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The Impact of Video Modeling on Improving Social Skills in Children with Autism

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Abstract

Children with autism often show a lack of the interactive social skills that would allow them to engage with others successfully. They therefore frequently need training to aid them in successful social interaction. Video modeling is a widely used instructional technique that has been applied to teach children with developmental disabilities such as autism. Previous research involving children with autism has shown that video modeling can be effective in teaching a variety of skills. The aim of this study is to evaluate the impact of video modeling on social skills development in children with autism**.** A small sample of five boys with autism was chosen to participate in this study. The boys ranged in age between five and seven years. Each child was asked to watch a video tape which presented two individuals interacting in a role play setting. One person portrays a therapist giving cues, whilst the second portrays a child acting appropriately and demonstrating correct social behaviors. The boys were then asked to complete a social task and their performance was compared against baseline assessment measures. The results of this study indicate this method is an effective method for instruction. Results are discussed and implications for further research and practice are provided.
(Key words: Autism, social skills deficits, intervention program, and video modeling)

The Impact of Video Modeling on Improving the Social Skills of Children with Autism

Autism is a developmental disorder that involves impairment in social interaction and communication development as well as patterns of repetitive behaviors and/or restricted interest (Al Zyoudi, 2008).

Children with autism show significant difficulty in building social relationships. Many children with autism resist and reject human contact and social interactions from a very early age. They show deficits such as; a lack of orientation towards a social stimulus, inadequate use of eye contact, problems initiating social interaction, difficulty interpreting both verbal and / or non-verbal social cues and inappropriate emotional response (Bellini & Akullian, 2007; Hine & Wolery, 2006; Zriqat & Amam, 2009).

Social skills are defined as observable, definable and learned behaviors. To be accepted by society an individual must behave appropriately. Appropriate and positive behaviors can be

taught in a systematic manner using specific teaching methods (Teteault & Lerman, 2010; Wilson, 2012).

Several researchers have developed social skills interventions to address the needs of children with autism (Baker, 2007; MacDonald, Sacramone, Mansfield, Wiltz & Ahern, 2009). Participants of varying age groups from preschool to adult have been studied. Social, academic and functional skills have also been evaluated (McCoy & Hermansen, 2007; Reichow & Volkmar, 2010). Similar strategies have been used to teach and remediate a variety of defined skills including; play skills (Bellini & Akullian, 2007; D'Ateno, Mangiapanello, & Taylor, 2003; MacDonald et al, 2009), self-help skills (Shipley-Benamou, Lutzker & Taubman, 2002), academic instruction skills (Kinney, Vedora, & Stromer, 2006), and communication skills (Wert & Neisworth, 2003). Researchers and practitioners have used methods including; direct teaching, social reinforcement, feedback, cooperative learning, providing cues, shaping, modeling, peer tutoring, social stories, and video modeling (Cotugno, 2009).

According to social learning theory most humans learn by watching others. This theory of learning through observation has two fundamental processes – modeling and imitating. Modeling is the demonstration of a desired behavior to an observer who can then reproduce the behavior in imitation. The use of video tape to present modeling is based on social learning theory (Al Zyoudi, 2008), and has been shown to be an effective method of teaching social skills (Baker, 2007, Bellini & Akullian, 2007; MacDonald, Sacramone, Mansfield, Wiltz & Ahern, 2009, Wang, Cui & Parrial, 2011; Shukl-Mehta, & Callahan, 2010).

In recent years, researchers and practitioners have applied video modeling in a variety of settings with participants ranging in ages from preschool to throughout adulthood. This method has been used to teach various social, academic, and functional skills to children with autism (McCoy & Hermansen, 2007; Reichow & Volkmar, 2010). Video modeling has also been used successfully to help remediate the social skills deficits of children with autism. Furthermore, this strategy was used to help establish a variety of other skills including play skills (e.g., Bellini & Akullian, 2007; D'Ateno, Mangiapanello, & Taylor, 2003; MacDonald et al, 2009), self-help skills (e.g., Shipley-Benamou, Lutzker & Taubman, 2002), academic instruction skills (e.g., Kinney, Vedora, & Stromer, 2006), and communication skills (Wert & Neisworth, 2003).

There are four styles of video modeling:

(i) Modeling with video - where the individual watches video recordings of all sub-steps of a skill displayed by a peer, adult, or the child herself/himself and then the child repeats these behaviors (Banda, Matuszny, & Turkan, 2007).

(ii) Feedback with video - where the individual watches her/his own performance in a non-edited videotape which helps the individual notice her/his appropriate and inappropriate behaviors and allows the individual to discuss these behaviors with the practitioner and make adjustments in future performance (Maione, & Mirenda, 2006)

*(iii)*Cue with video - which provides individuals with the opportunity to carry out the skill immediately after the cue is given by the role model. It actively involves the individual in the process (Mechling, 2005).

