu & Rosan, 2019). However, progressive social educators argue that it is social interactions and social learning which have the greatest implications for overall development and future success (Silveira-Zaldivar et al, 2021). Therefore, it is imperative for social skills deficits in ASD to be addressed with evidence-based social skills interventions and practices.

Social Skills Deficits in ASD

Social development is a critical area of development for all human beings (Silveira-Zaldivar et al., 2021) and is one of the central features of ASD (APA, 2013). Kasari and Patterson (2012) suggest that "social impairment may be the most complex and impenetrable core challenge facing children with autism" (p. 713). Children with ASD present with challenges in social communication, social interaction and the ability to initiate and sustain conversations, all of which are paramount to continued development and success (Silveira-Zaldivar et al., 2021).

Social Language. More specifically, social language or pragmatics is often an area of difficulty for individuals with ASD (Miller et al., 2014). This can include difficulty with behaviors such as eye contact, maintaining a conversation, taking turns, staying on topic, greetings, and prosody, and understanding figurative language, emotions and non-verbal body cues (Shaked & Yirmiya, 2003; Tager-Flusberg, 2003; Tierney et al., 2014). Similar to the varying degrees of severity of ASD, Papadopoulos (2018) acknowledged that pragmatics and social skills can also vary in this way, depending on an individual's functionality level.

Parsons et al. (2017) conducted a systematic review of pragmatic language interventions for children with ASD. After identifying 2,909 studies from their initial search, only 21 of those studies fit the inclusion criteria for their review. They concluded that, while it is known that "the consequences of the social communication impairments in children with ASD are far reaching and life-long, and tailored pragmatic language interventions have the potential to reduce these impacts for children with ASD," (p. 32) there still needs to be a greater understanding of

"a) how cognitive and language profiles influence treatment effects; b) the most effective intervention setting and intervention agents to achieve large effects; and c) the inclusion of more strategies to enhance skill generalization" (p. 32).

Joint Attention. Children with ASD also have difficulty engaging jointly with others or maintaining joint attention/engagement (Kasari & Patterson, 2012). This means that individuals with ASD have a limited awareness of others, as evidenced by their inability to coordinate attention between an object or an event and another person. Bruinsma et al. (2004) divided the concept of joint attention into two classes, due to its

multiple meanings: “1) response to joint attention (RJA), which can be defined as a child’s *response* to the parent’s point or shift in eye gaze, or 2) initiation of joint attention (IJA), which can be defined as a child’s seeking another’s attention” (p. 169). In typically developing children, this skill would be intertwined with intentional communication (Bruinsma et al.).

White et al. (2011) conducted a systematic review to analyze studies that measured joint attention as a treatment outcome. The majority of the 27 articles included in their review yielded positive results and further emphasized the importance of teaching joint attention to children with ASD. White et al. also noted the best practices for teaching joint attention to individuals with ASD, as evidenced by the included studies. Conducting joint attention interventions in the context of play, as well as using natural communication partners, such as parents, siblings and peers, provides the child with ample opportunities, outside of intervention sessions, to practice joint attention skills. Developmental strategies are most often used in conjunction with behavioral strategies to effectively teach joint attention skills. Developmental strategies used in the most successful interventions include “preferred or ritualistic items, task interspersal, prompting hierarchies, shaping and fading and time delay” (p. 1,292). The most commonly used behavioral principal was reinforcement. White et al. (2011) concluded that teaching joint attention is a pivotal area for individuals with ASD; however, it is imperative to assure that joint attention skills are taught based on the function of the behavior that is desired.

Social Communication. Social communication deficits for children with ASD include “difficulty making basic requests to access preferred items or activities in the

natural environment; difficulty initiating, responding to, maintaining, and terminating conversations with social partners; and atypical facial expressions and eye contact" (Wolfe et al., 2019, p. 791). Children with ASD may also engage in restricted and repetitive social communication behaviors. Wolfe et al. defined these behaviors as conversations only about circumscribed topics of interest and rote responses to social questions. Muharib and Lang's (2020) systematic review of social communication interventions for children with ASD concluded that school-based interventions are effective for increasing the frequency and duration of initiating and responding. However, they also note several limitations, including more descriptive intervention procedures, more details about participants' characteristics, implementation fidelity and the extent to which results can be generalized and maintained.

Negative Effects of Social Skills Deficits. Social skills deficits can have a substantial impact on the lives of children with ASD. Pragmatic language skills are critical to developmental outcomes (Miller et al., 2015), such as peer relations (Mok et al., 2014). Deficits in this area have also been linked to problems with both internalizing and externalizing behavior problems (Ketelaars et al., 2010). Appropriate and reciprocal play can be affected by difficulties with joint attention (Hwang & Hughes, 2000; Ingersoll & Shreibman, 2006; Kasari et al., 2015; Pierce-Jordan & Lifter, 2005). Kasari and Patterson (2012) note that being unable to engage jointly with others adversely affects the quantity and quality of social interactions for individuals with ASD.

Social communication deficits can lead to social isolation and decrease the likelihood for a child with ASD to engage socially (Silveira-Zaldivar et al., 2020). Repetitive social communication behaviors may limit an individual's access to

reinforcers and hinder the opportunity to acquire new skills (Wolfe et al., 2019). Wolfe et al. (2019) note that deficits in repetitive social communication, like limited pragmatic language skills, can also lead to problem behaviors. These behaviors can often be viewed as inappropriate or immature to peers and others (Brady et al., 2019).

As social demands increase throughout a child's life, social deficits become more amplified (Silveira-Zaldivar et al., 2020). Social difficulties can impact academic achievement, school attendance, mental health and behavior (Lauderdale-Litten et al., 2013; Mazurek et al., 2013; Munkhaugen et al., 2017; Patton et al., 2016; Rabiner et al., 2016), as well as have a dramatic impact on future life successes, including relationships, employment, health and higher education (Denham & Brown, 2010; Montroy et al., 2014; Zins et al., 2004; Silveira-Zaldivar, 2019). Social skills deficits of a child with ASD not only negatively impacts the child, but also parents, caregivers, educators, community members, peers and service providers (Silveira-Zaldivar et al., 2020). These deficits can also make finding future employment and developing independence exceedingly difficult (Brady et al., 2019). Therefore, evidence-based practices and interventions, which target the social competence of individuals with ASD, are crucial.

Positive Outcomes of Social Skills Development. When children with ASD can interact appropriately with their peers, they develop social competence and social relationships (Camargo et al., 2016). Parents consistently identify peer interactions and inclusion as the highest priorities for children with developmental disabilities (Boudreau et al., 2015). Social competence can lead to positive outcomes later in life, such as academic and vocational success, in addition to a better quality of life (Boudreau et al., 2015; Camargo et al., 2016; Watkins et al., 2017).

Specifically, friendships can help decrease feelings of loneliness and social anxieties, as well as help a child with ASD develop a support system and more opportunities to socially interact (Bossaert et al., 2012). Brady et al. (2019) states that "complex friendship skills include often intricate peer interactions such as initiating and maintaining conversations, responding appropriately, greetings, sharing, social play, responding to nonverbal cues and facial ex- pressions, listening, inviting others to join activities and developing networks" (p. 296). These social skills, although learned by typically developing children through social modeling and incidental opportunities, can be taught to children with ASD through social skills interventions that promote generalization.

Generalization of Skills in ASD

As individuals with ASD continue to experience difficulties with executive functioning, skill generalization becomes a significant challenge (Sartini et al., 2018). Children with ASD may demonstrate progress in a controlled setting; however, applying newly learned skills to real-world environments and situations can present problems (Hume et al., 2009). "As educators seek to apply evidence-based practices (EBPs) in less controlled, real-world settings, the issue of generalization to novel settings, materials, people, and exemplars can be especially challenging" (Sartini et al., 2018, p. 150). Therefore, these more authentic opportunities need to be balanced with what is practical for the individual(s) implementing the intervention (Kent et al., 2020). This can be achieved through appropriate programming for generalization (Gunning et al., 2019); however, this planning is often not recognized and/or reported.

Bellini and Akullian (2007) analyzed 23 single-subject design studies to examine the effectiveness of VM and video self-modeling interventions for children and adolescents with ASD. Only seven studies measured the generalization effects of VM and video self-modeling and the authors reported mixed results. Bellini and Akullian attributed this low number to "the narrow definition of generalization used in this study" and cautioned against mistaking intervention effects for true generalization (p. 284). It was suggested that future research should focus on facilitating generalization using video modeling strategies, specifically those features that improve generalization effects.

In their review of social skills treatments for children with ASD, Matson et al. (2007) acknowledged the notion that generalization should be programmed in social skills treatment and that experimenters in their study were consistently aware of the need for generalization promotion strategies. However, generalization planning and outcome data were not consistently present across all studies analyzed. Matson et al. suggested that, due to the saliency of social deficits, "…longer treatment phases, with much longer follow-ups and using a broader, more comprehensive set of social behaviors, would be of great value in future research" (p. 697). Promoting and documenting the generalization of skills will undoubtedly require increased planning and data collection; however, it will also prove that an intervention is more valid and noteworthy to implement with children with ASD.

In a systemic review of social stories to improve the social skills in children with ASD, Karkhaneh et al. (2010) "…highlighted general weaknesses with this body of literature including lack of measurement of 'treatment integrity and consistency' in applying the intervention (Sansosti et al., 2004, p. 201); unblinded outcome assessment;

lack of consideration of generalization and 'social validity' (Sansosti et al., 2004, p. 201) of the intervention; and comparisons with typically developing peers" (p. 644). Specifically, generalization was not adequately addressed in the literature, as most positive outcomes were produced in structured, predictable and controlled environments; therefore, making it uncertain whether or not the target skills would occur under more natural circumstances.

Brady et al. (2019) conducted a systematic review of interventions to teach friendship skills to children and adolescents with high-functioning autism. Of the 12 studies included in their review, only five measured generalization, with three of the five reporting that the demonstration was limited. The authors inferred that the lack of generalization outcomes reported could be due to the lack of programming for generalization prior to intervention implementation. They suggest that future research focuses on embedding generalization strategies within interventions, as "a powerful means to extend the effects of training across social interaction programs" (Brady et al., 2019, p. 303).

Fragale (2014) conducted a systematic review of interventions to improve the play skills of children with ASD. Of the 22 studies included, 15 studies reported generalization results. Generalization was said to be obtained if participants' gains in play behavior remained above baseline. Overall, the generalization results were mixed, with newly acquired play skills being mostly positive, and generalization across novel toys and materials varying. However, given the vague definition of generalization, as well as having seven studies omit generalization results, these findings suggest the need for continued programming for and evaluation of generalization results.

In their systematic review and meta-analysis of randomized control trials (RCTs), Kent et al. (2020) sought to report on play-based interventions to support skill development for children with ASD. Of the 19 studies used for the systematic review, 11 of which were also used in the meta-analysis, the authors stated that "…reporting of generalization of play skills across environments has been neglected in the studies included in this review" (p. 114). Kent et al. (2020) discusses the *possibility* of generalization throughout their study; however, they cannot be *certain* that the interventions analyzed will produce generalized outcomes.

In their single-case meta-analysis, Hutchins et al. (2020) examined the effects of social skills interventions for students with emotional and behavioral disorders (EBDs) and ASD. As with previous reviews of social skills interventions, the authors found that few studies collected maintenance and generalization data. For the studies that included maintenance and generalization data, greater effects were found for maintenance, prompting the authors to assert that generalization effects "remain underexamined and problematic" (Hutchins et al., 2020, p. 787). Hutchins et al. (2020) encouraged researchers to "remodel" the social skills intervention literature, which would include increased planning for and reporting of generalization of target skills.

Carruthers et al. (2020) conducted a systematic review to specifically address the extent to which generalization is currently measured and evidenced in RCT social communication interventions for children with ASD. Of the 38 studies eligible, 12 included sufficient measures of initial target learning and generalization; however, only 8 of these studies produced successful generalization in the target social communication areas. Carruthers et al. (2020) concluded that, despite the "widely cited lack of

generalisation associated with autism," children with ASD are capable of generalizing their skills to various people, settings and activities (p. 516). However, the authors also note that "…it is evident that there is a continuing need to improve our understanding of the strategies that can be used to enhance and support generalisation of learning among young children with autism" (Carruthers et al., 2020, p. 516).

Researchers have explored the extent to which generalization is addressed within social skills interventions for children with ASD, as well as the importance of implementing interventions in such a way that generalized outcomes occur. However, many research studies do not program for or report generalization results. This suggests a need for generalization promotion strategies to be put into place at the onset of an intervention, as well as a need for reporting generalization outcomes to inform future practice.

Generalization-Promotion Strategies

Falcomata and Wacker (2013) asserted that strategies for programming for generalization are important because the successful implementation of an intervention cannot assume generalization of outcomes across all natural contexts. Stokes and Baer (1977) presented a generalization framework using the key components from the strategies for increasing generalization. This framework helps researchers and practitioners to better understand generalization, as well as how to deduce whether behaviors and/or skills have been generalized:

> 1. Look for a response that enters a natural community; in particular, teach subjects to cue their potential natural communities to reinforce their desirable behaviors.
> 2. Keep training more exemplars; in particular, diversify them.

> 3. Loosen experimental control over the stimuli and responses involved in training; in particular, train different examples concurrently, and vary instructions, SDs, social reinforcers, and backup reinforcers.
> 4. Make unclear the limits of training contingencies; in particular, conceal, when possible, the point at which those contingencies stop operating, possibly by delayed reinforcement.
> 5. Use stimuli that are likely to be found in generalization settings in training settings as well; in particular, use peers as tutors.
> 6. Reinforce accurate self-reports of desirable behavior; apply self-recording and self-reinforcement techniques whenever possible.
> 7. When generalizations occur, reinforce at least some of them at least sometimes, as if "to generalize" were an operant response class" (Stokes & Baer, 1977, p. 364).

Stokes and Osnes (1989) refined Stokes and Baer's (1977) framework into three general principles: Exploit Current Functional Contingencies, Train Diversely, and Incorporate Functional Mediators.

Exploit Current Functional Contingencies. Exploiting current functional contingencies can be dissected into four parts: (1) contacting natural consequences, (2) recruiting natural consequences, (3) modifying maladaptive consequences and (4) reinforcing occurrences of generalization (Stokes & Osnes). When considering the function of a behavior, consequences serve to increase, maintain or decrease the behavior that they follow. These consequences can be naturally occurring or artificially programmed by a behavior change agent. A behavior may not be occurring frequently or sufficiently enough to attract consequences. A strategy for contacting and recruiting natural consequences is to include peers in the intervention process (Hansen et al., 1998).

Modifying maladaptive consequences refers to when a behavior is maintained by powerful consequences although the behavior itself is maladaptive (Stokes & Osnes, 1989). Maladaptive behaviors are often reinforced by peers and must be replaced by more appropriate behaviors that are also reinforced by peers and meaningful to the individual

(Hansen et al., 1998). Reinforcing occurrences of generalization refers to any occurrences of the target behavior being noted and followed by consequences that are likely to be reinforcing (Stokes & Osnes, 1989). Naturally occurring reinforcement in a real-life setting is more powerful than reinforcement in an artificial setting (Hansen et al., 1998). This means that including parents, siblings, peers, etc. can be helpful to promoting generalization of skills.

Train Diversely. Training diversely includes (1) using sufficient stimulus exemplars, (2) using sufficient response exemplars, (3) making antecedents less discriminable and (4) making consequences less discriminable (Stokes & Osnes, 1989). A stimulus exemplar refers to a training condition, such as the individual conducting the intervention or the environment in which the intervention is conducted. Response exemplars are the example(s) of the target behavior provided during training. Using sufficient stimulus and response exemplars signifies that various conditions and multiple means of eliciting the target behavior have been provided during training to promote generalization. Incorporating sufficient stimulus and response exemplars can include "exposure to varied social stimuli and responses via use of multiple role-play and problem scenarios, inclusion of multiple peers, exposure to novel role-play partners and situations, and intervention in multiple settings" (Hansen et al., 1998, p. 504).

Stokes and Osnes (1989) also discussed making antecedents and consequences less discriminable. This means that there should be variety in the conditions under which training occurs, as well as variability in the schedule or circumstances of reinforcement. This can be done through fading prompts and reinforcement, as well as changing who collects the data and broadening the target skill (Hansen et al., 1998).

Incorporate Functional Mediators. Incorporate functional mediators refers to (1) incorporating salient physical stimuli, (2) incorporating salient social stimuli, (3) incorporating self-mediated physical stimuli and (4) incorporating self-mediated verbal and covert stimuli (Stokes & Osnes, 1989). Stokes and Osnes define the following: a mediator as occurring between training and the occurrence of generalization; a physical stimulus typically refers to an object that is present in both the training and generalization conditions; and a social stimuli is the presence of a person or a characteristic, such as a gesture, which prompts generalization. Physical and social stimuli between the training and generalization conditions should be as similar as possible (Hansen et al., 1998). Hansen et al. stated that there are "many advantages to intervention in real-life settings, including the natural inclusion of common physical as well as social stimuli, involvement of significant others in the youth's natural environment (e.g. peers, siblings, teachers) can be valuable for doing such things as prompting, supporting, reinforcing, or recording information (p. 505).

Stokes & Osnes (1989) also discussed incorporating self-mediated physical stimuli. This means that individuals maintain and transport a stimulus as part of the treatment, such as a notebook with steps for performing a specific behavior. Self-mediated verbal and convert stimuli are processes, such as problem-solving, self-monitoring or self-reinforcement, to show demonstration and/or acquisition of the target skill. "Self-monitoring and other self-management procedures may be useful strategies for enhancing generalization of social skills training" (Hansen et al., 1998, p. 506).

Although many studies have adopted this framework and implemented some or all of these generalization-promotion strategies, Gunning et al. (2019) suggested that

employing any generalization strategy should support successful generalization outcomes. Burt and Whitney (2018), in an effort to make Stokes and Osnes' (1989) framework more accessible to practitioners, took their generalization-promotion strategies and turned them into a guide of recommendations for successful generalization outcomes. This guide includes: (1) decreasing the need for generalization-promotion strategies by implementing interventions in the child's natural environments; (2) conducting generalization probes before, during and after the intervention to ensure the most relevant data; (3) involving familiar people with whom the child interacts with regularly; (4) using the least intrusive and least costly methods by reducing the need for artificial reinforcement; and (5) contriving intervention approaches as needed, by referring back to Stokes and Osnes' (1989) generalization-promotion strategies and utilizing whichever components are necessary. These recommendations suggest there is no one strategy to implement for successful generalization outcomes, but rather that promoting generalization can be achieved by using Stokes and Osnes' framework as a reference to make appropriate considerations before an intervention is implemented. These recommendations also demonstrate the importance of choosing an intervention that can be done in multiple environments, with various individuals and with cost and time in mind.

Video Modeling

Many intervention strategies have been developed to provide social skills training to children with ASD (Wang et al., 2011). These models include behavior modification, peer-mediated training, social stories, VM, pivotal response training (PRT), joint attention training and the buddy system (Wang et al., 2011). However, the social skills

intervention that is chosen for a child with ASD must provide adequate evidence of effectiveness, particularly in the child's area(s) of need. According to Wang et al. (2011), "parents want to know how to choose an effective model for their children with ASD, clinicians want to adopt effective interventions for their evidence-based practice, and policy-makers are interested in funding programs with proven track records" (p. 562). Using an effective, appropriate intervention can be very beneficial to the social skills development of children with ASD (Ashori & Jalil-Abkenar, 2019).

