THE EFFICACY OF VIDEO SELF-MODELING FOR PROMOTING SOCIAL INITIATION SKILLS FOR CHILDREN WITH AUTISM SPECTRUM DISORDERS (ASD) TO PEERS

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Social initiation skills are considered among the most challenging skills to acquire by children with Autism Spectrum Disorders (ASD). Generalization of social initiations across settings, people, and materials is another related challenging area. Research indicates that when provided with appropriate interventions, children with ASD may enhance social initiation skills and generalize them across settings, people, and materials. This research study implemented a multiple probe single subject research design across three children with ASD to examine whether a video self-modeling intervention is effective in establishing a mand repertoire and other types of social initiations to peers. Generalization and maintenance effects were measured in addition to the social validity of the video self-modeling intervention. The results of the video self-modeling intervention and discussion of findings are provided. Study limitations and future recommendations are discussed as well.

Keywords: autism, children, video self-modeling, mands, social initiations.

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PREFACE

I dedicate this dissertation to Halil Kabashi, my brave, persistent, encouraging and loving father, whom I thank for always having been there for me, reminding me to not lose focus, helping me become who I am today. As a family and as a nation we faced so many challenges, but you, so faithfully, always encouraged me to go further, try harder, and do better, putting all your trust in me. I hope to have made you proud!

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1 INTRODUCTION

Autism Spectrum Disorders (ASD), including Autistic disorder, Asperger's syndrome, Rett's syndrome, Childhood Disintegrative Disorder (CDD), and Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) are neurodevelopmental disorders that fall into a category of Pervasive Developmental Disorders (Coben, Linden, & Myers, 2010; Levy, Mandell, & Schultz, 2009). In 1970, the prevalence of autism in the United States was approximately 3 per 10,000 children. In 1990, the prevalence was 30 per 10,000 children, a ten-fold increase (Blaxill, 2004). More recently, the prevalence has dramatically increased from 1 in 150 to 1 in 88 children (Center for Disease Control and Prevention [CDCP], 2012).

The term "spectrum disorders" is used to indicate that autism encompasses a range of deficits and impaired behaviors, such as deficits in establishing and maintaining social interests and interactions with others (McGrath, Bosch, Sullivan, & Fuqua, 2003; Shukla-Mehta, Miller, & Callahan, 2010), deficits in verbal and nonverbal communication (Koegel, Carter, & Koegel, 2003), attention deficits, resistance to environmental changes, unusual sensory experiences (Delano, 2005), and the presence of repetitive and stereotyped patterns of behaviors, interests, and activities (Wolfberg & Schuler, 1999).

Among all other impairments, social interaction impairments are considered the most essential features that define autism. Although the severity of such impairments varies from one individual to another, they usually are manifested in reduced opportunities to engage and share

joint experiences with others in both verbal and nonverbal ways (Blum-Dimaya, Reeve, Reeve, & Hoch, 2010; Charlop, Dennis, College, Carpenter, & Greenberg, 2010), social withdrawal (Brady, Shores, McEvoy, Ellis, & Fox, 1987), deficits in making eye contact with others, turn taking, and gesturing (Wert & Neisworth, 2003), lack of verbal and non-verbal initiations (Hume et al., 2009), and failure to develop and maintain friendships (Owen-DeSchryver, Carr, Cale, & Blakeley-Smith, 2008).

Social skills are necessary for interacting and communicating with other people. Typically developing children develop social skills from infancy and throughout their early childhood years via different events that occur naturally in their daily lives. However, for children with autism, engaging in social interactions does not occur naturally due to their social skills deficits (Trent, Kaiser, & Wolery, 2005). In particular, these deficits affect their relationships with peers (Nikopoulos & Keenan, 2007). Given that social interactions must be reciprocal, meaning that a person should initiate interactions as well as respond to the social bids of others, social interactions are quite a challenge for individuals with autism. It happens that some children with autism may improve their social behaviors to some degree after the age of 5; however, deficits in cooperative social skills with peers, establishing peer friendships, and recognizing the feelings and responses of others remain present throughout life. Consequently, it is highly unlikely that they will experience the benefits of developing and maintaining social relationships with other people, especially with peers, without specific interventions designed to facilitate such skills (Maione & Mirenda, 2006).

Social responses are defined as any contextual utterance or non-vocal behavior occurring within 5 seconds of an initiation by another person, such as looking when one's name is called; following directions, commands, or requests; answering questions; or replying to a verbal

interaction (Krantz & McClannahan, 1993; McGrath et al., 2003; Owen-DeSchryver et al., 2008). Although these skills are still challenging for children with ASD, responses have a tendency to occur more frequently and are learned more easily than social initiations (Tsao & Odom, 2006). Social initiations, on the other hand, are much more challenging skills for children with ASD to acquire than responses. There have been various speculations of what makes a social initiation such a complex skill for this population as well as what comprises a social initiation. This complexity, according to Hauck et al. (1995), may be related, even though in undetermined ways, to both mental and social cognition of children with autism, the severity of symptoms, and the specific setting where the social initiation is supposed to happen.

In addition to acquisition of social initiations, generalization of social initiations across settings, people, items, and events represents another area of concern for the majority of children with autism (Deitchman, Reeve, Reeve, & Progar, 2010; Kleeberger & Mirenda, 2010; Nikopoulos & Keenan, 2004). Research shows that deficits in generalization skills have great impact on their overall independence compared to typically developing peers. Supposedly, such deficits may occur as a result of: a) poor cognitive flexibility, consisting of difficulties shifting thoughts or actions in accordance to changes of the surroundings or circumstances; b) the inability to relate new stimuli to previous experiences, owing to a specific memory required and the inability to incorporate new experiences in their daily life; and c) lack of responsiveness to environmental stimuli, shifting from one stimulus to another, and relating one stimulus to another (Hume et al., 2009).

It has been well established that impairments in the social initiations area and the lack of generalization for children with autism usually endure across time and do not improve by simply exposing them to their typically developing peers. This represents a great concern for parents and

professionals who work with these children, knowing that failing to initiate means that they: a) have fewer opportunities to seek out social and verbal learning experiences, b) miss all the constructive information they can derive from the environment, c) fail to request assistance when necessary, d) have less opportunities to attain the responses that typically are derived from social initiations, and e) have limitations on accessing information and communicating beyond what others are willing to provide to them (Hume et al., 2009). Consequently, deficits in other areas of development are more likely to occur (Oke & Schreibman, 1990).

The complexity of autism spectrum disorders, the increase of its prevalence over the last decade, and the increase in the numbers of children with autism in general education settings have intensified the need for quality teaching as well as evidence-based interventions for young children with autism (Bellini, Akullian, & Hopf, 2007; Cihak, Fahrenkrog, Ayres, & Smith, 2010). In addition, current legislation (i.e., NCLB, IDEIA) requires that instructional strategies implemented in today's classrooms be research-based (Ganz, Earles-Vollrath, & Cook, 2011). Accordingly, continuous research on the effectiveness of approaches to improve social initiations of children with autism has been taking place in the field. In this respect, greater emphasis has been given to interventions that aim to establish a repertoire of requests, otherwise known as "mands," for children with autism. In addition, video instruction has also attracted researchers' attention in establishing and generalizing social initiations for children with autism. Therefore, designing appropriate and successful interventions that focus on establishing, generalizing, and maintaining social initiation skills have both theoretical and practical implications (Tsao & Odom, 2006).

1.1 STATEMENT OF THE PROBLEM

It has been well established that interventions designed to improve the overall social skills of children with autism should facilitate independence and generalization of such skills across people, settings, events, and items (Scattone, 2007). Interventions that focus on social initiation improvements, however, especially those intended to be used in inclusive classrooms, should not only increase independence and generalization, but also the likelihood of responsiveness from peers. An increase in the frequency of initiations to match the rate displayed by children without disabilities in that setting is also expected as is the use of various appropriate social behaviors leading to initiations of reciprocal social interactions. Finally, the intervention should be easily implemented by teachers so as not to take time away from other children in class (Zanolli, Draggett, & Adams, 1996).

Interventions such as mand training (Taylor et al., 2005) and video instruction are two common interventions that recently have been used to promote social initiations of children with autism (Nikopoulos & Keenan, 2003, 2004, 2007). Both types of interventions have great potential to establish social initiation skills, increase independence and generalization, facilitate responsiveness from peers, increase the frequency and appropriateness of social initiations, and be easily implemented by teachers.

Although the focus of mand training is the acquisition of mands, it has been noted that other types of social initiation skills may be facilitated via mand training given that language and communication skills have been shown to improve (Shafer, 1994). Mand training has been used to teach different types of mands to children with autism, such as mands for preferred items (Hancock & Kaiser, 1996; Pellecchia & Hineline, 2007; Taylor et al., 2005), missing items (Carr & Kologinsky, 1983; Hall & Sundberg, 1987), and information (Endicott & Higbee, 2007;

Sundberg et al., 2002). Although all the abovementioned studies indicated acquisition of mands, only a few of them reported improvements in the area of socialization. However, it was noted that mands were usually taught out of social context. For instance, children were not taught manding for preferred items in natural interactional contexts that might also include other appropriate social behaviors, such as greetings, complimenting, verbal commenting, and so on. Taylor et al. (2005) addressed this issue by suggesting that in order for children with autism to acquire social initiations, it is necessary to incorporate appropriate social interactions into mand training.

In addition, generalization of mands across people, especially peers, has been a concerning issue for the majority of studies that reported generalization findings. Mixed reviews about the generalization of acquired mands across people led to the assumption that mands for adults and peers should be taught separately. However, only one study (Pellecchia and Hineline, 2007) definitively supports this assumption. This study suggested that generalization of mands from adults to peers does not occur, and therefore these skills should be taught separately.

Video instruction is another intervention that has been successfully used to improve a variety of behaviors for children with autism, including social initiations as well as generalization of social initiations skills across people, settings, materials, and conditions (Nikopoulos & Keenan, 2007). Research shows that video instruction has not only resulted in positive treatment effects for acquisition of social initiations (Bellini et al., 2007; Buggey, 2005; Nikopoulos & Keenan, 2003, 2004, 2007) but also the transfer of treatment gains to generalized settings and conditions as a result of the diversity of contexts and variety of skills used (Nikopoulos, Canavan, & Nikopoulou-Smyrni, 2009). However, there were studies that reported failure achieving mastery of social initiations for some of the participating children (Apple,

Billingsley, & Schwartz, 2005; Nikopoulos & Keenan, 2003). Lack of motivation, attention skills deficits, and the visual processing abilities (Sherer et al., 2001) might be some of the potential explanations for the failure of video instruction for such children.

However, to date there is no evidence for using video instruction to establish mand repertoires in children with autism. The present study utilized video self-modeling, one of the approaches of video instruction, to teach mands for preferred items toward peers within the context of teaching other types of social initiations. Given that mands are controlled by motivational variables, and video viewing may have strong motivating operation effects (Nikopoulos, 2007), the probability for an increase in the child's motivation to mand for preferred items and to initiate other types of social initiations with video modeling is greater than with other methods of instruction. In addition, when an individual is provided with opportunities to exhibit social behaviors frequently, the sensitivity toward social reinforcers is more likely to occur (Koegel, Vernon, & Koegel, 2009). Subsequently, the acquisition of the targeted behaviors in this study is expected to happen given that the participants will be exposed to the target behaviors across conditions. Finally, by incorporating other types of social initiations in addition to manding for preferred items, the appropriateness of the use of mands in a social context, as suggested by Taylor et al. (2005).

1.2 DEFINITION OF TERMS

To date, investigators have proposed many definitions of social initiation. Although some studies defined a social initiation only as a verbal behavior or a motor behavior directed toward others, the majority of them looked at both verbal and motor behaviors addressed to a peer, sibling,

parent, or staff. For instance, Scattone (2007) focused mostly on verbal behaviors by defining a social initiation as any unprompted question or comment directed to a peer. Similarly, Buggey (2005) characterized social initiations as unsolicited verbalizations directed to peers and staff that were not preceded by the interactions of others for a period of 10 seconds.

In addition to verbal behavior directed to the interaction partner (e.g., Let's play), Nikopoulos and Keenan (2003, 2004, 2007) defined social initiations also as any motor behavior directed to another person, such as a targeted child approaching the experimenter and emitting motor behavior (e.g., taking by hands) and leading him toward a toy, object, or activity. Koegel, Koegel, Shoshan, and McNerney (1999) provided a definition similar to that of Nikopulous and Keenan with the only distinguishing difference being the length of the latency since the last interaction (e.g., 3 seconds instead of 5). Any verbal or motor behavior clearly directed to a sibling/child/adult to elicit a response, such as greeting others, asking questions, making comments, sharing materials, helping behaviors, saying another's name, and gesturing toward an item while maintaining eye contact with the other person, is another definition that seems to give a broader picture of what comprises a social initiation (Hauck, Fein, Waterhouse, & Feinstein, 1995; Morrison, Garcia, Kamps, & Parker, 2001; Tsao & Odom, 2006).

Mands are also considered to be social initiations. A mand refers to what is usually termed a "request," with the exception that the definition of a mand is said to be controlled by a motivating operation. For instance, a child mands or requests, "Cookie, please" and this response is reinforced by providing a cookie for him or her. However, the probability for the "cookie" response to occur is higher when the child has not consumed food, especially sweets, for a period of time (Wallace, 2007). So the child's motivation in this case is considered to be the

satisfaction of a need; what the child says is controlled by what the child wants (Murphy, Barnes-Holmes, & Barnes-Holmes, 2005; Sautter & LeBlanc, 2006; Sundberg & Michael, 2001).

Many initiations seen in a natural environment are considered to be mands. Overall, half of a person's daily verbal interactions consist of mands, such as mands for preferred or missing items, activities, actions, as well as asking questions to obtain information (Hall & Sundberg, 1987; Wallace, 2007). It is a known fact that, for various reasons, children with autism experience difficulty requesting preferred items, especially requesting items that are not present. Hence, establishing a strong mand repertoire has been seen as a way to improve overall communication skills as well as facilitate reciprocal social interactions with others (Sundberg, 2004), and is therefore considered extremely valuable as a target objective of behavioral interventions.

Based on the aforementioned definitions, social initiation may be defined as starting a new social sequence by using an unprompted verbal (i.e., "I want (item)") or motor behavior (i.e., waiving) that is clearly directed to a peer or adult. Such behaviors should be distinguished from an ongoing interaction by a change in partner, a change in activity, or a discontinuation of the previous interaction for at least 5 seconds, in an attempt to elicit a response from a communicative partner for such purposes as manding for preferred items (i.e. "I want (item)"), missing items, asking questions (i.e., to obtain information, perform an action), inviting another to play, commenting (i.e., "This (item) is cool!"; "This was fun!"), greeting (e.g., "Hi (name)"; "Hello" or waving), giving affection, sharing materials, and gesturing to an object while looking at peers or adults.

2 LITERATURE REVIEW

The following chapter reviews research literature on mand training and video instruction, with emphasis on video self-modeling for promoting acquisition of mands and other social initiation skills for young children with ASD. First, this chapter focuses on the theoretical perspective of mand training followed by a description of approaches used to teach mand repertoires. The research-based literature on teaching mands for preferred items will be addressed as well. Similarly, video instruction will also be discussed from its theoretical perspective. A description of various types of video instruction, with emphasis on video self-modeling, will be provided. An overview of advantages of video instruction is followed by the use of video instruction alone and with other additional intervention strategies on promoting social initiation skills. Additionally, the use of video instruction for improving social initiation skills while targeting other skills will be highlighted in this chapter. The aim of this chapter is to provide justification for combining mand training and video self-modeling to promote acquisition of social initiation skills for young children with ASD toward peers.

2.1 MAND TRAINING

The mand is considered the most important of the verbal operants identified by B.F. Skinner. Initially, Skinner defined a mand as a type of verbal relation, the response form that is controlled by an establishing variable (i.e., satiation, deprivation, and aversive stimuli) (Kates-McElrath & Axelrod, 2006). In 1988, Michael revised the definition of the mand by defining it as "a type of verbal operant in which a particular response form is reinforced by a characteristic consequence and is therefore under the functional control of the establishing operation relevant to that consequence… and has no specified relation to a prior discriminative stimulus" (p.7).

2.1.1 The motivating operation (MO)

Although it has been long recognized that the antecedent conditions other than discriminative stimuli (S^D) can influence the occurrence of an operant behavior, it wasn't until the late 80's when the distinction between the S^D and the establishing operation (EO), more recently termed motivating operation (MO), was made (Iwata, Smith, & Michael, 2000). Although both MO and S^D are antecedent variables that are learned, and evoke and abate the same behavior, they may, however, evoke or abate that behavior for different reasons (Carbone, Morgenstern, Zecchin-Tirri, & Kolberg, 2010). While a S^D has a correlation with differential availability of an effective form of reinforcement given a specific type of behavior, an MO is correlated to the differential reinforcing effectiveness of environmental events (Michael, 1993; Sundberg, 2004). More specifically, an MO is defined by Michael (1993) as "an environmental event, operation, or stimulus condition that affects an organism's behavior by altering a) the reinforcing effectiveness of other events and b) the frequency of occurrence of that part of the organism's repertoire

relevant to those events as consequences" (p.192). The S^D, on the other hand, is defined as a "stimulus condition which given the momentary effectiveness of some particular type of reinforcement increases the frequency of a particular type of response because that stimulus condition has been correlated with an increase in the frequency with which that type of response has been followed by that type of reinforcement" (Michael, 1988, p.149).

The role of the MO in evoking a pure mand repertoire, a response that occurs under the control of the MO only and is maintained by a specific reinforcer, is crucial (Sautter & LeBlanc, 2006). In fact, this control by MOs rather than by discriminative stimuli is the key that separates the mand from other verbal operants (Sundberg, 2004). For example, the word or object "juice" may function as a discriminative stimulus when evoking a listener's echoic (i.e., imitative) or tact (i.e., labeling) response, or it may function as an MO when producing a reinforcer (Pellecchia & Hineline, 2007). An adult pointing to a picture of a glass of juice and asking "What is it?" might get the response from the child "juice", then the adult praises the correct response by saying "that's right". In this case the child saying "juice" is a tact. A child who is thirsty, on the other hand, and says "juice" receives a glass of juice from the adult. In this case, the child has emitted the "juice" response as a mand (Wallace, Iwata, & Hanley, 2006). Accordingly, whereas mands receive reinforcement specific to the particular mand (i.e., the mand juice is reinforced by juice), the other verbal operants typically receive some form of generalized conditioned reinforcement such as social attention, acceptance, or ending of some sort of demand (Sundberg & Michael, 2001).

According to Sundberg (2004) there are two types of MOs: a) unconditioned motivating operations (UMOs) and b) conditioned motivating operations (CMOs). The first type of MO is related to unlearned forms of motivation, such as food, water, sleep, deprivation, changes of

temperature or other environmental features, and painful stimulation. The second type, on the other hand, is related to learned forms of motivation, consisting of innate reinforcer-establishing effects of the UMO, but the behavior that is evoked by it is learned. According to Michael (1993) the CMO is further classified into the following types: transitive, reflexive, and surrogate and can be both captured and manipulated. Transitive CMO consists of a present stimulus condition increasing the reinforcing value of some other stimulus condition and evoking the behavior that has elicited that object or action previously. For example, if a child sees a reinforcing object outside a window this increases the value of opening the door (Shafer, 1994). The reflexive CMO has been described by Sundberg (2004) as "an aversive stimulus condition that is a warning of some form of further worsening. This warning stimulus increases the current frequency of responses that have terminated the warning stimulus" (p. 8). For example, for an student who has bad experiences in instructional situations, verbal directions accompanying such instructions would function as a reflexive CMO because they are correlated with a form of worsening, that is, instruction (Shafer, 1994). Finally, a surrogate CMO is developed when a stimulus condition correlated with other effective MO generates the same effects as that MO. For example, a white coat of a doctor may be correlated with painful stimuli, therefore someone wearing a white coat may evoke behaviors that result in escaping or avoiding the stimulus (Shafer, 1994; Sundberg, 2004).

2.1.2 Approaches to teach a mand repertoire

The significance of developing a mand repertoire for children with autism has been the subject of investigation by many researchers. The development of mands is considered to be of great importance in the area of communication development, because children are more likely to

control conditioned and unconditioned reinforcers, institute the roles of a speaker and listener, improve verbal development, and, most importantly, develop verbal behaviors that might be emitted spontaneously and generalize quickly due to the effects of the MOs (Sundberg, 2004; Sundberg & Michael, 2001). Recently, the application of MOs for enhancing instruction and behavior management strategies for individuals with disabilities has been gaining greater attention (O'Reilly et al., 2008). Although the focus of many studies was on using the MOs as reinforcement, the MOs can establish and abolish the effectiveness of reinforcers as well as punishers (Laraway, Snycerski, Michael, & Poling, 2003). Accordingly, to ensure effective mand training for children with autism, teachers and practitioners are recommended to make sure that two effects of MOs, reinforcer establishing effect and evocative or abative effect, are present (Shafer, 1995). Reinforcer establishing effect influences the power of the consequences to act as reinforcers for the individual. For instance, when an individual is deprived of food, then food becomes a more powerful reinforcer. The evocative or abative effect, on the other hand, consists of evoking any behavior that has been successful in the past for obtaining that form of reinforcement. For instance, food deprivation may increase behaviors (e.g., foraging) that have been previously reinforced by food. Alternatively, an MO might decrease the probability of these behaviors by abolishing the reinforcing power of consequences and by decreasing or abating behaviors that have been reinforced by those consequences in the past (Lang, O'Reilly, Sigafoos, Machalicek, & Rispolli, 2010; O'Reilly et al., 2007; O'Reilly, Edrisinha, Sigafoos, Lancioni, & Andrews, 2006).

To date there are two approaches that researchers have used to establish a mand repertoire: a) single operant training approaches and b) facilitative operant training approaches (Wallace, 2007). The single operant training is the most common approach and includes such

trainings as incidental teaching, choice making, and interrupted behavior chain techniques. These training procedures have been recommended and depend on either capturing or contriving MOs to generate mands (Shafer, 1994). The facilitative operant training approach, on the other hand, consists of the use of instructional procedures that are already designed to establish one verbal relation (i.e., mand) to facilitate the emergence of other verbal relations (i.e., echoic) (Wallace, 2007). This approach, however, is debatable given that some researchers claimed a facilitative effect (Drash, High, & Tudor, 1999; Wallace et al., 2006), whereas others demonstrated an inhibitory effect (Hall & Sundberg, 1987; Lamarre & Holland, 1985).

To date, mand training has been implemented for purposes such as decreasing disruptive behaviors (Charlop-Christy, Carpenter, LeBlanc, & Kellet, 2002; Smith, Iwata, Goh, & Shore, 1995; Winborn-Kemmerer et al., 2010), increasing speech (Ross & Greer, 2003), teaching functional skills (Zayac & Johnston, 2008), asking questions to obtain information (Endicott & Higbee, 2007; Sundberg et al., 2002), requesting for desired items (Bartman & Freeman, 2003; Pellecchia & Hineline, 2007), requesting for missing items (Carr & Kologinsky, 1983; Hall & Sundberg, 1987), and improving social initiations (Taylor et al., 2005).

In general, mand training has proven to be more efficient when teaching mands for reinforcers that have high MO values. In this case, manipulating the MOs is not necessary. However, manipulations of MO have been shown to have great impact on the value of both positive and negative reinforcers (McGinnis, Houchins-Juarez, McDaniel, & Kennedy, 2010). In the following section, studies that have manipulated MOs to teach children with autism to mand for preferred items are examined.

2.1.3 Mands for preferred items

Although children with autism have social and communication deficits, a number of studies have been shown to be effective in teaching functional verbal and social behaviors by teaching these children to mand for preferred items. In 2005, Taylor and her colleagues implemented a reversal design to examine the effectiveness of the manipulation of the MO in order to increase social initiations of children with autism toward their peers with autism. To do this, the MO targeted deprivation of preferred edibles in order to increase the probability that mands for preferred items as well as other types of social initiations would occur. Two conditions, establishing operant present and establishing operant absent, were conducted. Whereas the establishing operant absent condition consisted of the teacher instructing both the target child and the peer to consume the food presented on two plates with equal amounts of food, the establishing operation present session offered the snack items only to a peer. When the participant used mands toward the peer for the snack item, the peer, prompted by an adult if necessary, provided the target child with a snack item. In order to establish mands with adults, an establishing operant present was conducted with adults as partners. Study results showed that participants were able to mand for preferred items as well as respond to the mands of their peers with autism. However, it was noted that mands were not always socially appropriate, given that they kept manding for an item even though the peer refused to grant an item to them or initiated for the item they already had access to it. To address this issue and facilitate improvements in the area of social initiations, the authors suggested incorporating social initiation behaviors, other than mands, in a study. Generalization effects across peers, items, and toys were reported for three of the participants.

In an effort to teach communication skills to a 2-year old girl with autism, Bartman and Freeman (2003) also used mand training to teach mands for preferred items with signs using

prompting and fading procedures. At first, three instructors used in this study associated themselves and the teaching environment with reinforcers that had high value for the child. Then, they began to fade in language opportunities. The environment was manipulated so that the child needed to direct the instructors to gain access to the desired item. The results of this study indicated that the child demonstrated the ability to communicate in the form of signing when taught to mand for preferred items.

Pellecchia and Hineline's study (2007) also used mand training to teach three preschool children with autism to mand for their preferred items such as snacks and toys, while investigating the degree to which a mand repertoire taught generalization across parents, instructors, siblings, and peers. Four of the manding sessions included a) manding with an adult instructor, b) manding with a parent, c) manding with a sibling, and d) manding with a peer. Study results supported previous findings that manding established with an adult does not generalize to peers or siblings. Although limited, generalization from instructors to parents was noticed. It was speculated that this might have happened due to the similarities and close age of instructors with parents compared to instructors with peers.

As seen from the studies discussed above, a single subject design was used to investigate teaching mands to children with autism, ages 3 to 14, who had some tacting and echoic skills and communicated either verbally or via other modes of communication (i.e., pictures). The studies all used adults as partners/prompters, and all used manipulation of motivating operations to establish mands. There were two studies though (Pellecchia & Hineline, 2007; Taylor et al., 2005) that used peers, in addition to adults, to teach mands for preferred items. Although both studies indicated that children with autism demonstrate the ability to acquire mands when using

adults as well as peers as partners, they both suggested that mands should be taught separately for adults and peers due to the lack of generalization effects from adults to peers.