Modeling, or observational learning, is an effective training method for children with ASD because it initially involves observation, rather than immediate interaction. Specifically, Ashori and Jalil-Abkenar (2019) suggest that VM allows children with ASD, who often struggle with social skills, the opportunity to learn and demonstrate a skill by viewing realistic video clips of the target skill prior to being faced with the challenges of interacting with another person. VM is also considered an EBP. Horner et al. (2005) outlined criteria for identifying EBPs as

> "(a) the practice is operationally defined; (b) the context in which the practice is to be used is defined; (c) the practice is *implemented with fidelity*; (d) results document the practice to be functionally related to change in dependent measures; and (e) the experimenter effects are replicated across a sufficient number of studies, researchers, and participants to allow *confidence in the findings*" (p. 176-177; Bellini & Akullian, 2007, p. 265).

Therefore, VM is a powerful, evidence-based learning modality for children with ASD, as it continues to demonstrate great promise as an effective intervention (Bellini & Akullian, 2007).

McCoy and Hermansen (2007) reviewed 34 studies which included five types of VM: adult models, peer models, self-models, POV models and mixed models. The authors determined that, despite which model was used, VM was always successful in producing positive outcomes for children with ASD. However, using self and peer models appeared to be the most influential on the overall effectiveness of VMs. McCoy and Hermansen (2007) also commented on the benefits of VM, noting that it is appealing to children with ASD, efficient in promoting skill acquisition and generalization, cost and time effective, holds the participant's attention and allows the interventionist to have complete control over the observed stimuli. In a similar study of VM models with similar results, Delano (2007) noted the following benefits of using VM with children with ASD: VM is useful in addressing some of the primary deficits found in children with ASD; VM is effective in different settings; VM promotes rapid skill learning and generalization, even though generalization is often not attained by children with ASD using other methods; using peer models, adult models and self-modeling has been effective; and VMs are easy to produce and implement (see Dorwick, 1991; Dorwick & Meuniers, 1999; Neumann, 2004).

In their meta-analysis, Bellini and Akullian's (2007) determined that VM and video self-modeling are effective intervention strategies for targeting social-communication skills, as well as behavioral functioning and functional skills. They attributed this positive outcome to the fact that VM "allows interventionists to remove irrelevant elements of the modeled skill or behavior through video editing. The removal of irrelevant stimuli allows the individual with ASD to better focus on essential aspects of the targeted skill or behavior" (p. 282). The authors also noted that VM strategies are

motivating for children with ASD, as watching videos tends to be a highly desired activity for many of these individuals.

In a meta-analysis of interventions to increase social skills for children and adolescents with ASD, Wang and Spillane (2009) sought to determine which interventions met the criteria for EBP. Of the 38 studies pulled for analysis, 11 used VM to teach social skills. VM met the criteria to be classified as an EBP, with a mean percentage of nonoverlapping data points (PND) score of 84.25%. With this EBP classification, VM was considered an effective socials skills intervention for children with ASD.

Shukla-Mehta et al.'s (2010) literature review comprised of 26 studies to evaluate the effectiveness of video instruction. Four of these studies included VM without any additional components. In three of the four studies, the participants acquired the target skills, as well as maintained and/or generalized these skills to unconditioned people, objects and settings. The authors noted that VM is often used in conjunction with other strategies and, therefore, reporting on the specific effects of prompting, error correction and reinforcers may be useful in determining the effectiveness of VM alone. Shukla-Mehta et al. (2010) also commented on the benefits of VM, stating that "this teaching strategy appears to (a) capitalize on the children's affinity for visual stimuli (Schreibman et al., 2000), (b) improve the efficiency with which instruction can be delivered (Charlop-Christy et al., 2000), (c) enable precise management of instructional stimuli and contingencies, and (d) promote consistency, with minimal training, across providers and settings, including homes (Wert & Neisworth, 2003)" (p. 10).

In her guidelines for successful VM implementation, Wilson (2012) notes the following reasons for using VM interventions: VM is considered an EBP; VM requires minimal training to implemented; VM can be used with consistency across settings, materials and people; VM is an effective intervention for children with ASD; and VM is cost-effective (Charlop-Christy et al., 2000). By incorporating VM strategies to address the challenges faced by children with ASD, Wilson (2012) predicts that lasting changes in social skills will be the result.

Kabashi and Kaczmarek (2016) reviewed the literature surrounding video-based instruction (VBI). A total of 36 studies were reviewed, which included VBI approaches such as VM, POV modeling, video self-modeling, video feedback and computer-based instruction. Of these studies, 14 implemented a VM approach. All VM studies reported an increase in social initiations, with the exception of one, suggesting that VM is a promising strategy for promoting social skills. According to Wilson (2012), in addition to the research evidence of its effectiveness, VM promotes "increased child independence, easy individualization, low cost, consistent implementation" and, most importantly, efficient use across professionals and settings" (p. 107).

Therefore, as evidenced by many studies, VM is a promising social skills intervention for children with ASD. However, for VM to increase the likelihood of generalized-outcomes, ways to promote generalization need to be considered when implementing this intervention. This is because generalized outcomes often fail to occur naturally and, rather than *hoping* for generalization after an intervention has been implemented, it is more worth the effort to take the time to *plan* and *program for* its occurrence (Burt & Whitney, 2018).

Prompting Generalization in VM

Many research studies have shown that VM can be successful in producing generalized outcomes. However, *planning and programming* for generalization is needed for more efficient instruction, rather than simply *hoping* that an intervention will result in the generalization of target skill(s) (Alexander et al., 2013). This planning and programming for generalization includes considering all relevant features of target stimuli in the training and natural environments (Alexander et al., 2013; Cooper et al., 2007); developing a concept analysis to determine relevant and irrelevant features of the stimuli across environmental conditions (Alexander et al, 2013; Becker, 1986); and instructional programs including a set(s) of stimuli sampling the range of stimulus features as determined by the concept analysis. By systematically programming for generalization, the practitioner increases the likelihood that the skill will generalize to different settings, materials and people (Alexander et al., 2013; Sprague & Horner, 1984). Alexander et al. (2013) also notes that generalization can be achieved by "targeting an individual's response to a small set of stimuli in a way that it will have collateral effects on nontargeted stimuli within the same stimulus class" (p. 1,347). Although VM models have been shown to produce generalized outcomes alone, many studies do not intentionally program for generalization and would benefit from doing so.

VM is also a less structured intervention strategy (Kleeberger & Mirenda, 2010). Therefore, VM promotes generalization by introducing naturally maintaining contingencies, which are self-reinforcing to children, thereby decreasing the need for tangible reinforcement. According to Stokes and Baer (1977), *training loosely*, with less control and restrictions, maximizes the potential for generalization. Efficiently training

multiple exemplars is another way that VM facilitates generalization (Kleeberger & Mirenda, 2010), as well as helping children with ASD focus on relevant cues through a means that is both engaging and motivating (Charlop-Christy et al., 2000).

Similarly to traditional VM, Plavnick et al. (2013) used video-based group instruction (VGI) to teach complex social skills to children with ASD. This type of instruction uses VM within social skills group instruction to teach target social behaviors (Plavnick et al., 2013). In their study, the authors programmed for generalization by "(1) incorporating multiple video exemplars with varied stimuli, models, and response topographies; and (2) embedding naturally occurring reinforcers into the video models and training trials" (Plavnick et al., 2013; MacFarland et al., 2021, p. 115). The authors then conducted a similar study in a high school setting, which promoted generalization by "conducting setting generalization probes in a student lounge within the school both pre- and post-intervention" (Plavnick et al., 2015; MacFarland et al., 2021, p. 115). Although both studies attempted to program for generalization, which produced some instances of generalization, the authors suggest that future research continue implement additional strategies to promote generalized outcomes.

In her guidelines for successful VM implementation, Wilson (2012) addresses *promoting and evaluating generalization and maintenance of skills*. She suggests that using a familiar classroom setting and materials in the intervention, as well as introducing video footage from a variety of familiar settings, with a variety of familiar materials and interaction partners, can promote generalization and maintenance of the target skill(s). Also, breaking target behaviors into smaller steps, or a task analysis, can not only increases maintenance, but also reduces the need for continuous prompts.

In their review, Kabashi and Kaczmarek (2016) note that in most of the VM studies reviewed, generalization of the target skills were reported. Although generalization assessments were unique for each study, they were conducted under unfamiliar conditions, including with different people, in various settings, involving new topics of conversation and with new manipulatives (Charlop and Milstein 1989; Nikopoulos & Keenan 2003, 2004b; Reagon et al. 2006; Nikopoulos and Keenan 2004a, 2007; Charlop et al. 2010).

Radley et al. (2017) conducted a study to evaluate the effects of the *Superheroes Social Skills* program on the social development of children with ASD and their peers with shared social deficits. One strategy used to promote generalization in their study was the inclusion of typically developing peers. Interventions involving typically developing peers rely on peer prompting, modeling, and reinforcement to produce improvements in target behaviors in training and generalization conditions. Peer inclusion also aligns with Stokes and Osnes' (1989) exploitation of current functional contingencies, "allowing for incorporation of stimuli from training settings into generalized environments, and training responses to diverse stimuli" (Radley et al., 2017, p. 235). Unfortunately, it may not always be feasible to incorporate typically developing peers and, therefore, peers with similar social deficits may be considered (Sansosti, 2010). These peers increase the generalization of social skills for children with ASD by allowing for ample practice and feedback, as well diverse training opportunities and natural consequences of social involvement.

While VM alone might lead to generalization, there are many explicit strategies to promote generalized outcomes in VM interventions (Bellini et al., 2007; Kleeberger &

Mirenda, 2010; Alexander et al., 2013; Plavnick et al., 2013; Radley et al., 2017) . Therefore, the design of VM interventions should include consideration of explicit strategies to increase the likelihood of generalized outcomes (Burt & Whitney, 2018) While research has yet to definitively answer the elusive question, "How does generalization happen with VM?," researchers have documented positive outcomes when generalization is programmed (e.g., Alexander et al., 2013), and even more promising generalization outcomes are possible with an adaptable intervention like VM.

Social Validity

Wolf (1978) describes social validity as the process of determining the social *significance* of the goals, the social *appropriateness* of the procedures and the social *importance* of the effects of an intervention. He suggests that, to decide on the validity of a behavioral objective, researchers should "approach the specific consumer or representatives of the relevant community, and through interviews or ratings determine much more precisely what the socially significant problems are" (Wolf, 1978, p. 209). Social appropriateness refers to the ethics, cost and practicality of an intervention. Much like determining the social significance of the goals, researchers will often decide on the appropriateness of an intervention by simply asking clients, teachers, guardians and/or others involved for their input. Lastly, the social importance of an intervention is determined by how helpful the intervention was in solving the problem. Although researchers may have an opinion on this, and even objective data to support that opinion, "it is the participants and other consumers who want to make the final decision about whether a program helped to solve their problem" (Wolf, 1978, p. 210).

Social validity is crucial when teaching social skills (Gul & Vuran, 2010). Bellini and Akullian (2007) note how easy it is to measure social validity in VM interventions, by suggesting that the interventionist, the child's parent/guardian and/or teachers be provided with a checklist "that documents when and how often the video was shown, and whether any events prevented the showing of the video…" (p. 283). These checklists should also encourage parents and/or teachers to "document formative and summative data such as their impressions of viewing procedures (e.g., the impact of the video on their classroom or home routines), or their impressions of the child's progress as a result of the intervention" (Bellini & Akullian, 2007, p. 283). Most importantly, measures of social validity should promote conversations with parents, teachers or even the child involved in the intervention whether or not the child enjoys engaging in watching videos (Bellini & Akullian, 2007).

In Wilson's (2012) guidelines for VM implementation, she used the example of being a speech-language pathologist (SLP) to address social validity concerns. From this standpoint, social validity data can be collected both formally and informally with the target child's team to come to a decision about which target skill(s) are important to the child's daily life. This decision will, not only influence specific choices about aspects of the intervention, but will also provide the opportunity for team members to be involved in creating videos for additional educational goals, therefore increasing the overall social validity.

Many studies have shown that VM is a socially valid social skills intervention for children with ASD. Specifically, in Delano (2007), five of the 19 studies reviewed reported specific measures of social validity. These measures included pre- and posttest

questionnaires for parents and pre- and posttest interviews with target students, as well as having parents watch videotapes of baseline and intervention sessions to rate the child's behavior in relation to the dependent measure. In addition, other indicators of social validity were cost-effectiveness, less staff time, selecting target skills based on each individual child's performance in the school curriculum and taking input from parents and teachers about skills needed for each participant. Wang and Spillane (2009) reported social validity measures for 16 of the 38 studies analyzed, noting that most of the studies demonstrated evidence of social importance. Social validity was assessed through either interviews or questionnaires, and stressed the importance of parents and teachers believing that the intervention strategies implemented were both effective and appropriate. Similar strategies were used in the studies reviewed by Kabashi and Kaczmarek (2016), where 22 of the 36 studies reported positive social validity outcomes and supported VBIs as effective practices for increasing the social skills of children with ASD.

According to Bellini and Akullian (2007), although not all studies document social validity data, that does not mean that they are not socially valid. However, they encourage future researchers to measure and report on social validity, as this data is essential to proving the social acceptability of the intervention results.

Conclusions

Children with ASD experience significant delays in social skills development. Social skills deficits include difficulties with social language, joint attention and social communication. These social deficits can adversely affect a child's ability to behave, play and interact appropriately with peers, as well as can lead to social isolation and the

inability to keep up with increasing social demands as they get older. Social incompetence can also negatively impact a child's future life successes and the livelihoods of those around him/her. However, when children are able to develop adequate social communication skills, they can interact appropriately with peers and develop meaningful relationships, which can lead to increased social and other opportunities throughout their lives. Therefore, social communication skills are crucial for children with ASD to acquire as early as possible.

Although children with ASD typically experience difficulty with generalizing newly-learned skills, generalization-promotion strategies increase the likelihood for generalized outcomes. Specifically, Stokes and Baer (1977) presented a generalization framework, which was later revised by Stokes and Osnes (1989) to include components, such as exploit current functional contingencies, train diversely and incorporate functional mediators. Burt and Whitney (2018) later modified this framework to create an accessible guide of recommendations for generalization promotion for practitioners. An effective, EBP for teaching social skills to children with ASD is VM. VM can be implemented in different settings, with multiple people and under various conditions and is, therefore, conducive to generalized outcomes, as well as a socially valid intervention. However, to increase the likelihood of generalization, VM should be implemented in conjunction with Burt and Whitney's generalization-promotion guide, which includes strategies proposed by Stokes and Osnes (1989). Teaching children with ASD social communication skills using a combination of VM and generalization-promotion strategies will ensure that they are fully learning and using these skills appropriately.

CHAPTER 3: METHODS

This study was conducted during the Fall of 2022. At this time, the COVID-19 pandemic was still ongoing, and many public spaces, including public schools, were just beginning to lift restrictions, such as masking and spacing. Also, public schools were just beginning to reinstate "normal" recesses, assemblies and classroom set-ups, after nearly two years of restrictions and mandates. Although a sense of normalcy was beginning to be restored, absences and residual effects from having COVID-19 and/or experiencing the pandemic were still prevalent.

Participants

The participants for this study were recruited from a public elementary school in a suburban area in Pennsylvania. Three males and one female participated after consent from a parent or guardian per the University's IRB (APPENDIX E). Their ages ranged from 8-years-old to 10-years-old and their grade levels ranged from third grade to fourth grade. Participants' racial/ethnic backgrounds were Caucasian, Hispanic and Asian. All participants spoke English as their first language. No participants received free or reduced lunch. All participants had a primary diagnosis of ASD and a secondary diagnosis of Speech and Language Impairment. Autism diagnoses came from multiple assessments, including Behavior Assessment System for Children, Second Edition (BASC-II), Childhood Autism Rating Scale, Second Edition (CARS-II), Adaptive Behavior Assessment System, Third Edition (ABAS-III) and Autism Spectrum Rating Scale (ASRS). According to each participant's Individualized Education Plan (IEP), there were no significant delays in imitation skills or any special considerations for visual acuity. Participants spent most of the school day in a Supplemental Autistic Support (AS)

classroom. The Supplemental AS classroom provided alternate curriculums, resources and routines to help students meet their educational needs, while also providing inclusion opportunities for Science/Social Studies, lunch, recess and specials.

Each participant's IEP was used to determine a need for social skills development. Current levels of performance, as well as social skills goals demonstrated a need for each participant to receive social skills intervention. An Autism Social Skills Profile (Bellini, 2006) was completed by each participant's parent or guardian and was used to determine social needs as they related to social reciprocity, social participation/avoidance and detrimental social behaviors (APPENDIX A). The following areas of need were determined by each participant's IEP and ratings on the Autism Social Skills Profile (Bellini, 2006): joining an activity, obtaining attention and taking turns.

Anna. Anna was an 8-year-old Asian female diagnosed with a primary disability of ASD and a secondary disability of Speech and Language Impairment. Anna's primary language was English; however, her parents also spoke Urdu. Anna demonstrated no significant delays in imitation skills or any special considerations for visual acuity. Anna spent most of her school day in a Supplemental Autistic Support classroom with opportunities for inclusion during homeroom, Science/Social Studies, specials, lunch and recess. Anna's IEP indicated a need for a Personal Care Assistant (PCA) due to difficulties with transitioning. Anna's IEP included goals for Reading, Math, Social Skills, Behavior and Speech. Consent to participate in this study was received from Anna's parents. Her parents completed the Autism Social Skills Profile (Bellini, 2006) to help target specific social skills for intervention. The items on the Autism Social Skills Profile (Bellini, 2006) were scored as *Never (N), Sometimes (S), Often (O) or Very Often*

(V). Anna's scores can be viewed in APPENDIX A. Anna received scores of N or S in all skill areas related to interacting with peers. Anna's overall scores on the profile suggested significant needs in the skill areas of asking questions and participating in reciprocal conversations.

John. John was a 9 year-old Hispanic male diagnosed with a primary disability of ASD and a secondary disability of Speech and Language Impairment. John's primary language was English; however, his parents also spoke Spanish. John demonstrated no significant delays in imitation skills or any special considerations for visual acuity. John spent most of his school day in the Supplemental Autistic Support classroom with opportunities for inclusion during homeroom, Science/Social Studies, specials, lunch and recess. John's IEP indicated a need for a PCA due to a medical condition, as well as due to a recent increase in unsafe and aggressive behaviors. John's IEP included goals for Reading, Math, Social Skills, Behavior, Speech and Occupational Therapy (OT). Consent to participate in this study was received from John's parents. His parents completed the Autism Social Skills Profile (Bellini, 2006) to help target specific social skills for intervention. Participant J's scores can be viewed in APPENDIX A. John received a score of N in all skill areas related to appropriate social interactions, such as making eye contact, engaging in reciprocal conversation and maintaining an appropriate distance when talking to others. John's overall scores on the profile suggested significant needs in the skill area of verbal interactions with peers.

Tim. Tim was a 10-year-old White male diagnosed with a primary disability of ASD and a secondary disability of Speech and Language Impairment. Tim's primary language was English. Tim demonstrated no significant delays in imitation skills or any

special considerations for visual acuity. Tim spent most of his school day in the Supplemental Autistic Support classroom with opportunities for inclusion during homeroom, Science/Social Studies, specials, lunch and recess. Tim's IEP indicated a need for a PCA due to challenging behaviors. Tim's IEP included goals for Reading, Math, Social Skills, Behavior, Speech, OT and Physical Therapy (PT). Consent to participate in this study was received from Tim's parents. His parents completed the Autism Social Skills Profile (Bellini, 2006) to help target specific social skills for intervention. Tim's scores can be viewed in APPENDIX A. Tim received a score of N in all skill areas related to initiating interactions and conversations with peers, as well as appropriately entering conversations. Tim's overall scores on the profile suggested significant needs in the skill area of initiating and joining social opportunities appropriately.

Yamir. Yamir was a 10 year-old Asian male diagnosed with a primary disability of ASD and a secondary disability of Speech and Language Impairment. Yamir's primary language was English; however, his parents also spoke Arabic. Yamir demonstrated no significant delays in imitation skills or any special considerations for visual acuity. Yamir spent most of his school day in the Supplemental Autistic Support classroom with opportunities for inclusion during homeroom, Science/Social Studies, specials, lunch and recess. Yamir's IEP indicated a need for an Instructional Assistant (IA) during times of inclusion to assist with staying on task and redirecting. Yamir's IEP included goals for Reading, Math, Social Skills, Behavior, Speech and OT. Consent to participate in this study was received from Yamir's parents. His parents completed the Autism Social Skills Profile (Bellini, 2006) to help target specific social skills for intervention. Yamir's scores

can be viewed in APPENDIX A. Yamir received scores of N or S in all skill areas related to interacting verbally or non-verbally with peers. However, he also received scores of N or S in all skill areas related to having negative interactions with peers, which suggested that he is interested in socializing with others. Yamir's overall scores suggested significant needs in the skill areas of interacting and engaging with peers.

Peer models for this study were selected from the same elementary school as the participants via an email sent to parents/guardians (APPENDIX F). The peer models were chosen from classrooms with which the participants had interactions with for inclusion opportunities, so the peer models were familiar to the participants prior to the study. The peer models were used to demonstrate appropriate social language skills in the VMs viewed by the students with ASD. Eleven peer models, four male and seven female, were recruited with consent from a parent or guardian, as well as consent to devote three consecutive recess periods (30 minutes each) to the study. Their ages ranged from 8-years-old to 9-years-old and they were all in third grade. The racial/ethnic backgrounds for these students were Caucasian and Hispanic, and all participants spoke only English. Participants were all middle-class students, with no participants receiving free or reduced lunch.

The data collectors for this study were four paraprofessionals, PCAs and IAs, who worked with the participants in the AS classroom. The data collectors were all women, whose ages ranged from 22 years-old to 60 years-old. All data collectors had some level of college education and at least one year of prior experience working with children with ASD.

Settings and Materials

The self-contained classroom, also known as the AS classroom, was used as the setting for the baseline in the classroom (A) and VM training and intervention in the classroom (B) conditions of this study. The AS classroom served as the setting where the VMs were recorded, and students with ASD watched the video models and worked on their social language skills. The AS classroom only had seven students assigned to it, so it provided a quiet space for the students with ASD to observe without distraction the video models. This classroom also served as the primary space for most of the students' academic instruction and, therefore, the students were accustomed to learning new concepts and skills in this environment. Video models were created in this environment, in order to provide a "safe space" for beginning to use social language skills with familiar peers and adults. The outdoor recess area served as an additional setting for the baseline in the generalization setting (C) and VM intervention with a generalization-promotion strategy in the generalization setting (D) conditions. The students with ASD participating in this study were included with their neurotypical peers during recess.

The materials for this study were determined by the skills being targeted, and the items and/or activities available in the intervention settings. First, an iPad was used to record and view the VMs. Next, in the AS classroom, games and activities, such as board games, puzzles and blocks were available for participants to use to engage in joining an activity and taking turns. In the outdoor recess area, items such as jump ropes, balls, bubbles and hula hoops were available for the participants to play with. After a preference assessment was administered, jump ropes, balls and hula hoops were determined to be the most preferred items in the outdoor recess area.

Dependent Variables and Measurement

The dependent variables for this study were determined after reviewing student participants' IEP goals related to social deficits, as well as each students' scores on the Autism Social Skills Profile (Bellini, 2006). The researcher also had a familiarity with each participant and his/her social needs. Each participants' IEP had a goal for greeting peers and/or adults appropriately or engaging in reciprocal play. According to the overall scores on each students' Autism Social Skills Profile (Bellini, 2006), the skill areas of joining activities and interacting with peers, initiating greeting and conversations and taking turns were scored as Never (N) or Sometimes (S) for all participants. Therefore, the skill areas of joining an activity, obtaining attention and taking turns were determined as the skills to be targeted in the intervention. Ledford and Gast (2018) highlighted the importance of including examples and non-examples when defining relevant behaviors; therefore, definitions included specific details, such as student proximity, body language, examples of exact words or phrases and specific non-examples of the target skills, to increase understanding and awareness of the skills being addressed, as well as to ensure more accurate data collection. Table 1 lists target skills and operational definitions for each, as well as examples and non-examples of the behaviors.

Table 1

Operational Definitions for Target Skills

Target Skill	Operational Definition	Examples	Non-Examples
Joining an activity	Using appropriate, direct verbalizations to request to participate in preferred activity with peers	"Excuse me?" "Excuse me, (name)?" "Excuse me, (name), can I play? "Excuse me, (name), can I join?" "Can I play?" "Can I play, (name)?" "Can I join?" "Can I join, (name)?"	Non-verbal gestures, such as tapping, pulling, pushing, pointing
Obtaining attention	Using appropriate, direct verbalizations or actions to garner a verbal or physical response from peers or adults	"Excuse me?" "Excuse me, (name)?" Hand raising without verbalizations Saying the person's name in proximity	Yelling a person's name from afar Hand raising with verbalizations Physical actions, such as tapping, pulling, pushing
Taking turns	Using appropriate, direct verbalizations or gestures to share in a game or an activity	"It's your turn," with eye contact "(Name), it's your turn." Handing a game or activity piece to another student	No verbalizations or gestures to indicate sharing or engagement

The dependent variables were measured by data collectors, who collected frequency data on the target behaviors using event recording. In each condition, each student was presented with as many opportunities as possible to perform the target skills. The number of correct responses divided by the total number of opportunities to perform the target skill produced a percentage of correct responding for each session for each student. In the baseline conditions, the sessions continued until each participant reached stability in level and trend for 3-5 consecutive sessions. In the intervention conditions, the sessions continued until each participant scored 80% correct responding or higher for 3-5 consecutive sessions.

Data Collector Training. Paraprofessionals who worked with the participants were invited to participate in the study as data collectors via email (APPENDIX F). Data collectors were four adults, including Instructional Assistants (IAs) and Personal Care Assistants (PCAs), all who had regular, daily contact with the student participants. Prior to the first baseline condition, the data collectors were trained to collect frequency data on the targeted social skills through researcher modeling and authentic practice opportunities. The baseline training was conducted over two 30-minute sessions and was scheduled based upon each data collectors' availability. In the first training session, the researcher modeled how to collect frequency data using event recording for each 30-minute baseline session. This method was chosen because the target skills being addressed in this study have a clearly defined beginning and end and, therefore, can be easily counted and documented. The researcher demonstrated examples and non-examples of the target skills, as well as how to record instances of the target skills being elicited.

The next training session included authentic opportunities for data collectors to practice collecting frequency data using event recording. The researcher chose a time during the school day when the student participants were most likely to demonstrate the target skills. During this time, the data collectors practiced collecting frequency data and contriving opportunities for the participants to perform the target skills. These opportunities looked like asking a participant if he/she would like to play a game, setting up preferred items around the classroom and/or having the student complete a task that he/she may need to ask for help with. Upon completion of this training session, the data collectors compared event recording sheets to determine interobserver agreement (IOA). IOA was calculated as smaller total divided by larger total, multiplied by 100 equals total method. An acceptable level of IOA for this training was at least 90% or higher to move on to implementing the intervention conditions. Additional training opportunities were provided to data collectors, as needed.

Interobserver Agreement (IOA). Interobserver agreement data were collected for at least 30% of the sessions of the 71 total data collection sessions, distributed across all conditions of the experiment. IOA was calculated using agreement for free operant behaviors measured with event recording, smaller total divided by larger total, multiplied by 100 equals total method (Ledford & Gast, 2018). An acceptable level of total IOA for each condition of this study was at least 90% or higher. For the initial baseline condition (A) for joining an activity, IOA was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. The total IOA for the initial baseline condition (A) for joining an activity was 100%. For obtaining attention, initial baseline condition (A) IOA was 100% for Anna, 100% for John, 67% (range 0%-100%) for Tim and 100% for Yamir. The total

IOA for the initial baseline condition (A) for obtaining attention was 92% (range 67%-100%). For the initial baseline condition (A) for taking turns, IOA was 100% for Anna, 100% for John, 92% (range 50%-100%) for Tim and 100% for Yamir. The total IOA for the initial baseline condition (A) for taking turns was 98% (range 92%-100%).

Each participant's IOA for the intervention condition (B) for joining an activity was 100% for Anna, 83% (range 50%-100%) for John, 100% for Tim and 92 % (range 50%-100%) for Yamir. The total IOA for the intervention condition (B) for joining an activity was 94% (range 83%-100%). For the intervention condition (B) for obtaining attention, the IOA was 100% for Anna, 100% for John, 100% for Tim and 92% (range 50%-100%) for Yamir. The total IOA for the intervention condition (B) for obtaining attention was 98% (range 92%-100%). For taking turns, the intervention condition (B) IOA was 100% for Anna, 88% (range 50%-100%) for John, 100% for Tim and 100% for Yamir. The total IOA for the intervention condition (B) for taking turns was 97% (range 88%-100%).

For the generalization baseline condition (C) for joining an activity, IOA was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. The total IOA for the generalization baseline condition (C) for joining an activity was 100%. For obtaining attention, generalization baseline condition (C) IOA was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. The total IOA for the generalization baseline condition (C) for obtaining attention was 100%. For the generalization baseline condition (C) for taking turns, IOA was 92% (range 50%-100%) for Anna, 100% for John, 100% for Tim and 100% for Yamir. The total IOA for the generalization baseline condition (C) for taking turns was 98% (range 92%-100%).

Each participant's IOA for the generalization intervention condition (D) for joining an activity was 100% for Anna, 90% (range 50%-100%) for John, 88% (range 50%-100%) for Tim and 100% for Yamir. The total IOA for the generalization intervention condition (D) for joining an activity was 95% (range 88%-100%). For the generalization intervention condition (D) for obtaining attention, the IOA was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. The total IOA for the generalization intervention condition (D) for obtaining attention was 100%. For taking turns, the generalization intervention condition (D) IOA was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. The total IOA for the generalization intervention condition (D) for taking turns was 100%.

Independent Variables

The independent variables of this study were the VMs and the generalization promotion strategies. The VMs were created in the self-contained classroom using the 11 peer models to demonstrate target behaviors for the participants with ASD. The peer models were trained and then recorded demonstrating the desired skills using an iPad. The VMs were shown in both intervention conditions (B and D) to the participants in the self-contained classroom. The first intervention condition (B) only used the VMs to increase skill acquisition and the second intervention condition (D) used the VMs and the introduction of generalization-promotion strategies. The generalization-promotion strategies were chosen based on a generalization-promotion assessment, including an indirect component (survey) and a direct component (observation). The generalization-promotion survey determined that all participants were affected by general environmental factors and low motivation/weak reinforcement. Once the generalization-promotion

assessment was completed, the results were analyzed and the generalization-promotion strategies (Table 2) were considered. The researcher and the data collectors determined that an environment with minimal noise and people would be beneficial for all participants. The researcher and the data collectors also determined that all participants were motivated by access to preferred items. A preference assessment revealed that the following items were preferred by all participants in the outdoor recess area: jump ropes, hula hoops and balls. Participants had access to these items during each session.

Independent variables also included the contrived opportunities to perform each target behavior. Each data collector was trained on how to do this during each training session. These opportunities looked like suggesting games/activities, presenting tasks the participants would need help with, placing preferred items/activities in close proximity, etc. Table 2 shows the average number of opportunities and the range of opportunities presented in each condition for each participant.

Table 2

Average Number of Opportunities for Each Participant

	Baseline			VM Intervention			Generalization Baseline			Generalization Intervention		
Anna	5 (5-10)	8.3 (5-10)	8.3 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)
John	6.7 (5-10)	9.3 (5-10)	9 (5-10)	6 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)
Tim	5 (5-10)	7.3 (5-10)	6 (5-10)	6.7 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)
Yamir	5 (5-10)	6.7 (5-10)	8.6 (5-10)	8.3 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)	10 (5-10)

Experimental Design

The experimental design was selected to investigate effects of video modeling on the acquisition and generalization of social language skills for children with ASD, and whether using a specific strategy to promote generalization is necessary to attain generalized outcomes using VM. Therefore, a multiple baseline across behaviors design was implemented (Ledford & Gast, 2018). The conditions of the design were baseline in the classroom (A), VM training and intervention in the classroom (B), baseline in the generalization setting (C) and VM intervention with a generalization-promotion strategy in the generalization setting (D). This design was chosen to support the need for multiple students with ASD, who exhibit similar social deficits, to be introduced to target social skills being modeled by neurotypical peers in VMs. A multiple baseline design also supported the need to evaluate the target skills in different environments and with different people.

A multiple baseline across behaviors design also supported demonstrations of experimental control. First, the target skills chosen for this study were topographically different from one another and functionally similar. Therefore, implementing the VMs in the first intervention condition (self-contained classroom) did not effect changes in other conditions. For example, two of the target behaviors were joining an activity and obtaining attention, these two behaviors were functionally similar because they involved the participant in social engagements with a peer. However, these behaviors were also functionally different because obtaining attention only required minimal interaction; whereas, joining an activity was more extensive in time and required more engagement. After all intervention conditions were implemented, a functional relation could be

determined if similar changes from baseline to intervention were observed across participants. A multiple baseline design also allowed for continuous measurement, which provided more opportunities to detect potential experimental effects and threats to internal validity.

Procedures

Classroom Setting Baseline (A). The first baseline setting was the self-contained classroom. In this setting, the data collectors collected data to establish a baseline for performing the target behaviors without intervention for each student (APPENDIX C). Each baseline data session lasted throughout the duration of the school day. A typical school day for the participants was Monday thru Friday from 8:25-3:45. Of their 7 hour and 20-minute school day, each participant spent about 5 hours in the self-contained classroom. Each day, the self-contained classroom was where the participants received instruction in reading, math, writing and social skills, in addition to having opportunities to work independently and take breaks, as needed. During each session, each student was presented with as many opportunities as possible to perform the target skills. Factors that maximized opportunities were being in a familiar space with familiar people, and minimal environmental factors, such as too much noise and too many, to distract the students or disrupt their routines. However, factors that limited opportunities were if participants had to leave the room for related services and each participant's mood each day: Was there a schedule change?; Is someone absent?; Did something happen earlier that triggered behaviors?; Was the lunch menu not appealing today? These opportunities were contrived by the data collectors to promote the desired behaviors. All opportunities were presented during breaks, independent work times and social skills lessons, so as to

not disrupt academic instruction. For example, for joining an activity, the data collectors made sure that the student was situated near peers who were engaged in a preferred activity, such as coloring, building a puzzle or playing with Play Doh. The data collector suggested one of these activities to the student ("Do you want to play with _____?") and allow the student to decide how to join the activity. For obtaining attention, the data collector presented tasks to the student that he/she would need help with, such as opening a snack, zipping a jacket or solving a math problem on a worksheet. The data collector would then walk away from the student to encourage him/her to appropriately get the data collector's attention and ask for help. If the target skill was taking turns, the adult engaged the student and his/her peers in a game where taking turns was necessary, such as Candy Land, Connect Four or Zingo. The data collector helped the students set up the game up and decide who would go first. The data collector moved away and allow the students to conduct the game themselves. During all sessions, the data collectors suggested an activity or task to the participants, but did not provide any prompting or additional support.

Data for this condition were collected and recorded by the data collectors using event recording. The number of correct responses divided by the total number of opportunities to perform the target skill produced a percentage of correct responding for each session for each student. For example, four correct responses divided by five opportunities would give that student an 80% for responding during that session. The baseline sessions continued until each participant reached stability in level and trend for 3-5 consecutive sessions. Therefore, this baseline condition varied in length for each

participant. Each data collector completed a fidelity checklist for each baseline session (APPENDIX E).

Peer Model Training and Video Model Creation. The researcher scheduled three consecutive recess periods (30 minutes each) to provide training. During the first recess period, the researcher trained the peer models on what they would be doing. The researcher demonstrated what joining an activity, obtaining attention and taking turns looked like. Each peer model had the opportunity to practice demonstrating each target skills without being recorded. The researcher used the next recess period to record the peer models using an iPad. Each peer model was recorded demonstrating each target skill in the self-contained classroom. This gave the researcher multiple videos to choose from when presenting the target skills to the students with ASD. The videos were re-recorded if the peer models made any mistakes; therefore, editing the VMs was not necessary. The third recess period involved having the peer models visit the AS classroom of the students with ASD and interacting with them (e.g. play a game, read a book, share a snack, etc.). This allowed the participants to become familiar with the peer models before previewing the videos. This also increased engagement when the videos were presented, as well as encouraged the participants to interact with the peer models outside of the self-contained classroom.

Data Collector Intervention Training. This training session lasted 30 minutes and was scheduled based on data collectors' availability. The researcher demonstrated how she would show the VMs to the students with ASD each day during the intervention condition. The researcher would access the VMs and select three VMs (one for each target skill) each morning. The researcher would show the VMs using different peer

models each day. For example, one day the researcher showed Michael (a peer model) modeling the target skill of joining an activity and the next day showed Ashley (a peer model) modeling that same target skill. The VMs were previewed individually on an iPad in the self-contained classroom, under the supervision of the researcher. The data collectors collected data throughout the school day in the self-contained classroom. Data collection procedures were the same as in the initial baseline condition. Additional training opportunities were provided to data collectors, as needed.

Video Modeling Intervention (B). The VMs were viewed individually on an iPad at the start of the school day in the self-contained classroom, around 9:00. Three VMs, one for each target skill, were set up by the researcher and viewed by each participant. Each VM was about 10 seconds long, so each participant watched a total of 30 seconds of VMs each day. A typical school day for the participants was Monday thru Friday from 8:25-3:45. Of their 7 hour and 20 minute school day, each participant spent about 5 hours in the self-contained classroom. Each day, the self-contained classroom was where the participants received instruction in reading, math, writing and social skills, in addition to having opportunities to work independently and take breaks, as needed. Therefore, during the 5 hours in the AS classroom, most of this time was spent engaged in academic work, with few relative opportunities to perform the target skills. As in baseline, during each session, each student was presented with as many opportunities as possible to perform the target skills. Factors that maximized opportunities were being in a familiar space with familiar people, and minimal environmental factors, such as too much noise and too many, to distract the students or disrupt their routines. However, factors that limited opportunities were if participants had to leave the room for related services

and each participant's mood each day: Was there a schedule change?; Is someone absent?; Did something happen earlier that triggered behaviors?; Was the lunch menu not appealing today? These opportunities were contrived by the data collectors to promote the production of the desired behaviors. All opportunities were presented during breaks, independent work times and social skills lessons, so as to not disrupt academic instruction. For example, for joining an activity, the data collectors made sure that the student was situated near peers who were engaged in a preferred activity, such as coloring, building a puzzle or playing with Play Doh. The data collector suggested one of these activities to the student ("Do you want to play with _____?") and allow the student to decide how to join the activity. For obtaining attention, the data collector presented tasks to the student that he/she would need help with, such as opening a snack, zipping a jacket or solving a math problem on a worksheet. The data collector would then walk away from the student to encourage him/her to appropriately get the data collector's attention and ask for help. If the target skill was taking turns, the adult engaged the student and his/her peers in a game where taking turns was necessary, such as Candy Land, Connect Four or Zingo. The data collector helped the students set up the game up and decide who would go first. The data collector moved away and allow the students to conduct the game themselves. During all sessions, the data collectors suggested an activity or task to the participants, but did not provide any prompting or additional support. Data collectors remained in the same vicinity as the student participants. However, depending on their role (IA or PCA), some data collectors needed to be in closer proximity to the students for safety reasons (e.g. elopement, aggression, non-compliance, etc.).