Of the three studies on mand training, only one study included generalization probes in their designs (Pellecchia & Hineline, 2007). Other studies reported generalization of mands across items and settings while discussing their overall findings, but they failed to report whether their participants were able to generalize from adults to peers. Consequently, generalization of mands from adults to peers does not seem to have the needed empirical support, and therefore further investigation of this issue is considered necessary.

Emphasis on the high value of reinforcers for achieving better outcomes appears to be another common component among reviewed studies. It was noted that MOs had powerful influences on reinforcer values and all children emitted faster acquisition of mands when items used had a history of functioning as reinforcers. It is worth mentioning that all of the studies taught children with autism to mand in a structured environment using prompting, fading procedures, and differential reinforcement. The effectiveness of procedures such as prompting, fading, and differential reinforcement in order to increase the probability of mands to occur for children with autism has been supported by Thomas, Lafasakis, and Sturmey (2010) as well. The use of such a treatment package resulted in a significant increase in mand repertoires for all children with autism who participated in this study as well as generalization of mands across settings and items for two out of three participants.

Of three studies reviewed, two of them established the children's mand repertoires in a more structured environment and only one study implemented mand training in a natural environment (Bartman & Freeman, 2003). There were no studies, however, that incorporated some kind of social interactions during mand training. Social interactions, such as initiating a

comment before manding for preferred items or embedding a social interaction into reinforcers (i.e., playing with the child after he/she mands), increased the probability of appropriate mands and facilitated other types of social initiations (Taylor et al., 2005). Given that social reinforcement does not represent as strong a source of reinforcement for children with autism as for typically developing children, integrating social interactions into reinforcers delivered during mand training might be effective to increase their sensitivity to social reinforcers as well as the frequency of other types of social initiations. A recent study by Koegel et al. (2009) investigated whether embedding social interactions into reinforcers delivered during Pivotal Response Training (PRT) would increase social initiations of children with autism compared to PRT alone. The data from this research indicated greater improvements of social initiation skills when social interactions were embedded into reinforcers compared to the non-embedded condition. The results of this study and recommendations made by Taylor et al. (2005) imply that there is a need to investigate mand training where social interactions would be embedded into reinforcers.

2.2 VIDEO INSTRUCTION

The appearance of video instruction in the literature dates as far back as the early 1970s. Video instruction is an intervention that evolved from the modeling literature. Although not a novel intervention, it was not until recent years that it gained momentum in the pursuit of effective practices facilitating social skills in children with Autism Spectrum Disorders (ASD) (Charlop-Christy, Le, & Freeman, 2000). Video instruction is based on Bandura's social learning theory (Hitchcock, Dowrick, & Prater, 2003), which purports that learning through observation allows an individual to make cognitive or behavioral changes by simply observing other people engaged

in similar behaviors or actions (Corbett & Abdullah, 2005). Attention, retention, production, and motivation are considered essential processes that facilitate observational learning (Bellini & Akullian, 2007). While the attentional process allows the child to be attending to a model and perceive it accurately, the retentional process helps with coding the modeled events into meaningful symbols and consequently stores them in memory. The production process enables the child to reproduce the modeled behavior accurately, while the motivational process consists of learning that occurs in the presence of reinforcement (Corbett & Abdullah, 2005).

2.2.1 Types of video instruction

Video instruction is designed and delivered based upon the individual needs of the child and can address a variety of skills in a variety of settings. Conceptually, video instruction includes approaches based upon the delivery type of targeted behaviors such as video modeling (i.e., adults, peers, siblings) (Delano, 2007; Shukla-Mehta et al., 2010), video self-modeling (i.e., self) (Hitchcock et al., 2003), and point-of-view video modeling (i.e., footage from the subjective viewpoint) (Tetreault & Lerman, 2010). Video modeling and point of view video modeling will be described in this section. Video self-modeling will be explained in a separate sub-section.

Video modeling, as the term implies, is an approach in which a model is videotaped, and the video is shown to the target child in an attempt to alter current behaviors or acquire novel ones (Nikopoulos & Keenan, 2003). Video modeling involves a target child watching a videotape of the targeted skill(s), which may be modeled by an adult, peer, or sibling, followed by an opportunity to imitate that target behavior in an activity session (LeBlanc, 2010). The next step may consist of an instructor prompting or reinforcing the child, if necessary, in order to pay attention to the video or perform the targeted behavior in the same context as the model in the

video until he or she finally imitates the behavior of the model (Boudreau & D'Entremont, 2010; Charlop, Dennis, Carpenter, & Greenberg, 2010) or there may be no prompts or reinforcers involved at all (Sancho, Sidener, Reeve, & Sidener, 2010).

In contrast to video modeling, which uses others as models, and video self-modeling, which uses the target individual himself as a model, point-of-view modeling has been defined as the process of videotaping elements of the environment or activity context from the standpoint of the individual who is the target of the intervention. Point of view video modeling shows the target behavior from the visual perspective or viewpoint of the child who needs to acquire and master the target behavior (Hine & Wolery, 2006; Tetreault & Lerman, 2010). Tetreault and Lerman (2010) argued in favor of point-of-view-video modeling compared to other strategies considering that "it further restricts the stimuli to those that are directly related to the target behavior, eliminating the necessity of identifying optimal characteristics of the model" (p. 397).

There are also other video instruction approaches: *Video prompting* uses a videotape of a model performing one step of the task and then gives the target individual the opportunity to complete that step before showing the next step (Alberto, Cihak, & Gama, 2005; Canella et al., 2006). *Video feedback* includes the target individual watching a non-edited videotape and then co-reviewing the videotape with the practitioner to evaluate his/her own behavior(s) in order to make adjustments in future performance (Gyl & Vuran, 2010; Maione & Mirenda, 2001). *Computer-based video instruction* addresses target behaviors through texts, graphics, animations, sound, music, power point slides, and movies that are presented via computer-based programs (Sansosti & Powell-Smith, 2008; Kinney, Vedora, & Stromer, 2003; Mechling, Gast & Cronin, 2006). *Video-based discrimination training* is another type of video instruction that involves the target individual watching a video and then determining which behavior is exemplified in each

scene (e.g., rude or polite) (LeBlanc, 2010). Finally, video instruction includes *video priming* in which the target individual watches the video and later has the opportunity to get engaged in an activity session with the same or similar materials, people, and/or settings (Sancho, Sidener, Reeve, & Sidener, 2010; Schreibman, Whalen, & Stahmer, 2000).

2.2.1.1 Video self-modeling intervention

Video self-modeling evolved since the early 1970s (Hitchcock, Dowrick, & Prater, 2003). The potential of video self-modeling is not only supported by Bandura's social learning theory, but also by Vygotsky's socio cultural view of learning, Skinner's behavior theory, and Dowrick's view of self-modeling (Hitchcock et al., 2003).

Bandura's social learning theory, however, provides the theoretical bases of video self-modeling. In addition to four aforementioned processes (i.e., attention, retention, motivation, and production), social learning theory emphasizes also self-efficacy as another important feature that has great influence over events and affects an individual's life (Bellini & Akullian, 2007). Bandura (1997) distinguished between self-efficacy and self-esteem. Self-efficacy is concerned with judgments of personal capability whereas self-esteem is concerned with judgments of self-worth. The acquisition of self-efficacy can be achieved through encouragement and external support, and especially through the observation of one's own success (Bellini & Akullian, 2007). Accordingly, when individuals see themselves perform successfully, according to Bandura's social learning theory, they will have clear information on how to appropriately perform the target skills as well as strengthen their beliefs on their own capabilities (Hitchcock, Dowrick, & Pratter, 2003). To support Bandura's view on self-modeling, Dowerick used two related terms,

feedforward and positive self-review, as key features of video self-modeling. Feedforward, in contrast to feedback, allows the individual to produce images of a skill to a level that was not previously achieved; positive self-review allows the individual to revisit the best examples of previous performance (Hitchcock et al., 2003).

Accordingly, video self-modeling is one of the few interventions that focuses almost exclusively the target individuals' strengths instead of weaknesses, meaning that it emphasizes what the target individual is capable of doing rather than what he or she is not able to do (Bellini & McConnell, 2010). The target individual observes oneself performing targeted behavior(s) and then imitates the behavior(s), previously viewed, in a similar situation (Bellini, Akullian, & Hopf, 2007). As a result, video self-modeling addresses Bandura's belief that children are more likely to attend to a model that they perceive as competent and similar to themselves (e.g., age, physical characteristics, ethnicity, gender, etc.). In addition, watching successful behaviors of their own self as opposed to unsuccessful behaviors impacts positively their attention and motivation to attend to the modeled behaviors (Bellini & Akullian, 2007).

In order for video self-modeling to be successful with individuals with ASD, two factors, self-recognition and attention span, play a critical role. Self-recognition consists of the target individual recognizing oneself on the video, whereas attention span is concerned with the target individual staying attentive throughout the video (Buggey & Hoomes, 2011). If the target individual does not recognize oneself or does not attend to the video, a treatment effect is unlikely. Therefore, visual self-recognition strategies (Spiker & Ricks, 1984) or "sticking out the tongue" (Buggey & Hoomes, 2011) are common strategies used to assess self-recognition skills of the target individuals. As for the attention span, the ability of the target individual to attend to the video for approximately 1 to 2 minutes is usually tested (Nikopoulos, Canavan, Nikopoulou-

Smyrni, 2009). If the target individuals meet these prerequisites, the probability for the video self-modeling to be successful is very high.

When creating and implementing video instruction, more or less any of the above mentioned approaches, the following steps need to be taken into consideration a) determining target skill(s)/behaviors, b) obtaining permission (i.e., parents/caregivers), c) interviewing parents and observing the child, d) determining who else will be in video and train models (e.g., adults, peers, siblings), e) preparing equipment and setting, f) filming the target behaviors, g) editing the video/raw footage, h) collecting baseline data, i) showing the video clip of desired behaviors to the target individual, j) collecting intervention data and graph data, and k) promoting maintenance and generalization (Banda et al., 2007; Bellini & McConnell, 2010).

2.2.2 Advantages of video instruction

Video instruction has been proven to be an effective intervention for children with ASD because it accounts for numerous features that benefit this population (Tetreault & Lerman, 2010). Being a visual-based approach, video instruction allows individuals with ASD to learn through visual means. Although associating meaning with verbal instructions represents an area of difficulty for children with ASD, this is not the case with instructions provided in a visual form since they learn best visually (Tissot & Evans, 2005). A visual format, allows individuals with ASD to review cues, decrease their reliance on prompts (i.e., teachers, adults), and increase their independence (Ganz, Earles-Vollrath, & Cook, 2011). Visual features of video instruction also allow individuals with ASD to be less stigmatized since visual reminders and prompts can take the place of verbal reminders/prompts by teachers and/or others in the presence of peers and/or other people (Ganz et al., 2011).

Reagon, Higbee, and Endicott (2006) mentioned time and cost effectiveness, systematic repetition of the same video numerous times, use of various models, and employment of strategies that promote generalization and maintenance of target behaviors as some of the possible benefits of video modeling. Nikopoulos and Keenan (2004, 2007) pointed out various opportunities that video modeling offers to address the generalization deficits displayed by children with autism. Hine and Wolery (2006) also emphasized the flexibility to edit images of targeted behaviors, the ability to discretely rehearse sessions or role-play targeted skills, and the flexibility to periodically review tapes as some of the advantages of video modeling.

In addition, Charlop-Christy et al. (2000) favored video modeling compared to in-vivo modeling because of its flexibility to a) create various natural environments, especially those difficult to re-create in the clinic setting; b) to take control over the modeling procedure since the videos can be reproduced until the final outcome of the video is achieved, and c) use videotapes with other people.

Buggey, Tooms, Gardener, and Cervetti (1999) saw video modeling as an appealing strategy to be used with children with autism since a) video modeling does not require human interaction, which works well for children with autism given that they are not comfortable having social interactions with others (Hume et al., 2009), b) it utilizes visual learning, meaning that it takes into consideration their strengths of being visually oriented, c) it is predictable, and d) it is easy to control.

Finally, Shipley-Benamou et al. (2002) considered video modeling as an appropriate approach for children with autism because it requires minimum attention skills from the child, given that the child does not need to look at a large spatial area and will only hear a minimum of necessary language. At the same time, the child's independence will be increased as a result of

reduced presence of an adult to support learning as well as enhance motivation, since watching a video is a low-demand activity and usually serves as a reinforcer to the child.

The above mentioned attributes of video instruction provide a clear picture of why children with ASD might benefit from video instruction for the improvement of social initiation skills, conversational skills (McCoy & Hermensen, 2007), functional skills (Bellini & Akullian, 2007). The following section reviews research studies that used three types of video instruction: video self-modeling, video modeling, and point-of-view video modeling to promote social initiation skills in children with ASD.

2.2.3 The use of video instruction for promoting social initiations

There are a handful of studies that used video self-modeling for improving social initiations skills of children with ASD with peers. The following sections will review studies that implemented video instruction as an intervention for improving social initiations of children with ASD. In addition, studies that initially focused on other skills but, along the way, facilitated the emergence of social initiations will be discussed. Finally, studies that used video instruction as their primary intervention in addition to other strategies will be examined.

2.2.3.1 Video self-modeling

Except for the study of Buggey (2005), which was conducted with school aged children, four studies reviewed in this section implemented video self-modeling intervention to improve the social initiation skills of children under 5 years of age with ASD.

Recently, Buggey, Hoomes, Sherberger, and Williams (2011) employed a multiple baseline across participants to demonstrate the efficacy of video self-modeling for facilitating the social initiations (i.e., vocal and physical initiations) of four preschoolers during playground time. All four participants, three of them 4 years 2 months and one 3 years 10 months, were involved in a buddy system study in a previous school year. Since the intervention, which addressed social interactions between children with ASD and their peers, did not yield positive results, video self-modeling intervention was implemented. A video vignette 2.5-3.5-min in length was viewed 1 hour prior to recess. The video featured each participant interacting socially with a peer while playing with the participant's favorite equipment on the playground,. They viewed the video for 2 weeks and then maintenance of the target skills was evaluated. Of four participants, three of them increased the frequency of social initiations, although one participant's results were reported as questionable. A fourth participant did not display any changes in behavior. Three of the participants maintained the skills, and one of them increased social initiations slightly compared to the baseline. Social validity results showed that teachers, therapists, and parents were supportive of the intervention.

Bellini et al. (2007) also investigated the effect of video self-modeling intervention for promoting social engagement of two preschool aged children with ASD, ages 4.4 and 5.1 years old. The videotapes featured the target child interacting with a typically developing peer without any prompting from peers or adults. The intervention was implemented across 4 weeks and consisted of three 2-minute video clips. Participants watched their own videos every morning, each school day, but the videos were alternated so the children would not watch the same video clips every day. After they watched the video, in the presence of an adult, they were instructed to go out and participate in free play with their friends. The results showed that both participants

engaged in reciprocal social interactions with typically developing peers in a natural environment but failed to engage in social interactions while in a structured environment. Social initiations, including requesting (i.e., assistance, information), inviting a peer to play, greeting, showing objects, and providing physical affection, improved as well. Social validity questionnaires, conducted weekly by teachers, indicated that children increased their overall spontaneous requests.

In 2005, Buggey's three studies demonstrated the efficacy of video self-modeling for modifying behaviors such as language production, tantrums, aggressive pushing, and social initiations. In the first study, which targeted social initiations, a 3-minute video clip showed the participants engaging in an appropriate social interaction with peers. The two participants, age range 9.11-11.3, watched their video clip every morning before the classes began. Both participants showed considerable improvements in the frequency of social initiations and generalized their skills across people, events, and settings.

Wert and Neisworth (2003) conducted a study that used video self-modeling to improve spontaneous requesting of four children with autism, age range 4-5 ½. The dependent measure, spontaneous requesting, consisted of independently asking an adult for an object or action. Prior to the study, Discrete Trial Training (DTT) procedures were used to teach participants to mand for missing items. After the participants' acquired the targeted skills, then the video modeling intervention was implemented. Participants watched video segments of themselves requesting pieces of a play activity that were withheld by the adult prompter. Then when provided with the same play context as the video, they were expected to request with adult prompting. The adult prompting was faded so that they were spontaneously requesting. Research findings showed that three of the children made great improvements in the frequency of the spontaneous requesting,

which was maintained over 2-6 weeks, and one child showed an increase in the frequency of spontaneous requesting during the intervention but did not maintain the skills after the intervention was over. Generalization of the skills across settings was reported.

2.2.3.2 Video modeling

In addition to video self-modeling intervention, researchers implemented video modeling to facilitate social initiations of children with ASD, using peers, siblings, or adults as models. A series of studies by Nikopoulos and Keenan (2003, 2004, 2007) were conducted to examine the effectiveness of a video modeling intervention on promoting social initiations of children with autism. In the first study, Nikopoulos and Keenan (2003) examined the effectiveness of video modeling for enhancing the social initiations of seven children with autism. A multiple-treatment design was implemented, except for one child with whom an A-B design was used. Three different models, such as an adult that was unfamiliar to the child, a familiar adult, and a typically developing peer were used as models. Four of the seven children who participated in this study increased social initiations as well as appropriate play across numerous conditions, whereas three of the seven children did not learn to initiate or get engaged in reciprocal play. Some of the supposed reasons contributing to the failure of these children to initiate social initiations were: a) two of the children did not get engaged in watching the video appropriately due to their disruptive behaviors, and b) all of them lacked any kind of play skills. Given that one of the children did not respond to video modeling, video self-modeling was implemented, but was unsuccessful. Four of the children were able to generalize across settings, peers, and toys. Maintenance of skills was observed at 1 and 2 month follow-ups. This study did not find any changes in the social initiations due to the model used in a video session; however, the

participants were more likely to elicit social initiations when presented with a single stimulus, one toy instead of a variety of toys.

Nikopoulous and Keenan's second study (2004) was focused on examining whether video modeling enhances social initiations and reciprocal play of children with autism. A multiple baseline design across three participants was implemented. Generalization across toys, settings, and people was targeted. The results indicated an increase in social initiations and reciprocal play with all three participants when using a single stimulus (e.g., one item). In addition, generalization across toys and people occurred in the absence of a video display and experimenter prompts. Both skills were maintained up to 1 and 3 months after the intervention was over.

Finally, Nikopoulos and Keenan's third study (2007), which was comprised of two experiments, investigated the effect of video modeling to teach three children with autism to build more complex social sequences. A multiple baseline design across participants was implemented as well. Four video modeling conditions were implemented, using different videotapes but with the same model and the same experimenter. Generalization, conducted in the absence of any video display with a different typically developing peer, and maintenance of skills at 1 and 2 months follow ups were also measured. This study demonstrated that video modeling helped to build complex sequences of social behaviors in all participants. The enhancement of social initiation skills was present in all of them and they were also able to generalize across peers as well as maintain targeted skills at a 2-month follow up period.

Spontaneous requests were the focus of the Banda et al. (2010) study. The purpose of this study was to examine whether two individuals with autism would acquire spontaneous requesting skills using a speech-generating device (SGD) following a video modeling

intervention. There were no prompts or cues given at any point throughout the intervention. It was noted that even though video modeling increased spontaneous requesting skills for one participant more than for the other, both of them, however, failed to generalize to the second preferred object, which was the only generalization measure addressed in the generalization phase in this study.

A study of Charlop and Milstein (1989) used video modeling to facilitate conversational skills of three children with autism while focusing on generalization of those skills across untrained topics of conversation, unfamiliar persons, peers with autism, siblings, new toys, and settings. In addition to imitating the conversations in the videotapes, participants' ability to ask questions using proper intonation and politeness words was also investigated. The results indicated that in addition to acquisition and generalization of conversational skills the participants increased question asking as well.

More recently, Charlop et al. (2010) implemented video modeling, this time to improve appropriate social behaviors (i.e., verbal comments, intonation, gestures, and facial expressions) but still examining the generalization of skills across people, settings, and stimuli. Two adults were the primary models in the three video vignettes created for each child. Participants were asked to watch the video two consecutive times and then their behaviors were assessed in a play session. The results of this study indicated that all three participants improved social behaviors. Two of them acquired the targeted behaviors after four sessions only. Such rapid acquisition of the target behaviors was explained by incorporating reinforcement into the activity, such as watching a video given that it was a reinforcing activity for all participants. Although generalization results varied across children and behaviors, they all demonstrated generalization of the skills across people, settings, and stimuli.

2.2.3.3 Summary

Data from the studies reviewed provide clear evidence that video instruction can be successfully used to improve social initiation skills of children with autism. Although children who participated in those studies all had diagnoses of autism, they functioned at different levels. While their language skills ranged from no speech to fluent and rich vocabulary, their social skills were all at low levels (i.e., withdrawn, quiet, no interactions with others). Given that the participants' language and social skills ranged from very low to moderate levels, most of them experienced some kind of improvements, even though not at the same level. It is very important to mention, though, that participants who were more verbal seemed to improve their social initiation skills more than those with limited language, supporting one more time the suggestion that there is a strong relationship between language and social skills (Wallace, 2007). In general, video modeling, with video clips ranging in length from 27 seconds to 5 minutes, proved to be effective in some studies after 4 sessions only. This supports one of the key attributes of video instruction, that is, achieving results within a short period of time (Buggey, 2005). However there were some studies that required 24 sessions in order to achieve desired outcomes.

A hallmark of the reviewed studies was the generalization of social initiation skills across people, settings, and items. Prior to the use of video modeling the participants did not demonstrate the ability to perform the targeted behaviors; however, after the video modeling was introduced they not only acquired the targeted behaviors but also transferred those skills across different settings, people, and items. In order to facilitate generalization many studies used adults, peers, and self as models, or mixed models that consisted of unfamiliar adults, familiar adults, and peers as models, as well as a variety of toys or items and different settings. It was

noted that generalization was related to the reinforcing attributes of the items/toys and activities featured on the video clip. Overall, incorporating generalization probes at intervention showed that video modeling may be useful in transferring learned behaviors to settings other than those featured in the video as well as with other people and other items.

The majority of studies reported social validity of video modeling intervention. Studies that implemented the intervention at the beginning of the school day (Bellini et al., 2007; Buggey, 2005) or one hour before recess (Buggey et al., 2011) reported that video modeling was an easy intervention to be implemented and did not interrupt the classroom schedule. Maintenance of skills up to two months after the intervention ended was reported by many studies as well. It was noted, however, that not all the children who participated in those studies demonstrated acquisition of the targeted behaviors, generalization of skills across people, settings, and materials or maintenance of acquired skills for longer periods of time (Banda et al., 2010; Buggey et al., 2011; Nikopoulos & Keenan, 2003). This was an issue especially for those studies that included participants who displayed play skills deficits, those that had participants who engaged in disruptive behaviors, or who simply were not interested in watching the video. This supports the findings that for video instruction to be successful attention span, motivation, and self-recognition should be present. To resolve such issues, some studies switched from video modeling to video-self modeling as an alternative to increase participants' interest in watching the videos. Despite this, the results were still at the unsatisfactory level.

2.2.4 The use of video intervention for improving social initiations while targeting other skills

In addition to the use of video modeling for promoting social initiations, there were a handful of studies that initially targeted skills such as functional daily living skills, perspective taking, and especially play skills that collaterally facilitated social initiations. Play skills, which involve such diverse and multifaceted behaviors as imitations, reciprocity, responses, and initiations (Hine & Wolery, 2006) are considered to be among the most fundamental skills for the development of young children, and they have long been a focus of video modeling. Although the primary targets of the following studies were appropriate play or engagement in play with peers, other types of social initiations were targeted as well in order to fully achieve these play goals.

Sancho et al. (2010) compared the effectiveness of two variations of video modeling, video priming and simultaneous video modeling, on the acquisition of play skills in two children with autism. A combined adapted alternating treatment design with a reversal and multiple baseline design across participants was implemented. While video priming did not use reinforcement or prompts for imitation of targeted skills, simultaneous video modeling utilized reinforcement and prompts to acquire the targeted skills. Two play sets with five characters each, a house set and a circus set, were used to teach sequencing actions (i.e., "Jump through hoop") and scripts (i.e., "Look! Elephant spins".) A point-of-view video modeling was used to create the video vignettes. Prior to intervention, participants were trained in a snack-in-a-cup motivation system, to which they had already been exposed. The motivation system consisted of a teacher dropping one small piece of an edible into the cup contingent upon independent compliance with one instruction and immediately giving access to the cup. Study results indicated that both video

modeling procedures produced acquisition and maintenance of play skills. Generalization of play skills (actions) failed to generalize across novel play sets for both procedures; however, for one child scripted play skills generalized using simultaneous video modeling with house play sets rather than priming. Appropriate unscripted actions and verbalization did not occur for any of the participants.

Bodreau and D'Entremont (2010) in a study similar to that of Sancho et al. (2010) used video modeling to teach play skills to two young children with autism using two play sets, a veterinary play set and a construction play set. Play skills consisted of modeled actions (i.e., "Remove workers from car") and scripted verbalizations (i.e., "Lunch time") and unmodeled actions and unscripted verbalizations (actions/verbalizations that were contextually relevant to the ongoing scenario). After the children watched the video, they were provided with the toy set and were allowed to play for 10 min. The appropriate target behaviors were reinforced verbally, physically, and tangibly. The results indicated a rapid acquisition of modeled actions and scripted verbalizations for both participants; however, unmodeled actions were noted for one participant only, whereas a decrease of unscripted verbalizations was noted for both participants. Generalization of modeled actions and scripted verbalizations were successful across stimuli and settings. Both participants maintained the skills over a short time; only one of them maintained the skills for four weeks after the short-term maintenance.

In 2009, MacDonald et al. examined the effect of video modeling on facilitating engagement in long sequences of pretend play for two children with autism. A multiple probe design replicated across play sets was implemented. The experiment consisted of both the target child and a typically developing peer watching a video clip twice a day and then playing with the same play materials, without any prompting or reinforcement from adults. Following the video

modeling intervention, both children increased production of a reciprocal verbal interaction chain, which involved requesting items and commenting, as well as cooperative play involving handing toys or materials to the peer without promoting or reinforcement.