Data for this condition were collected and recorded by the data collectors using event recording. The number of correct responses divided by the total number of opportunities to perform the target skill produced a percentage of correct responding for each session for each student. The intervention sessions continued until each participant scored 80% correct responding or higher for 3-5 consecutive sessions. Therefore, this intervention condition varied in length for each participant. Each data collector and the researcher completed a fidelity checklist for each intervention session (APPENDIX E).

Generalization Setting Baseline (C). The generalization setting baseline took place in the outdoor recess area. In this setting, the data collectors collected data to establish a baseline for performing the target behaviors without intervention for each student. During these 30-minute sessions, each student was presented with as many opportunities as possible to perform the target skills. Factors that maximized opportunities were the presence of preferred activities and peer models, as well as participants wanting to change activities frequently. However, factors that limited opportunities were the small selection of items available to play with and each participant's mood each day (e.g. schedule change, unappealing lunch, absences, inappropriate behavior). These opportunities were contrived by the data collectors to promote the production of the desired behaviors. For example, for joining an activity, the data collector suggested activities to the students that peers were engaged in ("Do you want to play _____?"), such as playing tag, playing jump rope or blowing bubbles. The data collector would then allow the student to decide how to go about asking to join his/her peers. For obtaining attention, the data collector presented the student with an activity or task that he/she would need help with, such as zipping a jacket, getting an item

from the recess bins or helping to resolve a problem with a peer. Data collectors also maintained enough distance from the students that they would have to address them to get their attention. However, depending on their role (IA or PCA), some data collectors needed to be in closer proximity to the students for safety reasons (e.g. elopement, aggression, non-compliance, etc.). For taking turns, the data collector would encourage the student to join in an activity with his/her peers ("Do you want to play _____?)", such as playing with hula hoops, throwing a ball or playing basketball, which required the student and his/her peers to take turns. In all sessions, the data collectors would not provide any prompting or support to the participant.

Data for this condition were collected and recorded by the data collectors using event recording. The number of correct responses divided by the total number of opportunities to perform the target skill will produce a percentage of correct responding for each session for each student. The baseline sessions continued until each participant reached stability in level and trend for 3-5 consecutive sessions. Therefore, this baseline condition varied in length for each participant. Each data collector completed a fidelity checklist for each baseline session (APPENDIX E).

Generalization-Promotion Assessment. This assessment was used by data collectors to determine why generalization was not occurring in the generalization setting. This assessment had two parts; an indirect survey and a direct observation. First, each data collector completed a Generalization-Promotion Assessment for each participant (APPENDIX D). This encouraged data collectors to think about what factors, both external and internal, were affecting each student's ability to perform the desired behaviors. Next, the data collectors observed each participant in the generalization setting

(outdoor recess area). This observation was completed in one 30-minute session. Each student was presented with as many opportunities as possible to perform the target skills. These opportunities were contrived by the data collectors to evaluate the intervention effects on targeted behaviors. However, instead of collecting frequency data, the data collectors took notes on what happened before opportunities were presented to perform the behavior, how the child responded to the opportunities and what happened after the child elicited his/her response. The interventionists were also encouraged to document other relevant information, such as noise level, number of students in the area, items available to play with, weather, etc. which could have affected participant responding. For example, social skills can be difficult to develop if the environment is too crowded, too bright or too loud. There could also be other factors, such as what is being served for lunch, what is available to play with at recess, or discomfort when peers (other than peer models or classmates) approach a student participant.

After both the indirect and direct portions were completed, the data collectors and the researcher determined at least one generalization-promotion strategy to implement for each participant. The generalization-promotion strategy was chosen based on what appeared to be inhibiting the child's performance. Table 3 lists inhibitors and corresponding strategies to address them. Inhibitors are defined here as anything, internal or external, that decreases the likelihood of the target behaviors being performed. As a solution to these inhibitors, generalization-promotion strategies will alter and/or address any internal or external inhibitors to increase the likelihood of the target behaviors being performed.

Table 3

Generalization-Promotion Strategies

Inhibitors	Generalization-Promotion Strategies
General Environmental factors	Select an environment with fewer people or where students are expected to talk more softly (e.g. a classroom, the library) Provide the student with noise-cancelling headphones to help block out some of the surrounding sound Select an environment where you can control the brightness of the room or consider placing something over the lights to dim them (e.g. sheer curtains) Create a smaller group for activities with a larger number of students, such as lunch and recess
Low Motivation / Weak Reinforcement (reinforcing occurrences of generalization, contacting natural consequences, incorporating salient physical stimuli)	Conduct a preference assessment with each student and send one home to each students' parents/guardians to determine activities and/or items of – make these activities/items readily available in the appropriate environment (e.g. if a student likes to play soccer, have a soccer ball placed in the outdoor recess area or have an adult provide one) Conduct a preference assessment with each student on different environments to see which environment(s) each student prefers – allow for social skills instruction in preferred environments to increase skill acquisition and generalization

Table 3 Continued

Generalization-Promotion Strategies

Inhibitors	Generalization-Promotion Strategies
Social Anxiety (using sufficient stimulus exemplars, incorporate salient social stimuli, incorporate self-mediated physical stimuli)	Provide the student with a fidget or something small and familiar to minimize anxious behaviors Allow the student to select peers with whom to interact with Allow two students to work together to interact with a peer Consider starting with a smaller target behavior, such as sitting next to a peer, before having the student initiate an interaction
Skill deficits	Provide additional training and intervention opportunities to students who do not know how to perform the skill Consider breaking the target behavior into smaller tasks [e.g. the target skill is greeting so (1) be in proximity of peers, (2) make eye contact with peers, (3) gesture towards or turn body towards peers and (4) verbalize a greeting] Consider formal evaluations for related deficits, such as vision and hearing, which may be hindering a child's ability to perform the target behavior

Table 3 Continued

Generalization-Promotion Strategies

Inhibitors	Generalization-Promotion Strategies
Training vs. Generalization Setting(incorporate salient physical stimuli, incorporate salient social stimuli, incorporate self-mediated physical stimuli, incorporate self-mediated social stimuli)	Make the generalization setting as similar as possible to the training setting in terms of number of peers present, size of the environment, what is available in the environment, who is available in the environment, time of day, etc.

The generalization-promotion assessment and the observations of participants revealed the common inhibitors of general environmental factors and low motivation/weak reinforcement. Specifically, participant responding in the generalization setting was affected by the noise level, the number of peers present and access to preferred items. Therefore, it was decided that the generalization setting would be confined to a small part of the outdoor playground during recess with only peer models present. A preference assessment was also completed by each data collector to determine which items and/or activities the participants preferred when playing outside. The results of the preference assessments indicated that all participants enjoyed jump ropes, hula hoops and balls. The students most likely chose the same items due to the limited availability of items to choose from at recess, as well as how these particular items can be used in a variety of non-traditional ways. For example, while Anna likes to use the jump rope to jump, Yamir prefers to make designs with the jump rope on the ground and in the air. John likes to swing the hula hoop in circles around his arm, but Tim likes to hold the

hula hoop around his waist and pretend that it is a car. These items were placed in the generalization setting during each intervention session.

Video Modeling with a Generalization-Promotion Strategy Intervention (D). The VMs were viewed individually on an iPad before recess in the self-contained classroom. Three VMs, one for each target skill, were set up by the researcher and viewed by each student. Prior to the students going to the generalization setting (outdoor recess area), the researcher made sure that a small section of the outdoor recess area was blocked off for participants and that a few peer models were present to interact with. The researcher also placed preferred items (jump ropes, balls and hula hoops) in the generalization setting. Each student was presented with as many opportunities as possible to perform the target skills in the generalization setting. Factors that maximized opportunities were the presence of preferred activities and peer models, as well as participants wanting to change activities frequently. However, factors that limited opportunities were the small selection of items available to play with and each participant's mood each day. These opportunities were contrived by the data collectors to promote the production of the desired behaviors. For example, for joining an activity, the data collector would suggest activities to the students that peers were engaged in ("Do you want to play _____?"), such as playing tag, playing jump rope or blowing bubbles. The data collector would then allow the student to decide how to go about asking to join his/her peers. For obtaining attention, the data collector would present the student with an activity or task that he/she would need help with, such as zipping a jacket, getting an item from the recess bins or helping to resolve a problem with a peer. Data collectors would also maintain enough distance from the students that they would have to

address them to get their attention. However, depending on their role (IA or PCA), some data collectors needed to be in closer proximity to the students for safety reasons (e.g. elopement, aggression, non-compliance, etc.). For taking turns, the data collector would encourage the student to join in an activity with his/her peers ("Do you want to play _____?)", such as playing with hula hoops, throwing a ball or playing basketball, which required the student and his/her peers to take turns. In all sessions, the data collectors would not provide any prompting or support to the participant. Data for this condition was collected and recorded by the data collectors using event recording. The number of correct responses divided by the total number of opportunities to perform the target skill will produce a percentage of correct responding for each session for each student. The intervention sessions continued until each participant scored 80% correct responding or higher for 3-5 consecutive sessions. Therefore, this intervention condition varied in length for each participant. Each data collector and the researcher completed a fidelity checklist for each intervention session (APPENDIX E).

Maintenance Procedures. After both baseline and intervention conditions were implemented, data continued to be collected by the data collectors every Wednesday for maintenance. Maintenance data was collected anywhere from 0-12 weeks following each intervention condition and was collected using the same frequency data sheets that were used in the baseline and intervention conditions. During this time, the conditions were the same as in baseline, with no video models being shown and no adult prompting or support being provided.

Procedural Fidelity

Procedural fidelity checklists (APPENDIX E) were used to determine the consistency of implementation over all conditions, baseline conditions, intervention conditions and the generalization-promotion condition. The checklist listed the steps for baseline and intervention implementation. The researcher and data collectors checked "Yes" if a step was completed or "No" if a step was not completed.

Procedural fidelity data were collected for all of the sessions of the 71 total data collection sessions, distributed across all conditions of the experiment, for both the data collectors and the researcher. For the initial baseline condition (A) for joining an activity, procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. The total procedural fidelity for the initial baseline condition (A) for joining an activity was 100%. For obtaining attention, initial baseline condition (A) procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. The total procedural fidelity for the initial baseline condition (A) for obtaining attention was 100%. For the initial baseline condition (A) for taking turns, procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. The total procedural fidelity for the initial baseline condition (A) for taking turns was 100%.

Each data collector's and the researcher's procedural fidelity for the intervention condition (B) for joining an activity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. Procedural fidelity for the intervention condition (B) for joining an activity was 100%. For the intervention condition (B) for obtaining attention, procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. Procedural fidelity for the intervention condition (B) for obtaining attention was 100%.

For taking turns, the intervention condition (B) procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. Procedural fidelity for the intervention condition (B) for taking turns was 100%.

For the generalization baseline condition (C) for joining an activity, procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. Procedural fidelity for the generalization baseline condition (C) for joining an activity was 100%. For obtaining attention, generalization baseline condition (C) procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. Procedural fidelity for the generalization baseline condition (C) for obtaining attention was 100%. For the generalization baseline condition (C) for taking turns, procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. Procedural fidelity for the generalization baseline condition (C) for taking turns was 100%.

Each data collector's and the researcher's procedural fidelity for the generalization intervention condition (D) for joining an activity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. Procedural fidelity for the generalization intervention condition (D) for joining an activity was 100%. For the generalization intervention condition (D) for obtaining attention, the procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. Procedural fidelity for the generalization intervention condition (D) for obtaining attention was 100%. For taking turns, the generalization intervention condition (D) procedural fidelity was 100% for Anna, 100% for John, 100% for Tim and 100% for Yamir. Procedural fidelity for the generalization intervention condition (D) for taking turns was 100%.

Social Validity

After the study was completed, parents/guardians and data collectors completed a questionnaire on a 5-point Likert Scale to determine their satisfaction with the intervention, as well as if the target skills from the intervention were being generalized outside of the school environment (APPENDIX B). The 5-point Likert scale ranged from "Strongly Disagree" to "Strongly Agree," with "Disagree," "Neutral" and "Agree" as the in-between options. The parent/guardians and data collectors rated the following ten statements: (1) The social skills addressed in the intervention are important to children with autism; (2) I agree with the procedures of the intervention; (3) The intervention improved the targeted social skills; (4) Video modeling is an effective social skills intervention technique; (5) Identifying generalization-promotion strategies is an effective social skills intervention technique; (6) Video modeling and generalization-promotion strategies are most effective when they are used together; (7) The participants of the study improved their use of social skills throughout the school day; (8) The participants of the study improved their use of social skills in environments outside of school (home, community, etc.); (9) I am happy with the progress reported from the intervention; (10) I will continue to use video modeling and generalization-promotion strategies as an intervention to improve social skills in the future.

This study demonstrated durability during the COVID-19 pandemic. Despite the transition back to "normal" school routines, increased absences and other residual effects of the pandemic, the study resulted in improved social skills acquisition for all participants.

Data Analysis

Visual analysis allowed for an in-depth evaluation of data across all conditions of the study (Ledford et al., 2017). It was used for formative analysis of data throughout a study, which allowed the researcher to make data-based decisions while the study was being conducted. The tools of visual inspection that were considered are stability, level, trend, (non)overlap, immediacy and magnitude. Ledford and Gast (2018) defined stability as predictability and consistency across data points, meaning that there is not much change from one data point to another. For this study, data stability was used to change conditions from baseline to intervention once data were determined to be stable for 3-5 consecutive sessions. Stability considerations relied largely on visual analysis of the trend and level of the data. The trend of the data referred to the slope and direction of the data (Ledford & Gast). In this study, the trend was accelerating and therapeutic; an accelerating trend is therapeutic, or improving, when introducing an intervention to increase social skills acquisition. Similarly, the level was the amount of behavior change that occurred (Ledford et al., 2017). The level remained low in the baseline conditions and increased in the intervention conditions, following a similar pattern to the trend. Another visual analysis tool that was considered is the percentage of non-overlapping data. This tool was used to determine between-condition behavior change and corresponded to the level of the data (Ledford et al., 2017). Immediacy was determined by how quickly behavior changes occurred when the condition changed (Ledford & Gast, 2018). An abrupt change was anticipated and clearly indicated a functional relationship, gradual changes also may suggest a functional relationship when "a) delay is predicted a priori (e.g., as might be the case with some academic skills) (b) latency to change

(number of data points prior to change) is consistent across conditions or tiers, and (c) magnitude of change in level or trend is consistent across conditions or tiers" (Lieberman et al., 2010; Parsonson & Baer, 1978). Lastly, the magnitude, or amount of behavior change, considered the trend and level of the data and resulted in a large and socially valid rating (Ledford & Gast, 2018).

Ledford and Gast (2018) suggested that a convincing functional relationship can be determined by consistent changes in baseline and intervention conditions. These changes were abrupt and concurrent with condition changes; however, these changes were not seen in baseline conditions, only treatment phases. Visual analysis also demonstrated a functional relationship when overlap was minimal, and variability and trends in any condition did not make it impossible to see between-condition changes. In this study, we saw a functional relationship between VM and social skills generalization. The baseline condition demonstrated the need for an intervention, by visually representing how little the student participants engage in the target skills. Once the intervention was introduced, the student participants showed an increase in demonstrating the target skills before going back to second baseline condition, where little to no target skills were being documented. The second intervention condition showed a slight increase from the first, due to the student participants' familiarity with the procedures and increased comfortability with producing the target skills. The generalization-promotion condition showed an increase from both intervention conditions, suggesting that generalization-promotion strategies do increase the generalization of social skills for students with ASD.

CHAPTER 4: RESULTS

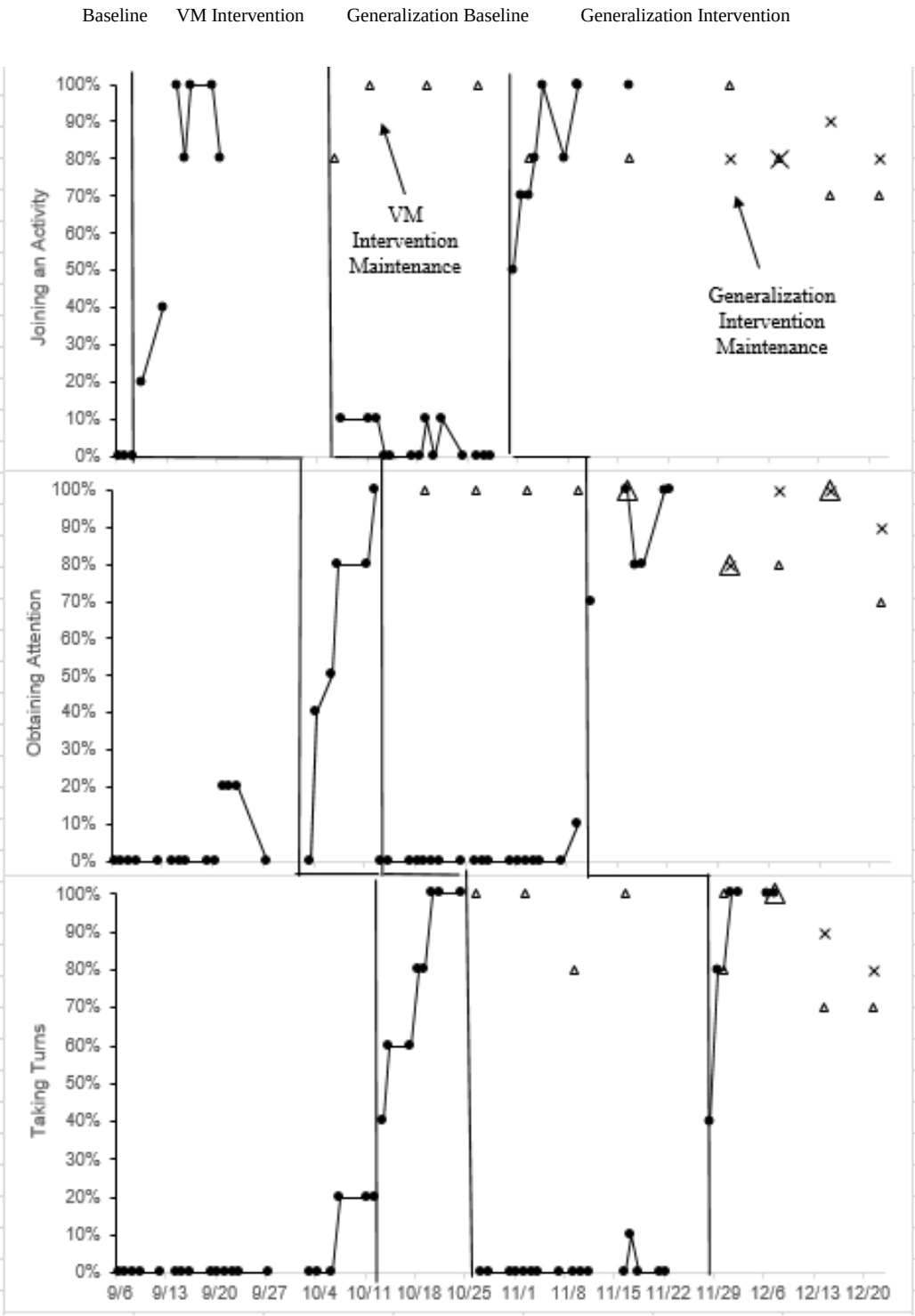
The results of the video modeling and generalization-promotion strategies intervention are described below for each participant. Visual analysis tools, including stability, level, trend, (non)overlap, immediacy and magnitude, are used in conjunction with graphs to describe each participants' outcomes for each phase of the study. Maintenance data is also documented on each participant's graph for each phase of the study. Social validity data results are presented for each data collector and each participant's parent/guardian.