Reagon et al. (2006) replicated the Taylor, Levin, and Jasper (1999) study. This study differed from the original study in that it changed the setting from home to preschool, did not use extraneous reinforcements, used an AB design across four play scenarios, and used a sibling as a model and a play partner instead of an adult. The results showed that the child engaged in all play scenarios with the trained sibling, responded appropriately to another untrained sibling, and displayed social initiations by inviting his mother to play within teacher and doctor scenarios. Overall, video modeling increased the participant's generalization of play skills across settings and people.

Summary. Research findings of the aforementioned studies provide support to the effectiveness of video modeling for producing meaningful increases in the area of social initiations while targeting play skills. It is noteworthy that participants in all the studies did improve appropriate social initiations such as toy item/toy requests, questions, play statements, play comments, and play invitations. In some studies participants demonstrated the ability to initiate social behaviors in the absence of any prompting from adults or reinforcement other than video modeling itself (Reagon et al., 2006; Sancho et al., 2010). One possible explanation for such results might be that participants already had a repertoire of solitary play skills but did not engage in appropriate play with others and although they had verbal repertoires, they did not use words without being prompted. The evidence supporting the generalization of treatment gains, however, remains equivocal given that only one study reported generalization of play skills from the school to the home setting as well as generalization of skills across people, from trained

siblings to an untrained sibling and the child's mother (Reagon et al., 2006), whereas two other studies did not report generalization measures.

Given the visual processing strengths of many children with autism, it is obvious that video modeling provides them with the opportunity to learn social initiation skills through observations. There were numerous studies that showed that video modeling is an effective intervention for improving social initiations; there were a few studies, however, that were initially designed to use video modeling alone, yet watching a video by itself was not sufficient to improve social initiation skills for all participants. Video modeling was also been purposefully combined with other interventions in order to influence the outcomes for each and every participant. Consequently, there have also been studies that used additional strategies along with video modeling due to the failure of video modeling alone, and other studies that from the outset used video modeling and other strategies as a treatment package.

2.2.5 Video instruction as the primary intervention with additional intervention strategies

In addition to the use of video instruction alone, there were several studies that have used video instruction as the primary intervention with additional intervention components and other strategies. Video instruction has shown to be successfully combined with reinforcement (Apple et al., 2005; LeBlanc et al., 2003; Taylor et al., 1999; Tetrault & Lerman, 2010), self-management (Apple et al., 2005), video feedback (Maione & Mirenda, 2006), prompting (Alberto, Cihak, & Gama, 2005; Cihak et al., 2010; Murzynski & Bourret, 2007), self-monitoring (Coyle & Cole, 2004), computer-based programming (Kinney, Vedora, & Stromer, 2003; Sansosti et al., 2008; Simpson, Langone, & Ayres, 2004), social stories (Scattone, 2008),

peer mediated instruction (Oglivie & Dieker, 2010), activity schedules (Blum-Dinalya et al., 2010; Kimball, Kinney, Taylor, & Stromer, 2004).

The following section will discuss studies that used video instruction in conjunction with other strategies, such as reinforcement, self-management, social stories, and peer mediated instruction in order to improve social initiations for children with autism. While the studies by Apple et al. (2005) and Maione and Mirenda (2006) added other strategies after video modeling alone did not produce desired outcomes for all the participants, the other studies examined in the following section were initially designed as a combined.

The most recent study by Tetrault and Lerman (2010) incorporated reinforcement into point-of-view video modeling to teach three children with autism social initiations with a communicating partner. A multiple baseline design across three scripts ("Get Attention", "Request Assistance", and "Share a Toy") was employed. Generalization of skills across materials and maintenance of skills over time were examined as well. Two adults were present all the time during the intervention sessions; one adult played the role of the conversant whereas the other one was the trainer. The trainer was responsible for delivering food items when the child paid attention to the video and also during the practice sessions when the child was engaged on the scripted exchange with the communicating partner. The trainer also provided cues when the child did not get engage in the scripted exchange. Results show that the intervention was successful in increasing the frequency of social initiations for two out of three participants, whereas one of the participants required additional prompting in order to acquire the target behaviors.

Apple et al. (2005) conducted two experiments with five high-functioning children with autism to teach them to give compliments to peers as well as initiate. The first experiment used a

multiple-baseline design replicated across participants. In addition to video modeling, which consisted of three video segments of compliment-giving responses and one video segment of compliment-giving initiations for each participant, a reinforcement phase was used as well. In fact, the reinforcement phase was added given that both children failed to initiate compliments to typically developing peers. This phase consisted of participants gaining access to tangible reinforcers after they initiated two compliments toward their peers. The second experiment, on the other hand, used a self-management strategy in addition to video modeling to teach children with autism to initiate giving compliments. As in the first experiment, the three children who participated in the second experiment watched a video segment of a peer giving a compliment about an item to the other peer. After the video modeling session, two children used wrist counters as self-management devices and one of them used a small laminated checklist. A clicking on the counter or checking on the checklist preceded each compliment-giving initiation. When 2 instances of compliment giving were displayed on their self-management devices or checklists, they received a prize. In respect to compliment-giving initiations, this study indicated that video modeling combined with self-management was more effective than video modeling and reinforcement. Moreover, the use of self-management enabled children to independently monitor their initiations.

A study by Taylor et al. (1999), which extended Charlop and Milstein's (1999) findings, combined video modeling with reinforcement to improve engagement of two children with autism by making play comments to their siblings. Both studies evaluated scripted and unscripted play comments via a multiple probe baseline across three play activities. Both participants watched video segments of a dialogue between their siblings and adults, and then were provided with the same stimuli as the setting to use scripted comments or requests (i.e.,

"This is the bad guy", "Let's play with trains") and unscripted play comments. Reinforcement was provided when the child independently generated any of the scripted play comments (i.e., "These hotdogs taste yummy") from the video segment. This study extended previous findings that video modeling is an effective intervention for children with autism for engaging in conversational responses as well as play comments. It was noted that scripted comments toward siblings increased for both participants whereas unscripted comments increased for one child only.

Maione and Mirenda (2006) incorporated feedback and prompting into the video modeling intervention to teach social initiations and responses with typical peers during play to a child with autism. This study employed a multiple baseline design across three play activities (i.e., "Play-Doh", "Chevron Cars", "Caillou's Tree House"). Video feedback was introduced for the second play activity given that there was no evidence of an increase in the frequency of social initiations and responses. In addition to video feedback, verbal and visual prompting were introduced to interrupt the participant's engagement in perseverative behavior with Chevron cars. The results indicated that for two play activities ("Play-Doh", "Caillou's Tree House), the video modeling intervention alone increased social initiations and responses; however, the Chevron Cars activity required video feedback and prompting in addition to video modeling. An interesting finding in this study was that the child produced greater numbers of initiations than responses, which is very uncommon for children with autism. Although there was no formal generalization included in the study design, some anecdotal evidence indicated that stimulus generalization outside of the activity session was present.

Sansosti et al. (2008) used computer-assisted instruction to teach social skills to individuals with ASD. They implemented a packaged intervention, computer-presented social

stories and video models, with three boys with ASD. A multiple baseline across participants was used to demonstrate changes in social communication skills, joining and maintaining conversations with a peer or group of peers. A Microsoft PowerPoint presentation comprised of a social story and accompanying video model was designed for each of the participants. After a slide of a social story, the video clip of "how to perform" the targeted behavior played automatically. The participants reviewed the video modeled social story daily right before recess. Results show an increase of social communication skills for all three participants. For two of the participants an additional component, prompting, was implemented. Generalization of skills was noticed for one of the participants. Maintenance of the skills, however, was observed at a 2-week follow-up.

Video modeling in combination with social stories has also been investigated by Scattone (2008). The researcher used a multiple baseline across three behaviors (i.e., eye contact, smiling, and initiation behaviors). Three social stories addressed eye contact, eye contact and smiling, and eye contact, smiling, and initiation behaviors. After the narration of each social story, the child watched a video segment of two adults modeling the target skill. Study results showed that the eye contact and initiation behaviors increased as a result of video modeling combined with social stories, but smiling behavior did not improve. Generalization was demonstrated across people and from the clinic setting to the school setting.

Finally, video modeling has been combined with peer-mediated instruction to improve five social skills of individuals with ASD (Ogilvie & Dieker, 2010). A multiple baseline across subjects was implemented. The participants viewed five video vignettes, one for each of the five target behaviors (i.e., greeting a peer/teacher, participating in a conversation, tracking the talker, following directions, and asking a question). Three trained peer mentors were involved in peer-

mediated intervention. The peer mentors, who were also classmates of the participants, role-played the targeted social skills with the participants. A 20-min session took place in resource room and inclusion classrooms (i.e., science, art, and physical/health classes). Video vignettes of two targeted skills were viewed daily. After they viewed the video of the first skill, both the participant and the peer mentor reviewed the steps orally and then role-played the skill. Then, the same procedure was followed for the other skills. Findings indicated that two of the social skills, greeting a peer/teacher and tracking the talker were increased.

Summary. Based on this review of research studies on video instruction, it appears that video instruction can promote social initiations when used alone, but it also might be enhanced with the support of other strategies as well. Studies that combined or supplemented video instruction with strategies such as reinforcement, video feedback, prompting, self-management, social stories, increased the probabilities of all participants to improve social initiation skills. The majority of studies had designed additional strategies as part of the intervention package; however, as noted previously, that there were studies that used an additional strategy after they realized that participants, for various reasons, were not achieving the expected outcomes. In both cases, the additional strategies complemented video instruction and facilitated social initiations to emerge. However, there is a critical limitation for these studies when it comes to the findings. Given that video instruction was implemented in combination with other additional strategies, it is inconclusive whether video instruction or other additional strategies incorporated in the intervention produced more salient results.

Although learning through observation might be challenging, at the same time it is a very important and successful channel for learning (Gena, Couloura, & Kymissis, 2005). Lack of motivation experienced by children with autism, in addition to difficulties in developing

imitative repertoires and attending to multiple cues, increases the complexity of acquiring new behaviors via observation for this population. Several studies emphasized that the failure of their intervention was due to the participants' lack of motivation to watch a video or lack of attention or imitative skills. McCoy and Hermensen (2007), on the other hand, explained the variability of the effectiveness of video modeling in relation to the children's level of language and cognitive abilities, their imitation and attention skills, types of models used, length of the video, number of times viewed, and the setting in which video modeling took place. In addition, lack of sensitivity to social reinforcers may be critical when it comes to improvements in social initiations for children with autism. Subsequently, combining video modeling with strategies that address such deficits has great potential to influence the outcome of children with autism in the area of social initiations. One possible explanation why video modeling was combined with strategies such as prompting, self-management, social stories, and especially reinforcement could be related to deficits in any of the areas mentioned by McCoy and Hermensen.

In regard to spontaneous requesting, it is worth mentioning that although Wert and Neisworth (2003) and Banda et al. (2010) are the only two studies that investigated spontaneous requesting their results differed from one another in regard to acquisition and generalization of targeted skills. These differences may be attributed to various factors such as the use of video self-modeling intervention (Wert & Neisworth, 2003) compared to video modeling (Banda et al., 2010). In addition, the participants' initial skills as well as the use of DTT prior to intervention (Wert & Neisworth, 2003) may have played a role. While participants in the Wert and Neisworth (2003) study already displayed a low level of appropriate requesting behaviors prior to intervention, participants in Banda et al. (2010) displayed requesting skills that were mostly inappropriate skills (e.g., grabbing the desired items, pulling adults to the desired object).

Therefore, an investigation of the combined use of mand training and video modeling for children who do not have a mand repertoire might yield better generalization of mands, including the use of mands with peers.

As seen from the literature review on mand training and video modeling, it is obvious that both interventions were successful to a degree, when used separately to establish a mand repertoire and other types of social initiations. However, both of them have some serious limitations when it comes to generalization and treatment effects respectively. Therefore, this research study is designed to incorporate mand training into a video self-modeling intervention in order to establish a mand repertoire and other types of social initiations skills in children with autism.

3 METHODS

This chapter will describe the methodology employed in conducting the present study. The study purpose and research questions open this chapter. Next, the target population and selection and pre-experimental procedures are described. Then information on the research design, dependent and independent variables, is provided, followed by procedures employed in the study. Interobserver reliability and procedural fidelity data for each participant and condition, including the social validity measures conclude this chapter.

The purpose of this study was to investigate the efficacy of a video self-modeling intervention to establish a mand repertoire and other types of social initiations to peers in young children with ASD. More specifically, the purpose of this study was a two-fold purpose: first, to investigate the efficacy of video self-modeling on increasing the frequency of mands and other types of social initiations (i.e., greeting, commenting) of children with ASD to peers and second, to investigate the efficacy of video self-modeling on facilitating the transfer of treatment gains across people, settings, and materials. Permission to conduct this study was issued by the Institutional Review Board of the University of Pittsburgh (Appendix A).

The study was designed to answer the following research questions: a) Will children with ASD acquire mands for preferred toy items to peers through a video self-modeling intervention? b) Will children with ASD acquire greeting skills to a peer through a video self-modeling intervention? c) Will children with ASD acquire toy comments through a video self-modeling

intervention? e) Will children with ASD acquire activity comments through a video self-modeling intervention? f) Will children with ASD generalize mands across people, items, and settings through a video self-modeling intervention? g) Will children with ASD generalize greeting skills across people, items, and settings through a video self-modeling intervention? g) Will children with ASD generalize toy comments across people, items, and settings through a video self-modeling intervention? and h) Will children with ASD generalize activity comments across people, items, and settings through a video self-modeling intervention?

3.1 TARGET POPULATION AND SELECTION

3.1.1 Participants

The participants in this study were three preschool-aged children with ASD. Participants were selected in accordance with the following five criteria: a) the child had a diagnosis of autism spectrum disorders, b) the child was between 3 and 5 years of age, c) the child was able to say at least three-word sentences or use an Augmentative and Alternative Communication (ACC) device, d) the child had low or nonexistent levels of social initiation skills with peers, and e) the child was not able to produce independent mands for preferred items to peers.

Four participants were initially selected for participation in this study. One of the selected participants was withdrawn from the study by his parents due to health issues (not related to the study). The remaining three participants, all boys, met the eligibility criteria. After parent consent was given for all participants, they were enrolled in the study. Three typically developing peers, referred by the teachers based on their language skills as well as their social

responsiveness to peers with ASD, were selected as communication partners for the children with ASD. The parents of the typically developing peers also gave permission for their children to participate in the study.

Prior to the current investigation, each participant had received a diagnosis of autism. Results of previous assessment instruments conducted by previous agencies and the preschool personnel were utilized to determine the participants' levels of language and social development. These assessment instruments included: the Battelle Developmental Inventory – 2nd Edition (BDI-2), Preschool Language Scale – 4th Edition, Vineland II, and the Behavioral Language Assessment. In addition, the mand section of the Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP; Sundberg, 2008), a criterion-referenced assessment, was the only assessment instrument that was administered at the beginning of the study in order to determine the baseline level of the participants' manding skills (i.e., manding for preferred items). This assessment instrument is designed to determine the existing language and related skills for children with ASD. It contains 16 measurements of language and language related skills, mand being one of these measures, which are presented in a developmental sequence within 3 levels (i.e., Level I –III). The participants' mand repertoire in Level 1 (0-18 months) was assessed through 5 milestones, consisting of the ability to emit mands with and without prompts, the number of different mands emitted, and the level of spontaneity and generalization,. In Level 2 (18-30 months) the participants' mand repertoire for requesting missing items and actions was assessed through 5 milestones as well as the number of words used to mand, the level of spontaneity, and the number of novel mands. Finally, Level 3 (30-48 months) assessed the participants' ability to mand for information, stop/remove undesirable activities, give directions, instructions, or explanations, and mand for others to attend to his own intraverbal

behavior (e.g., listen to me, I'll tell you…) through 5 milestones (Sundberg, 2008). The scoring procedure for each level consisted of 0, ½, or 1 point for each milestone. Hence, the score of 5 indicated that the participant met each milestone in that level. The VB-MAPP results for the participants' in this study will be interpreted based on their level and their points within that level.

3.1.1.1 Tuan

Tuan was a 4-year, 10-month old male at the beginning of the study. Vietnamese and English were the languages used at home. The participant's abilities to use and understand English were assessed via the Preschool Language Scale – 4th Edition. His standard scores were 2.5 deviations below the mean. Tuan's social skills were assessed using the Battelle Developmental Inventory – 2nd Edition (BDI-2). In the social and language (expressive and receptive) areas, Tuan scored 2.6 and 3 deviations below the mean respectively. Results of the behavioral language assessment form showed that Tuan used 5-10 words, signs, or pictures to ask for reinforcers, vocalized frequently, and said many clearly understandable words, repeated many words, followed a few instructions, verbally identified 16 to 50 items or actions, was able to answer at least 10 simple questions, and did not initiate interaction with others. The participant's manding skills, assessed at the beginning of the study using the VB-MAPP Milestones Assessment, showed that Tuan's mand repertoire was at Level I, scoring 4 ½ out of 5 points, across 5 milestones. The child displayed all the skills at Level 1 except the generalization of mands across people, settings, and reinforcers. In Level II Tuan met only 2 milestones, scoring 2 ½ out of 5 points. In this level he demonstrated the ability to mand for 20 different missing items only when prompted "What do you need?" which is permitted in assessing this milestone. He was able to mand for others to

emit 5 different actions and also 3 different mands containing 2 words (e.g., my turn). He did not score more then 1 and 2 mands respectively in Level III. No questions for acquiring information or any other questions were displayed at any point during the assessment or the study.

3.1.1.2 Sam

Sam was a 4-year, 11-month old male at the beginning of the study. His language skills were assessed via the Vineland-II. His expressive and receptive *v*-scale scores were 7 and 6, respectively. Both scores indicated language impairment and qualified him for early intervention services, because his score was 11 or below. The child displayed echolalia. As for his social development, the Vineland-II (parent interview), the Behavior Assessment System for Children-2nd Edition (BASC-2), and The Childhood Autism Rating Scale (CARS) were utilized. His social skills were within the delayed range on the Vineland-II, 2.5 deviations below the mean. The results of the BASC-2 showed that his T score for behavioral symptoms was 80, which rated him within the Clinically Significant range of Withdrawal and Social Skills (T score of 70 or higher), while the results of the CARS rated him within the Mildly-Moderately Autistic (range 30-37) with a total score of 37. The behavioral language assessment form, conducted by the preschool personnel, showed that the child pulled people, pointed, or stood by reinforcing items as his form of requesting. He did vocalize many speech sounds and clearly repeated any word, even simple phrases. He followed few instructions and identified 16 to 50 items or actions when shown pictures of those items. He did not interact with others. The participant's manding skills were assessed at the beginning of the study using the VB-MAPP Milestones Assessment. Results showed that his scores for mands were 4 ½ at Level I and 2 ½ at Level II. He was able to mand without being prompted beyond the use of the question "What do you want?" which was

permitted in assessing this milestone. He did not meet the milestone related to generalization of mands across people, settings, and reinforcers, scoring only a ½ point out of 1. In Level II the child did not spontaneously emit different mands or novel mands without specific training. No questions to acquire information were displayed by the child at any time during the assessment or the overall study.

3.1.1.3 Jeremy

Jeremy was a 4-year, 2-month old male at the beginning of the study. The Battelle Developmental Inventory – 2nd Edition (BDI-2) was utilized to assess his language and social skills. His standard score of 1 in the area of language, expressive and receptive, was indicative of a developmental delay given that the qualifying score in this area is a standard score of 6 or below. He used an augmentative and alternative communication device (AAC) to communicate his wants and needs. In regard to social skills, his standard scores showed a 1.5 deviation below the mean. The results of the VB-MAPP showed that Jeremy met almost all the milestones at Level 1, scoring 4 ½ out of 5 points. Using the AAC device, the child was able to emit mands without other prompts other than the question "What do you want?" Generalization of mands represented one of the areas of difficulty for him in this level. In Level II Jeremy scored 3 out of 5 points. However, given that he used the communication device, he communicated in phrases, hence emitted mands that contained 2 or more words (e.g., blow bubbles). Emitting novel mands was not feasible because of the limited access to words on the AAC device. He was observed asking questions to mand for preferred items toward adults (i.e., Can I play with iPad?). However, this question was asked using one button only. He did not demonstrate the ability to

use separate buttons in his AAC device to ask questions, to request from his peers, or to acquire information.

3.1.2 Pre-experimental procedures

A preference assessment was conducted in the training setting, using a paired stimulus procedure (Lavie & Sturmey, 2002) in order to generate a list of preferred items that would be used in the training. A list was generated for each of the participants based on the information from interviews with the children's teachers and parents. Each item was paired once with every other item in a random order. On each trial, the experimenter placed two items on the table in front of the child (0.7m from one another and 0.7m from the child) and waited for 5 seconds. If the child pointed to the item, reached it, or grabbed it, then the child was granted access to the chosen item for 5 seconds, whereas the non-chosen item was removed immediately. Attempts of the child to approach both items simultaneously were blocked by holding both items down on the table. If neither item was approached within 5 seconds, the experimenter prompted the participant to hold or consume one of the two items. This procedure was then repeated with the other item. After the child sampled both items, both items were presented again and the trial was repeated (still the same trial). If the child did not approach either of the items then the items were removed. The sessions were video recorded and the data were recorded for each trial on the prepared score sheet.

In addition to the preference assessment, a self-recognition assessment was also conducted in the training setting. The child sat at the experimenter's lap and faced the mirror for approximately 10 seconds. Then he was turned 180^0 facing away from the mirror and engaged in play with his preferred toy items that were placed on a table within his reach. While playing with

the toys, the experimenter wiped red makeup, concealed in a tissue, onto the child's nose. The experimenter turned the child around to face the mirror again. If the child did not touch his nose within 15 seconds then the experimenter cleaned his nose. Two of the three children responded to the make-up as expected. However, since Jeremy did not touch his nose, the experimenter showed him a video of himself and other people. The experimenter stopped the video and asked the participant to show who was the person on the video by asking "Show me who is this." The child pressed the button on the AAC device for the peer's name when the video was stopped at a picture of the peer and the button for his name when the video was stopped at his picture.

Finally, the participants' abilities to attend to the video were assessed. The assessment was conducted in the training setting and the participant was instructed to sit and watch a 1-minute video of himself on a laptop. The participant's behavior was recorded. All three participants were able to attend to the video for at least 1 minute.

3.1.2.1 Settings

The study took place in an inclusive preschool. The study was conducted in two settings, the participants' classrooms and a training setting. The classroom consisted of a room divided into a partitioned instructional area, a play area, a library, and a table area. The training setting consisted of a partitioned area in a teachers' room, 3" x 4", divided by barriers. Baseline sessions were conducted in both the participants' classrooms and the training setting. Intervention sessions, including video viewing and the activity session, took place in the training setting only. Generalization sessions for Tuan and Jeremy took place in both settings, whereas for Sam they took place only in his classroom. The maintenance condition was conducted in the training

setting and the children's classrooms. Preference assessment, attendance to the video, and self-recognition assessment were conducted in the training setting as well.

3.1.2.2 Materials

The classroom contained typical teaching materials (i.e., tables, chairs, toys) while the training setting contained a child size table and a chair for watching the video and a second table and two child sized chairs for the activity session. A video camcorder, a laptop computer for video viewing, and food and toy reinforcers for peers and the participants were used as well. In addition, three highly preferred toy sets for the participants were used throughout the study. Table 1 provides further details on the toy sets and the order of use for each participant. Prior to the start of the study, four video vignettes were created for each participant. The participants were used as primary models for the construction of all video vignettes. Three highly preferred toy sets, specific to each of the participant's preferences, were utilized in each of the video vignettes. If at any point during the study the participant lost interest in playing with the preferred toy item displayed in the video vignette, another highly preferred toy set was identified and the video vignettes were modified to display the exact toy set. This was the case with two participants, Sam and Jeremy. Another modification of the video vignettes was made for Jeremy in Condition video B. The second video vignette created displayed his greeting behavior using a motor behavior in addition to using the AAC device, touching the hand of the peer as a greeting gesture. The experimenter provided prompts and reinforcers to the participants and then edited the videos to show only the desired behaviors. iMovie software was used to edit the video vignettes. For instance, the experimenter prompted the participant to mand for a preferred item by saying, "(Name) say I want (item)." Then, the video clip was edited and only independent

mands and other types of social initiation behaviors were shown in the video vignette. The duration of each video vignette was between 1 to 3 minutes long. The length of video vignettes depended upon the number of target behaviors displayed in each condition video. Each video vignette was played on a laptop computer for the participants.

Table 1. Preferred toy items for each participant

Participant	Order of toy sets used in the video vignette & activity session		
	First	Second	Third
Tuan	- Train set (3 items)	- Ice Cream toy set (4 items)	- Garage & Cars (3 items)
Sam	- Train set (4 items)	- Poker chips & Box (3 items)	- String & Beads (3 items) - Ball Maze (3 items)
Jeremy	- Ramp & Cars (2 items) - Garage & Cars (3 items)	- Fridge Phonics & Letters (4 items)	- Matching Middles (4 items) (3 items)

Note: Sam lost interest in the third selected toy item, which was replaced with a new preferred toy, Ball Maze; Jeremy lost interest in the first selected toy item, which was replaced with a new preferred Garage and cars. The number of items for the first and the third set of toys changed for Jeremy accordingly.

3.2 RESEARCH DESIGN

A multiple probe design across participants was utilized to demonstrate experimental control and establish a functional relationship between the independent and dependent variables. The design included: baseline, intervention, maintenance without the video, generalization, and maintenance over time. For baseline, targeted behaviors, independent mands and other types of social initiations were measured consistently under the same environmental conditions until a stable pre-intervention trend and level were established (Gast, 2010). After a stable pattern was established, a video self-modeling intervention was introduced to one of the participants, while continuing the baselines of the other participants through weekly probes. After the first participant reached a stable pattern for the behavior to which intervention was applied, the video self-modeling intervention was introduced to the second participant. After the participant reached the criterion performance for the last video condition (D), three condition D sessions without video were conducted. This condition assessed the participants' abilities to display target skills without the presence of the video. Then, generalization sessions were implemented. Finally, maintenance of skills after one month was assessed. The same process was repeated for each of the participants.