Anna

Figure 1 displays the data collected for each phase of the study for Anna. Initial baseline data was collected in the self-contained AS classroom. This data showed a need for intervention for all three behaviors. The average initial baseline accuracy for Anna were 0% for joining an activity, 0% for obtaining attention and 4% (range 0%-20%) for taking turns. This demonstrated a low level of accuracy for each behavior. The overall trend for each baseline was stable, with low variability between baseline probes.

Figure 1

Study Data for Anna



The VM intervention for joining an activity was introduced first in the self-contained AS classroom. VM intervention data showed an immediate change from the initial baseline condition to the VM intervention condition. There were no overlapping data between the initial baseline condition and the VM intervention condition for joining an activity. Baseline data for joining an activity was a low accuracy of 0%, while VM intervention data produced a high accuracy average of 74% (range 20%-100%). VM intervention data for joining an activity reached stability (80%-100%) after five consecutive data collection sessions. The trend for the VM intervention data for joining an activity is accelerating and therapeutic, and the level is high for producing the desired behavior of joining an activity. Although an abrupt change did not occur, there was a 20% increase in accuracy right away from the initial baseline condition to the VM intervention condition, and the trend continued to accelerate from there. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 0% accuracy in the initial baseline condition to an average accuracy of 74% in the VM intervention condition.

The VM intervention for obtaining attention was then introduced in the self-contained AS classroom. VM intervention data showed an immediate initial change from the initial baseline condition to the VM intervention condition. There were two overlapping data points between the initial baseline condition and the VM intervention condition for obtaining attention both at 0%. Baseline data for obtaining attention was a low accuracy of 0%, while VM intervention data produced a high accuracy average of 51% (range 0%-100%). VM intervention data for obtaining attention reached stability (80%-100%) after five consecutive data collection sessions. The trend for the VM

intervention data for obtaining attention began as decelerating and contra-therapeutic, but quickly changed to accelerating and therapeutic, and the level is high for producing the desired behavior of obtaining attention. Although an abrupt change did not occur, there was a 20% increase in accuracy right away from the initial baseline condition to the VM intervention condition, and the trend briefly decelerated then accelerated from there. A moderate magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 0% accuracy in the initial baseline condition to an average accuracy of 51% in the VM intervention condition.

The VM intervention for taking turns was introduced last in the self-contained AS classroom. VM intervention data showed an immediate initial change from the initial baseline condition to the VM intervention condition. There were no overlapping data between the initial baseline condition and the VM intervention condition for taking turns. Baseline data for taking turns was a low accuracy average of 4% (range 0%-20%), while VM intervention data produced a high accuracy average of 78% (range 40%-100%). VM intervention data for taking turns reached stability (80%-100%) after five consecutive data collection sessions. The trend for the VM intervention data for taking turns is accelerating and therapeutic, and the level is high for producing the desired behavior of taking turns. Although an abrupt change did not occur, there was a 20% increase in accuracy from the initial baseline condition to the VM intervention condition, and the trend accelerated from there. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 4% accuracy in the initial baseline condition to an average accuracy of 78% in the VM intervention condition.

Generalization data showed a need for further intervention for all three behaviors. The average generalization baseline accuracy for Anna were 4% (range 0%-10%) for joining an activity, 1% (range 0%-10%) for obtaining attention and 1% (range 0%-10%) for taking turns. This demonstrated a low level of accuracy for each behavior. The overall trend for each generalization baseline was stable, with low variability between baseline probes.

After generalization baseline data was collected, a generalization-promotion survey was completed for Anna by the data collectors. The results of the generalization-promotion survey revealed that noise level and number of people were an inhibitor for Anna, as well as access to preferred items. Therefore, the generalization setting was limited to a small section of the outdoor recess area with only peer models and participants present. A preference assessment was also given to the data collectors for Anna to provide preferred items in the generalization setting. The preference assessment suggested that Anna enjoyed playing with hula hoops, jump ropes and balls. These items were included in the generalization setting during the generalization-promotion intervention.

The generalization-promotion intervention condition for joining an activity was introduced first. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for joining an activity. Generalization baseline data for joining an activity was a low accuracy average of 4%

(range 0%-10%), while the generalization-promotion intervention condition produced a high accuracy average of 81% (range 50%-100%). Generalization-promotion intervention data for joining an activity reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the generalization-promotion intervention data for joining an activity was accelerating and therapeutic, and the level was high for producing the desired behavior of joining an activity. An abrupt change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 50% increase in accuracy, and the trend continued to accelerate from there. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 4% accuracy in the generalization baseline condition to an average accuracy of 81% in the generalization-promotion intervention condition.

The generalization-promotion intervention condition for obtaining attention was then introduced. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for obtaining attention. Generalization baseline data for obtaining attention was a low accuracy average of 1% (range 0%-10%), while the generalization-promotion intervention condition produced a high accuracy average of 88% (range 70%-100%). Generalization-promotion intervention data for obtaining attention reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the generalization-promotion intervention data for

obtaining attention is accelerating and therapeutic, and the level is high for producing the desired behavior of obtaining attention. An abrupt change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 60% increase in accuracy, and the trend continued to accelerate. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 1% accuracy in the generalization baseline condition to an average accuracy of 88% in the generalization-promotion intervention condition.

The generalization-promotion intervention condition for taking turns was introduced last. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for taking turns. Generalization baseline data for taking turns was a low accuracy average of 1% (range 0%-10%), while the generalization-promotion intervention condition produced a high accuracy average of 83% (range 70%-100%). Generalization-promotion intervention data for taking turns reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the generalization-promotion intervention data for taking turns was accelerating and therapeutic, and the level is high for producing the desired behavior of taking turns. An abrupt change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 40% increase in accuracy right away, and the trend continued to accelerate from there. A large magnitude of change occurred

between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 1% accuracy in the generalization baseline condition to an average accuracy of 83% in the generalization-promotion intervention condition.

Anna's results show substantial improvement in accuracy for all three behaviors from the initial baseline to the VM intervention, as well as from the generalization baseline to the generalization-promotion intervention. Skill acquisition for Anna occurred more quickly from the generalization baseline condition to the generalization-promotion intervention conditioned, than it did from the initial baseline condition to the VM intervention condition. Anna's overall level of accuracy went from less than 10% in all three behaviors during the initial baseline phase, to over 50% with the introduction of a VM intervention and over 80% when a generalization-promotion strategy was added. This demonstrates a functional relationship between using VMs and generalization-promotion strategies and increasing Anna's ability to acquire social skills, such as joining an activity, obtaining attention and taking turns.

Maintenance data was collected for Anna for the VM intervention condition and the generalization-promotion intervention condition. Data was collected every Wednesday following achieved stability in each condition. VM intervention maintenance data for joining an activity was collected for 10 weeks following the completion of the intervention, with an average accuracy of 88% (range 70%-100%). VM intervention maintenance data for obtaining attention was collected for 9 weeks following the completion of the intervention, with an average accuracy of 81% (range 70%-100%). VM intervention maintenance data for taking turns was collected for 7 weeks following the

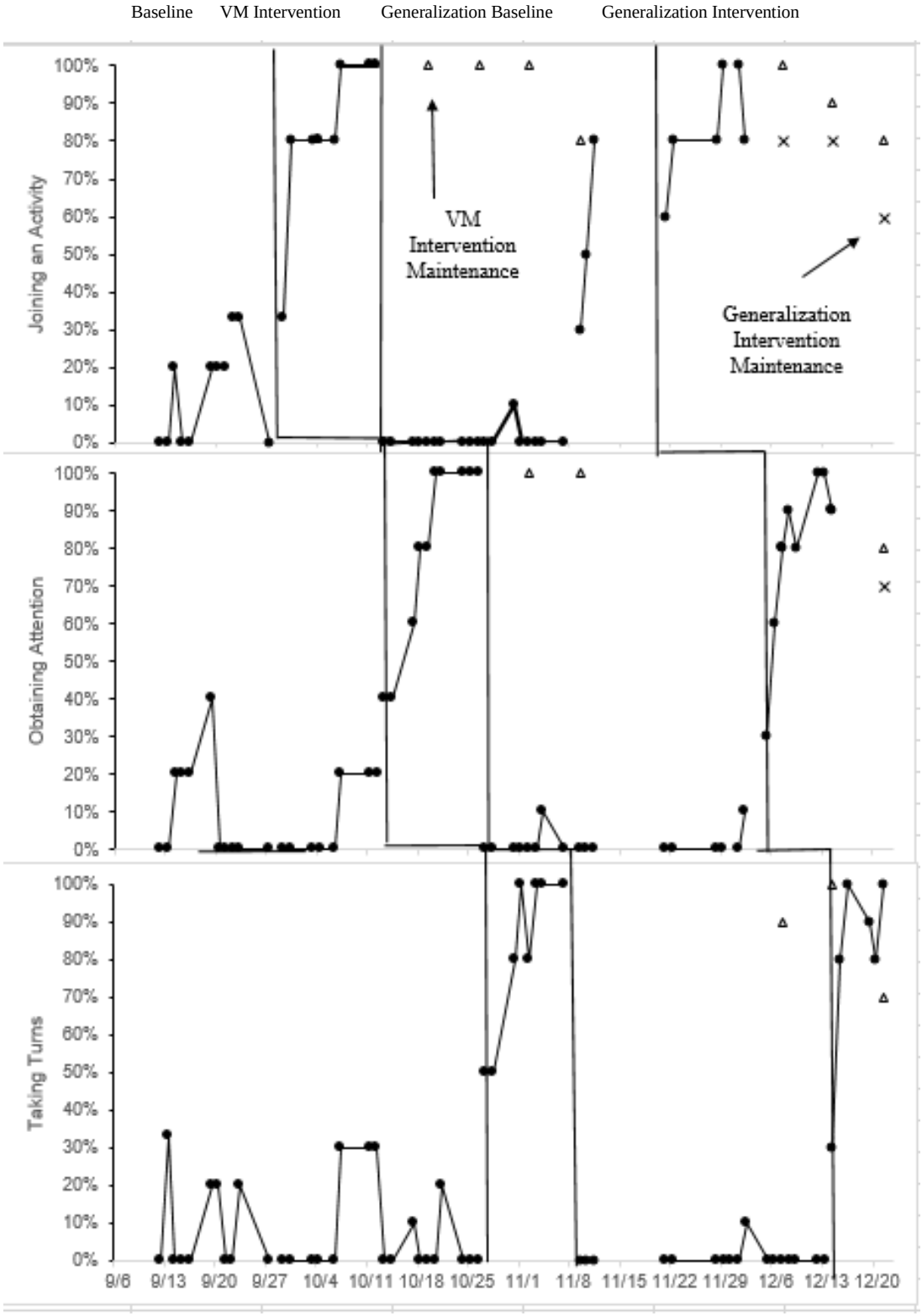
completion of the intervention, with an average accuracy of 89% (range 70%-100%). Generalization-promotion intervention maintenance data for joining an activity was collected for 5 weeks following the completion of the intervention, with an average accuracy of 86% (range 80%-100%). Generalization-promotion intervention maintenance data for obtaining attention was collected for 4 weeks following the completion of the intervention, with an average accuracy of 93% (range 80%-100%). Generalization-promotion intervention maintenance data for taking turns was collected for 3 weeks following the completion of the intervention, with an average accuracy of 90% (range 80%-100%). Overall, Anna remained in the 70%-100% accuracy range across all 3 behaviors using a VM intervention and remained in the 80%-100% accuracy range across all 3 behaviors using a VM intervention and generalization-promotion strategies.

John

Figure 2 displays the data collected for each phase of the study for John. Initial baseline data was collected in the self-contained AS classroom. This data showed a need for intervention for all three behaviors. The average initial baseline accuracy for John were 10% (range 0%-20%) for joining an activity, 8% (range 0%-40%) for obtaining attention and 7% (range 0%-33%) for taking turns. This demonstrated a low level of accuracy for each behavior. The overall trend for each baseline was stable, with low variability between baseline probes.

Figure 2

Study Data for John



The VM intervention for joining an activity was introduced first in the self-contained AS classroom. VM intervention data showed an immediate change from the initial baseline condition to the VM intervention condition. There was one overlapping data point between the initial baseline condition and the VM intervention condition for joining an activity at 0%. Baseline data for joining an activity was a low accuracy of 10%, while VM intervention data produced a moderate accuracy average of 65% (range 0%-100%). VM intervention data for joining an activity reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the VM intervention data for joining an activity began as accelerating and therapeutic, briefly decelerated and became contra-therapeutic, and then returned to accelerating and therapeutic. The level was high for producing the desired behavior of joining an activity. Although an abrupt change did not occur right away, there was a 10% increase in accuracy right away from the initial baseline condition to the VM intervention condition, and the trend continued to accelerate from there, despite a small decline initially. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 10% accuracy in the initial baseline condition to an average accuracy of 65% in the VM intervention condition.

The VM intervention for obtaining attention was then introduced in the self-contained AS classroom. VM intervention data showed an immediate initial change from the initial baseline condition to the VM intervention condition. There were two overlapping data points between the initial baseline condition and the VM intervention condition for obtaining attention both at 40%. Baseline data for obtaining attention was a low accuracy of 8%, while VM intervention data produced a high accuracy average of

80% (range 40%-100%). VM intervention data for obtaining attention reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the VM intervention data for obtaining attention is accelerating and therapeutic, and the level is high for producing the desired behavior of obtaining attention. Although an abrupt change did not occur, there was a 20% increase in accuracy from the initial baseline condition to the VM intervention condition, and the trend accelerated from there. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 8% accuracy in the initial baseline condition to an average accuracy of 80% in the VM intervention condition.

The VM intervention for taking turns was introduced last in the self-contained AS classroom. VM intervention data showed an immediate initial change from the initial baseline condition to the VM intervention condition. There were no overlapping data points between the initial baseline condition and the VM intervention condition for taking turns. Baseline data for taking turns was a low accuracy average 7% (range 0%-33%), while VM intervention data produced a high accuracy average of 83% (range 50%-100%). VM intervention data for taking turns reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the VM intervention data for taking turns is accelerating and therapeutic, and the level is high for producing the desired behavior of taking turns. An abrupt change did occur, with a 50% increase in accuracy from the initial baseline condition to the VM intervention condition, followed by an accelerating trend. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 7% accuracy in the

initial baseline condition to an average accuracy of 83% in the VM intervention condition.

Generalization baseline data was then collected in the generalization setting (outdoor recess area. This data showed a need for intervention for all three behaviors. The average generalization baseline accuracy for John were 1% (0%-10%) for joining an activity, 1% (0%-10%) for obtaining attention and 1% (0%-10%) for taking turns. This demonstrated a low level of accuracy for each behavior. The overall trend for each generalization baseline was stable, with low variability between baseline probes.

The results of the generalization-promotion survey revealed that noise level and number of people were an inhibitor for John, as well as access to preferred items. Therefore, the generalization setting was limited to a small section of the outdoor recess area with only peer models and participants present. A preference assessment was also given to the data collectors for John to provide preferred items in the generalization setting. The preference assessment suggested that John enjoys playing with hula hoops, jump ropes and balls. These items will be included in the generalization setting during the generalization-promotion intervention.

The generalization-promotion intervention condition for joining an activity was introduced first. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for joining an activity. Generalization baseline data for joining an activity was a low accuracy average of 1%

(range 0%-10%), while the generalization-promotion intervention condition produced a high accuracy average of 73% (range 30%-100%). Generalization-promotion intervention data for joining an activity reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the generalization-promotion intervention data for joining an activity is accelerating and therapeutic, and the level is high for producing the desired behavior of joining an activity. An abrupt change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 30% increase in accuracy, and the trend continued to accelerate from there, with a brief 20% decrease during the first few sessions of this condition. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 1% accuracy in the generalization baseline condition to an average accuracy of 73% in the generalization-promotion intervention condition.

The generalization-promotion intervention condition for obtaining attention was then introduced. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for obtaining attention. Generalization baseline data for obtaining attention was a low accuracy average of 1% (range 0%-10%), while the generalization-promotion intervention condition produced a high accuracy average of 79% (range 30%-100%). Generalization-promotion intervention data for obtaining attention reached stability (80%-100%) after 5 consecutive data

collection sessions. The trend for the generalization-promotion intervention data for obtaining attention is accelerating and therapeutic, with a small 10% decrease in the beginning of the condition, and the level is high for producing the desired behavior of obtaining attention. A slight change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 20% increase in accuracy followed by an accelerating trend. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 1% accuracy in the generalization baseline condition to an average accuracy of 79% in the generalization-promotion intervention condition.

The generalization-promotion intervention condition for taking turns was introduced last. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for taking turns. Generalization baseline data for taking turns was a low accuracy average of 1% (range 0%-10%), while the generalization-promotion intervention condition produced a high accuracy average of 80% (range 30%-100%). Generalization-promotion intervention data for taking turns reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the generalization-promotion intervention data for taking turns was accelerating and therapeutic, and the level was high for producing the desired behavior of taking turns. An abrupt change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 30% increase in accuracy right away, and

the trend continued to accelerate. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 1% accuracy in the generalization baseline condition to an average accuracy of 80% in the generalization-promotion intervention condition.

A summary of John's results shows that there was a substantial improvement in accuracy for all three behaviors from the initial baseline to the VM intervention, as well as from the generalization baseline to the generalization-promotion intervention. Skill acquisition for John occurred more quickly from the generalization baseline condition to the generalization-promotion intervention conditioned, than it did from the initial baseline condition to the VM intervention condition. John's overall level of accuracy went from 10% or less in all three behaviors during the initial baseline phase, to over 60% with the introduction of a VM intervention and over 70% when a generalization-promotion strategy was added. This indicated a functional relationship between VMs and generalization-promotion to improve John's social skills for joining an activity, obtaining attention, and taking turns.