3.2.1 Variables

3.2.1.1 Dependent variables

The following dependent variables were targeted in this study: a) independent manding for preferred toy items, b) greeting, c) toy comments, and d) activity comments. *Independent manding* is defined as the child requesting a preferred toy item using a mand frame "I want

(item)" directed to the peer. *Greeting* is defined as the child using vocalizations, or pressing a button on the AAC device, such as "Hi", "Hello", "Hi/Hello (name)" directed to the peer. *Commenting on toys* is defined as the child expressing opinion on preferred toy items (i.e., "This (item) is cool!") directed to the peer. Finally, *Commenting on the activity* consisted of the child expressing enjoyment to the peer regarding the activity (i.e., "This was fun!") Such behaviors should be clearly directed to a peer, distinguished from an ongoing interaction by a change in items/activities or a discontinuation of the previous interaction for at least 5 seconds. The operational definitions of the dependent variables and the scoring system are summarized in Appendix E.

3.2.1.2 Independent variables

The independent variable consisted of a video self-modeling intervention. Video self-modeling involved four video conditions (A, B, C, D). Condition video A displayed the target child manding for preferred toy items toward the peer. Condition video B displayed the target child greeting the peer and manding for preferred toy items. Condition video C displayed the target child greeting the peer, commenting on the toy item, and manding for preferred toy items toward the peer. Finally, condition video D displayed the target child greeting the peer, commenting on the toy item, manding for preferred toy items, and commenting on the activity to the peer. In order for the motivating operations to be present, target children were deprived of playing with their preferred toy items other times except during the study. After the child watched the video vignette, an activity session took place in which the child's behavior was assessed. After the child reached the criterion performance for one video condition, the child was transferred to the next video condition. The video conditions are summarized in Appendix E.

3.2.2 Additional instructional strategies

In addition to the video self-modeling intervention in which only the video was shown, prompting alone, video self-modeling plus prompting, prompting plus reinforcement, video self-modeling plus prompting and reinforcement, and video self-modeling plus cueing were used as independent variables for participants who did not respond to the video self-modeling intervention alone. These intervention strategies were implemented based on the participants' ability to meet the criterion performance for that particular condition.

The same scenarios used in condition video A, B, C, and D were utilized with additional intervention strategies accordingly. Prompting utilized the same scenario but there was no video presented to the participants. The experimenter provided verbal prompts to the participants. Prompting was also used as an additional component to video self-modeling. The procedures were similar to the video self-modeling intervention with the addition of the experimenter's prompts. Prompting plus reinforcement was utilized for one participant only. The procedures were similar to the prompting condition with additional use of reinforcers provided for both the participant and the peer by the experimenter. Video self-modeling plus prompting plus reinforcement was implemented using the same procedures as the video self-modeling intervention with additional prompts and the use of reinforcers for the participants and the peer, delivered by the experimenter. Edible reinforcers identified through a paired-stimulus preference assessment were not as reinforcing for Jeremy as watching the video during this phase of the intervention. As a result, watching the video was used as a reinforcer instead of edibles by the middle of the Condition video B plus prompting plus reinforcement. For one participant only, Sam, cueing from the peer was added to the Condition video D. Given that Sam responded well to the peer but closed his eyes when watching the video section displaying him commenting

"This was fun!" the peer's cue "This was fun" was added to the initial video vignette in this condition. The criterion performance section will provide further details on the above mentioned intervention strategies within the conditions.

3.2.2.1 Criterion performance

The criterion performance for Condition video A was set at independently manding 8 out of 10 trials after watching the video once for three consecutive sessions. After the child reached the criterion performance for Condition video A, the child was transferred to the Condition video B. If the child did not independently mand at least 3 out of 10 trials for three consecutive sessions, then the peer switched to the second toy set and if the child still did not mand within 5-sec then the third toy set was presented. The criterion performance consisted of the child independently manding 8 out of 10 trials after watching the video once for three consecutive sessions. See Figure 1 for further details.

If the child still did not independently mand at least 3 out of 10 trials for 3 consecutive sessions then prompting alone was implemented. The criterion performance consisted of the child independently manding 8 out of 10 trials for three consecutive sessions.

If the child did not independently mand 8 out of 10 trials for three consecutive sessions when prompting alone was implemented, then video self-modeling plus prompting was implemented. The criterion performance consisted of the child independently manding 8 out of 10 trials after watching the video once for three consecutive sessions.

If the child did not independently mand 8 out of 10 trials for three consecutive sessions after video self-modeling plus prompting was implemented then prompting plus reinforcement

was implemented. The criterion performance consisted of the child independently manding 8 out of 10 trials for three consecutive sessions.

If the child did not independently mand 8 out of 10 trials for three consecutive sessions after video self-modeling plus prompting was implemented then video self-modeling plus prompting and reinforcement was implemented. The criterion performance consisted of the child independently manding 8 out of 10 trials for three consecutive sessions.

The criterion performance for Condition video B consisted of the child independently greeting the peer once per session and independently manding 8 out of 10 trials after watching the video once for three consecutive sessions. After the child reached the criterion performance for Condition video B, the child was transferred to Condition video C. The same sequence of prompting procedures were followed as for the Condition video A if the child did not meet the criterion level for this condition via video self-modeling intervention alone.

The criterion performance for Condition video C consisted of the child independently greeting the peer once per session, commenting on the toy item once per session, and independently manding 8 out of 10 trials after watching the video once for three consecutive sessions. After the child reached the criterion performance for Condition video C the child was transferred to Condition video D. The same criterion performance as for the previous conditions was implemented for the Condition video C if the child did not meet the criterion level for this condition via video self-modeling intervention alone.

The criterion performance for Condition video D consisted of the child independently greeting the peer once per session, commenting on the toy item once per session, independently manding 8 out of 10 trials, and commenting on the activity once per session after watching the video once for three consecutive sessions. After the child reached the criterion performance for

Condition video D, the child was transferred to the Condition D, which assessed the participants' ability to maintain the skills without watching the video. The same criterion performance as for the previous conditions was implemented for the Condition video D if the child did not meet the criterion performance for this condition via video self-modeling intervention alone.

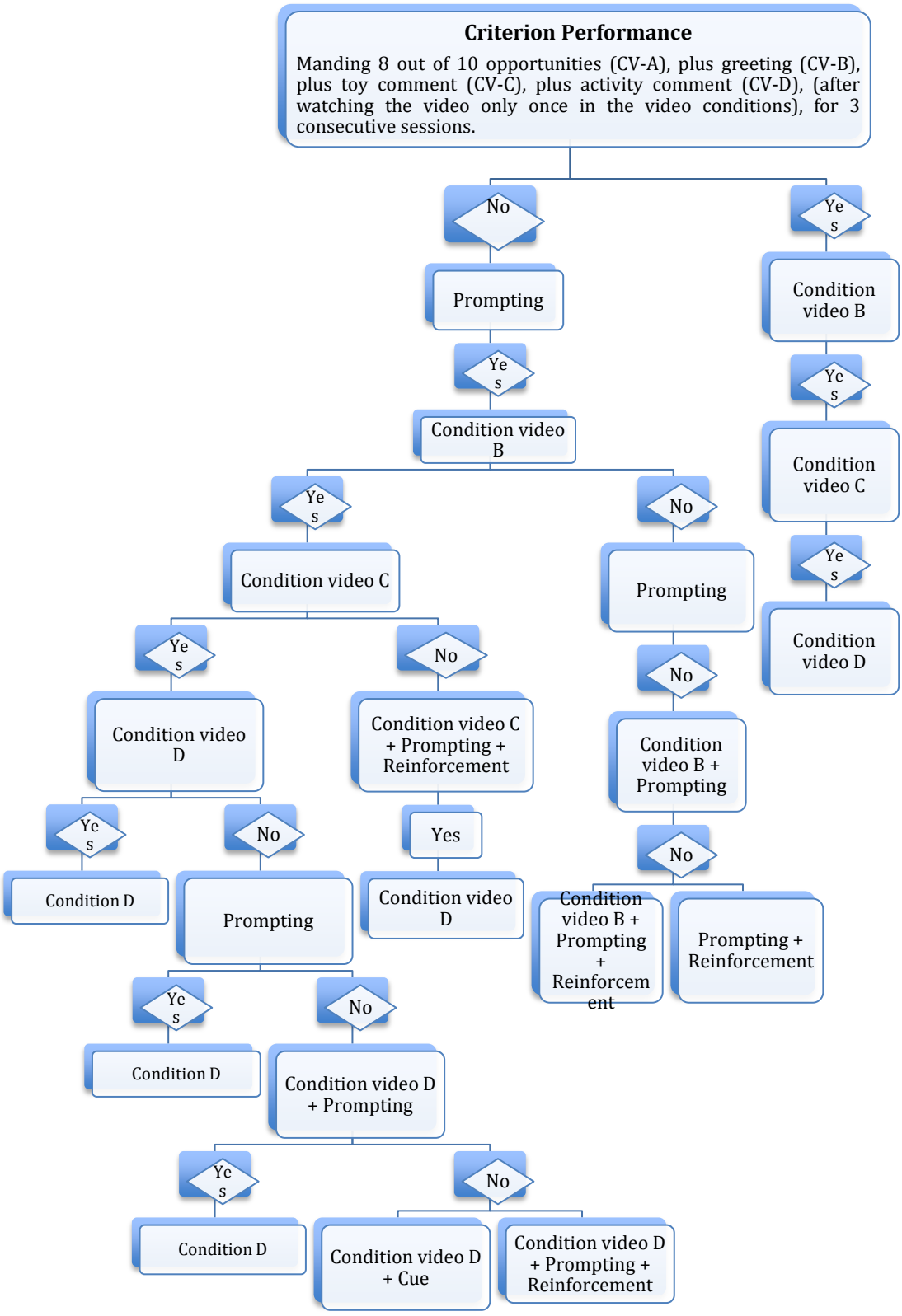


Figure 1. Criterion performance for all conditions

3.3 PROCEDURES

3.3.1 Pre-intervention peer training

Prior to the onset of the intervention, three typically developing peers were trained on verbal responses and play skills to use with the participants in the study. Video modeling was utilized for training. Two adults, a graduate student (GS) and the experimenter, were used as models in the video vignettes. Peers watched the video vignette and then role-played the scenario with the experimenter as displayed in the video vignette. The training continued in this fashion until the peers displayed 80% of the target behaviors for 2 consecutive sessions.

3.3.1.1 Video vignettes for displayed and not displayed behaviors

Two sets of video vignettes were created for peer training. The first set of video vignettes showed the experimenter in the role of the target child acting out the target behaviors with a graduate student in the role of the peer acting out the cues and responses for correct behaviors on the part of the target child. . The second set of video vignettes showed the experimenter in the role of the target child not displaying the target behaviors and the graduate student acting out the appropriate cues and responses for incorrect behaviors on the part of the target child.

Four video vignettes (A, B, C, D) of target behaviors displayed with preferred toy items were created. The video vignettes showed three preferred toy set items placed on a table. The graduate student (GS) was shown sitting at the table playing with the toy items and saying, “This (item) is cool!” The experimenter approached the GS and greeted her by saying “Hi (name).” The GS greeted the experimenter back with “Hi (name).” The experimenter joined the GS at the

table and then commented on the item, “This (item) is cool!” The GS commented back, “Yeah, it is cool!” The experimenter manded, “I want (item).” The GS said, “Sure” and gave the experimenter the toy item. The experimenter took the toy item and started playing with it. Then, the experimenter manded for other toy pieces of the same toy set on the table. After the experimenter played with one toy set for the requisite number of mands, the GS said “Let’s play with something else” and started playing with the second set of toys. The experimenter gave the item back to the GS and manded for the toy item. The same procedure was followed for a total of ten trials. Three sets of toys, including a total of 10 toys/pieces of toys, provided 10 opportunities for mands. After ten trials the experimenter commented, “This was fun!” The GS commented back, “Yeah, it was fun!”

Video vignettes of toy items created for targeted behaviors that were not displayed consisted of the following vignettes: a) *Video vignette A:* Three preferred toy items were placed on a table. The GS was shown sitting at the table playing with toy items and commented, “This (item) is cool!” The experimenter approached the GS and sat at the table. The experimenter did not mand, “I want (item).” The GS invited the experimenter to watch the video again, “(Name), let’s watch the video again.” They both stood up and went to watch the video. b) *Video vignette B*: In this video vignette, the experimenter displayed the previous behavior (i.e., manding) but did not display greeting behavior. The GS cued the experimenter, “Hi (name)” and when the experimenter did not greet her back the GS invited the experimenter to watch the video again, same as in the previous condition. c) *Video vignette C:* In this video vignette, the experimenter displayed the previous behaviors (i.e., manding, greeting) but did not comment on the toy item. The GS cued her, “This (item) is cool!” and when the experimenter did not comment back, the same procedure as in first two conditions was followed. d) *Video vignette D:* This video vignette

showed the experimenter displaying previous behaviors (i.e., greeting, commenting, manding) but she did not comment on the activity at the end of the session. The GS cued her, “This was fun!” and when there was no response the experimenter was invited to watch the video again as in previous video vignettes.

3.3.1.2 Peer training

Peer-training session included a) explaining the purpose of the intervention to the peer, b) watching video vignettes of the two adult models displaying the target behaviors, and c) practicing the targeted skills with the experimenter. The following describes a peer training session.

Three preferred toy items were placed on a table. The peer was seated at the child size table and while playing with the first toy set commented, “This (item) is cool!” The experimenter approached and greeted the peer, “Hi (name).” The peer greeted the experimenter back, “Hi (name).” If the peer did not respond to the experimenter then he/she was invited to watch the video again and then the next trial began. If the peer responded to the experimenter, then the experimenter commented on the item, “This (item) is cool.” The peer responded to the experimenter, “Yeah, it is cool.” If the peer did not respond to the experimenter then he/she was invited to watch the video again. Then the next trial began. If the peer did comment, then the experimenter manded, “I want (item).” The peer said, “Sure,” and gave the experimenter the toy item. The experimenter reached for the toy item and played with it. If the peer did not give the item to the experimenter then he/she was invited to watch the video again. The next trial began following the same procedure as previously described. There were total of 10 trials for a training session. Training sessions continued until the peer displayed 80% of the targeted behaviors for three consecutive sessions.

3.3.2 Baseline

Baseline sessions were conducted for each participant in the absence of any video presentation. Participants' abilities to mand independently for preferred toy items as well as initiate other types of social behaviors toward peers were recorded. Baseline sessions were conducted both in the training and natural environments.

In the training environment, the setting was arranged in the same way as it would have been for the intervention activity sessions. The peer was seated at the table and while playing with the child's preferred toy items he commented "This (item) is cool! Three sets of preferred toy items consisting of a total of 10 toys/pieces of a toy set were placed on the table. The participant was provided with ten opportunities to mand. In a 10-min session, the number of mands, greetings, and comments displayed by each participant was tallied. In the natural environment the baseline setting was arranged as it would be for the generalization sessions. This setting provided opportunities for the child to mand and get engaged in social behaviors with peers during a free play. Children were given the instruction "(Name) go play with your friends." The frequency of mands, greetings, and comments in this 20-minute session was tallied.

3.3.3 Video self-modeling intervention

During the intervention, the child watched one video vignette every school day. At the beginning of the session the experimenter invited the child to watch a video (e.g., "(Name) let's watch the video"). Then, the participant sat quietly and watched his own video vignette. The experimenter did not engage the child in conversation during the viewing of the video vignette other than redirecting if the child looked away from the video for more than 10 seconds by saying,

"(Name), watch the video." After watching the video vignette, the experimenter said "(Name), let's do the same as in the video," then brought the child outside the training setting, and then opened the door for him to enter the room again, and the activity session took place. The following provides detailed information on the four video conditions (i.e., A, B, C, D) and the subsequent activity sessions respectively.

3.3.3.1 Condition video A

In the first video vignette, the peer was shown seated at a child size table. Three of the child's preferred toy items were placed on the table. As soon as the participant entered the room the peer who was playing with the toy item comments, "This (name of the item) is cool!" The participant approached the peer and sat at the chair already located near the table. The participant manded, "I want (item)." The peer said, "Sure" and gave him the toy item. The participant reached for the toy item and played with it. Then, the participant manded for the first piece of the toy set "I want (item)." The peer said, "Sure," and gave the participant the item. The child reached for the item and played with it or put the piece of the toy in the toy set. Finally, the child manded for the third item, "I want (item)." The peer said, "Sure" and gave the child the last piece of the toy set. The child reached for the item and played with it. Then, the peer said, "Let's play with something else." The participant let the toy item go and continued manding for the second toy set. The same procedures were used for the three toy sets.

The activity session for condition video A was conducted in the same setting, using the same items, and with the same peer as displayed in the video, right after the participant watched the video clip. The experimenter invited the participant to the activity session by saying, "(Name), let's do the same as in the video." Three of the child's preferred toy items were placed

on the table. As soon as the participant entered the room the peer who was playing with the toy item commented, “This (item) is cool!” The participant approached the peer and sat at the chair already located near the table. The participant manded ,“I want (item).” The peer said, “Sure” and gave the participant the toy item. The child reached for the toy item and played with it. If the participant did not mand toward the peer then he was invited by the peer to watch the video again, “Let’s watch the video again.” If the child manded, “I want (item),” the peer said “Sure” and gave the toy item to the participant. The participant reached for the toy item and played with it or put the piece of the toy in the toy set. Finally, the child manded for the third item, “I want (item).” The peer said, “Sure” and gave the child the last piece of the toy set. The child reached for the item and played with it. Then, the peer said, “Let’s play with something else,” reached for the second toy set, and started playing with it. The participant let the toy item go and continued manding for the second toy set. The same procedures were used for the three toy sets. The duration of the activity session depended upon the participant’s performance. If the child manded 10 out of 10 opportunities toward the peer, despite of the number of correct responses (i.e., mand frame “I want (item)”, then the activity session ended. If the participant did not mand for all toy sets then the duration of the activity session continued until the 10 minutes had elapsed. For the third participant 15 minutes time was allowed instead of 10 due to his use of an AAC device to communicate.

3.3.3.2 Condition video B

In Condition video B, the target child watched a video that displayed one additional target behavior – greeting in addition to the previous target behaviors in Video A (i.e., manding). As soon as the participant entered the room, he greeted the peer, “Hi (name)”, “Hello” or touching

the hand of the peer, since that was how one of the participants greeted adults sometimes, and then joined the peer who was playing with the participant's preferred toy items at the table. The participant who used the AAC device joined the peer first and then pressed the button for greeting the peer. In addition, for the participant who used the AAC device this condition involved him touching the peer's hand as a greeting gesture in addition to the verbal "Hello" displayed by pressing the button in the AAC device. Similar procedures were used as in the previous video vignette. The activity session B consisted of the participant displaying greeting behavior in addition to manding, as seen in the video vignette. If the participant did not greet the peer then he was invited to watch the video again.

3.3.3.3 Condition video C

In Condition video C, the target child watched a video vignette that displayed greeting (i.e., Hi (name)" or "Hi/Hello), commenting on the toy item (i.e., This (item) is cool!"), and manding (i.e., "I want (item)" for 10 opportunities. Similar procedures were used as in the previous video vignette. In the activity session for Condition video C, the child was expected to display the three target behaviors (i.e., greeting, commenting, manding) after he/she watched the video vignette.

3.3.3.4 Condition video D

The Condition video D differed from the condition video C in that the target child displayed all four targeted behaviors (i.e., Hi (name)" or "Hi/Hello), commenting on the toy item (i.e., This (item) is cool!"), manding (i.e., "I want (item)" for 10 opportunities, and commenting on the activity (i.e., "This was fun!"). The procedure was similar to the other video vignettes. As in

condition video D, the activity session D focused on the target child displaying the four target behaviors (i.e., greeting, commenting on the toy item, manding, commenting on the activity) as seen in the video.

3.3.4 Condition D

This condition was conducted to demonstrate the participants' ability to maintain the targeted behaviors without first watching the video. Condition D was conducted for three consecutive sessions. The environment, toy items, and peers remained the same as in the Condition video D. Due to the time limitation, Condition D was conducted with first and second participants only.

3.3.5 Generalization condition

Once the performance criterion-level on Condition video D was met and after three Condition D sessions for two of the participants, five consecutive generalization sessions were conducted. Five 20-minute generalization sessions for two participants and three for one participant were conducted in the participants' classrooms during a free play activity. The participants' behaviors were observed in relation to the target behaviors during free play. Five 10-minute generalization sessions were also conducted in the participants' classrooms, but these sessions were conducted by purposefully arranging the environment as to provide an opportunity for the participants to mand independently as well as initiate other types of social behaviors to novel peers using novel items in a novel setting. If the participant did not generalize the skills across all three novelties, then one of the components remained unchanged (i.e., same peer, different setting, different toy

items). This process was repeated until generalization across novel peers, settings, and toy items was assessed.

3.3.6 Maintenance condition

Maintenance condition was conducted one month after the completion of the intervention. The three maintenance sessions, which were identical to baseline and generalization conditions, were conducted for three consecutive sessions. The child was given the opportunity to mand for preferred toy items and to display other types of social initiations to peers. There were no videos or cues provided in any time during the maintenance condition.

3.4 DATA COLLECTION AND ANALYSIS

3.4.1 Data collection

All sessions were videotaped for subsequent data collection. Video recordings were also used for reliability purposes. The experimenter was the primary coder and transcribed and scored occurrences of the dependent measures from all video recordings across conditions and participants.

3.4.1.1 Reliability training

A graduate student served as the reliability observer. The adult video vignettes produced for peer training and video vignettes of peer training were used for reliability training. A scoring

manual containing operational definitions of the target behaviors, examples and non-examples of the target behaviors, and a scoring protocol were provided to the reliability observer as well. Initial training consisted of the reliability observer engaging in a practice session during which she identified and recorded target behaviors while watching the aforementioned video recordings. She recorded the target behaviors and then her recordings were compared to the experimenter's recordings. Training continued in this fashion until a 90% agreement of her recordings with the experimenter's recordings for each condition on three consecutive sessions was reached. Interobserver agreement (IOA) was calculated by dividing the total number of agreements by the total number of agreements plus disagreements multiplied by 100.

3.4.1.2 Interobserver agreement (IOA)

The reliability observer reviewed randomly selected session videos, independently scoring 25-40% of sessions, based on the number of sessions for each condition, across each condition and each participant. The IOA was calculated by dividing the total number of agreements by the total number of agreements plus disagreements multiplied by 100. The IOA for all participants was above 90%, except for one session for Jeremy, which was 89% agreement that the behaviors had occurred. The data for IOA can be found in Table 2.

Table 2. Interobserver reliability data for each participant and each condition

Conditions		Tuan		Sam		Jeremy	
		Sessions	IOA	Sessions	IOA	Sessions	IOA
Baseline	Manding	25%	100%	29%	100%	33%	100%
	Free Play	25%	100%	29%	100%	33%	100%
Condition Video A	Condition video A	33%	100%	30%	100%	33%	96%
	Prompting	40%	96%	N/A		33%	100%
Condition video B	Condition video B	25%	92%	33%	100%	25%	100%
	Prompting	33%	100%	N/A		33%	100%
	Condition video B + Prompting	25%	96%	N/A		33%	100%
	Prompting + Reinforcement	33%	100%	N/A		N/A	
	Condition video B + Prompting + Reinforcement	N/A		N/A		33%	96%
Condition video C	Condition video C	40%	94%	25%	100%	33%	100%
	Condition video C + Prompting + Reinforcement	40%	100%	N/A		N/A	
Condition video D	Condition video D	33%	97%	40%	100%	33%	100%
	Condition video D + Prompting	N/A		33%	100%	N/A	
	Condition video D + Cue	N/A		29%	97%	N/A	
	Condition video D + Prompting + Reinforcement	33%	100%	33%	100%	N/A	
Condition D		33%	100%	33%	100%	N/A	
Generalization		40%	100%	40%	97%	33%	100%
Maintenance		33%	100%	33%	94%	100%	100%

3.4.1.3 Procedural fidelity

To determine whether the intervention procedures were being implemented accurately and consistently, procedural reliability data sheets were developed for all conditions. The person her served as the reliability observer also served as the procedural fidelity observer and reviewed the video recordings using the checklist to evaluate whether the experimenter and the peers followed and accurately implemented each step of the intervention. The observer recorded "yes" if the step was followed and implemented accurately and "no" if the step was not followed or implemented accurately. The following formula was used to calculate procedural fidelity for each session: total number of steps completed accurately divided by the total number of steps completed accurately plus the total number of steps completed inaccurately/missed multiplied by 100. The procedural data was recorded on 25-40% of sessions, depending on the number of sessions for each condition and each participant. The criterion for procedural fidelity was set at 90% of the steps implemented accurately and consistently. The procedural fidelity for Tuan was 100% for all conditions, whereas the procedural fidelity for Sam ranged from 99% to 100% for all conditions. The procedural fidelity for Jeremy was the lowest, ranging from 91% to 100%.

In addition, reliability on procedural fidelity was conducted for 25-40% of sessions for each participant and each condition. The reliability on procedural fidelity was calculated by dividing the total number of agreements by the total number of agreements plus disagreements multiplied by 100. The reliability on procedural fidelity across children and conditions was above 90%, except for Condition B for Jeremy that was 89%. See Table 3 for further details on procedural fidelity and reliability on procedural fidelity.

Table 3. Procedural fidelity and reliability on procedural fidelity for each participant and each condition

Conditions		Tuan			Sam			Jeremy		
		Sessions	PF	IOA	Sessions	PF	IOA	Sessions	PF	IOA
Baseline	Manding	25%	100%	100%	29%	100%	100%	33%	100%	100%
	Free Play	25%	100%	100%	29%	100%	100%	33%	100%	100%
Condition video A	Condition video A	33%	100%	100%	30%	100%	100%	33%	100%	100%
	Prompting	40%	100%	100%	N/A			33%	91%	98%
Condition video B	Condition video B	25%	100%	100%	33%	99%	88%	25%	89%	100%
	Prompting	33%	100%	100%	N/A			33%	100%	100%
	Condition video B + Prompting	25%	100%	100%	N/A			33%	92%	98%
	Prompting + Reinforcement	33%	100%	100%	N/A			N/A		
	Condition video B + Prompting + Reinforcement	N/A			N/A			33%	92%	96%
Condition video C	Condition video C	40%	100%	94%	25%	100%	100%	33%	90%	98%
	Condition video C + Prompting + Reinforcement	40%	100%	100%	N/A			N/A		
Condition video D	Condition video D	33%	100%	99%	40%	100%	100%	33%	95%	100%
	Condition video D + Prompting	N/A			33%	100%	100%	N/A		
	Condition video D + Cue	N/A			29%	99%	98%	N/A		
	Condition video D + Prompting + Reinforcement	33%	100%	100%	33%	100%	100%	N/A		
Condition D		33%	100%	100%	33%	100%	100%	N/A		
Generalization		40%	100%	100%	40%	100%	96%	33%	100%	100%
Maintenance		33%	100%	100%	33%	100%	95%	100%	100%	100%

3.4.2 Data analysis

The effect of the independent variable (video self-modeling) on the dependent variables (independent mands for preferred items and other types of social initiations) was determined through the visual inspection of the graphic representation of the data as well as by calculating the average level and analyzing the range level of independence for each dependent variable across each condition. The average level of independence for each dependent variable was calculated by summing the scores of the dependent variable for all sessions within that condition and dividing them by the total number of sessions conducted in that condition. This resulted in analysis of the data range for each of the dependent variables, consisting of 0 to 15 for mands for preferred toy items and 0 to 1 for the other three dependent variables.