Maintenance data was collected for John for the VM intervention condition and the generalization-promotion intervention condition. Data was collected every Wednesday following achieved stability in each condition. VM intervention maintenance data for joining an activity was collected for seven weeks following the completion of the intervention, with an average accuracy of 93% (range 80%-100%). VM intervention maintenance data for obtaining attention was collected for 5 weeks following the completion of the intervention, with an average accuracy of 90% (range 80%-100%). VM intervention maintenance data for taking turns was collected for 3 weeks following the

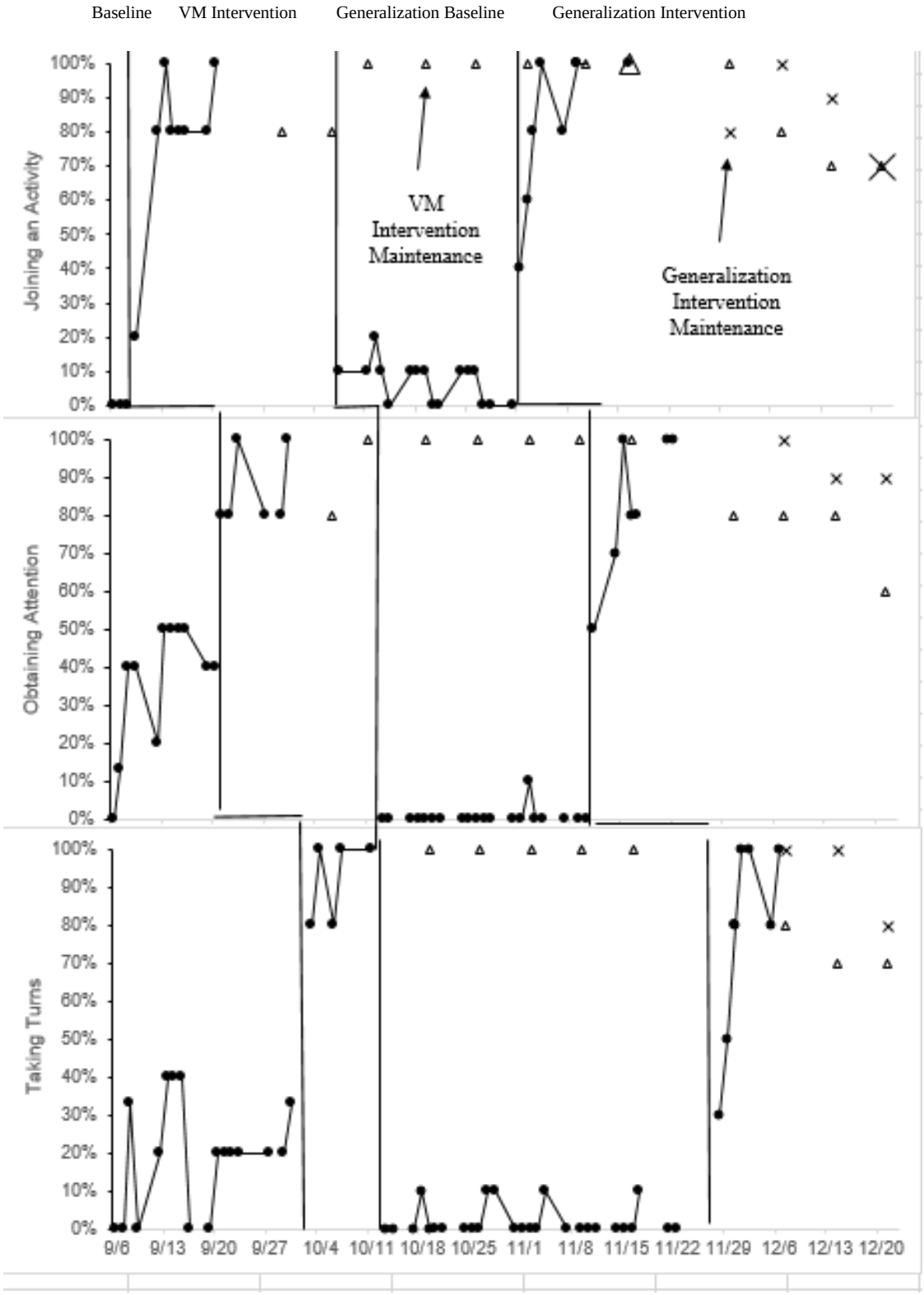
completion of the intervention, with an average accuracy of 87% (range 70%-100%). Generalization-promotion intervention maintenance data for joining an activity was collected for 3 weeks following the completion of the intervention, with an average accuracy of 73% (range 60%-80%). Generalization-promotion intervention maintenance data for obtaining attention was collected for one week following the completion of the intervention, with an accuracy of 70%. Generalization-promotion intervention maintenance data for taking turns was not collected. Overall, John remained in the 70%-100% accuracy range across all 3 behaviors using a VM intervention and remained in the 60%-70% accuracy range across all 3 behaviors using a VM intervention and generalization-promotion strategies.

Tim

Figure 3 displays the data collected for each phase of the study for Tim. Initial baseline data was collected in the self-contained AS classroom. This data showed a need for intervention for all three behaviors. The average initial baseline accuracy for Tim were 0% for joining an activity, 36% (range 0%-50%) for obtaining attention and 19% (range 0%-40%) for taking turns. This demonstrated a low level of accuracy for each behavior. The overall trend for each baseline was stable, with low variability between baseline probes.

Figure 3

Study Data for Tim



The VM intervention for joining an activity was introduced first in the self-contained AS classroom. VM intervention data showed an immediate change from the initial baseline

condition to the VM intervention condition. There were no overlapping data points between the initial baseline condition and the VM intervention condition for joining an activity. Baseline data for joining an activity was a low accuracy of 0%, while VM intervention data produced a moderate accuracy average of 78% (range 20%-100%). VM intervention data for joining an activity reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the VM intervention data for joining an activity was accelerating and therapeutic. The level is high for producing the desired behavior of joining an activity. Although an abrupt change did not occur, there was a 20% increase in accuracy right away from the initial baseline condition to the VM intervention condition, and the trend continued to accelerate from there. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 0% accuracy in the initial baseline condition to an average accuracy of 78% in the VM intervention condition.

The VM intervention for obtaining attention was then introduced in the self-contained AS classroom. VM intervention data showed an immediate change from the initial baseline condition to the VM intervention condition. There were no overlapping data between the initial baseline condition and the VM intervention condition for obtaining attention. Baseline data for obtaining attention was a low accuracy of 36%, while VM intervention data produced a high accuracy average of 87% (range 80%-100%). VM intervention data for obtaining attention reached stability (80%-100%) after

5 consecutive data collection sessions. The trend for the VM intervention data for obtaining attention is accelerating and therapeutic, and the level is high for producing the desired behavior of obtaining attention. An abrupt change occurred, there was a 40% increase in accuracy from the initial baseline condition to the VM intervention condition, and the trend accelerated from there. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 36% accuracy in the initial baseline condition to an average accuracy of 87% in the VM intervention condition.

The VM intervention for taking turns was introduced last in the self-contained AS classroom. VM intervention data showed an immediate initial change from the initial baseline condition to the VM intervention condition. There were no overlapping data points between the initial baseline condition and the VM intervention condition for taking turns. Baseline data for taking turns was a low accuracy average 19%, while VM intervention data produced a high accuracy average of 92% (range 80%-100%). VM intervention data for taking turns reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the VM intervention data for taking turns is accelerating and therapeutic, and the level is high for producing the desired behavior of taking turns. An abrupt change did occur, with a 47% increase in accuracy from the initial baseline condition to the VM intervention condition, and the trend subsequently accelerated. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 19% accuracy in the initial baseline condition to an average accuracy of 92% in the VM intervention condition.

Generalization baseline data was then collected in the generalization setting (outdoor recess area. This data showed a need for intervention for all three behaviors. The average generalization baseline accuracy for Tim were 7% (0%-20%) for joining an activity, 1% (0%-10%) for obtaining attention and 2% (0%-10%) for taking turns. This demonstrated a low level of accuracy for each behavior. The overall trend for each generalization baseline was stable, with low variability between baseline probes.

The results of the generalization-promotion survey revealed that noise level and number of people were an inhibitor for Tim, as well as access to preferred items. Therefore, the generalization setting was limited to a small section of the outdoor recess area with only peer models and participants present. A preference assessment was also given to the data collectors for Tim to provide preferred items in the generalization setting. The preference assessment suggested that Tim enjoys playing with hula hoops, jump ropes and balls. These items will be included in the generalization setting during the generalization-promotion intervention.

The generalization-promotion intervention condition for joining an activity was introduced first. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for joining an activity. Generalization baseline data for joining an activity was a low accuracy average of 7% (range 0%-20%), while the generalization-promotion intervention condition produced a high accuracy average of 80% (range 40%-100%). Generalization-promotion intervention

data for joining an activity reached stability (80%-100%) after five consecutive data collection sessions. The trend for the generalization-promotion intervention data for joining an activity is accelerating and therapeutic, and the level is high for producing the desired behavior of joining an activity. An abrupt change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 40% increase in accuracy, then the trend continued to accelerate. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 7% accuracy in the generalization baseline condition to an average accuracy of 80% in the generalization-promotion intervention condition.

The generalization-promotion intervention condition for obtaining attention was then introduced. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for obtaining attention. Generalization baseline data for obtaining attention was a low accuracy average of 1% (range 0%-10%), while the generalization-promotion intervention condition produced a high accuracy average of 83% (range 50%-100%). Generalization-promotion intervention data for obtaining attention reached stability (80%-100%) after five consecutive data collection sessions. The trend for the generalization-promotion intervention data for obtaining attention is accelerating and therapeutic, and the level is high for producing the desired behavior of obtaining attention. An abrupt change occurred between the

generalization baseline condition and the generalization-promotion intervention, with a 50% increase in accuracy right away, and the trend continued to accelerate from there. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 1% accuracy in the generalization baseline condition to an average accuracy of 83% in the generalization-promotion intervention condition.

The generalization-promotion intervention condition for taking turns was introduced last. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for taking turns. Generalization baseline data for taking turns was a low accuracy average of 1% (range 0%-10%), while the generalization-promotion intervention condition produced a high accuracy average of 80% (range 30%-100%). Generalization-promotion intervention data for taking turns reached stability (80%-100%) after five consecutive data collection sessions. The trend for the generalization-promotion intervention data for taking turns is accelerating and therapeutic, and the level is high for producing the desired behavior of taking turns. An abrupt change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 30% increase in accuracy right away, and the trend continued to accelerate from there. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 1% accuracy in the generalization baseline

condition to an average accuracy of 80% in the generalization-promotion intervention condition.

A summary of Tim's results show substantial improvement in accuracy for all three behaviors from the initial baseline to the VM intervention, as well as from the generalization baseline to the generalization-promotion intervention. Skill acquisition for Tim occurred more quickly from the generalization baseline condition to the generalization-promotion intervention condition, than it did from the initial baseline condition to the VM intervention condition. Tim's overall level of accuracy went from 36% or less in all three behaviors during the initial baseline phase, to over 75% with the introduction of a VM intervention and 80% or more when a generalization-promotion strategy was added. This indicated a functional relationship between using VMs and generalization-promotion strategies and increasing Tim's ability to acquire social skills, such as joining an activity, obtaining attention and taking turns.

Maintenance data was collected for Tim for the VM intervention condition and the generalization-promotion intervention condition. Data was collected every Wednesday following achieved stability in each condition. VM intervention maintenance data for joining an activity was collected for 12 weeks following the completion of the intervention, with an average accuracy of 90% (range 70%-100%). VM intervention maintenance data for obtaining attention was collected for 11 weeks following the completion of the intervention, with an average accuracy of 89% (range 60%-100%). VM intervention maintenance data for taking turns was collected for 9 weeks following the completion of the intervention, with an average accuracy of 89% (range 70%-100%). Generalization-promotion intervention maintenance data for joining an activity was

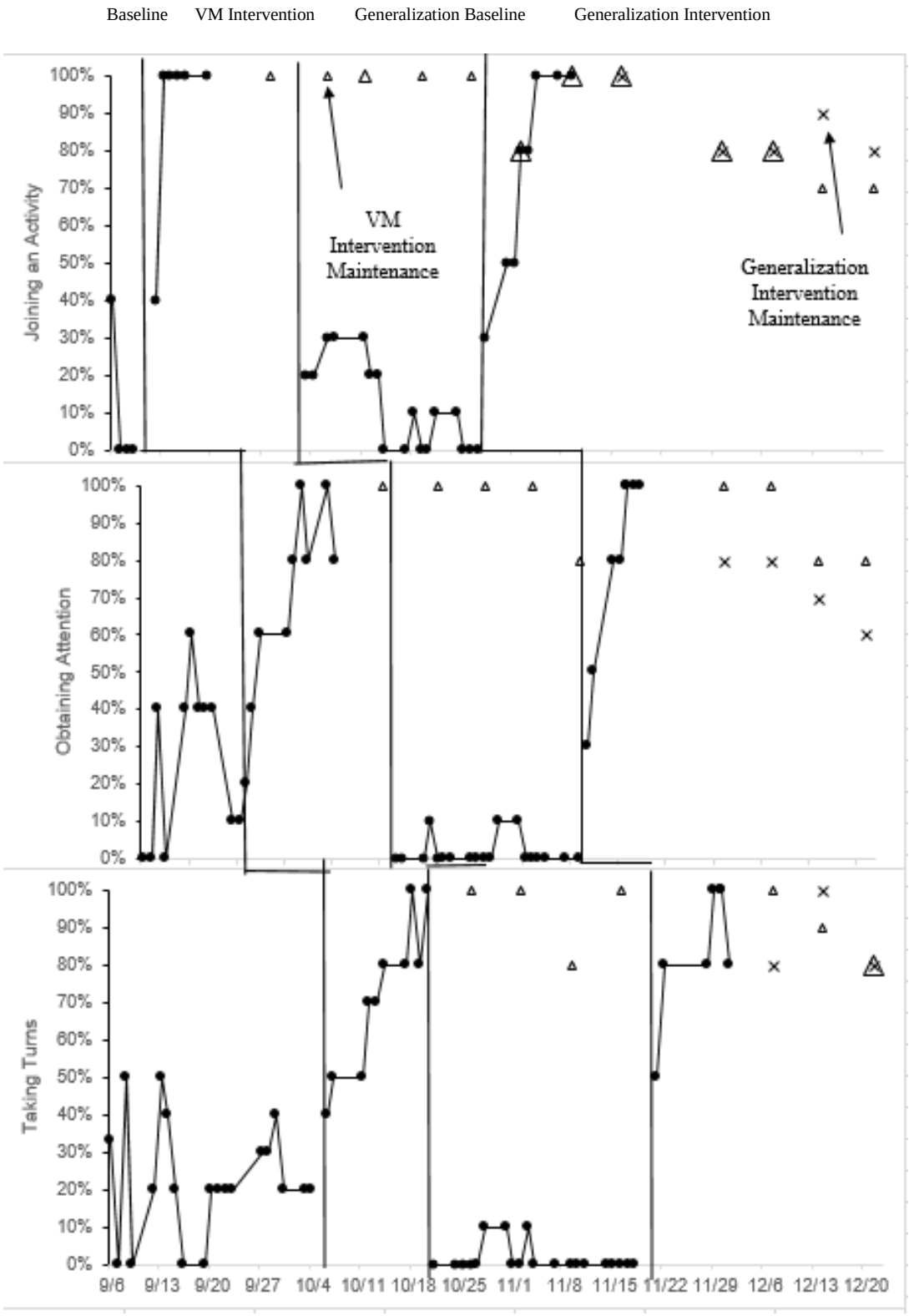
collected for 5 weeks following the completion of the intervention, with an average accuracy of 88% (range 70%-100%). Generalization-promotion intervention maintenance data for obtaining attention was collected for 3 weeks following the completion of the intervention, with an accuracy of 93% (range 90%-100%). Generalization-promotion intervention maintenance data for taking turns was collected for 2 weeks following the completion of the intervention, with an accuracy of 90% (range 80%-100%). Overall, Tim remained in the 60%-100% accuracy range across all 3 behaviors using a VM intervention and remained in the 70%-100% accuracy range across all 3 behaviors using a VM intervention and generalization-promotion strategies.

Yamir

Figure 4 displays the data collected for each phase of the study for Yamir. Initial baseline data was collected in the self-contained AS classroom. This data showed a need for intervention for all three behaviors. The average initial baseline accuracy for Yamir were 10% (range 0%-40%) for joining an activity, 27% (range 0%-60%) for obtaining attention and 25% (range 0%-50%) for taking turns. This demonstrated a low level of accuracy for each behavior. The overall trend for each baseline was stable, with low variability between baseline probes.

Figure 4

Study Data for Yamir



The VM intervention for joining an activity was introduced first in the self-contained AS classroom. VM intervention data showed an immediate change from the initial baseline condition to the VM intervention condition. There was one overlapping data point between the initial baseline condition and the VM intervention condition for joining an activity at 40%. Baseline data for joining an activity was a low accuracy of 10%, while VM intervention data produced a high accuracy average of 90% (range 40%-100%). VM intervention data for joining an activity reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the VM intervention data for joining an activity was accelerating and therapeutic. The level was high for producing the desired behavior of joining an activity. An abrupt change did occur was indicated by a 40% increase in accuracy from the initial baseline condition to the VM intervention condition, and the trend continued to accelerate from there. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 10% accuracy in the initial baseline condition to an average accuracy of 90% in the VM intervention condition.

The VM intervention for obtaining attention was then introduced in the self-contained AS classroom. VM intervention data showed an immediate initial change from the initial baseline condition to the VM intervention condition. There were three overlapping data points between the initial baseline condition and the VM intervention condition for obtaining attention, with two at 40% and one at 60%. Baseline data for obtaining attention was a low accuracy of 27%, while VM intervention data produced a moderate accuracy average of 63% (range 10%-100%). VM intervention data for obtaining attention reached stability (80%-100%) after 5 consecutive data collection

sessions. The trend for the VM intervention data for obtaining attention is accelerating and therapeutic, and the level was high for producing the desired behavior of obtaining attention. An abrupt change did not occur, with only a 10% increase in accuracy from the initial baseline condition to the VM intervention condition, and the trend accelerated from there. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 27% accuracy in the initial baseline condition to an average accuracy of 63% in the VM intervention condition.

The VM intervention for taking turns was introduced last in the self-contained AS classroom. VM intervention data showed an immediate initial change from the initial baseline condition to the VM intervention condition. There were three overlapping data points between the initial baseline condition and the VM intervention condition for taking turns, two at 50% and one at 40%. Baseline data for taking turns was a low accuracy average 25%, while VM intervention data produced a high accuracy average of 72% (range 40%-100%). VM intervention data for taking turns reached stability (80%-100%) after five consecutive data collection sessions. The trend for the VM intervention data for taking turns is accelerating and therapeutic, and the level is high for producing the desired behavior of taking turns. An abrupt change did not occur, with a 20% increase in accuracy from the initial baseline condition to the VM intervention condition, and the trend accelerated from there. A large magnitude of change occurred between the initial baseline condition and the VM intervention condition, from an average of 25% accuracy in the initial baseline condition to an average accuracy of 72% in the VM intervention condition.

Generalization baseline data was then collected in the generalization setting (outdoor recess area. This data showed a need for intervention for all three behaviors. The average generalization baseline accuracy for Yamir were 12% (0%-30%) for joining an activity, 2% (0%-10%) for obtaining attention and 2% (0%-10%) for taking turns. This demonstrated a low level of accuracy for each behavior. The overall trend for each generalization baseline was stable, with low variability between baseline probes.

The results of the generalization-promotion survey revealed that noise level and number of people were an inhibitor for Yamir, as well as access to preferred items. Therefore, the generalization setting was limited to a small section of the outdoor recess area with only peer models and participants present. A preference assessment was also given to the data collectors for Yamir to provide preferred items in the generalization setting. The preference assessment suggested that Yamir enjoys playing with hula hoops, jump ropes and balls. These items will be included in the generalization setting during the generalization-promotion intervention.

The generalization-promotion intervention condition for joining an activity was introduced first. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There was one overlapping data point between the generalization baseline condition and the generalization-promotion intervention condition for joining an activity at 30%. Generalization baseline data for joining an activity was a low accuracy average of 12%, while the generalization-promotion intervention condition produced a high accuracy average of 74% (range 30%-100%). Generalization-promotion intervention data for

joining an activity reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the generalization-promotion intervention data for joining an activity is accelerating and therapeutic, and the level is high for producing the desired behavior of joining an activity. A slight change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 30% increase in accuracy, and the trend continued to accelerate from there. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 12% accuracy in the generalization baseline condition to an average accuracy of 74% in the generalization-promotion intervention condition.