3.4.3 Social validity

Upon completion of the study, teachers, paraprofessionals, other preschool professionals, and parents from the participant's preschool were asked to participate in a social validity assessment. They rated a total of six videotapes, three baseline and three intervention videotapes. The videotapes of each of the children were selected based on the degree to which the child exhibited the targeted behaviors, meaning that the participant did not display any of the target behaviors in the baseline video vignette and all or almost all of the target behaviors in the intervention video vignette. The raters were not informed whether they were observing video clips from baseline or video self-modeling intervention. Then, a nine-item questionnaire was provided for them to rate (1) the child's mands for preferred items, (2) his greeting behavior, (3) toy comment, (4) activity comment, (5) the importance of targeted behaviors for children with ASD, (6) the practicability

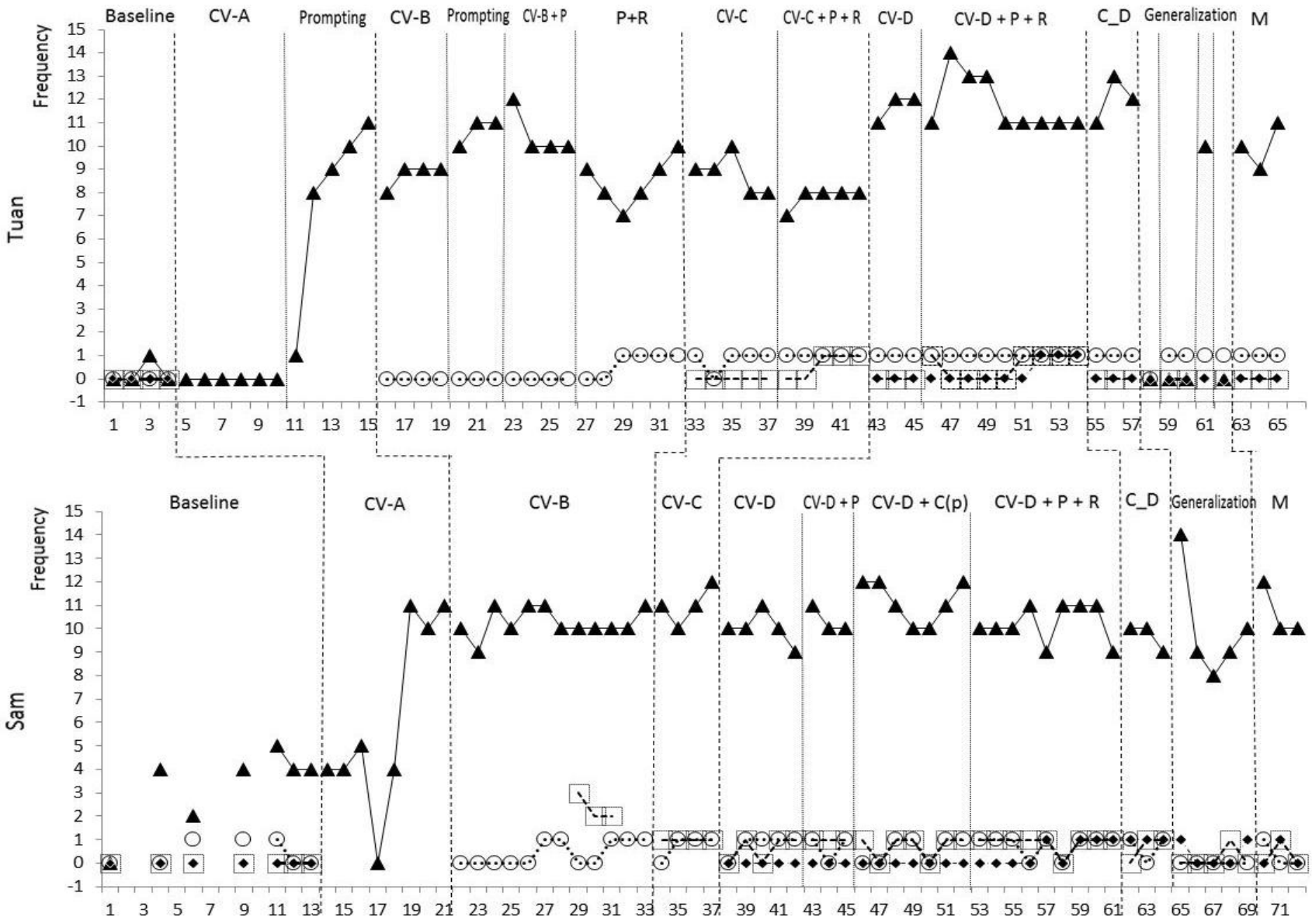
of the intervention, 7) motivation of children to participate in intervention, and 8) recommendation of the intervention to other children with autism, and (9) the generalization of skills. A 5-point Likert rating scale (1-strongly disagree, 2-disagree, 3-neither agree nor disagree, 4-agree, and 5-strongly agree) was utilized. See Appendix G for further details on the questionnaire.

4 RESULTS

The results of this study were analyzed in terms of each participant for each of the conditions. The graph displayed in Figure 2 depicts the number of mands, greetings, toy comments, and activity comments for each participant. The target behaviors represented in Figure 2 were displayed independently, that is, they were displayed during the activity session after one viewing of the video (if the video was part of the condition). The maximum number of mands was 10 mands per session, given that participants were provided with 10 opportunities to mand for a preferred toy item toward a peer. However, if the participant, for a variety of different reasons manded independently to the peer more than 10 times, those were also scored. Some of the reasons for more than 10 mands per session may have included: the peer not granting the toy to the child within 5 seconds of the participant's initial manding or the participant manding for a toy item that was reserved as a play item for the peer. Consequently, in some sessions shown on the graph, more than 10 mands were recorded. Given that in any typical social/play situation there would be only one opportunity for greeting a communication partner, the number of greetings was limited to greeting the peer once when starting the session. Similarly, the criterion level of responding was also set at one toy comment and one activity comment per session.

Overall, the results demonstrated that all participants made substantial gains manding to peers for preferred toy items; however, the results for the three other behaviors were not as consistent. All three participants displayed very few target behaviors during baseline sessions,

both in the training setting and the free play sessions. Only one of the participants reached the criterion through video self-modeling alone. The two other participants required additional strategies (i.e., prompting, reinforcement, cuing) in teaching the target behaviors. These strategies were implemented alone or in combination with the video self-modeling.


Tuan
Frequency
Baseline
CV-A
Prompting
CV-B
Prompting
CV-B + P
P+R
CV-C
CV-C + P + R
CV-D
CV-D + P + R
C_D
Generalization
M
Sam
Frequency
Baseline
CV-A
CV-B
CV-C
CV-D
CV-D + P
CV-D + C(p)
CV-D + P + R
C_D
Generalization
M

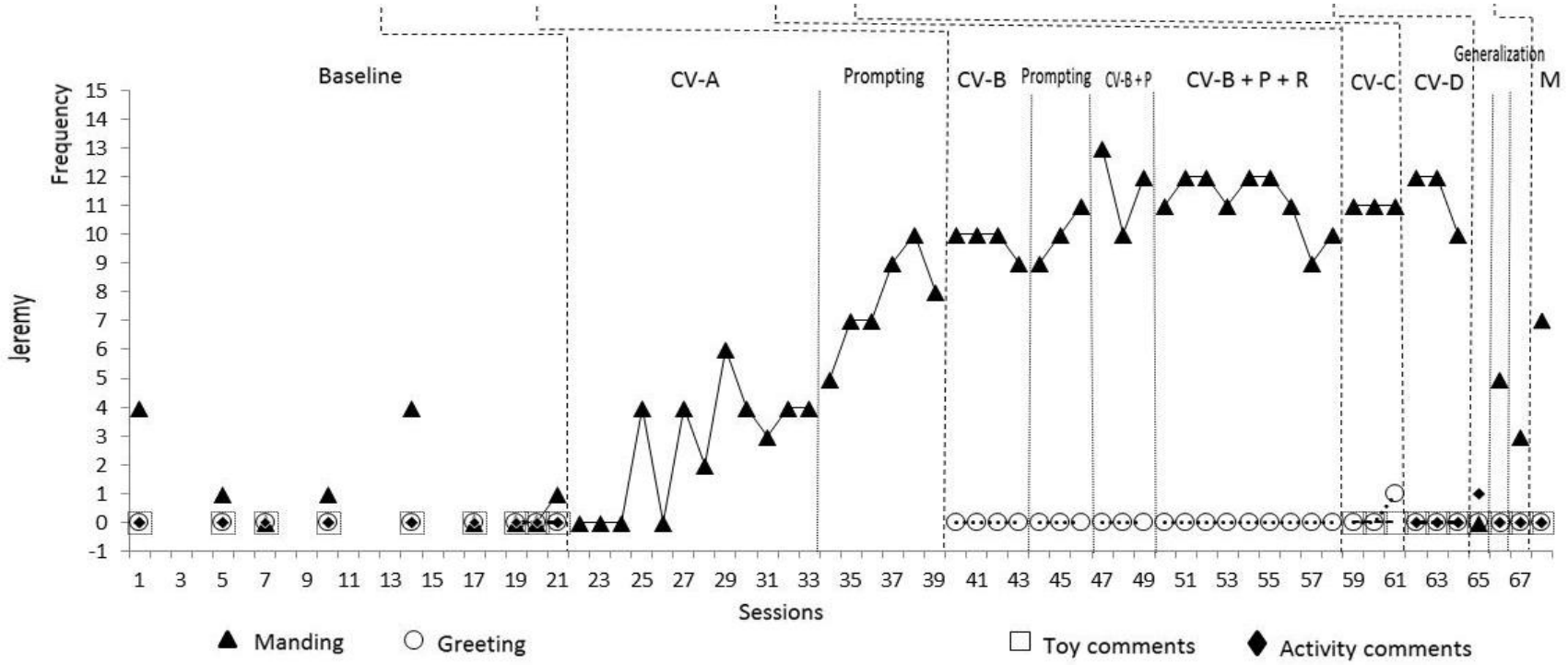


Figure 2. Number of independent mands, greetings, toy comments, and activity comments during the video self-modeling intervention alone and with other additional components

Note: CV-A = Condition video A; Prompting; CV-B = Condition video B; Prompting; CV-B + P = Condition video B + Prompting; C_B + P + R = Prompting + Reinforcement; CV-B + P + R = Condition video B + Prompting + Reinforcement; CV-C = Condition video C; CV-C + P + R = Condition video C + Prompting + Reinforcement; CV-D = Condition video D; CV-D + C = Condition video D + Cue from the peer (on the video); CV-D + P + R = Condition video D + Prompting + Reinforcement; C_D = Condition D (no video), M = Maintenance

4.1 TUAN

During four baseline sessions in the training and free play settings, Tuan displayed few to none of the targeted behaviors. In the training setting, he displayed an average of .25 (range 0-1) mands per baseline session for preferred toy items, but he did not greet the peer nor comment on the toys or the activity. Within the 20-minute free play session, Tuan did play alongside his peers but he did not address any of the target behaviors to them.

During six video self-modeling intervention sessions in Condition video A, Tuan did not display any independent mands to the peer for preferred toy items. As a result, prompting alone was implemented. In the first prompting alone session, Tuan displayed 1 independent mand. This increased to 8 in the second session. Overall, he averaged 7.8 mands in this condition (range 1-11).

For the four Condition video B sessions (video only), Tuan did not display greeting behavior toward the peer, but the frequency of mands remained high with a mean of 7.7 (range 8-9) for the 4 sessions. Prompting alone was then implemented for the next 3 sessions. Although Tuan did not greet the peer when prompting alone was used, he continued manding independently to the peer with a mean of 10.3 (range 9-11) for the 3 sessions. Video self-modeling intervention plus prompting was then implemented for 4 sessions. Although his greeting behavior still remained unchanged, he manded an average of 10.5 times (range 10-12) during these sessions. Prompting plus reinforcement without the video was then implemented. In the third prompting plus reinforcement session, Tuan finally greeted the peer independently. Tuan greeted the peer as soon as he entered the room without being prompted by the

experimenter. He was, however, rewarded with edibles by the experimenter for the behavior displayed. A mean of .7 (range 0-1) was achieved over the 6 sessions.

During the five Condition video C sessions (video only), Tuan displayed independent mands (M = 8.8, range 8-10) and independently greeted the peer (M = .8, range 0-1), but did not make any independent comments on the toy item(s). Since prompting plus reinforcement had been successful in establishing the greeting, the video plus prompting and reinforcement were implemented next. In the third session, Tuan started commenting on the toy items (M = .6, range 0-1), greeted the peer (M = 1; range 1), and manded for preferred toys (M = 7.8; range 7-8).

In the final condition, Condition video D (video only), Tuan averaged 11.7 mands (range 11-12) in 3 sessions. He greeted the peer (M = 1, range 1), but did not maintain commenting on the toy item(s) nor was commenting on the activity established. After prompting and reinforcement were added to the activity session, Tuan displayed all the target behaviors: greeting the peer (M = .9; range 0-1), toy comments (M = .6; range 0-1), mands (M =11.8; range 11-14), and activity comments (M = 0.3; range = 0-1).

Results for Condition D to assess the participant's ability to display the targeted behaviors in the absence of the intervention procedures (i.e., video, prompting, reinforcement) showed that Tuan maintained independent mands (M = 12; range 11-13) and independently greeted the peer (M =1), although he did not display any comments in the 3 sessions.

Generalization was conduced for five days and included four variations. In the first variation, the generalization of target behaviors across a novel peer, who was also trained before the generalization condition started, novel setting (i.e., classroom), and novel toy items was assessed. Results showed that Tuan did not display any of the target behaviors in this condition. The next condition assessed his ability to generalize the target behaviors across novel toy items

in a novel setting with the peer who participated in the training. Tuan greeted the peer in a novel setting using novel toy items, but did not display any of the other target behaviors. The third condition involved assessing Tuan's generalization skills toward a novel peer using the same toy items in a novel setting. Results showed that he did display 10 independent mands to a novel peer for preferred toy items but no other behaviors were displayed. Finally, his ability to generalize target behaviors with a novel peer in the training setting using novel toy items was assessed. The only behavior displayed was greeting of the peer.

Generalization was assessed in the free play setting in conditions analogous to baseline. In five 20-minute sessions, Tuan displayed none of the targeted behaviors, except for one initiation to play where he said "Knock, knock" and the peer responded "Who is there?" This was scored as "other initiations." Anecdotal notes from classroom teachers and other professionals indicated that after Tuan learned the greeting during training, he started to generalize greeting behavior to peers when coming to school in the morning.

Maintenance one month after the completion of the intervention was conducted. Three maintenance sessions were conducted in the training setting with another 3 in the participant's classroom. Results showed that Tuan maintained greeting and independent mands to the peer for preferred toy items in both conditions. The frequency of independent mands displayed in the training setting was higher (M = 10, range 9-11) than in the classroom (M =6.3, range 3-8). He also maintained greeting behavior in both the training (M = 1) and classroom (M = 1) settings. No comments on toys or the activity were displayed in either setting.

4.2 SAM

Seven baseline sessions in the training setting and another seven during free play were conducted. In the training setting, Sam averaged 3.3 independent mands to the peer (range 0-5). However, this behavior was displayed with one set of toys only. He did not mand for either of the other two highly preferred sets of toy items available. He independently greeted the peer an average of .43 times (range 0-1). The two other targeted behaviors, commenting on the toy items and on the activity, were not displayed. In the free play session, Sam did not initiate any of the target behaviors with his peers.

In the first 4 Condition video A sessions, Sam independently manded to the peer, but only for the same set of toys as in the baseline. When this favorite toy was removed (Session 4), his mands decreased to zero. In the next session, this highly preferred toy item was brought back but a newly developed interest in another toy was noticed. A brief multiple-stimulus preference assessment was conducted to re-identify toy items. One new toy set was utilized in the sixth session and was used as a substitute for one of the two less preferred original toy sets in the remaining sessions. His mands for preferred items toward the peer increased to as high as 11 and remained almost as high throughout the intervention. Sam reached an average of 6.3 (range 0-11) mands per session over 8 sessions of the Condition video A.

In the Condition video B (video only), Sam not only acquired the greeting behavior targeted in this condition but also manded for the toy items. He greeted the peer an average of .42 times (range 0-1) and manded to the peer an average of 10.3 times (range 9-11) across 12 sessions. In this condition, Sam also started to comment spontaneously on the toy items. He commented on the toy item 3 days in a row – 3 times in session 8 and 2 times each in sessions 9 and 10. Although Sam did not see himself on the video commenting on the toy items in this

condition, the peer in the video always started the session by commenting on the toy item. However, the comments on the toy items were not observed to occur at this higher frequency per session after that.

Sam commented on the toy item in the first session of the Condition video C (video only). In the four sessions in this condition, he displayed an average of one comment on the toy item, an average of .75 (range 0-1) greetings to the peer, and an average of 11 (range 10-12) mands for preferred toy items.

In Condition video D all four targeted behaviors were viewed on the video. After five sessions, Sam did not comment on the activity item at all. He did display the other target behaviors most of the time: greeting the peer, an average of .8 times (range 0-1); commenting on the toy item, an average of .6 times (range 0-1); mands for toy items, an average of 10 times (range 9-11). Given that the target behavior was not acquired, video self-modeling plus prompting was implemented. In these three sessions, three of the previously learned targeted behaviors were displayed as follows: greeting the peer, an average of .67 times (range 0-1); commenting on the toy item, an average of once per session; manding for toy items an average of 10.3 times (range 10-11). However, even with the added prompting, Sam scored zero independent comments during the activity sessions. Consequently, video self-modeling with a cue from the peer was implemented for 7 sessions. The peer's cue "This was fun!" was added in the video vignette that Sam watched at the beginning of the session. In this condition the child continued displaying mands an average of 11.1 (range 10-12); greetings, an average of .57 (range 0-1); and toy comments, an average of .71 (range 0-1). Sam still scored zero independent activity comments. Prompting and reinforcement were added to the previous video self-modeling condition; Condition video D plus prompting plus reinforcement. Sam did not display any

activity comments until the fifth session. Sam's performance, within 9 sessions, included activity comments (M = .44, range 0-1), greeting the peer (M = .78, range 0-1), toy comments (M = .89, range 0-1), and independent mands for preferred items toward the peer (M = 10.2, range 9-11).

In Condition D (no video or other intervention procedures), Sam's ability to maintain the skills without the presence of the intervention procedures was assessed for three sessions. He manded for preferred toy items an average of 9.7 times (range 9-10); greeted the peer an average of .67 times (range 0-1); commented on the toy an average of .67 times (range 0-1); and commented on the activity an average of 1 time per session.

Generalization of skills in a novel setting with novel toy items and novel peers was assessed for five sessions. Sam did generalize independent mands for non-trained preferred toy items with novel peers in a novel setting (i.e., participant's classroom) an average 10 times per session (range 8-14). He commented on the activity twice (M = .4; range 0-1) and on the toy item once (M = .2; range 0-1). He did not demonstrate generalization of the greeting behavior, however. Results of five free play generalization sessions showed that Sam manded twice to the peer (once in session 3 and the other in session 5), but displayed none of the other target behaviors. Anecdotal notes from the classroom teachers and other professionals indicated that, like Tuan, he generalized the greeting behavior across settings and individuals. The OT reported that Sam displayed manding for preferred toys toward the peer occasionally.

As with the first participant, three maintenance sessions in the training setting and three in the child's classroom were conducted one month after the intervention ended. Results revealed that Sam displayed the same range of mands in the training setting (M = 10.7, range 10-12) and the classroom (M = 10.7, range 10-12). He maintained all three other targeted behaviors, although he did not display them consistently. The only greeting behavior that was displayed

occurred in the first maintenance sessions in both the training setting (M = .33, range 0-1) and the classroom (M = .33, range 0-1). In the training setting, Sam maintained toy comments (M = .33, range 0-1) and activity comments (M = .33, range 0-1). In the classroom Sam commented on the activity twice (M = .66, range 0-1) but displayed no toy comments.

4.3 JEREMY

Jeremy displayed few to no targeted behaviors in the structured setting and during free play baseline sessions. In the structured setting, he displayed an average of 1.22 (range 0-4) independent mands to the peer for preferred toy items. No mands were displayed in the free play baseline sessions. He neither greeted nor commented on the toys or activities in either the structured or free play baseline settings.

In the Condition video A (video only), Jeremy manded to the peer from zero to six times per session, averaging 2.6 times per session over the 12 sessions. However, all the mands were displayed for the same set of toys (musical toy), except in the 17th session when he displayed two mands for the second set of toys. The child's mands for the toy items were scored only once. Since the objective was to mand for items within three different play sets, any additional manding for the same toy items above the required number were not scored. Given that he did not mand for other sets of available toys, prompting alone was implemented. During prompting alone, which was conducted over six sessions, the participant reached the criterion of manding 8 out of 10 opportunities to the peer, including all three sets of preferred toys (M = 7.7, range 5-10),

Throughout four sessions of the Condition video B (video only), Jeremy continued to mand to the peer for the toys (M = 9.8, range 9-10), but he displayed zero greetings to the peer. As in Condition video A, the video was removed and prompting alone was implemented after the initial four sessions. In this condition, Jeremy continued manding for the toys (M = 10, range 9-11) and would greet the peer after being prompted, which occurred after a 5 second time delay, but he never greeted independently. Consequently, video self-modeling was reinstated with prompting as an additional component. Independent mands for preferred items increased (M = 11.7, range 10-13), but no greeting behavior was displayed. As a result, reinforcement was added to previous condition of video self-modeling plus prompting. Given that Jeremy, according to his mother, greeted other people by softly touching their hand (palm), this behavior was defined as a greeting behavior in this condition. Although his mands to the peer remained high (M = 11.1, range 9-12), he never did independently greet the peer. Due to time constraints (the school was coming to a close), there were no additional components implemented or other modifications made to establish greeting behavior to the participant.

Condition video C was conducted for three sessions only, also due to time limitations. Jeremy's independent mands continued on the average of 11 times per session but he never commented on the toy items. However, in the third session he greeted the peer independently (M = .33, range 0-1).

Finally, in Condition video D, which was also conducted for three sessions only, Jeremy continued manding independently for preferred items toward the peer (M = 11.3, range 10-12). However, none of the other targeted behaviors were displayed.

Due to time constraints, maintenance of targeted behaviors without the intervention procedures was not conducted. The generalization condition, however, was conducted over three

sessions. Given that there was no available novel trained peer, the generalization condition was conducted with the same peer that participated in the study. Consequently, Jeremy's ability to generalize the target behaviors across peers was not assessed. Generalization of target behaviors in a novel setting using novel toy items was assessed. Results showed that Jeremy did not display any mands, greeting behavior, or toy comments in this condition. However, he did comment once on the activity. His ability to generalize the target behaviors across a novel setting using the same toy items was then assessed. Jeremy displayed an average of 5 independent mands in this condition, but no other target behaviors were displayed. Finally, the generalization was assessed in the same setting using novel toys. In this condition, Jeremy displayed 3 independent mands for the novel toy items.

The maintenance condition with Jeremy was different from the maintenance condition for the two other participants. Due to time limitations and the participant's absences, only one maintenance session was conducted and it was conducted the day following the last generalization session. In this situation, Jeremy displayed 7 mands but no other target behaviors. Four independent mands were the only behaviors displayed in the classroom as well.

Table 4 provides an overview of the changes in the target behaviors across conditions for each participant. Further details on the range and means for each condition and each participant are provided on the Appendix F.

Table 4. Average number of target behaviors for each participant by condition

Participants	Mands				Greetings				Toy Comments				Activity Comments			
	B(#)	I(#)	G(#)	M(#)	B(#)	I(#)	G(#)	M(#)	B(#)	I(#)	G(#)	M(#)	B(#)	I(#)	G(#)	M(#)
Tuan	.25(4)	8.66(53)	2(5)	10(3)	0(4)	0.67(42)	0.6(5)	1(3)	0(4)	0.32(25)	0(5)	0(3)	0(4)	0.25(12)	0(5)	0(3)
Sam	3.28(7)	9.73(51)	10(5)	10.7(3)	0.4(7)	0.63(43)	0(5)	0.33(3)	0(7)	1.03(31)	0.4(5)	0.33(3)	0(7)	0.26(27)	0.4(5)	0.33(3)
Jeremy	1.2(9)	7.9(44)	2.67(3)	7(1)	0(9)	0.04(26)	0(3)	0(1)	0(9)	0(6)	0(3)	0(1)	0(9)	0(3)	0.33(3)	0(1)

Note: B=Baseline, I = Intervention, G = Generalization, M = Maintenance, # = total number of sessions

4.4 SOCIAL VALIDITY

After the study was completed, 2 teachers, 2 assistant teachers, 1 Speech Language Pathologist, 1 Occupational Therapist, and 3 parents of the children ASD participated in assessing the social validity of the video self-modeling intervention. The professionals watched two video vignettes of each participant, one baseline and one video self-modeling intervention, and then completed a social validity questionnaire focused on the children's outcomes and the intervention characteristics using a 5-point Likert scale (1-strongly disagree to 5-strongly agree). Parents watched two video vignettes, one baseline and one video self-modeling intervention of their own children only, but completed the same questionnaire as the professionals. Video vignettes were randomly presented and there were no details provided of which video belonged to which condition.

The professional's responses on the questionnaire validated the success of the intervention. Mean responses for the presence of the target behaviors after viewing baseline segments were: mands, 1.06; greetings, 1.19; toy comments, 1.25, and activity comments, 1.21. In contrast, their responses for the presence of the target behaviors after viewing intervention segments were: mands, 4.6, greetings, 4.6, toy comments, 4.2, and activity comments, 3.67. , The professionals agreed that the targeted behaviors were important skills for children with ASD (M = 4.69). On the other hand, the professionals were undecided as to whether the intervention was easily implementable (M = 3.4). They agreed that the participants enjoyed the session (M = 4.30) and they recommended it for other children with ASD (M = 4.6). Professionals agreed that they had noticed the participants generalizing the target behaviors in different settings since their

involvement in the study (M =4.18). They were asked to circle any of the four target behaviors that they might have observed the participants displaying with other people and in different settings. They reported observing manding and greeting but no commenting on toys or activities.

The parent's responses were somewhat different from those of the professionals. All three parents strongly disagreed that there were any target behaviors displayed in baseline by any of their children (M = 1). In contrast to the baseline sessions, all three parents strongly agreed that their children displayed independent mands (M = 5) and appropriately greeted the peer (M = 4.67). Although two of them strongly agreed that they observed their children comment on toys and the activity, one of them did not, resulting in a mean of 3.67. All three parents strongly agreed that these are important skills for children with ASD (M = 5). They also strongly agreed that their children enjoyed the sessions (M = 5). They all indicated that they thought the video self-modeling was an easy intervention to implement (M = 5) and recommended it for other children with ASD (M = 5). It was interesting that all three parents reported that they noticed the target behaviors at home (M = 5). They were also asked to circle any of the four target behaviors that they might have observed the participants displaying with other people and in the home setting. Like the professionals, they reported observing manding and greeting but no comments on toys or activities. Table 4 provides a summary of results for both groups of respondents.

Table 5. Number of responses, range, and means for the social validity for both groups of respondents

Social Validity Questionnaire	Baseline						Intervention					
	Professionals			Parents			Professionals			Parents		
	# of responses	Range	Mean	# of responses	Range	Mean	# of responses	Range	Mean	# of responses	Range	Mean
The child appropriately greets the peer	16	1-2	1.06	3	1	1	15	4-5	4.6	3	4-5	4.67
The child appropriately comments on the toy item(s)	16	1-2	1.19	3	1	1	15	1-5	4.2	3	1-5	3.67
The child independently mands for preferred toy item(s) to the peer	16	1-2	1.25	3	1	1	15	3-5	4.6	3	5	5
The child appropriately comments on the activity	14	1-2	1.21	3	1	1	15	1-5	3.67	3	1-5	3.67
The targeted behaviors are important skills for the child with ASD to learn							13	4-5	4.69	3	5	5
The child seems to enjoy the session							13	3-5	4.30	3	5	5
Video self-modeling intervention seems to be easily implemented							13	3-5	3.92	3	5	5
I would recommend using the video self-modeling intervention with other children with ASD							12	4-5	4.6	3	5	5
I have noticed that the child has been greeting/commenting/ manding (requesting) at home/classroom setting since he has been involved in the study							11	3-5	4.18	3	5	5

5 DISCUSSION

The purpose of this chapter is to discuss the relationship between the results of the present study and the existing literature on video self-modeling intervention for children with ASD. This chapter contains a summary and discussion of the findings, a discussion of the findings as they relate to positive features of video self-modeling intervention, and possible reasons for the efficacy of video self-modeling in the teaching of a mand repertoire. Additionally, limitations of the present study are discussed. Recommendations for further research in the area of social initiation skills for children with ASD utilizing video self-modeling intervention are presented as well. Finally, a conclusion of the study findings is provided.

5.1 SUMMARY AND DISCUSSION OF FINDINGS

This investigation sought to determine the efficacy of video self-modeling in establishing social initiations with peers in children with ASD. This was accomplished by implementing a multiple probe design across three participants. It was hypothesized that by watching themselves on video performing the target behaviors with peers, the participants would independently mand, greet, and comment on toys and the activity in an activity session with their peers immediately following the viewing of the video. Video self-modeling led to substantial improvements in almost all of the target behaviors for only one participant, Sam. The results of this study,

however, might be considered inconclusive regarding the efficacy of video self-modeling to promote acquisition of manding and social initiation skills for the two other participants, Tuan and Jeremy.

Although video self-modeling alone was effective in establishing mands, greetings, and toy comments for Sam, intervention strategies such as prompting, reinforcement, and cuing were required in addition to the video self-modeling for the establishment of the fourth target behavior, activity comments. For the two other participants, video self-modeling on its own was insufficient for establishing the target behaviors. As a result, additional intervention strategies such as prompting, reinforcement, and cueing were implemented to promote acquisition of the remaining target behaviors.

The results showed that prompting alone was effective in establishing a mand repertoire for both participants, Tuan and Jeremy, but not in establishing other target behaviors. Video self-modeling combined with prompting and reinforcement produced greater results in acquiring activity comments for Sam and toy comments and activity comments for Tuan. It is important to mention that video self-modeling alone or in combination with other intervention strategies did not promote the acquisition of other target behaviors for Jeremy. The video self-modeling intervention, however, is believed to have had some effect on the other intervention strategies used. For example, Tuan did not display any independent mands while in the video-self modeling intervention; however, after only one prompting session he displayed 8 out of 10 independent mands for preferred items to the peer. Knowing that children with ASD have a tendency for prompt dependency and the issues that researchers and practitioners face when trying to fade the prompts (Hume et al., 2009), the role that the video self-modeling intervention played in establishing the target behaviors for this participant should be taken into consideration.

Accordingly, we should be cautious when reporting the efficacy of video self-modeling for establishing the target behaviors for Tuan.

The findings of the present study are noteworthy in that the target skills were maintained for two participants after the video self-modeling intervention was withdrawn. These results, especially Sam's, provide further support for the efficacy of video self-modeling intervention for maintaining learned skills without the presence of the video. In addition, maintenance results for Tuan and Sam showed that they both maintained the target behaviors over time. Sam's maintenance of all target behaviors (i.e., manding for preferred toy items to the peer, greeting the peer, toy comments and activity comments) in both the training setting and the classroom supports previous findings that video self-modeling is an effective intervention for maintaining acquired skills over time. Tuan maintained manding for preferred toy items to the peer and greeting behavior in both settings; however, he did not maintain toy comments or activity comments. The maintenance results for Jeremy might be considered inconclusive given that his only maintenance session, although conducted one week after the intervention ended, followed generalization sessions.

In addition, the efficacy of video self-modeling for the generalization of skills across peers, settings, and materials is best supported by the performance of Sam. He was the only participant that transferred all the target skills, except greeting, to a novel peer, using novel toy items in a novel setting. Two other participants transferred manding skills into a novel setting when using the same toy items only. While in a training setting, manding skills were transferred to novel toy items for Jeremy, and greeting a novel peer for Tuan. Tuan also transferred greeting behavior to a novel setting but with the only the peer who participated in training. Jeremy's activity comment displayed in the novel setting and with novel toys should be interpreted with

caution because he pressed a button to display activity comments only once during the intervention and that was after the peer commented on the activity first.

Indeed, the social validation data provided further evidence that video self-modeling is an effective intervention to improve social initiation skills of children with ASD. Both professionals and parents indicated that all three children demonstrated more appropriate greeting and manding skills during the intervention than in the baseline. Both respondents agreed that participants enjoyed video self-modeling sessions and recommended the intervention for other children with ASD. In addition, they indicated that the occurrence of manding and greeting behaviors was observed in classroom and home settings as a result of the intervention.

Overall, video self-modeling intervention produced better outcomes for Sam compared to the other two participants. One speculation for such results is related to the child's characteristics. It was observed that the child displayed characteristics of echolalia. He was the only child that also imitated the peer's behaviors seen in the video in addition to behaviors targeted for him in particular. For example, when the peer did not say "sure" while granting the toy item to Sam after he manded for that particular toy item, Sam would frequently say it instead. He would also use the play invitation "Let's play with something else," if the peer did not invite him to play with other toy sets as seen in the video. Other researchers have also pointed out that the presence of echolalia (i.e., the child repeating word for word what was spoken) might be a possible explanation for the efficacy of video instruction for promoting acquisition of social skills (Charlop & Milstein, 1989).

5.2 SUPPORTING POSITIVE FEATURES OF VIDEO SELF-MODELING

The video self-modeling literature shows that researchers have been using this intervention successfully to promote the acquisition, generalization, and maintenance of social initiation behaviors of children with ASD. Research points out many positive features that make video self-modeling an ideal intervention for improving social behaviors in children with ASD. Several of these features have been addressed in the present study.

Video self-modeling is characterized by its immediate results. Results are usually noticed shortly after the intervention begins (Buggey, 2005). Accordingly, if there is no instant effect exhibited by the participants then there is no point to continue with the intervention without making modifications because it is unlikely that the intervention will produce any effects. This study supported this feature of video self-modeling given that there were modifications made when no target behaviors were exhibited shortly after the implementation of video self-modeling. Modifications consisted of changes to the video vignette and/or changing a less preferred toy for a highly preferred one. In addition, watching the video was also discontinued and other intervention strategies were implemented or supplemental components were added to the video self-modeling intervention. This feature was supported best by Sam's performance. Modifications of the toy items used and the video vignette displaying the new preferred toy set were made after 4 sessions of Condition video A. After the motivating operations were already in place, his highly preferred toy items were present; he met the criterion performance for this condition after 4 sessions only.

One of the key features of video self-modeling involves the target child observing himself successfully performing the target behaviors; hence, there is an increase in the participants' attention and motivation (Buggey, 2005). The use of the iMovie software allowed

both video and audio editing; thus, increasing the participants' frequent exposure to the exemplar target behavior. For example, the video depicted the child displaying a correct mand frame "I want (item)." In addition, greeting behaviors, toy comments, and activity comments depicted the participants appropriately displaying social behaviors with peers. Accordingly, throughout all video conditions, the participants watched a competent self performing all the target behaviors while appropriately interacting with the peer. Consistent with previous research findings, both attention and motivation to attend to the modeled behaviors (Bellini & Akullian, 2007) associated with video self-modeling intervention were evident in all three participants.

Video instruction is often seen as an intervention in which no explicit prompting or extrinsic reinforcement is necessary (MacDonald et al., 2009). The results of one participant, Sam, support this feature. Video self-modeling alone proved to be successful enough for him to reach the criterion performance for three conditions, Condition video A, B and C (i.e., manding, greeting, and toy comments). There were no additional intervention strategies such as prompting or reinforcement necessary. Jeremy's data support the feature that video instruction does not need extrinsic reinforcement. In an attempt to establish his greeting behavior to the peer, the video vignette itself was used as a reinforcer, given that he did prefer watching the video instead of getting edible reinforcers, already selected via a preference assessment. This is consistent with Shipley-Benamoy's et al. (2002) findings that the video itself is reinforcing for children with ASD.

Another attractive feature of video self-modeling is related to generalization of treatment gains across people, settings, and materials (Nikopoulos & Keenan, 2009). Findings of the present study vary across participants regarding generalization of treatment gains across peers, settings, and toy items. Sam's results, however, support this feature of video self-modeling

intervention given that he generalized all target behaviors, except greeting, to a novel peer, using untrained toy items in a novel setting.

Maintenance of target behaviors has been reported as another key feature of video self-modeling. Results of this present study, support previous research (Wert & Neiswoth, 2003) on maintenance of skills one month after the intervention, though in Sam's case more than in Tuan's case. Both participants maintained manding independently for preferred toy items with the same peer in the training setting as well as in the classroom. Tuan maintained greeting behavior across three sessions and in both settings, whereas Sam maintained all target behaviors, although he did not use them consistently across three sessions and in both settings.

5.3 SUPPORTING THE USE OF VIDEO SELF-MODELING IN TEACHING MAND REPERTOIRE

For all participants, manding independently for preferred toys to the peer was acquired, generalized, and maintained more than the other target behaviors. There are a few explanations for these results. First, it is well established that the mand is distinguished from other types of language because it is controlled by motivational variables (Sundberg, 2004). According to Sundberg and Michael (2001) "mands receive specific reinforcement to the particular mand" (p. 706). The literature emphasizes deprivation as one of the most common motivating operations in establishing mands (Harman & Klatt, 2005). It was suggested that an increase in the level of deprivation could possibly evoke specific behaviors (Sundberg, 2004). Additionally, teaching a child to mand with highly preferred items is more effective than using less preferred toy items (Harman & Klatt, 2005). Given that the toy items used in this study were empirically-determined

as highly preferred toys, it was more likely that deprivation would evoke their mands. Consequently, all participants did not have access to their preferred toy items at any time other than during the study session. During the study two of the participants changed their preferences for toy items. Sam lost interest in the third toy set (i.e., string & beads) whereas Jeremy lost interest playing with the first toy set (i.e., ramp & cars). Until the optimal sets of toys were determined, the frequency of mands remained low. It is worth mentioning that initially Sam was interested in playing with only one of his highly preferred toy items. When that toy was removed his mands to the peer decreased to zero. When the preferred toy item was returned and the non-preferred toy item was replaced with a new preferred toy item he reached the criterion for that condition within 5 sessions. Acquisition of other target behaviors was not controlled by the motivating operation as was the case with mands. On the contrary, the participants were not as motivated by their peer's responses to display greeting or any of the commenting behaviors.

Second, the children had more opportunities to observe themselves manding on the video and more opportunities to actually mand in the activity sessions than they had for the other target behaviors. The video showed the children having 10 opportunities to mand for preferred toys across three different toy sets. In the activity session, which followed immediately, the children were provided with 10 opportunities to mand for the same toy items in the activity session. This was not the case with other target behaviors. Based on the social appropriateness of the behaviors targeted in this study, greeting was displayed at the beginning, commenting on toys when starting to play with toys, and the last comment was displayed at the end of the activity. Consequently, three of these target behaviors were only observed once on the video and displayed only once in the activity sessions.

Third, the order of preferred toy items seemed to have an effect on manding. For two participants, Tuan and Jeremy, the second toy set was the most highly preferred toy item (i.e., ice cream, fridge phonics). The most preferred toy item for Sam was the first toy set (i.e., a train set). Tuan and Jeremy seemed to mand for the first toy set in order to play with their second toy set. While Tuan did not put away the ice cream when playing with the third toy set (i.e., garage and cars), the Jeremy displayed a lower rate of independent mands for the third toy set compared to the first two toy sets across conditions. In one of the sessions, Jeremy was observed pressing the button appropriately, "Let's play another game" when he had finished playing with the first and second toy sets.

5.4 IMPLICATIONS FOR PRACTICE

Although both professionals and family members can easily be potential users of video self-modeling intervention, the most recent data (Bellini & McConnell, 2010) showed that the use of video self-modeling by professionals or family members was not at a satisfactory level. The rationale proposed for not using video self-modeling intervention with young children with ASD was the lack of expertise needed to create the video vignettes as well as the lack of proper equipments and the time required to implement such an intervention (Bellini & McConnell, 2010). The research findings of the present investigation have valuable implications for all parties involved in educating children with ASD.

Research findings of this study provided evidence that although basic technology knowledge is needed to capture the video and edit the video vignette, innovation in video technology (e.g., Flip Video camcorder, Apple – iMovie) has greatly simplified the procedures

for successfully designing and implementing the video self-modeling intervention. For example, the iMovie software used in this study allowed editing of the video vignettes as well as the audio to the point that individual words were clipped and pasted into a video so the child could observe himself using the mand frame targeted in the study (i.e., "I", "want", "car"). In addition, the video vignette displayed the target behaviors as frequent as necessary. Professionals and family members may find this intervention attractive because through editing, they expose their children to verbal or motor behaviors that go beyond what they are demonstrating at the present time (Buggey & Hoomes, 2011). However, constructing a video of target behaviors should be done with caution, given that children with ASD will learn new behaviors only if they are appropriate to their development and ability levels.

As noted in the results of this study, all the participants were highly motivated to watch their own video vignettes. Accordingly, professionals who employ video self-modeling intervention in their classrooms are more likely to find that children with ASD who meet two basic prerequisites -- self recognition and attention to the video (Bellini & Akullian, 2007) -- will most likely be motivated to participate in the intervention as did all the participants in this study; hence transitioning challenges due to changes from one activity to another are less likely to occur.

In regard to capturing the video, this study implemented the imitation strategy, which involved the child imitating the target behavior and then the prompt was edited out. Professionals and family members might consider other strategies such as role playing, which involves children acting out different scenarios, or simply letting the camera roll to capture the target behavior(s) that do not occur as frequently and then edit the video so only the exemplar target behavior will be shown to the child. The later does require minimum effort, therefore may be

very beneficial for professionals in the schools because they may be able to create a video vignette while conducting other teaching activities.

5.5 LIMITATIONS

Although the purpose of this study was to examine the efficacy of video self-modeling alone, additional intervention strategies (e.g., prompting, reinforcement, cuing) implemented in order to establish the target behaviors or reach the criterion may be considered as one of the study limitations. For Tuan and Jeremy, prompting alone was used to establish a mand repertoire and greeting. Prompting and reinforcement alone were utilized with Tuan to establish his greeting behavior, whereas prompting and reinforcement in addition to video self-modeling were used for both Tuan and Jeremy to promote the acquisition of all the target behaviors and with Sam for the acquisition of the activity comment. Although it is clear that the video self-modeling intervention was not successful in improving all the target behaviors for all the participants, the use of other intervention strategies makes it difficult to extrapolate exactly which part of the intervention produced more significant results.

Another potential limitation was the large number of sessions conducted in this study. This limitation might be considered in light of the fact that although the number of sessions ranged from 66 to 72 sessions for the participants, the duration of each session was 10 minutes or shorter for some conditions based on the child's performance within a session. In addition, the intervention itself was enjoyable for all of them and not once did they refuse or display non-compliant behaviors before or during the sessions. The duration of the session was up to 15 minutes for Jeremy only, given that he used the AAC device for communication and was also

engaged in stereotypical behaviors. For example, in Condition video A the session consisted of the child watching a 1.5-minute video vignette and displaying mands toward peers. The session ended as soon as the child manded for the toys available, 10 opportunities.

Given that one of the participants used an AAC device as his communication mode whereas two other participants were verbal represented another limitation to the study. Although for the two other participants the video vignettes and the activity sessions were shorter, the length of the video vignettes for Jeremy were longer because they depicted him pressing the button and displaying the target behaviors. For the same reason, the activity sessions were also longer; it took longer for him to display the target behaviors than for the other two participants.

The results of this study are limited in that the same conditions and the same number of sessions across conditions were not conducted with all the participants due to time constraints. For Jeremy, 3 sessions of Condition video C and D were conducted only. Condition D, which assessed maintenance of skills after the video, prompting, and reinforcement were removed, was not conducted at all. The number of sessions for generalization and maintenance conditions included 3 generalization sessions and 1 maintenance session instead of 5 and 3 respectively, conducted with the other two participants.

Another possible limitation involves the time, approximately two months, required for peer training. Video modeling was utilized to train peers on the verbal and motor behaviors that they needed to display during the activity session if the target behaviors were displayed or not displayed by the child with ASD. Additional strategies (i.e., prompting, visual cues) during the training session might have reduced the time spent on peer training.

Creation of the video vignettes before the baseline condition might be considered a limitation. During the creation of the video vignettes for each participant prompting and

reinforcement was involved for several days, approximately 10 minutes a day, in order for the participants to display the target behaviors clear enough so they would learn from watching their performance on the video vignette. This might have contaminated baseline data. The child might have picked up the target behaviors during the creation of the video and have displayed any of them during the baseline.

5.6 FUTURE RECOMMENDATIONS

Although there were many findings in this investigation, there are several issues that remain unanswered and in need of further investigation. First, there is a considerable body of literature that reported failure of video self-modeling or other types of video instruction for improving the social initiation skills of children with ASD. Lack of participants' motivation to watch oneself in the video, lack of self-recognition skills, and an inability to attend to the video for at least 1 minute were some of the speculations of what might have caused the failure of these interventions. According to Bellini and Akullian (2007) attention and motivation are two essential features that contribute to the success of video self-modeling. It was assumed that if the child does not attend to the video, it is less likely that he or she will imitate the behavior. Although all participants, throughout the intervention, were very attentive to the video and were highly motivated to be in the study, the video self-modeling alone was not shown to be successful in promoting acquisition of the social initiation skills targeted in this study for all participants. They all had already shown the ability to recognize themselves. As a result, further research should be done on examining the characteristics and traits of children with ASD in order to determine who might benefit the most from the video self-modeling intervention.

It is well established that video self-modeling is a promising intervention for children with ASD. However, many of these studies did not use video self-modeling alone but combined it with other intervention strategies, providing ambiguous results concerning the isolating effects of each intervention. This study also utilized other intervention strategies alone in addition to the video self-modeling intervention. Given that the purpose of this investigation was not to compare the efficacy of video self-modeling alone to video self-modeling with other additional intervention strategies no conclusions can be made with certainty about the efficacy of video self-modeling alone or in combination with other strategies. Therefore, there is a need for comparative studies to be conducted in order to determine the efficacy of video self-modeling compared to video self-modeling plus other additional components as well as video self-modeling alone compared to prompting and reinforcement alone.

Further research is needed to investigate the efficacy of the video self-modeling intervention in the acquisition of mands for information. Research shows that the information itself is not motivating for children with ASD (Endicott & Higbee, 2007). This intervention might be beneficial given that watching the video is motivating for most children with ASD.

Finally, it would be useful for research to assess the use of a the video self-modeling intervention in establishing a mand repertoire in a natural environment instead of a structured environment. The use of the newest technology (e.g., iPad, iPod) is quite common in today's classrooms. It would be of interest to investigate the efficacy of video self-modeling utilizing this technology in a natural environment.

5.7 CONCLUSION

As the results of this investigation have revealed, video self-modeling has a potential to promote acquisition of social initiation skills for young children with ASD. Findings of this study showed that (a) viewing oneself displaying the target behaviors to a peer in 1-3 minutes video vignettes, and (b) then imitating those target behaviors in an activity session with the peer using the exact materials as seen in the video, increased correct performance for three out of four target behaviors for one of the three participants.

Therefore, findings of this study expanded the literature on video self-modeling in several ways. First, video self-modeling may be utilized to establish a mand repertoire with young children with ASD. Second, children with ASD may benefit from this intervention in regard to greeting their peers as well as commenting while playing with the peer. Third, children with ASD who display characteristics of echolalia seem to respond better to the video self-modeling intervention. Fourth, the video self-modeling intervention combined with prompting and reinforcement seems to produce greater outcomes for children with ASD. Fifth, children with ASD who use an AAC device to communicate may also benefit from the video self-modeling intervention.

In summary, the most recent data on the prevalence of autism has been alarming, pointing out a real a need for evidence-based interventions for promoting social initiation skills for children with ASD. Ready access and ease of use of today's technology provides greater opportunities for the video self-modeling intervention to be implemented with young children with ASD.

APPENDIX A

A.1 INSTITUTIONAL REVIEW BOARD LETTER OF APPROVAL, PARENT CONSENT FORMS

University of Pittsburgh

Institutional Review Board

3500 Fifth Avenue
Pittsburgh, PA 15213
(412) 383-1480
(412) 383-1508 (fax)
http://www.irb.pitt.edu

Memorandum

To: Lema Kabashi
From: Christopher Ryan, PhD, Vice Chair
Date: 7/15/2011

IRB#: PRO11010445
Subject: The Efficacy of Video Self-Modeling for Promoting Social Initiation Skills of Children with Autism

The University of Pittsburgh Institutional Review Board reviewed and approved the above referenced study by the expedited review procedure authorized under 45 CFR 46.110 and 21 CFR 56.110. Your research study was approved under: 45 CFR 46.110.(5)(6)(7).

Approval Date: 7/15/2011
Expiration Date: 7/14/2012
For studies being conducted in UPMC facilities, no clinical activities can be undertaken by investigators until they have received approval from the UPMC Fiscal Review Office.

Please note that it is the investigator's responsibility to report to the IRB any unanticipated problems involving risks to subjects or others [see 45 CFR 46.103(b)(5) and 21 CFR 56.108(b)]. The IRB Reference Manual (Chapter 3, Section 3.3) describes the reporting requirements for unanticipated problems which include, but are not limited to, adverse events. If you have any questions about this process, please contact the Adverse Events Coordinator at 412-383-1480.

The protocol and consent forms, along with a brief progress report must be resubmitted at least one month prior to the renewal date noted above as required by FWA00006790 (University of Pittsburgh), FWA00006735 (University of Pittsburgh Medical Center), FWA00000600 (Children's Hospital of Pittsburgh), FWA00003567 (Magee-Womens Health Corporation), FWA00003338 (University of Pittsburgh Medical Center Cancer Institute).

Please be advised that your research study may be audited periodically by the University of Pittsburgh Research Conduct and Compliance Office.

UNIVERSITY OF PITTSBURGH

SCHOOL OF EDUCATION

Informed Consent

Dear Parent or Guardian:

As a Ph.D student in Early Intervention, Special Education, at the University of Pittsburgh, I am very interested in identifying interventions that promote social initiation skills of young children with autism. By doing this research study, I hope to provide support to parents and professionals on improving social interaction skills of children with autism toward adults and peers. At this time, I am looking for children ages three to five years old and who have a diagnosis of Autism Spectrum Disorders (ASD). Your child's program coordinator and teacher have referred your child for participation in this study. By allowing your child to participate in this study, you are giving permission for your child's teacher to provide information to the investigator regarding your child's levels of performance in the areas of social and communication development. In addition, you are giving permission to the investigator to conduct assessments, observations, and teaching instructions with your child. Before you agree to permit your child to participate in this study you should know enough about the research study to make an informed decision.