The generalization-promotion intervention condition for obtaining attention was then introduced. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for obtaining attention. Generalization baseline data for obtaining attention was a low accuracy average of 2%, while the generalization-promotion intervention condition produced a high accuracy average of 77% (range 30%-100%). Generalization-promotion intervention data for obtaining attention reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the generalization-promotion intervention data for obtaining attention is accelerating and therapeutic, and the level is high for producing the desired behavior of obtaining attention. A slight change occurred between the generalization

baseline condition and the generalization-promotion intervention, with a 30% increase in accuracy, and the trend continued to accelerate. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention condition, from an average of 2% accuracy in the generalization baseline condition to an average accuracy of 77% in the generalization-promotion intervention condition.

The generalization-promotion intervention condition for taking turns was introduced last. This data was collected in the generalization setting (outdoor recess area). Generalization-promotion intervention data showed an immediate change from the generalization baseline condition to the generalization-promotion intervention condition. There were no overlapping data points between the generalization baseline condition and the generalization-promotion intervention condition for taking turns. Generalization baseline data for taking turns was a low accuracy average of 2%, while the generalization-promotion intervention condition produced a high accuracy average of 82% (range 50%-100%). Generalization-promotion intervention data for taking turns reached stability (80%-100%) after 5 consecutive data collection sessions. The trend for the generalization-promotion intervention data for taking turns is accelerating and therapeutic, and the level is high for producing the desired behavior of taking turns. An abrupt change occurred between the generalization baseline condition and the generalization-promotion intervention, with a 50% increase in accuracy, and the trend continued to accelerate. A large magnitude of change occurred between the generalization baseline condition and the generalization-promotion intervention

condition, from an average of 2% accuracy in the generalization baseline condition to an average accuracy of 82% in the generalization-promotion intervention condition.

A summary of Yamir's results shows that there was a significant improvement in accuracy for all three behaviors from the initial baseline to the VM intervention, as well as from the generalization baseline to the generalization-promotion intervention. Skill acquisition for Yamir occurred more quickly from the generalization baseline condition to the generalization-promotion intervention condition when compared to the initial baseline condition to the VM intervention condition. Yamir's overall level of accuracy went from less than 30% in all three behaviors during the initial baseline phase, to over 60% with the introduction of a VM intervention and 74% or more when a generalization-promotion strategy was added. This indicates a functional relationship between VMs and generalization-promotion strategies and Yamir's social skills to join an activity, obtain attention and take turns.

Maintenance data was collected for Yamir for the VM intervention condition and the generalization-promotion intervention condition. Data was collected every Wednesday following achieved stability in each condition. VM intervention maintenance data for joining an activity was collected for 12 weeks following the completion of the intervention, with an average accuracy of 90% (range 70%-100%). VM intervention maintenance data for obtaining attention was collected for 10 weeks following the completion of the intervention, with an average accuracy of 94% (range 80%-100%). VM intervention maintenance data for taking turns was collected for eight weeks following the completion of the intervention, with an average accuracy of 94% (range 80%-100%). Generalization-promotion intervention maintenance data for joining an activity was

collected for five weeks following the completion of the intervention, with an average accuracy of 86% (range 80%-100%). Generalization-promotion intervention maintenance data for obtaining attention was collected for four weeks following the completion of the intervention, with an accuracy of 73% (range 60%-80%). Generalization-promotion intervention maintenance data for taking turns was collected for three weeks following the completion of the intervention, with an accuracy of 87% (range 80%-100%). Overall, Yamir remained in the 90%-100% accuracy range across all three behaviors using a VM intervention and remained in the 70%-90% accuracy range across all three behaviors using a VM intervention and generalization-promotion strategies.

Ledford and Gast (2018) suggested that a convincing functional relationship can be determined by consistent changes in baseline and intervention conditions. These changes were abrupt and concurrent with condition changes; however, these changes were not seen in baseline conditions, only treatment phases. Visual analysis also demonstrated a functional relationship when overlap was minimal, and variability and trends in any condition did not make it impossible to see between-condition changes. In this study, we saw a functional relationship between VM and social skills generalization. The baseline condition demonstrated the need for an intervention, by visually representing how little the student participants engage in the target skills. Once the intervention was introduced, the student participants showed an increase in demonstrating the target skills before going back to second baseline condition, where little to no target skills were being documented. The second intervention condition showed a slight increase from the first, due to the student participants' familiarity with the procedures and increased comfortability with producing the target skills. The generalization-promotion

condition showed an increase from both intervention conditions, suggesting that generalization-promotion strategies do increase the generalization of social skills for students with ASD.

Social Validity Questionnaire Responses

After the study was completed, parents/guardians and data collectors completed a questionnaire on a 5-point Likert Scale to determine their satisfaction with the intervention targeted skills (APPENDIX B). The 5-point Likert scale ranged from "Strongly Disagree" to "Strongly Agree," with "Disagree," "Neutral" and "Agree" as the in-between options. Table 4 summarizes parent responses to the survey and Table 5 summarizes data collectors' responses to the survey.

Parent Responses. Parents/guardians of all four participants were contacted via email explaining the process and purpose for completing the social validity survey. A social validity survey was sent home weekly until it was completed and returned to the researcher. The researcher also offered options for translating the survey to the parents' native language. After four consecutive weeks of sending home surveys, a total of two surveys for two different participants were returned to the researcher. Respondents were randomly assigned a number to remain anonymous. Table 4 provides an overview of statements, responses, means and ranges. Overall, parent/guardian respondents scored each statement Agree (4) or Strongly Agree (5), with means of 4-5 and ranges of 4-5. This indicates an overall positive response to the intervention.

Table 4

Parent/Guardian Responses to Social Validity Survey

Statement	Respondent		Mean	Range
	1	2		
The social skills addressed in the intervention are important to children with autism	5	5	5	5
I agree with the procedures of the intervention	5	5	5	5
The intervention improved the targeted social skills	5	4	4.5	4-5
Video modeling is an effective social skills intervention technique	5	5	5	5
Identifying generalization-promotion strategies is an effective social skills intervention technique	4	4	4	4
Video modeling and generalization-promotion strategies are most effective when they are used together	4	5	4.5	4-5
The participants of the study improved their use of social skills throughout the school day	5	5	5	5
The participants of the study improved their use of social skills in environments outside of school (home, community, etc.)	4	5	4.5	4-5
I am happy with the progress reported from the intervention	5	5	5	5
I will continue to use video modeling and generalization-promotion strategies as an intervention to improve social skills in the future	4	4	4	4

Data Collector Responses. All four data collectors were debriefed in-person about the process and purpose for completing the social validity survey. A social validity survey was given to each data collector to be completed and returned to the researcher. After one week, all surveys were completed and returned to the researcher. Respondents were randomly assigned a number to remain anonymous. Table 5 provides an overview of statements, responses, means and ranges. Overall, data collector respondents scored each statement Neutral (3), Agree (4) or Strongly Agree (5), with means of 3-5 and ranges of 3-5. This indicates an overall positive response to the intervention. Due to data collectors not having access to participants outside of the school environment, the statement "The participants of the study improved their use of social skills in environments outside of school (home, community, etc.) was omitted.

Table 5

Data Collector Responses to Social Validity Survey

Statement	Respondent				Mean	Range
	1	2	3	4		
The social skills addressed in the intervention are important to children with autism	4	5	5	5	5	4-5
I agree with the procedures of the intervention	5	5	5	5	5	5
The intervention improved the targeted social skills	4	4	5	4	4	4-5
Video modeling is an effective social skills intervention technique	4	4	4	4	4	4
Identifying generalization-promotion strategies is an effective social skills intervention technique	4	4	4	5	4	4-5
Video modeling and generalization-promotion strategies are most effective when they are used together	4	5	5	5	5	4-5
The participants of the study improved their use of social skills throughout the school day	5	5	4	4	4.5	4-5
I am happy with the progress reported from the intervention	4	5	4	5	4.5	4-5
I will continue to use video modeling and generalization-promotion strategies as an intervention to improve social skills in the future	4	4	4	4	4	4

CHAPTER 5: DISCUSSION

Communicating and interacting effectively are lifelong objectives for children with autism spectrum disorder (ASD), and successful acquisition of social skills contributes to success in other critical areas of development (Lee, 2015). Children with ASD rely on special education services to address their learning needs. ASD is a developmental disability that is characterized by significant deficits in social interactions, speech and non-verbal communication and restricted, repetitive patterns of behavior (American Psychiatric Association [APA], 2013). The social communication and social interaction deficits of children with ASD encompass social-emotional reciprocity, non-verbal communication and developing, maintaining and understanding relationships (APA, 2013). Although social skills deficits are a defining characteristic of individuals with ASD, there is no single cause or explanation for why children with ASD experience significant social delays (Cotugno, 2009). This study was designed to increase the social skills of children with ASD by using a video modeling approach for initial acquisition, followed by the addition of a generalization-promotion strategy to support development in other settings. In this final chapter, the research questions posed earlier will be addressed, followed by discussions surrounding study limitations, implications for practice and future research.

Research Questions

The following research questions were addressed during this study and will be discussed in this section:

1. What are the effects of VM without generalization promotion strategies on increasing the peer-directed social language performance of children with

ASD in a training setting and a generalization setting, where no intervention takes place?

2. What are the effects of adding a generalization-promotion strategy to VM on the peer-directed social language performance of children with ASD in the generalization setting?
3. What are the perceptions of primary consumers (students) and secondary consumers (teachers and parents) on the goals, procedures, and effects of interventions?

Research Question One. The first research question addressed the effects of VM interventions without generalization-promotion strategies on increasing peer-directed social language performance of children with ASD in a training setting and a generalization setting, where no intervention took place. This question is answered by discussing the results of the VM intervention and the generalization-promotion intervention, and comparing how participants performed in both conditions. A discussion of the research surrounding VM interventions and generalization will also be addressed to support the need to include generalization-promotion strategies when attempting to generalize skills taught and learned in a training setting.

Modeling is an effective training method for children with ASD because it initially involves observation, rather than immediate interaction. Specifically, Ashori and Jalil-Abkenar (2019) suggest that VM allows children with ASD, who often struggle with social skills, the opportunity to learn and demonstrate a skill by viewing realistic video clips of the target skill prior to being faced with the challenges of interacting with another person. In this study, participants increased performance in all three target skills; joining

an activity, obtaining attention and taking turns; from the initial baseline condition (A) to the VM intervention condition (B).

For all three target behaviors, initial baseline averages were below 40% for all four participants. With the introduction of the VMs, averages across all behaviors were between 51% and 92%. This increase in demonstrating the target behaviors aligns with the current research on video modeling as an effective intervention for children with ASD. Shukla-Mehta et al. (2010) stated that "this teaching strategy appears to (a) capitalize on the children's affinity for visual stimuli (Schreibman et al., 2000), (b) improve the efficiency with which instruction can be delivered (Charlop-Christy et al., 2000), (c) enable precise management of instructional stimuli and contingencies, and (d) promote consistency, with minimal training, across providers and settings, including homes (Wert & Neisworth, 2003)" (p. 10). These results further confirm video modeling is an EBP, by producing social skills for all participants with ASD (Wang & Spillane, 2009).

However, once participants began the generalization condition and were no longer being shown the VMs, averages for each behavior were less than 15%. The results for each participant demonstrated how, although a video modeling intervention alone is effective in teaching behaviors in one setting, it does not lead to behaviors occurring in a different setting. This supports the idea that, while VM interventions can produce generalized outcomes, *planning and programming* for generalization is needed, rather than *hoping* that an intervention will result in the generalization of targeted skill (Alexander et al., 2013). There are many explicit strategies to promote generalized outcomes in VM interventions (Bellini et al., 2007; Kleeberger & Mirenda, 2010;

Alexander et al., 2013; Plavnick et al., 2013; Radley et al., 2017). Therefore, the design of VM interventions should include the consideration of explicit strategies to increase the likelihood of generalized outcomes (Burt & Whitney, 2018).

In conclusion, this study responds to the first research question by demonstrating that a VM intervention does produce social skills acquisition in the training setting. However, once a new setting is introduced to demonstrate generalization, a VM did not produce generalized responding. For VMs to increase the likelihood of generalized outcomes, ways to promote generalization need to be considered when implementing this type of intervention. This conclusion leads to the second research question.

Research Question Two. The second research question addressed the effects of adding a generalization-promotion strategy to VM on the peer-directed social language performance of children with ASD in the generalization setting. Rao et al. (2008) emphasized that generalization of social skills is important for individuals with ASD because being able to do so increases social competence, development of friendships and relationships and the ability to navigate complex social environments. Falcomata and Wacker (2013) asserted that strategies for programming for generalization are important because the successful implementation of an intervention cannot assume generalization of outcomes across all natural contexts. Burt and Whitney (2018) stressed that, while there are research-based strategies to promote generalization, appropriate considerations need to be made when deciding how best to promote generalization. For this study, a generalization-promotion assessment (Appendix C) and corresponding generalization promotion strategies, developed in accordance with Stokes and Osnes' (1989)

framework, were used to decide how best to promote the generalization of the target social skills for each participant in the generalization setting.

Gunning et al. (2019) concluded that Baer's (1977) "Train and Hope" strategy appeared to be the most often used. Although educators using this strategy *hope* that generalization will occur after training, they do not *plan* for generalization. Generalization is imperative to the long-term success of children with ASD; therefore, it requires more attention and meaningful planning, in order to produce successful outcomes, as in this study. Participants in this study increased performance in all three target skills; joining an activity, obtaining attention and taking turns; from the VM intervention (B) to the generalization-promotion-intervention condition (D). For all participants, there was a decrease in performance of the target behaviors from the VM intervention to the generalization baseline. However, once the VM and the appropriate generalization-promotion strategies were used, all participants' generalization of skills increased in the generalization-promotion intervention condition.

The results for each participant confirm the *train and hope* strategy for generalization was ineffective, as each participants' performance of the target skills decreased between the VM intervention condition (B) and the generalization baseline condition (C). However, when properly *planned and programmed* for, generalization occurred in the generalization-promotion condition (D) for all participants.

In conclusion, the study demonstrated that generalization occurred when generalization-promotion strategies based on the needs of each participant were implemented.

Research Question Three. The final research questions focused on the perceptions of primary consumers (students) and secondary consumers (teachers and parents) on the goals, procedures and effects of interventions.

Wolf (1978) describes social validity as the process of determining the social *significance* of the goals, the social *appropriateness* of the procedures and the social *importance* of the effects of an intervention. At the conclusion of this study, parents/guardians and data collectors were asked to complete a social validity survey. After numerous attempts for responses, two participant's parents/guardians and all four data collectors responded. First, it was important for secondary consumers of the study to agree that "the social skills addressed in the intervention are important to children with autism." Both parents and three data collectors strongly agreed with this statement, and one data collector agreed with this statement. This suggested that secondary consumers find the social skills of joining an activity, obtaining attention and taking turns to be important for children with ASD to learn.

Next, the goals of the study were encompassed in the survey statements "identifying generalization-promotion strategies is an effective social skills intervention technique" and "video modeling and generalization-promotion strategies are most effective when they are used together." Again, both parents/guardians and all data collectors either agreed or strongly agreed with both statements. This demonstrated that secondary consumers acknowledge that taking the time to identify and implement strategies, based on the unique needs of participants, is important in producing generalized outcomes. Parents/guardians and data collectors all agreed or strongly agreed the improvement of social skills throughout the school day was important. PCAs and IAs

did not have much interaction with the parents of participants, therefore they could not accurately assess social skills improvement outside of school. Parents/guardians had regular contact with the researcher, so they were able to evaluate social skills improvement throughout the school day more accurately, through direct conversations and daily communication logs. Lastly, the procedures of the intervention were explained to secondary consumers (Appendix E) prior to receiving consent for participation in the study. The statement "I agree with the procedures of the intervention" was strongly agreed upon by all secondary consumers.

In conclusion, the answer to the third research question is that all secondary consumers who responded to the questionnaire agreed or strongly agreed with the goals and procedures of the study, and saw improvement in social skills for each participant in the environments where they interacted with them the most. This suggests that implementing VM for social skills acquisition and setting generalization may be socially valid to secondary consumers, as well as yields positive social outcomes for primary consumers.

Limitations

This study had multiple limitations worth noting when considering the results and implications for future research. First, the study was being conducted during the COVID-19 pandemic in North America. During this time, participant and data collector absences often meant days and sometimes weeks during which data collection was interrupted. When data collection resumed, there were often a few days of data with relatively low scores, due to participants having to reacclimate to being in school. Also, increased staff absences and shortages in general meant that coverages may have been needed

elsewhere. Therefore, there were days when data collectors were not following their normal schedules, which impacted both data collection and student routines. This also extended the duration of the study much longer than initially intended.

Similarly, most of the participants in this study had PCAs due to challenges with behavior. On days when behaviors were amplified and/or participants were in crisis, data collection was skewed or limited. Occasionally, participant routines modified or they would have to leave school early to accommodate their behavioral needs and/or to ensure the safety of themselves and others. These instances could have affected data collection and may explain why some participants experienced unexpected decreases in performing the target skills.

Further, the researcher also was the special education teacher for all participants. This indicates that the participants had a history with the researcher and her teaching methods (reinforcement, style, pacing, etc.) which could have affected responding. The participants also were familiar with the data collectors and their roles within the classroom (i.e. which student(s) they were assigned to), which could also have affected responding (i.e. a student responds more to his/her PCA than to another paraprofessional in the classroom). Although the researcher indicated that participation was not mandatory and would not influence her opinions of families and/or students, many participants' parents/guardians may have felt obligated to consent to the study. This could also be true for data collectors' decisions to participate, as they were all support staff assigned to the researcher's classroom.

The dependent variables were also just three of many social skills that could have been addressed. The Autism Social Skills Profile (Bellini, 2006) completed by

participants' parents/guardians revealed a number of skill areas that were scored low. However, the researcher considered her prior knowledge of each participant, as well as the resources, time and generalization setting(s) that were needed, in her decision to focus on joining an activity, obtaining attention and taking turns. The researcher also chose these target skills because they could be clearly defined and easily measured. Similarly, the social validity of this study was limited, due to a small number responses from participant parents.

The varying number of opportunities to perform the target skills also presented itself as a limitation. Although participants were in the AS classroom for most of the school day, they were mostly completing academic tasks. Whereas recess, while only a 30-minute period, was entirely social. Therefore, the researcher did not want to establish a minimum or maximum number of opportunities in either setting and, instead, calculated percent correct responding based on the number of times the skills were performed divided by the total number of opportunities presented.

COVID-19

The researcher initially started the study in the Spring of 2022. A few weeks into the study, students and staff were experiencing increased absences due to COVID-19. In addition, the researcher had the data collectors running the intervention and noticed low procedural fidelity. Due to these factors, the researcher made the decision to stop the study and resume in the fall. The researcher also decided that she would run the intervention and have the data collectors strictly collect data. Once the study resumed in the fall, the data collectors had already had a few weeks of authentic experiences

collecting data and viewing the VMs had become apart of the participants' daily routines from the first day of school, so the procedural fidelity of the study greatly increased.