The purpose of this study is to investigate the efficacy of video self-modeling intervention to promote social initiation skills as well as generalization of these skills across people, settings, and items for young children with autism. Four children with ASD will participate in the study. Participation will involve assessments, observations, and instructions, which will be conducted at the LEAP preschool. Assessments will consist of identifying the child's level of performance on the social and communication area as well as his/her preferred food and toy items. Intervention sessions will consist of a child watching a video vignette of his/her own self, approximately 1-2 minutes long, and then performing modeled behaviors in an activity sessions that will last approximately 30 minutes. The targeted behaviors will consist of the child manding (the mand is a type of language in which what the child says is controlled by what the child wants) for highly preferred food and toys items and initiating other appropriate social behaviors such as approaching, greeting, and commenting to the communication partner. The food and toy video vignettes will be alternated daily. In order for the motivating operations to be in place the child will have access to highly preferred items during the study sessions only. The transfer of treatment gains to generalized settings, items, and people, will be conducted daily in a 30-minute generalization session. In order to assess the transfer of treatment gains from adults to peers, across settings and items, generalization data will also be collected once a week during the whole school day, using the Language Environment Analysis (LENA) System. The LENA Digital Language Processor (DLP), a digital recorder that weighs 2.5 ounces, will fits into the front pocket of custom-made clothing (i.e., vest) that your child will be wearing and is tailored specifically to hold the device and optimize audio files from the DLP. Finally, an assessment of maintenance will be conducted 1-month and 2-months after the completion of the intervention. Consequently, participants are most likely to participate in this study over the entire semester.

The potential benefits to your child for taking part in this study are improvements in social initiation skills toward adults and peers, increase of meaningful social interactions with others, and developing and maintaining friendships with their peers. However, no benefits are guaranteed. The results of this investigation may help you get better understanding on how to improve your child's social initiation skills. Allowing your child to participate will also help identify interventions that promote social initiations skills.

The potential risks to your child for taking part in this study are minimal. The intervention has been designed to be enjoyable for the child. However, if engaging in the instruction sessions or deprivation of preferred items during any other times except in the study sessions appear to distress your child or an occurrence of challenging behaviors such as crying, aggression, property damage is noticed, possible alternatives /modifications will be discussed with you. If there are no alternatives that will satisfy you, you are free to withdraw your child from the study. Your child's identity, assessment records, and data related to this research will be kept confidential. Any research reports based on this project will be presented as a group data and the data will be stored on computers with password protected. However, there is a minimal risk for breach of confidentiality.

Your child's participation in this project will occur on voluntary basis and with no charge to you. In addition, you will not receive any payments for participation. As a study participant, you will receive a summary of the research findings at the end of the study. You have the right to withdraw your child from this study at any time without adverse consequences. If you wish to discontinue your child's participation at any time, you will be free to do so with no effect on current or future educational services or your participation in future research studies. If the child refuses to participate in this study, we ensure you that he/she will not be forced to participate in the study. In addition, if your child does not meet all inclusive/exclusive criteria then he/she will be considered ineligible to participate in the study.

At the end of this study, any records that personally identify your child will remain stored in locked or password protected files and will be kept for a minimum of seven years. In unusual cases, your child's research records may be released in response to an order from a court of law. It is also possible that authorized representatives from the University of Pittsburgh Research Conduct and Compliance Office may review your child's data for the purpose of monitoring the conduct of this study. Also, if the investigators learn that your child or someone with whom your child is involved is in serious danger or potential harm, they will need to inform the appropriate agencies, as required by Pennsylvania law.

With your consent, I plan to video record your child's behavior in order to create two sets of video vignettes (4 food items & 4 toy items) with adults and peers that will be used for instruction purposes. In addition, I plan to video and audio record your child's behaviors and vocalizations throughout all the conditions (i.e., baseline, intervention, generalization, and maintenance) for the subsequent data collection and for reliability purposes. You can indicate your permission for video and audio recordings by checking the appropriate boxes following the signature line.

By signing this consent form, you are agreeing that all your questions have been answered to your satisfaction. However, if you have any further questions, you can reach Lema Kabashi (412) 371-0585 or lek43@pitt.edu or Louise Kaczmarek, Ph.D, an associate professor at the University of Pittsburgh, who is supervising this research study, at (412) 648-7449 or kaczmk@pitt.edu.

Sincerely,

Lema Kabashi,
Doctoral Student
Early Intervention
Special Education
University of Pittsburgh
5513 Wesley W. Posvar Hall
Pittsburgh, PA 15260
(412) 371-0585
lek43@pitt.edu

PERMISSION FOR CHILD'S PARTICIPATION

I, (parent's/guardian's full name)_____,
agree to permit (child's full name)_____to participate in the research study entitled "The efficacy of video self-modeling for promoting social initiation skills of children with autism", carried out by Lema Kabashi. I have read the attached letter and the investigator has informed me regarding the general nature of the project and any anticipated potential risks. I acknowledge that any questions I have raised have been fully explained to me. Furthermore, I understand that I may withdraw my permission for my child to participate in the research study at any time and discontinue participation in the project without prejudice. Finally, I acknowledge that I have read the consent form and I sign it freely and voluntarily. A copy of the consent form has been given to me.

Parent/Guardian Signature _____ Date _____

Investigator's Signature _____ Date _____

UNIVERSITY OF PITTSBURGH

SCHOOL OF EDUCATION

Informed Consent

The Child Participating as a Peer of the Child with Autism Spectrum Disorders (ASD)

Dear Parent or Guardian:

My name is Lema Kabashi, and I am a Ph.D student in the Early Intervention, Special Education, at the University of Pittsburgh. I am conducting a research study on the efficacy of video self-modeling on promoting social initiation skills of young children with autism. Dr. Louise Kaczmarek, an associate professor at the University of Pittsburgh, is supervising this study.

The purpose of this study is to investigate the efficacy of video self-modeling intervention to promote social initiation skills as well as generalization of these skills across people, settings, and items for young children with Autism Spectrum Disorders (ASD). Four typically developing peers ages three to five years old will participate in the study as communication partners of four children with ASD. Your child is being invited to participate in this research study as a typical peer. Your child has been asked to participate in this study because your child's teacher has referred him/her as an ideal communication partner to a child with ASD and also falls within the age range of the study. In addition, the study will be conducted at the LEAP preschool, the preschool that your child is currently attending.

This study targets the child with autism requesting highly preferred food and toy items and other appropriate social behaviors such as approaching, greeting, and commenting toward adults and peers. Two sets of video vignettes (4 food items & 4 toy items) will be created. Your child will be videotaped as a communication partner of a child with ASD. Such video vignettes may or may not be used for instruction purposes due to the child's with ASD response toward intervention. Initially, your child will participate in a 30-minute generalization session to assess if the child with ASD will initiate social skills toward the peer. If the child with ASD fails to initiate toward a peer (i.e., your child), then the video vignettes with the peer will be implemented and your child will participate in both video self-modeling sessions and generalization sessions. Finally, the maintenance of skills will be assessed 1-month and 2-months after the completion of the intervention. Accordingly, your child is going to participate in this study over the entire semester.

The potential benefits from this study are that this study will provide early intervention professionals with valuable information about video self-modeling intervention on improving social initiation skills of children with ASD. As a result, they will have greater selection and use of evidence-based interventions on improving social initiations skills to other children with ASD. There are no direct benefits to your child. The results of this investigation may add to a growing body of literature in support of video self-modeling as an effective intervention on improving social initiation skills of children with ASD.

The potential risks to your child for taking part in this study are minimal. The intervention has been designed to be enjoyable for the both the child with ASD and the peer. However, if engaging in the study sessions appears to upset your child (e.g., dislike activities, unpleasant experience with videotapes, etc) we may discuss some alternatives with you. Since the participation on this project will remain voluntary no one will have to remain in situation if dissatisfied. In addition, there is a minimal risk for breach of confidentiality.

Your child's participation in this project will occur on voluntary basis and with no charge to you. In addition, you will not receive any payments for participation. As a study participant, you will receive a summary of the research findings at the end of the study. You have the right to withdraw your child from this study at any time without adverse consequences. If you wish to discontinue your child's participation at any time, you will be free to do so with no effect on current or future educational services or your participation in future research studies. In addition, if the child refuses to participate in this study, we ensure you that he/she will not be forced to participate in the study.

In regard to confidentiality, all efforts within limits given by law will be made to protect your child's identity. At the end of this study, any records that personally identify your child will remain stored in locked or password protected files and will be kept for a minimum of seven years. In unusual cases, your child's research records may be released in response to an order from a court of law. It is also possible that authorized representatives from the University of Pittsburgh Research Conduct and Compliance Office may review your child's data for the purpose of monitoring the conduct of this study. Also, if the investigators learn that your child or someone with whom your child is involved is in serious danger or potential harm, they will need to inform the appropriate agencies, as required by Pennsylvania law.

With your consent, in addition to videotapes, your child's vocalizations will also be audio recorded throughout all the conditions (i.e., baseline, intervention, generalization, and maintenance) for the subsequent data collection and for reliability purposes. You can indicate your permission for video and audio recordings by checking the appropriate boxes following the signature line.

By signing this consent form, you are agreeing that all your questions have been answered to your satisfaction. However, if you have any further questions, you can reach Lema Kabashi (412) 371-0585 or lek43@pitt.edu or Louise Kaczmarek, Ph.D, an associate professor at the University of Pittsburgh, who is supervising this research study, at (412) 648-7449 or kaczmk@pitt.edu.

Sincerely,

Lema Kabashi
Doctoral Student
Early Intervention, Special Education
University of Pittsburgh
5513 Wesley W. Posvar Hall
Pittsburgh, PA 15260
(412) 371-0585
lek43@pitt.edu

PERMISSION FOR THE CHILD PARTICIPATING AS A PEER OF THE CHILD WITH AUTISM SPECTRUM DISORDERS (ASD)

I, (parent's/guardian's full name)_____, agree to permit (child's full name)_____to participate in the research study entitled "The efficacy of video self-modeling for promoting social initiation skills of children with autism", carried out by Lema Kabashi. I have read the attached letter and the investigator has informed me regarding the general nature of the project and any anticipated potential risks. I acknowledge that any questions I have raised have been fully explained to me. Furthermore, I understand that I may withdraw my permission for my child to participate in the research study at any time and discontinue participation in the project without prejudice. Finally, I acknowledge that I have read the consent form and I sign it freely and voluntarily. A copy of the consent form has been given to me.

Parent/Guardian Signature _____ Date _____

Investigator's Signature _____ Date _____

APPENDIX B

B.1 PEER TRAINING PROCEDURES

Peer Training – Condition Video B

Participant _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed.

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with toy item and comments "This (item) is cool!"										
2	Experimenter approaches the peer										
3	Experimenter greets the peer "Hi (name)"										
4	Peer greets the experimenter back "Hi (name)"										
5	Experimenter mands "I want (item)"										
6	Peer says "Sure/Here you go"										
7	Peer gives the item to the experimenter										
8	Experimenter plays with the item										
9	Peer says "Let's play with something else"										
10	Experimenter gives the item back to the peer										
Total											

* Steps 5-8 are repeated through 10 trials *(Indicate in the following trials)*
* If the toy has multiple pieces then the experimenter will mand for the pieces. If not, the experimenter will play with it for 20 sec.
* The peer will say "*Let's play with something else*" two times during a session.

Peer Training – Condition Video C

Peer _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with the toy item and comments "This (item) is cool!"										
2	Experimenter approaches the peer										
3	Experimenter greets the peer "Hi (name)"										
4	Peer greets the experimenter back "Hi (name)"										
5	Experimenter comments "This (item) looks cool!"										
6	Peer responds "Yeah, it is cool!"										
7*	Experimenter mands "I want (item)"										
8*	Peer says "Sure/Here you go"										
9*	Peer gives the item to the experimenter										
10*	Experimenter plays with the item										
11*	Peer says "Let's play with something else"										
12*	Experimenter gives the item back to the peer										
Total											

* Steps 7-12 are repeated through 10 trials *(Indicate in the following trials)*
* If the toy has multiple pieces then the experimenter will mand for the pieces. If not, the experimenter will play with it for 20 sec.
* The peer will say *"Let's play with something else"* two times during a session.

Peer Training – Condition Video D

Peer _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with the toy item and comments "This (item) is cool!"										
2	Experimenter approaches the peer										
3	Experimenter greets the peer "Hi (name)"										
4	Peer greets the experimenter back "Hi (name)"										
5	Experimenter comments "This (item) looks cool!"										
6	Peer responds "Yeah, it is cool!"										
7*	Experimenter mands "I want (item)"										
8*	Peer says "Sure/Here you go"										
9*	Peer gives the item to the experimenter										
10*	Experimenter plays with the item (20 sec)										
11*	Peer says "Let's play with something else"										
12*	Experimenter gives the item back to the peer										
13	Experimenter comments "This was fun!"										
14	Peer comments back "Yeah it was fun!"										
Total											

* Steps 7-12 are repeated through 10 trials *(Indicate in the following trials)*
* If the toy has multiple pieces then the experimenter will mand for the pieces. If not, the experimenter will play with it for 20 sec.

Peer Training – Condition Video A1 (BnD)

Peer _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with the toy item and comments "This (item) is cool!"										
2	Experimenter does not approach the peer										
3	The peer cues the experimenter by saying "This (item) is so cool"?										
4	Experimenter does not approach the peer										
5	The peer changes the item and comments on the new item "This (item) is so cool?										
6	Experimenter does not approach the peer										
7	The peer says: "(Name) let's watch the video again"?										
Total											

Peer Training – Condition Video A2 (BnD)

Peer _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with the toy item and comments "This (item) is cool!"										
2	Experimenter approaches the peer										
3	Experimenter does not mand "I want (item)"										
4	The peer says: "(Name) let's watch the video again"?										
Total											

Peer Training – Condition Video B (BnD)

Participant _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed.

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with toy item and comments "This (item) is cool!"										
2	Experimenter approaches the peer										
3	Experimenter does not greet the peer "Hi (name)"										
4	Peer cues the experimenter "Hi (name)"										
6	Experimenter does not greet the peer "Hi (name)"										
7	Peer says "(Name) let's watch the video again"										
Total											

Peer Training – Condition Video C (BnD)

Participant _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed.

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with toy item and comments "This (item) is cool!"										
2	Experimenter approaches the peer										
3	Experimenter greets the peer "Hi (name)"										
4	Peer greets the experimenter back "Hi (name)"										
6	Experimenter does not comment "This (item) looks cool!"										
7	Peer cues the experimenter "This (item) is so cool"										
9	Experimenter does not comment after the cue "This (item) is cool"										
10	Peer says "(Name) let's watch the video again"										
Total											

Peer Training – Condition Video D (BnD)

Participant _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed.

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with toy item and comments "This (item) is cool!"										
2	Experimenter approaches the peer										
3	Experimenter greets the peer "Hi (name)"										
4	Peer greets back "Hi (name)"										
5	Experimenter comments "This (item) looks cool!"										
6	Peer comments back "Yeah, it is cool"										
7	Experimenter mands "I want (item)"										
8	Peer says "Sure/Here you go" and gives the item to the experimenter										
9	Experimenter plays/takes the item										
10	Peers says "Let's play with something else"										
11	Experimenter gives the item back										
12	Experimenter does not comment "This was fun!"										
13	Peer comments "This was fun!"										
14	Experimenter does not comment after the cue "This was fun!"										
15	Peer says "(Name) let's watch the video again"										
Total											

Peer Training – Condition Video D2 (BnD)

Participant _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed.

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with toy item and comments "This (item) is cool!"										
2	Experimenter approaches the peer										
3	Experimenter greets the peer "Hi (name)"										
4	Experimenter comments "This (item) looks cool!"										
5	Peer comments back "Yeah, it is cool"										
6	Experimenter mands "I want (item)"										
7	Peer says "Sure/Here you go" and gives the item to the experimenter										
8	Experimenter plays/takes the item										
9	Peers says "Let's play with something else"										
10	Experimenter gives the item back										
11	Experimenter doesn't mand but tries to grab the item										
12	Peer blocks the item on the table and asks "What do you want?"										
13	Experimenter does comment "This was great!"										
14	Peer comments "This was great!"										
Total											

Peer Training – Condition Video E (BnD)

Participant _____ Time: _____

Date: _____ Session # _____

Instructions:
Indicate with "+" if the behavior is displayed or "-" if the behavior is not displayed.

#	Steps	Trials									
		1	2	3	4	5	6	7	8	9	10
1	Peer is playing with toy item and comments "This (item) is cool!"										
2	Experimenter approaches the peer										
3	Experimenter greets the peer "Hi (name)"										
4	Experimenter comments "This (item) looks cool!"										
5	Peer comments back "Yeah, it is cool"										
6	Experimenter mands "I want (item)"										
7	Peer says "Sure/Here you go" and gives the item to the experimenter										
8	Experimenter plays/takes the item										
8	Peers says "Let's play with something else"										
9	Experimenter does not give the item back										
10	Peer blocks the item on the table and asks "What do you want?"										
11	Experimenter does not comment "This was fun!"										
12	Peer comments "This was fun!"										
13	Peer says "(Name) let's watch the video again"										
Total											

APPENDIX C

C.1 INTERRATER OBSERVER AGREEMENT AND PROCEDURAL FIDELITY

Baseline Condition – Manding with Peers

Manding with toy items

Participant: _____ Date: _____

Peer:_____ Session #: _____

Time: _____

Instructions

Toy items: The peer will be sitting in the child size table playing with the child's preferred toy and the child's ability to mand for preferred toys with a peer, as the communication partner, will be recorded.

The child's behavior will be recorded for 10-minute sessions.

#	Mands	Number of occurrences of the same mands
1		☐☐☐☐☐☐ ☐☐☐☐☐☐
2		☐☐☐☐☐☐ ☐☐☐☐☐☐
3		☐☐☐☐☐☐ ☐☐☐☐☐☐
4		☐☐☐☐☐☐ ☐☐☐☐☐☐
5		☐☐☐☐☐☐ ☐☐☐☐☐☐
6		☐☐☐☐☐☐ ☐☐☐☐☐☐
7		☐☐☐☐☐☐ ☐☐☐☐☐☐
8		☐☐☐☐☐☐ ☐☐☐☐☐☐
9		☐☐☐☐☐☐ ☐☐☐☐☐☐
10		☐☐☐☐☐☐ ☐☐☐☐☐☐

Summary:

Total number of occurrences _____ Reliability Percentage _____%

Comment:

Baseline_Free Play

Participant: _____ Date: _____

Session #: _____ Time: _____

Other children present: ***Yes*** ☐ ***No*** ☐

Instructions:
Indicate the occurrence of a behavior within the interval with "+" and non-occurrence of a behavior within the interval with "-"

Behaviors displayed	***20 Minutes Interval***																			
	1'	**2'**	**3'**	**4'**	**5'**	**6'**	**7'**	**8'**	**9'**	**10'**	**11'**	**12'**	**13'**	**14'**	**15'**	**16'**	**17'**	**18'**	**19'**	**20'**
Child greets a peer(s)																				
Child comments with a peer(s)																				
Child mands/requests to a peer(s)																				
Other initiations																				

Summary:

Number of occurrences of greeting to the peer(s) _____

Number of occurrences of commenting the peer (s) _____

Number of occurrences of mands to a peer(s) _____

Reliability Percentage _____%

Procedural Fidelity Checklist

Baseline – Manding

Participant: _____ Date: _____

Peer: _____ Session #: _____

Time: _____

Instructions:
Place a checkmark in the corresponding box (yes (Y) or no (N)) for each component during each trial.

#	Procedural steps	Trials																			
		1		2		3		4		5		6		7		8		9		10	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
1	Was the peer playing with the child's preferred toy item and commented "This (item) is cool?																				
2	Did the child approach the peer within 0.5 meters within 5 seconds?																				
3*	Did the child mand to the peer "I want (item)"?																				
4*	Did the peer say "Sure" or "Here you go" and give the item to the child?																				
5*	Did the child take/play with the toy/piece of toy item?																				
6	Did the peer say "Let's play with something else"?																				
7	Did the child give the item back to the peer?																				
Total																					

** Steps 3-5 will be repeated for ten trials. Indicate in the following trials.*
** Steps 6 & 7 will be repeated only twice.*

Comment:

Procedural Fidelity Checklist

Baseline_Free Play

Participant: _____ Date: _____

Session #: _____ Time: _____

Instructions:
Place a checkmark in the corresponding box Yes or No for behaviors that occur one time. Indicate with "+" for YES or "-" for NO for behaviors that occur multiple times within 20 minutes interval.

#	Steps	
1	Did the experimenter say to the child "Go play with your friends"?	Yes ☐ No ☐
2	Were the peers present?	Yes ☐ No ☐

#		20 Minutes Interval																		
		1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'
3	Did the child greet the peer(s)?																				
4	Did the child comment on the activity/item?																				
5	Did the child mand/request to the peer(s)?																				
6	Did the child display any other initiations?																				

Summary:

Number of occurrences _____ Reliability Percentage _____%

Activity Session Event Recording

Condition Video D

Participant _____ Date: _____

Session # _____ Time: _____

Instructions:

Indicate with "+" if the participant displays the behavior independently (I), partial mand (P.M.) when cued (C), after changing the item (Ch. I), a non-targeted behavior occurred (N-T. B), there was no occurrence of the behavior (N. O. B), or the participant was invited to watch the video again (W. V). ***(Any mand displayed before the greeting/commenting does not count).***

# Trials	Target Behaviors																	
	Greeting "*Hi/Hello (name)*"				Commenting "This (item) is cool!"				Manding "*I want (item)*"						Commenting "This was fun!"			
	I	C	N.O.B	W. V	I	C	N.O.B	W. V	I	P.M.	C	N-T.B	N.O.B	W. V	I	C	N.O.B	W.V
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

Summary:

Total number of occurrences of approaching the peer independently _____

Total number of occurrences of greeting the peer independently _____

Total number of occurrences of commenting independently _____

Total number of occurrences of independent mands _____

Reliability Percentage _____ %

Procedural Fidelity Checklist

Condition Video _____

Participant: _____ Date: _____

Session: _____ Time: _____

Instructions:

Place a checkmark in the corresponding box (yes (Y) or no (N)) for each component during each trial.

#	Procedural Steps	Trials																							
		1		2		3		4		5		6		7		8		9		10		11		12	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
1	Did the experimenter say: "(Name) let's watch the video" and show the video to the child?																								
2	Did the child watch the video?																								
3	If the child did not pay attention to the video did the experimenter say: "(Name) watch the video"?																								
4	Did the child watch the video after the experimenter's demand?																								
5	After watching the video vignette, did the experimenter say to the child: "(Name) let's do the same as in the video"?																								
6	Was the peer playing with the child's preferred toy item and commented "This (item) is cool!"?																								
7	Did the child approach the peer within 0.5m?																								
8	If the child did not approach the peer within 5 seconds did the peer cue the child again by saying: "This (item) is so good"?																								
9	Did the child approach the peer within 0.5m after the cue?																								
10	If the child did not approach the peer within 5 sec did the peer change the item and commented "This (item) is cool!"?																								
11	Did the child approach the peer within 0.5m after the change of items?																								
12	Did the child greet the peer "Hi (peer's name)"?																								

#	Procedural Steps	Trials																							
		1		2		3		4		5		6		7		8		9		10		11		12	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
13	Did the peer greet the child back "Hi (name)"?																								
14	If the child did not greet the peer within 5 seconds did the peer cue the child by saying "Hi (name)"?																								
15	Did the child respond "Hi (peer's name)"?																								
16	Did the child comment "This (item) is cool!"?																								
17	Did the peer respond "Yeah, it is cool"?																								
18	Did the child mand to the peer "I want (item)"?																								
19	Did the peer say "Sure" or "Here you go" and give the item to the child?																								
20	Did the child play with toy item?																								
21	Did the peer say "Let's play with something else?"																								
22	Did the child give the item back or let go the item?																								
23	Did the child comment "This was fun!"?																								
24	Did the peer respond "Yeah, it was fun"?																								
25	If the child did not comment within 5 sec did the peer cue "This was fun!"																								
26	Did the child comment after the cue "This was fun!"?																								
27	If the child did not comment within 5 seconds did the peer say "(Name) let's watch the video again"?																								
28	If the child did not mand within 5 sec did the peer say "(Name) let's watch the video again"?																								
29	If the child did not mand but tried to grab the toy item did the peer block it and say "What do you want"?																								

*** If there is YES for step 2 skip to step 5*
****If there is YES for step 7 then skip to step 12*
***** If there is YES for step 9 then skip to step 12*
****** If there is NO for step 12 then skip to step 14*
******* If the child uses only one word to mand for an item (e.g., ball instead of "I want ball") then score as NO*
******** If the child mands repeatedly within 5 seconds or while the item is being granted to him it will still be scored as the same mand.*
********* Any displayed mand before the greeting does not get scored.*

Summary:

Total number of YES _____ Total number of NO _____ Reliability Percentage _____ %

Activity Session Event Recording

Condition Video _____ + Prompting + Reinforcement

Participant _____ Date: _____

Session # _____ Time: _____

Instructions:

Indicate with "+" if the participant displays the behavior independently (I), partial mand (P.M.), when cued (C), if there was no occurrence of the behavior (N. O. B), the behavior occurred after prompting plus reinforcement, or the participant was invited to watch the video again (W. V).

(Any mand displayed before the greeting/commenting does not count).

# Trials	Target Behaviors																									
	Greeting "*Hi/Hello (name)*"						Commenting "This (item) is cool!"						Manding "*I want (item)*"							Commenting "This was fun!"						
	I	C	P+R		N.O.B	W. V	I	C	P+R		N.O.B	W. V	I	P.M	C	P+R		N.O.B	W. V	I	C	P + R		N.O.B	W.V
			F	P					F	P						F	P					F	P		
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									

Summary:

Total number of occurrences of greeting the peer independently _____

Total number of occurrences of first comment independently _____

Total number of occurrences of independent mands _____

Total number of occurrences of second comment independently _____

Reliability Percentage_____%

Procedural Fidelity Checklist

Condition Video ____ + P + R

Participant: _____ Date: _____

Session: _____ Time: _____

Instructions:
Place a checkmark in the corresponding box (yes (Y) or no (N)) for each component during each trial.

#	Procedural Steps	Trials																							
		1		2		3		4		5		6		7		8		9		10		11		12	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
1	Did the experimenter say: "(Name) let's watch the video" and show the video to the child?																								
2	Did the child watch the video?																								
3	If the child did not pay attention to the video did the experimenter say: "(Name) watch the video"?																								
4	Did the child watch the video after the experimenter's demand?																								
5	After watching the video vignette, did the experimenter say to the child: "(Name) let's do the same as in the video"?																								
6	Was the peer playing with the child's preferred toy item and commented "This (item) is cool!"?																								
7	Did the child approach the peer within 0.5m?																								
8	If the child did not approach the peer within 5 seconds did the peer cue the child again by saying: "This (item) is cool"?																								
9	Did the child approach the peer within 0.5m after the cue?																								
10	If the child did not approach the peer within 5 sec did the peer change the item and commented "This (item) is cool!"?																								
11	Did the child approach the peer within 0.5m after the change of items?																								

#	Procedural Steps	Trials																							
		1		2		3		4		5		6		7		8		9		10		11		12	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
12	Did the child greet the peer "Hi (peer's name)"?																								
13	Did the peer greet the child back "Hi (name)"?																								
14	If the child did not greet the peer within 5 seconds did the peer cue the child by saying "Hi (name)"?																								
15	Did the child respond "Hi (peer's name)"?																								
16	Did the child comment "This (item) is cool!"?																								
17	Did the peer respond "Yeah, it is cool"?																								
18	If the child did not comment on the toy item within 5 sec did the experimenter prompt "This train is cool?"																								
19	Did the child comment after the prompt?																								
20	Did the peer respond "Yeah, it is cool?"																								
21	Did the experimenter reinforce his (peer's) behavior?																								
22	Did the child mand to the peer "I want (item)"?																								
23	Did the peer say "Sure" or "Here you go" and give the item to the child?																								
24	Did the child play with toy item?																								
25	Did the peer say "Let's play with something else?"																								
26	Did the child give the item back or let go the item?																								
27	Did the child comment "This was fun!"?																								

28	Did the peer respond "Yeah, it was fun"?																							
29	If the child did not comment within 5 sec did the peer cue "This was fun!"?																							
30	Did the child comment after the cue "This was fun!"?																							
31	If the child did not comment on the within 5 sec did the experimenter prompt "This was fun?																							
32	Did the child comment "This was fun!?																							
33	Did the peer respond Yeah, it was fun!"?																							
34	Did the experimenter reinforce his (peer's) behavior?																							
35	If the child did not comment on the within 5 sec did the peer say "(Name) let's watch the video again"?																							
36	If the child did not mand to the peer within 5 seconds did the peer say "(Name) let's watch the video again"?																							
37	If the child did not mand but tried to grab the toy item did the peer block the item and say "What do you want?"																							

#	Procedural Steps	Trials																							
		13		14		15		16		17		18		19		20		21		22		23		24	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
12	Did the child greet the peer "Hi (peer's name)"?																								
13	Did the peer greet the child back "Hi (name)"?																								
14	If the child did not greet the peer within 5 seconds did the peer cue the child by saying "Hi (name)"?																								
15	Did the child respond "Hi (peer's name)"?																								
16	Did the child comment "This (item) is cool!"?																								
17	Did the peer respond "Yeah, it is cool"?																								
18	If the child did not comment on the toy item within 5 sec did the experimenter prompt "This train is cool?"																								
19	Did the child comment after the prompt?																								
20	Did the peer respond "Yeah, it is cool?"																								
21	Did the experimenter reinforce his (peer's) behavior?																								
22	Did the child mand to the peer "I want (item)"?																								
23	Did the peer say "Sure" or "Here you go" and give the item to the child?																								
24	Did the child play with toy item?																								
25	Did the peer say "Let's play with something else?"																								
26	Did the child give the item back or let go the item?																								
27	Did the child comment "This was fun!"?																								

28	Did the peer respond "Yeah, it was fun"?																							
29	If the child did not comment within 5 sec did the peer cue "This was fun!"?																							
30	Did the child comment after the cue "This was fun!"?																							
31	If the child did not comment on the within 5 sec did the experimenter prompt "This was fun?																							
32	Did the child comment "This was fun!?																							
33	Did the peer respond Yeah, it was fun!"?																							
34	Did the experimenter reinforce his (peer's) behavior?																							
35	If the child did not comment on the within 5 sec did the peer say "(Name) let's watch the video again"?																							
36	If the child did not mand to the peer within 5 seconds did the peer say "(Name) let's watch the video again"?																							
37	If the child did not mand but tried to grab the toy item did the peer block the item and say "What do you want?"																							

** Steps 17-19 will be repeated for total of 10 trials*

*** If there is YES for step 2 skip to step 5*

****If there is YES for step 7 then skip to step 12*

***** If there is YES for step 9 then skip to step 12*

****** If there is NO for step 12 then skip to step 14*

******* If the child uses only one word to mand for an item (e.g., ball instead of "I want ball") then score as NO*

******** If the child mands repeatedly within 5 seconds or while the item is being granted to him it will still be scored as the same mand.*

********* Any displayed mand before the greeting does not get scored.*

Summary:

Total number of YES _____ Total number of NO _____ Reliability Percentage_____ %

Condition D

Participant _____ Date: _____
Session # _____ Time: _____

Instructions:
Indicate with "+" if the participant displays the behavior independently (I), partial behavior (P.B.) when cued (C), there was no occurren of the behavior (N. O. B), or the participant was invited to watch the video again (W. V).

# Trials	Target Behaviors												
	Greeting *"Hi/Hello (name)"*			Commenting "This (item) is cool!"			Manding *"I want (item)"*				Commenting "This was fun!"		
	I	P.B.	N.O.B	I	P.B.	N.O.B	I	P.B.	C	N.O.B	I	P.B.	N.O.B
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

Summary:
Total number of occurrences of greeting the peer independently _____
Total number of occurrences of first comment independently _____
Total number of occurrences of independent mands _____
Total number of occurrences of second comment independently _____
Reliability Percentage _____ %

Procedural Fidelity Checklist

Condition D

Participant: _____ Date: _____

Session: _____ Time: _____

Instructions:

Place a checkmark in the corresponding box (yes (Y) or no (N)) for each component during each trial.

#	Procedural Steps	Trials																							
		1		2		3		4		5		6		7		8		9		10		11		12	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
1	Was the peer playing with the child's preferred toy item and commented "This (item) is cool!"?																								
2	Did the child approach the peer within 0.5m?																								
3	Did the child greet the peer "Hi (peer's name)"?																								
4	Did the peer greet the child back "Hi (name)"?																								
5	Did the child comment "This (item) is cool!"?																								
6	Did the peer respond "Yeah, it is cool"?																								
7	Did the child mand to the peer "I want (item)"?																								
8	Did the peer say "Sure" or "Here you go" and give the item to the child?																								
9	Did the child play with toy item? (if he didn't mand (#7) then he grabbed it)																								
10	Did the peer say "Let's play with something else?"																								
11	Did the child give the item back or let go the item?																								
12	Did the child comment "This was fun!"?																								
13	Did the peer respond "Yeah, it was fun"?																								

#	Procedural Steps	Trials																							
		13		14		15		16		17		18		19		20		21		22		23		24	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
7	Did the child mand to the peer "I want (item)"?																								
8	Did the peer say "Sure" or "Here you go" and give the item to the child?																								
9	Did the child play with toy item? (if he didn't mand (#7) then he grabbed it)																								
10	Did the peer say "Let's play with something else?"																								
11	Did the child give the item back or let go the item?																								
12	Did the child comment "This was fun!"?																								
13	Did the peer respond "Yeah, it was fun"?																								

** Steps 7-9 will be repeated for total of 10 trials (or more, if the child mands for more than 10 toy items)*
*** If the child uses only one word to mand for an item (e.g., ball instead of "I want ball") then score as NO*
**** If the child mands repeatedly within 5 seconds or while the item is being granted to him it will still be scored as the same mand.*
***** If there is no opportunity for the peer to respond to the child (initiation not displayed by the child) then leave it blank.*
****** If the child does not mand but grabs the toy(s) and plays with it then indicate that in step #9.*

Summary:

Total number of YES _____ Total number of NO _____ Reliability Percentage _____ %

Generalization (peer/setting/items)

Participant _____ Date: _____
Session # _____ Time: _____

Instructions:
Indicate with "+" if the participant displays the behavior independently (I), partial mand (P.M.) or there was no occurrence of the behavior (N. O. B).

# Trials	Target Behaviors								
	Greeting "*Hi/Hello (name)*"		Commenting "This (item) is cool!"		Manding "*I want (item)*"			Commenting "This was fun!"	
	I	N.O.B	I	N.O.B	I	P.M.	N.O.B	I	N.O.B
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Summary:
Total number of occurrences of greeting the peer independently _____
Total number of occurrences of first comment independently _____
Total number of occurrences of independent mands _____
Total number of occurrences of second comment independently _____

Reliability Percentage _____ %

Procedural Fidelity Checklist

Generalization (peer/setting/items)

Participant: _____ Date: _____

Session: _____ Time: _____

Instructions:

Place a checkmark in the corresponding box (yes (Y) or no (N)) for each component during each trial.

#	Procedural Steps	Trials																							
		1		2		3		4		5		6		7		8		9		10		11		12	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
1	Was the peer playing with the child's preferred toy item and commented "This (item) is cool!"?																								
2	Did the child approach the peer within 0.5m?																								
3	Did the child greet the peer "Hi (peer's name)"?																								
4	Did the peer greet the child back "Hi (name)"?																								
5	Did the child comment "This (item) is cool!"?																								
6	Did the peer respond "Yeah, it is cool"?																								
7	Did the child mand to the peer "I want (item)"?																								
8	Did the peer say "Sure" or "Here you go" and give the item to the child?																								
9	Did the child play with toy item? (if he didn't mand (#7) then he grabbed it)																								
10	Did the peer say "Let's play with something else?"																								
11	Did the child give the item back or let go the item?																								
12	Did the child comment "This was fun!"?																								
13	Did the peer respond "Yeah, it was fun"?																								

** Steps 7-9 will be repeated for total of 10 trials (or more, if the child mands for more than 10 toy items)*

*** If the child uses only one word to mand for an item (e.g., ball instead of "I want ball") then score as NO*

**** If the child mands repeatedly within 5 seconds or while the item is being granted to him it will still be scored as the same mand.*

***** If there is no opportunity for the peer to respond to the child (initiation not displayed by the child) then leave it blank.*

****** If the child does not mand but grabs the toy(s) and plays with it then indicate that in step #9.*

Total number of YES _____ Total number of NO _____ Reliability Percentage _____%

Generalization _ Free Play

Participant: _____ Date: _____

Session #: _____ Time: _____

Instructions:
Place a checkmark in the corresponding box Yes or No for behaviors that occur one time. Indicate with "+" for YES or "-" for NO for behaviors that occur multiple times within 20 minutes interval.

#	Steps	20 Minutes Interval																			
		1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'
1	**Greeting *"Hi/Hello (name)" or waiving/touching peer's hand***																				
2	**Commenting "This (item) is cool!"**																				
3	**Manding *"I want (item)"***																				
4	**Commenting "This was fun!"**																				
	Other initiations																				

Summary:

Number of greeting occurrences _____ Reliability Percentage _____%

Number of commenting (I) occurrences _____ Reliability Percentage _____%

Number of manding occurrences _____ Reliability Percentage _____%

Number of commenting (II) occurrences _____ Reliability Percentage _____%

Maintenance (Classroom/Training Setting)

Participant _____ Date: _____
Session # _____ Time: _____

Instructions:
Indicate with "+" if the participant displays the behavior independently (I), partial mand (P.M.) or there was no occurrence of the behavior (N. O. B).

# Trials	Target Behaviors								
	Greeting "*Hi/Hello (name)*"		Commenting "This (item) is cool!"		Manding "*I want (item)*"			Commenting "This was fun!"	
	I	N.O.B	I	N.O.B	I	P.M.	N.O.B	I	N.O.B
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Summary:
Total number of occurrences of greeting the peer independently _____
Total number of occurrences of first comment independently _____
Total number of occurrences of independent mands _____
Total number of occurrences of second comment independently _____

Reliability Percentage _____%

Procedural Fidelity Checklist

Maintenance (Classroom/Training setting)

Participant: _____ Date: _____

Session: _____ Time: _____

Instructions:
Place a checkmark in the corresponding box (yes (Y) or no (N)) for each component during each trial.

#	Procedural Steps	Trials																							
		1		2		3		4		5		6		7		8		9		10		11		12	
		Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
1	Was the peer playing with the child's preferred toy item and commented "This (item) is cool!"?																								
2	Did the child approach the peer within 0.5m?																								
3	Did the child greet the peer "Hi (peer's name)"?																								
4	Did the peer greet the child back "Hi (name)"?																								
5	Did the child comment "This (item) is cool!"?																								
6	Did the peer respond "Yeah, it is cool"?																								
7	Did the child mand to the peer "I want (item)"?																								
8	Did the peer say "Sure" or "Here you go" and give the item to the child?																								
9	Did the child play with toy item? (if he didn't mand (#7) then he grabbed it)																								
10	Did the peer say "Let's play with something else?"																								
11	Did the child give the item back or let go the item?																								
12	Did the child comment "This was fun!"?																								
13	Did the peer respond "Yeah, it was fun"?																								

** Steps 7-9 will be repeated for total of 10 trials (or more, if the child mands for more than 10 toy items)*

*** If the child uses only one word to mand for an item (e.g., ball instead of "I want ball") then score as NO*

**** If the child mands repeatedly within 5 seconds or while the item is being granted to him it will still be scored as the same mand.*

***** If there is no opportunity for the peer to respond to the child (initiation not displayed by the child) then leave it blank.*

****** If the child does not mand but grabs the toy(s) and plays with it then indicate that in step #9.*

Summary: Total number of YES _____ Total number of NO _____ Reliability Percentage_____

APPENDIX D

D.1 PREFERENCE INVENTORY, PAIRED STIMULUS PREFERENCE ASSESSMENT

Preference Inventory

Participant:_____
Date: _____
Diet: _____

#	Toy Items	Available	Not Available	Total
1.		☐	☐	☐
2.		☐	☐	☐
3.		☐	☐	☐
4.		☐	☐	☐
5.		☐	☐	☐
6.		☐	☐	☐
7.		☐	☐	☐
8.		☐	☐	☐
9.		☐	☐	☐
10.		☐	☐	☐

#	Food Items	Available	Not Available	Total
1.		☐	☐	☐
2.		☐	☐	☐
3.		☐	☐	☐
4.		☐	☐	☐
5.		☐	☐	☐
6.		☐	☐	☐
7.		☐	☐	☐
8.		☐	☐	☐
9.		☐	☐	☐
10.		☐	☐	☐

Paired Stimulus Preference Assessment

Participant: _____ Date: _____

Evaluator: _____Time: _____

List the ten items (five food items & five toy items) to be evaluated:

Food Items	*Toy Items*
1. _____	6. _____
2. _____	7. _____
3. _____	8. _____
4. _____	9. _____
5. _____	10. _____

Instructions:

Array: Present the two items such that the items are 0.7m apart from one another and 0.7m from the child.

SD: Place items on the table in front of the child and say, "Pick one."

Response: If the child will point to the item, reach it, or grab it, then the child will have access to the chosen item for 5s., whereas the non-chosen item will be removed immediately. Attempts of the child to approach both items simultaneously will be blocked by holding both items down on the table. If neither item will be approached within 5s., the experimenter will prompt the participant to hold or consume one of the two items. This procedure will then be repeated with the other item. After the child samples both items, then both items will be presented again and the trial will be repeated (still the same trial). If the child does not approach either of the items then the items will be removed.

Circle item number chosen by the participant (using the experimenter's left/right). Use X under No Response if no choice.

Trial	Left Position	Right Position	No Response	Trial	Left Position	Right Position	No Response
1.	1	2					
2.	2	3					
3.	3	4					
4.	4	5					

5.	5	6					
6.	6	7					
7.	8	9					
8.	9	10					
9.	1	3					
10.	2	4					
11.	3	5					
12.	4	6					
13.	5	7					
14.	6	8					
15.	7	9					
16.	8	10					
17.	1	4					
18.	2	5					
19.	3	6					
20.	4	7					
21.	5	8					
22.	6	9					
23.	7	10					
24.	1	5					
25.	2	6					

26.	3	7					
27.	4	8					
28.	5	9					
29.	6	10					
30.	1	6					

31.	2	7					
32.	3	8					
33.	4	9					
34.	5	10					
35.	1	7					
36.	2	8					
37.	3	9					
38.	4	10					
39.	1	8					
40.	2	9					
41.	3	10					
42.	1	8					
43.	2	10					

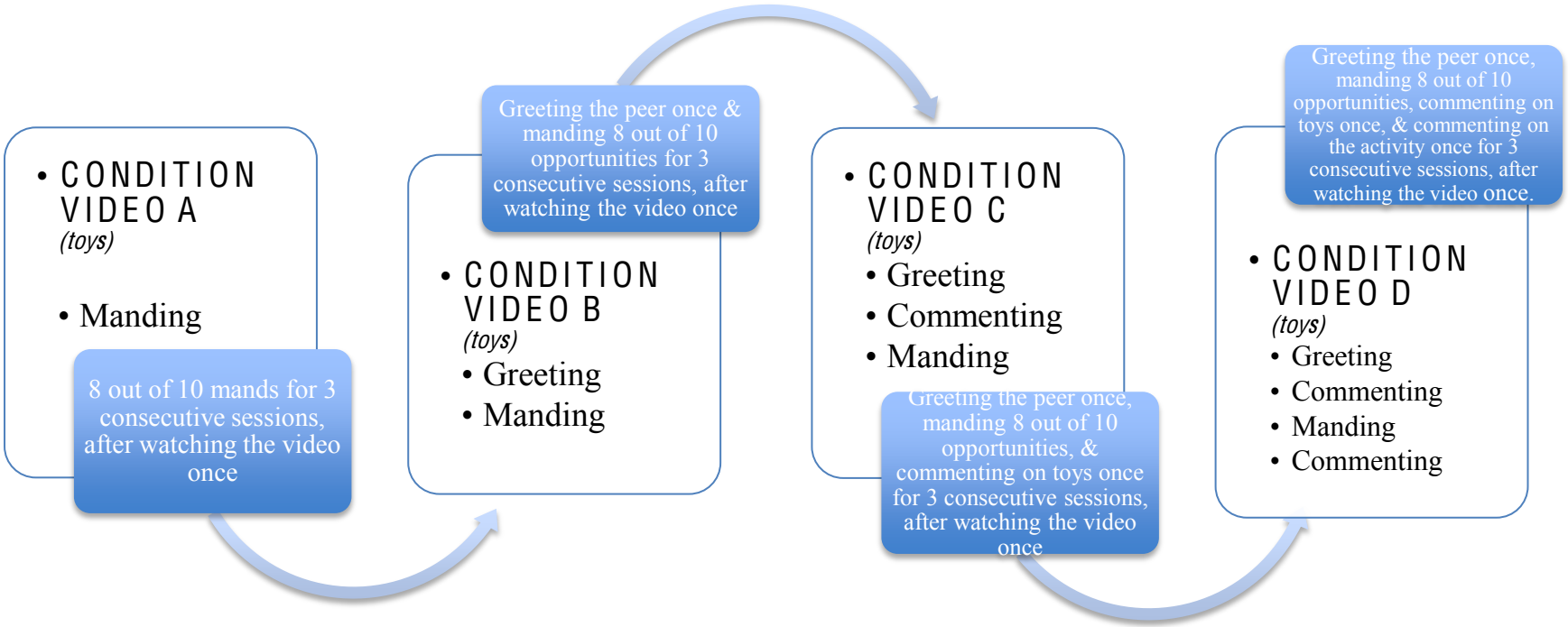
APPENDIX E

E.1 OPERATIONALLY DEFINED TARGET BEHAVIORS, THE SEQUENCE OF VIDEO SELF-MODELING INTERVENTION

Operationally Defined Target Behaviors and Scoring System

Dependent Variables	*Definitions*	*Scoring*
Mands	The child requesting a preferred item using a mand frame "I want (item)". Mands should be clearly directed to a peer, distinguished from the previous mands for at least 5 seconds.	A response will be scored as correct mand if the child requests an item using a mand frame "I want (item)", as modeled in the video. If the child uses only one word (i.e., (label of the item) or mands within 5 seconds the response will be scored as incorrect.
Greeting	Greeting is defined as the child using vocalizations or the AAC device, such as "Hi", "Hi (name)", or "Hello (name)". The behavior should be clearly directed to a peer, within 5 seconds of the child joining him/her.	A response will be scored as correct greeting if the child uses vocalizations or the AAC device, such as "Hi", "Hello", "Hi (name)", or "Hello (name)", directed to the peer. If the child uses gestures to greet a communication partner, except for the child who uses the AAC device, or will respond to communication partner's greeting then the response will be scored as incorrect.
Toy Comments	Commenting is defined as the child expressing his/her opinion on preferred food/toy items, such as "This (item) looks good!", "This (item) is cool!" Such behaviors should be clearly directed to a peer, distinguished from an ongoing interaction or a discontinuation of the previous interaction for at least 5 seconds.	A response will be scored as correct commenting if the child expresses his/her opinion on preferred food/toy items, such as "This (item) looks good!", "This (item) is cool!" to the peer regarding the preferred items. If the child uses another approximate sentence contextually related to the ongoing scenario (e.g., "It's good") then the response will still be scored correct. If the child uses only one word to express his opinion (i.e., cool) or comments after the communication partner's cue then the response will be scored incorrect.
Activity Comments	Activity comments are defined as the child expressing his enjoyment to the peer regarding the activity, such as "This was great!" "This was fun!" Such behaviors should be clearly directed to a peer, distinguished from an ongoing interaction or a discontinuation of the previous interaction for at least 5 seconds.	A response will be scored as correct activity comment if the child expresses his enjoyment to the peer regarding the activity, such as "This was great!", "This was fun!" If the child uses another approximate sentence contextually related to the ongoing scenario (e.g., "How fun", "How cool!") then the response will still be scored correct. If the child uses only one word to express his opinion or enjoyment (e.g., fun) or comments after the communication partner's cue then the response will be scored incorrect.

The Sequence of Video Self-modeling Conditions



APPENDIX F

F.1 OPERATIONALLY DEFINED TARGET BEHAVIORS, THE SEQUENCE OF VIDEO SELF-MODELING INTERVENTION

Number of sessions, range of target behaviors, and means of target behaviors for each participant and each condition.

		Participant	Baseline		Intervention													C_D (no video)	Generalization						Maintenance	
			Manding	Free Play	CV-A	Prompting	CV-B	Prompting	CV-B + P	C_B +P+R	CV-B +P+R	CV-C	CV-C+P+R	CV-D	CV-D+P	CV-D+C	CV-D +P + R		Peer/Toys /Setting	Setting/ Toy Items	Peer/ Setting	Peer/Toy Items	Setting	Toy Items	Training Setting	Classroom
Number of sessions		Tuan	4	4	6	5	4	3	4	6	0	5	5	3	0	0	9	3	1	2	1	1	0	0	3	3
		Sam	7	7	8	0	12	0	0	0	0	4	0	5	3	7	9	3	5	0	0	0	0	0	3	3
		Jeremy	9	9	12	6	4	3	4	0	9	3	0	3	0	0	0	0	0	1	0	0	1	1	1	1
Independent Mands	Range	Tuan	0-1	0	0	1-11	8-9	10-11	10-12	7-10		8-10	7-8	11-12			11-14	11-13	0	0	10	0			9-11	3-8
		Sam	0-5	0	0-11		9-11					10-12		9-11	10-11	10-12	9-11	9-10	8-14						10-12	10-12
		Jeremy	0-4	0	0-6	5-10	9-10	9-11	10-13		9-12	11		10-12						0			5	3	7	4
	Mean	Tuan	.25	0	0	7.8	8.6	10.7	10.5	8.5		8.8	7.8	11.7			11.8	12	0	0	10	0			10	6.3
		Sam	3.28	0	6.1		10.3					11		10	10.3	11.1	10.2	9.7	10						9.7	10.7
		Jeremy	1.2	0	2.6	12.1	9.8	10	11.7		11.1	11		11.3						0			5	3	7	4
Greeting the peer(s)	Range	Tuan	0	0			0	0	0	0-1		0-1	1	1			1	1	0	1	1	1			1	1
		Sam	0-1	0			0-1					0-1		0-1	0-1	0-1	0-1	0-1	0						0-1	0-1
		Jeremy	0	0			0	0	0		0	0-1		0						0			0		0	0
	Mean	Tuan	0	0			0	0	0	.7		.8	1	1			1	1	0	1	1	1			1	1
		Sam	.4	0			.4					.8		.8	.7	.6	.8	.7	0						.3	.3
		Jeremy	0	0			0	0	0		0	.3		0						0			0		0	0
Toy Comments	Range	Tuan	0	0								0	0-1	0			0-1	0	0	0	0	0			0	0
		Sam	0	0			2-3					1		0-1	1	0-1	0-1	0-1	0-1						0-1	0-1
		Jeremy	0	0								0		0						0			0		0	0
	Mean	Tuan	0	0								0	.6	0			.6	0	0	0	0	0			0	0
		Sam	0	0			.6					1		.6	1	.7	.9	.7	.2						.3	.3
		Jeremy	0	0								0		0						0			0		0	0
Activity Comments	Range	Tuan	0	0										0			0-1	0	0	0	0	0			0	0
		Sam	0	0										0	0	0	0-1	1	0-1						0-1	0-1
		Jeremy	0	0										0						0-1			0		0	0
	Mean	Tuan	0	0										0			.3	0	0	0	0	0			0	0
		Sam	0	0										0	0	0	.4	1	.4						.3	.7
		Jeremy	0	0										0						.3			0		0	0

APPENDIX G

G.1 SOCIAL VALIDITY QUESTIONNAIRE

Social Validity Questionnaire

Please view the video vignettes and then rate the extent to which you agree or disagree with the statements below on a scale of 1 to 5 with 1 Strongly Disagree and 5 Strongly Agree.
(1- *Strongly Disagree*, 2 - *Disagree*, 3 -*Neither Agree nor Disagree*, 4 - *Agree*, and 5 - *Strongly Agree)*

1. The child appropriately greets the peer

   1 2 3 4 5

2. The child appropriately comments on the toy item(s)

   1 2 3 4 5

3. The child independently mands for preferred toy item(s) toward the peer

   1 2 3 4 5

4. The child appropriately comments on the activity

   1 2 3 4 5

5. The targeted behaviors are important skills for the child with ASD to learn

   1 2 3 4 5

6. The child seems to enjoy the session

   1 2 3 4 5

7. Video self-modeling intervention seems to be easily implemented

   1 2 3 4 5

8. I would recommend using the video self-modeling intervention with other children with ASD

   1 2 3 4 5

9. I have noticed that the child has been greeting/commenting/manding (requesting) at home/classroom setting since he has been involved in the study

   1 2 3 4 5

Comments:
_____
_____
_____
_____
_____

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