Implications for Practice

This study sought to fill in the gaps in current research concerning VM as an effective social skills intervention, generalization-promotion strategies as a necessary accompaniment to VM interventions to produce generalized outcomes and the social validity of teaching social skills to children with ASD. Consistent with the literature surrounding VM interventions to teach social skills, this study demonstrated that VMs are effective in teaching children with ASD social skills. Delano (2007) noted the following benefits of using VM with children with ASD: VM is useful in improving social skills acquisition for children with ASD. This study also showed VM is effective in different settings and promotes rapid skill learning generalization, even though generalization is often not attained by children with ASD using other methods. Also, using peer models, adult models and self-modeling has been effective and VMs are easy to produce and implement (see Dorwick, 1991; Dorwick & Meuniers, 1999; Neumann, 2004). Therefore, as evidenced by many studies, VM is a promising social skills intervention for children with ASD. However, for VM to increase the likelihood of generalized-outcomes, ways to promote generalization need to be considered when implementing this intervention. This was further evidenced in this study, as participant's scores lowered significantly from the VM intervention condition (B) to the generalization baseline condition (C).

Next, this study demonstrated how generalization-promotion strategies can help students with ASD transfer skills from one condition to another. Children with ASD may demonstrate progress in a controlled setting; however, applying newly learned skills to

real-world environments and situations can present problems (Hume et al., 2009). “As educators seek to apply evidence-based practices (EBPs) in less controlled, real-world settings, the issue of generalization to novel settings, materials, people, and exemplars can be especially challenging” (Sartini et al., 2018, p. 150). Therefore, these more authentic opportunities need to be balanced with what is practical for the individual(s) implementing the intervention (Kent et al., 2020). This can be achieved through appropriate programming for generalization (Gunning et al., 2019); however, this planning is often not recognized and/or reported. In this study, the addition of a generalization-promotion strategy in a generalized setting proved to be the step that may be missing from research. After an intervention is implemented, this study demonstrated how it is beneficial to provide supports in a generalized environment as a steppingstone to authentic generalization for children with ASD.

Lastly, the social validity of teaching social skills to children with ASD was considered in this study. According to Bellini and Akullian (2007), although not all studies document social validity data, that does not mean that they are not socially valid. However, they encourage future researchers to measure and report on social validity, as this data is essential to proving the social acceptability of the intervention results. In this study, the parent/guardians and data collectors who responded to the social validity survey provided by the researcher scored each statement highly, with most responses being agree or strongly agree. This study demonstrated that the goals, the procedures and the outcomes of a VM intervention with a generalization-promotion strategy to increase the social skills acquisition of children with ASD is socially valid. However, the social

validity of this study is a limitation due to the number of parents/guardians who did not respond.

Future Research

Future research should focus on planning for and reporting generalization data. As individuals with ASD continue to experience difficulties with acquiring new skills, skill generalization becomes a significant challenge (Sartini et al., 2018). Children with ASD may demonstrate progress in a controlled setting; however, applying newly learned skills to real-world environments and situations can present problems (Hume et al., 2009). Brady et al. (2019) conducted a systematic review of interventions to teach friendship skills to children and adolescents with high-functioning autism. Of the 12 studies included in their review, only five measured generalization, with three of the five reporting that the demonstration was limited. The authors inferred that the lack of generalization outcomes reported could be due to the lack of programming for generalization prior to intervention implementation. They suggest that future research focuses on embedding generalization strategies within interventions, as "a powerful means to extend the effects of training across social interaction programs" (Brady et al., 2019, p. 303). Researchers have explored the extent to which generalization is addressed within social skills interventions for children with ASD, as well as the importance of implementing interventions in such a way that generalized outcomes occur. However, many research studies do not program for or report generalization results. This suggests a need for generalization promotion strategies to be put into place at the onset of an intervention, as well as a need for reporting generalization outcomes to inform future practice.

Future research should also focus on providing generalization-promotion strategies to increase generalized outcomes of using VM interventions. While VM alone might lead to generalization, there are many explicit strategies to promote generalized outcomes in VM interventions (Bellini et al., 2007; Kleeberger & Mirenda, 2010; Alexander et al., 2013; Plavnick et al., 2013; Radley et al., 2017) . Therefore, the design of VM interventions should include consideration of explicit strategies to increase the likelihood of generalized outcomes (Burt & Whitney, 2018). While research has yet to definitively answer the elusive question, "How does generalization happen with VM?," researchers have documented positive outcomes when generalization is programmed (e.g., Alexander et al., 2013), and even more promising generalization outcomes are possible with an adaptable intervention like VM. Rather than continuing to *train and hope*, future research should focus on the intentional *programming and planning* for generalization and reporting on the generalization-promotion strategies implemented. This will help researchers and practitioners build a repertoire of strategies to refer to and ultimately increase the likelihood of generalizing skills.

Lastly, future research should consider a replication of this study, taking into account the limitations specified. This study produced positive outcomes for children with ASD acquiring social skills; however, more research is needed on VMs and generalization-promotion strategies to determine if this combination is effective. Also, future research should consider conducting a similar intervention, but without VMs. As researchers continue to develop more generalization-promotion strategies to choose from, this intervention will ultimately be able to stand alone by itself, allowing researchers to more accurately conclude its effectiveness.

SUMMARY

This study sought to find an increase in social skills acquisition for children with ASD using a VM intervention and generalization-promotion strategies. A multiple baseline across behaviors design was used with four participants with ASD to target the skills of joining an activity, obtaining attention and taking turns. The results of the study were positive, demonstrating an increase in generalized social skills acquisition when generalization-promotion strategies were implemented. Parents/guardians and data collector social validity survey responses yielded an overall positive outlook on the goals, procedures and effectiveness of the study. The limitations of the study did not affect the outcome; however, they did lend themselves to some obstacles throughout the duration of the study. Educators in the field of special education should continue to use video modeling to teach social skills to children with ASD and consider using their knowledge of their students to implement effective generalization-promotion strategies. Future research should continue to investigate the functional relationship between video modeling and generalization-promotion strategies, and seek to provide a more extensive base of strategies for researchers and practitioners to choose from.

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APPENDIX A: AUTISM SOCIAL SKILLS PROFILE SCORES

Autism Social Skills Profile Scores

Skill Area	Scores			
	A	J	T	Y
Invites peers to join him/her in activities	S	S	N	N
Joins in activities with peers	S	S	S	N
Takes turns during games and activities	S	N	S	S
Maintains personal hygiene	O	O	O	S
Interacts with peers during unstructured activities	O	S	N	N
Interacts with peers during structured activities	V	O	S	N
Asks questions to request information about a person	N	N	N	N
Asks questions to request information about a topic	N	S	S	N
Engages in one-on-one social interactions with peers	O	S	S	N
Interacts with groups of peers	S	S	S	N
Maintains the “Give-and-Take” of conversations	N	N	S	N
Expresses sympathy for others	V	O	O	O
Talks about or acknowledges the interests of others	N	S	S	S
Recognizes the facial expressions of others	V	S	O	O
Recognizes the nonverbal cues, or “body language” of others	O	S	S	S

Requests assistance from others	S	V	O	S
Understands the jokes or humor of others	S	S	S	O
Maintains eye contact during conversations	V	N	S	S
Maintains an appropriate distance when interacting with peers	S	N	S	N
Speaks with an appropriate volume in conversations	S	O	S	S
Considers multiple viewpoints	N	N	S	N
Offers assistance to others	O	S	S	N
Verbally expresses how he/she is feeling	O	S	O	S
Responds to the greetings of others	V	O	S	S
Joins a conversation with two or more people without interrupting	N	N	N	N
Initiates greetings with others	S	S	N	N
Provides compliments to others	N	S	S	S
Introduces self to others	S	S	S	S
Politely asks others to move out of his/her way	N	N	N	N
Acknowledges the compliments directed at him/her by others	S	S	S	S
Allows peers to join him/her in activities	S	S	S	N
Responds to the invitations of peers to join them in activities	O	S	S	N
Allows others to assist him/her with tasks	V	S	O	S
Responds to questions directed at him/her by others	S	S	O	S

Experiences positive peer interactions	O	O	S	N
Compromises during disagreements with others	O	N	S	N
Responds slowly in conversations	S	O	O	N
Changes the topic of conversation to fit self-interests	O	V	S	N
Misinterprets the intentions of others	O	S	O	O
Makes inappropriate comments	O	S	S	N
Engages in solitary interests and hobbies	V	V	V	S
Ends conversations abruptly	V	V	O	N
Fails to read cues to terminate conversations	V	N	S	N
Exhibits fear or anxiety regarding social interactions	S	S	S	S
Experiences negative peer interactions	S	S	S	N
Engages in socially inappropriate behaviors	S	S	S	N
Exhibits poor timing with his/her social initiations	V	N	O	N
Is manipulated by peers	S	S	N	N
Engages in solitary activities in the presence of peers	O	V	O	N

Note. The table shows the scores for each participant on the Autism Social Skills Profile (Bellini, 2006). Each skill area was scored as *Never (N), Sometimes (S), Often (O)* or *Very Often (V).*

APPENDIX B: SOCIAL VALIDITY SURVEY

Social Validity Survey

Name (print): _____

Relationship to Participant(s): _____

Date: _____

Directions: Please check **one** response that best indicates your feelings about each statement.

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The social skills addressed in the intervention are important to children with autism					
I agree with the procedures of the intervention					
The intervention improved the targeted social skills					
Video modeling is an effective social skills intervention technique					
Identifying generalization-promotion strategies is an effective social skills intervention technique					
Video modeling and generalization-promotion strategies are most effective when they are used together					
The participants of the study improved their use of social skills throughout the school day					
The participants of the study improved their use of social skills in environments outside of school (home, community, etc.)					
I am happy with the progress reported from the intervention					
I will continue to use video modeling and generalization-promotion strategies as an intervention to improve social skills in the future					

APPENDIX C: DATA COLLECTION SHEET

Data Collection Sheet

Data Collector's Name:_____

Student's Name: _____

	Date:	**Date:**	**Date:**	**Date:**	**Date:**
Joining an Activity					
Obtaining Attention					
Taking Turns					

	Date:	**Date:**	**Date:**	**Date:**	**Date:**
Joining an Activity					
Obtaining Attention					
Taking Turns					

	Date:	**Date:**	**Date:**	**Date:**	**Date:**
Joining an Activity					
Obtaining Attention					
Taking Turns					

APPENDIX D: GENERALIZATION-PROMOTION ASSESSMENT SURVEY

Generalization Promotion Assessment Survey

For each student, please answer the following questions with as much detail as possible.

Student name: _____Interviewer: _____

Interviewee: _____Date / time: _____

Target behavior (s): _____

1. Are there conditions under which the target behavior(s) occurs for this student? Describe.

2. Under what conditions does the target behavior(s) not occur for this student? Describe.

3. What external factors may be contributing to the student not performing the target behavior? Explain.

4. What internal factors may be contributing to the student not performing the target behavior? Explain.

5. What consequences appear to be motivating for the student?

6. Under what conditions or in which situations do you think the student *should* be performing the target behavior(s)?

7. What do you think would help the student perform the target behavior(s)?

APPENDIX E: FIDELITY CHECKLISTS

Baseline Fidelity Checklist

Data Collector Name (printed):_____

Date of Data Collection: _____

Directions: Respond "yes" or "no" to the following statements. If a statement receives a response of "no," please provide a detailed explanation for why this intervention step was not completed.

Intervention Step	Completed: Yes or No (if no, please explain)
Researcher Only: The video model was set up on an iPad for each participant	[redacted]
Researcher Only: The video model was viewed on an iPad by each participant	
Data Collectors Only: Each participant was provided with multiple opportunities to perform the desired social skill	
Data Collectors Only: The data collectors did **not** provide prompting or support to the participants to perform the desired social skill	
Data Collectors Only: The data collectors recorded **only** instances of correct performing of the desired social skill	

Consent: By completing and signing this checklist, you are confirming that all the above information has been completed correctly and accurately.

Signature of Data Collector:

_____

Video Modeling Intervention Fidelity Checklist

Researcher/Data Collector Name (printed):_____

Date of Intervention: _____
Directions: Respond "yes" or "no" to the following statements. If a statement receives a response of "no," please provide a detailed explanation for why this intervention step was not completed.

Intervention Step	Completed: Yes or No (if no, please explain)
Researcher Only: The video model was set up on an iPad for each participant	
Researcher Only: The video model was viewed on an iPad by each participant	
Data Collectors Only: Each participant was provided with multiple opportunities to perform the desired social skill	
Data Collectors Only: The data collectors did **not** provide prompting or support to the participants to perform the desired social skill	
Data Collectors Only: The data collectors recorded **only** instances of correct performing of the desired social skill	

Consent: By completing and signing this checklist, you are confirming that all the above information has been completed correctly and accurately.

Signature of Researcher/Data Collector:
_____

Generalization Intervention Fidelity Checklist

Researcher/Data Collector Name (printed): _____

Date of Intervention: _____

Directions: Respond "yes" or "no" to the following statements. If a statement receives a response of "no," please provide a detailed explanation for why this intervention step was not completed.

Intervention Step	Completed: Yes or No (if no, please explain)
Researcher Only: The video model was set up on an iPad for each participant	
Researcher Only: The video model was viewed on an iPad by each participant	
Both: The generalization-promotion strategy (small play group) was available to each participant in the generalization setting	
Both: The generalization-promotion strategy (less noise) was available to each participant in the generalization setting	
Both: The generalization-promotion strategy (presence of preferred activities) is available to each participant in the generalization setting	
Data Collector Only: Each participant was provided with multiple opportunities to perform the desired social skill	
Data Collector Only: The data collector did **not** provide prompting or support to the participants to perform the desired social skill	
Data Collector Only: The data collector recorded **only** instances of correct performing of the desired social skill	

Consent: By completing and signing this checklist, you are confirming that all the above information has been completed correctly and accurately.

Signature of Researcher/Data Collector:

_____

APPENDIX F: RECRUITMENT LETTERS AND FORMS

Recruitment Letter for Parents/Guardians of Participants

Dear Parent/Guardian,

My name is Megan Roberts and I am one of the Special Education teachers at Davis Elementary. I am reaching out to see if you are interested in having your (son or daughter) participate in a social skills research project that I am conducting. Specifically, this research project focuses on teaching social skills to children with Autism Spectrum Disorder (ASD) by using videos of peers performing appropriate social interactions. Your child will be viewing videos on an iPad of (his or her) peers performing appropriate social interactions. Your child will then have the opportunity to perform these social skills independently. The social skills chosen will be based on your child's specific IEP goals and will not interrupt (his or her) daily routine or instruction. Your child's social skills goals will be fulfilled through participation in this study. You can request to have your child removed from the study at any time. Participation is completely optional. If you are interested in having your child participate, please fill out the attached consent form by Monday, April 4th. If you have questions about your child's participation at any time, please do not hesitate to email robeme@centennialsd.org. Thank you for your consideration!

Sincerely,

Megan Roberts

Recruitment Letter for Parents/Guardians of Peer Models

Dear Parent/Guardian,

My name is Megan Roberts and I am one of the Special Education teachers at Davis Elementary. I am reaching out to see if you are interested in having your (son or daughter) participate in a social skills research project that I am conducting. Specifically, this research project focuses on teaching social skills to children with Autism Spectrum Disorder (ASD) by using videos of peers performing appropriate social interactions. Your child will be trained on how to perform each social skill and will be recorded performing each skill using an iPad. The video(s) of your child will then be viewed by students with autism throughout the duration of the project to help increase social skills acquisition. The video(s) will only be seen by the participating students and adults in the research project. Your child will be required to devote 3 consecutive recess periods to this project. No instructional time will be interrupted. You can request to have your child removed from the study at any time. Participation is completely optional. If you are interested in having your child participate, please fill out the attached consent form by Monday, April 4th. If you have questions about your child's participation at any time, please do not hesitate to email robeme@centenialsd.org. Thank you for your consideration!

Sincerely,

Megan Roberts

Recruitment Letter for Adult Data Collectors

Dear (Adult Data Collector Name),

My name is Megan Roberts and I am a Special Education teacher at Davis Elementary. I am reaching out to see if you are interested in participating in a social skills research project that I am conducting. Specifically, this research project focuses on teaching social skills to children with Autism Spectrum Disorder (ASD) by using videos of peers performing appropriate social interactions. Your role in this project would be to support students with autism in viewing the social skills videos on iPads, as well as collecting data on each student's progress throughout the study. This project will require two brief training sessions scheduled around your availability, but will otherwise not interfere with your daily schedule/responsibilities. You can request to be removed from the study at any time. Participation is completely optional. If you are interested in participating, please fill out the attached consent form by Monday, April 4th. If you have questions at any time, please do not hesitate to email robeme@centennialsd.org. Thank you for your consideration!

Sincerely,

Megan Roberts

RESEARCH SUBJECT CONSENT FORM

Title:	Use of Generalization-Promotion Strategies and Video Modeling to Increase Social Skills Acquisition for Young Children with Autism
Protocol No.:	29226
Sponsor:	Matt Tincani, tincani@temple.edu
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RESEARCH CONSENT SUMMARY

Your child is invited to participate in a research study designed to help promote social skills acquisition using video modeling and generalization-promotion strategies. Participation is completely voluntary.

What should I know about this research?

- Someone will explain this research to you and your child
- Participation is voluntary
- Choosing to not participate will not affect you or your child
- You can withdraw your child from the study at any time without any repercussions
- Questions can be asked and answered before, during and after the completion of the study

Why is this research being done?

The purpose of this research is to examine how traditional video modeling and generalization-promotion strategies can be used to promote the generalization of social skills of young children with autism. This research will build upon the current research base on evidence-based social skills interventions for children with autism, in addition to filling in the gaps in the literature about how we can help children with autism to generalize the skills that they have acquired.

What are my child's responsibilities if they participate in this research?

Your child will be prompted to view video models on an iPad of peers demonstrating target social skills before social opportunities occur in the self-contained (Autistic Support) classroom. This will occur daily in 30-minute sessions until your child has responded to 80% of social opportunities over 3-5 consecutive sessions. Your child's daily schedule and instructional periods will not be interrupted.

Is there any way this research could be bad for my child?

This research will only require your child practice his/her social skills more frequently. Participation is voluntary and your child may be withdrawn from the study at any time.

Will being in this research benefit my child?

Your child may benefit from increased opportunities to perform social skills and may begin to generalize his/her newly learned skills to other people, settings and circumstances.

What happens to the information collected for this research?

All of your child's identifying information will remain private. When data concerning your child is used, your child's identity will remain anonymous and replaced with a pseudonym.
Data collected on your child will include demographic information (age, gender, ethnicity, etc.), disability information (category, assessments and any other relevant information) and information presented in his/her IEP, as it relates to social skills development.
We will keep all identifying information confidential. We protect all information from disclosure to others to the extent required by law. We cannot promise complete secrecy.

Who can answer my questions about this research?

If you have questions, concerns, or complaints, or think this research has hurt you or made you sick, talk to the research team at the phone number listed above on the first page.
This research is being overseen by an Institutional Review Board ("IRB"). An IRB is a group of people who perform independent review of research studies. You may talk to them at (215) 707-3390 or irb@temple.edu if:

- You have questions, concerns, or complaints that are not being answered by the research team.
- You are not getting answers from the research team.
- You cannot reach the research team.
- You want to talk to someone else about the research.
- You have questions about your rights as a research subject.

What happens if I agree to be in this research, but I change my mind later?

You may stop your child from participating at any time without penalty.

Signatures

To be filled out by parent or guardian:

Your signature documents your permission for your son/daughter to participate in this research.

Signature of parent or guardian	Date
Printed name of parent or guardian	

To be filled out by student participant:

Signature of student	Date
Printed name of student	

To be filled out by Ms. Roberts:

Signature of person obtaining consent	Date
Printed name of person obtaining consent	