(i) Computer-aided video teaching - which presents texts, graphics, animations, sound, music, slides, films and movie recordings within a single system (Scattone, 2008; Mechling, 2005; Shukl-Mehta, & Callahan, 2010).

The research literature shows the majority of studies of video modeling investigated social skills instruction and focused on relatively simple behaviors. Different video modeling types used with children with autism were examined by; Delano, 2008; McCoy, and Hermansen, 2007; Mechling, 2005; and Wang et al.,2011. Video models with contingent praise were used by Bidwell & Rehfeldt (2004) and used by Paterson and Arco (2007) to teach adults with severe disabilities to initiate an interaction by bringing a cup of coffee to an adult peer. Nikopoulos & Keenan (2007) demonstrated that using video models alone was sufficient for teaching three autistic children to initiate an interaction by gesturing or vocally requesting an adult to join the child in play.

This research study is designed to evaluate the impact of video modeling on improving the social skills of children with autism. It differs from the studies reviewed in the literature in the following six ways: Firstly, it is based on studies conducted with individuals diagnosed with autism. Secondly, this study aims to examine the benefits of using a video modeling intervention to increase the social skills of children diagnosed with autism. Thirdly, this study analyses the video model practices used in social skills training in terms of factors such as subjects, environment, the research model and also the reasons the particular social skills were selected, whether they have social validity and whether the skills are maintained or generalized. Thus the practice and its' effectiveness are evaluated. Fourthly, this study focuses on social engagement in a natural setting. Fifthly, the present study addresses a limitation of existing research by studying the effect of video modeling alone without the use of other intervention strategies. Finally, according to the research teams' knowledge, no such study has been conducted either in the UAE or Arab countries.

Method

Procedure for participants' selection

The participants were selected from a Centre-Based Program that provides behavioural interventions for children with autism located in Al Ain, United Arab Emirates. The children display deficits in social interaction skills as observed and reported by teachers, therapists, and parents.

A Multi-disciplinary team of special educators, social workers, psychologists and administrators screened male students aged between five and seven years using the DSM-IV-TR (American Psychiatric Association, 2000), the Autism Behavior Checklist (Arab version and the Autism Rating Scale. Five participants were subsequently selected for this study because they all displayed deficits in socially expressive behaviors (e.g. social initiation, conversational skills, appropriate nonverbal communication, and answering/asking informational questions).

Participants

The names of the children used in this research are pseudonyms to protect the identity of the participants and the families. All the children have been diagnosed with autism based on the above selection criteria.

- Ali is 6 years old and was referred by specialists. He displays specific behaviors: aggression, making loud unintelligible sounds and screaming, repetitive hand slapping, head beating and staring at the ceiling. He has limited receptive language and responds by screaming when he hears his name. He speaks less than 25 words.

- Salem is 5.5 years old, He frequently engages in a few stereotyped behaviors such as hand flapping and also displays self-injurious behavior. He lacks eye contact, does not interact with other children and is generally unresponsive to people, preferring solitary activity. He needs to be supervised and directed most time.

- Hossien is 7 years old. He has some speech, mainly words in response to visual prompts, but he can make simple requests. He likes playing with toys, painting, puzzles and a few games on the computer. He does not make eye contact, interact with other children or respond to people.

- Falah is 6 years old and he has inappropriate speech. He displays a variety of challenging behaviors and needs to be supervised and directed most of the time. He engages in stereotypical and repetitive behaviors. He has a limited concentration span and transfers from one activity to another very quickly.

- Mohamed is 6 years old and he displays a variety of challenging behaviors including a lack of social behavior and lack of interaction with other children. Most of his speech consists of delayed echolalia phrase and his receptive language is limited to a few words and very simple instructions. He engages in a few stereotyped behaviors, mainly spinning objects and playing with pens.

Research Environment

The participant children were evaluated in the school, a familiar environment where they would be comfortable. However this presented the researchers with some barriers:

1) Limited Space – since the classroom was not conducive for individual testing, the hallway was identified as the most suitable location to work with the participants.

2) Diagnostician - The teacher was the only appropriate person to carry out the individualized testing and therefore had to be taught the methodology by the researchers who then observed and recorded the responses of teacher and participant.

Dependent and Independent Variables

The dependent variable consisted of the number of tasks that the student correctly modelled from the video. A response was correct when the students performed the task without error, consistent with the visual and auditory model from the video. The student was expected to respond by modeling only the four types of behavior demonstrated in the video (social initiation, conversational skills, appropriate nonverbal communication, and answering/asking informational questions). The response was incorrect if the participant didn't perform the task consistent with the video model.

The mastery criterion was met when a participant completed 80% of tasks correctly by displaying the four responses and maintaining this level for a minimum of three sessions during the intervention plan. The correctly modelled tasks were presented as a percentage of the total number of target tasks based on the task analysis. The percentage of correct tasks completed was calculated by summing the correct tasks completed and dividing by the maximum total target tasks and multiplying by 100.

The independent variable was the presentation of the video model of the teacher to each participant. The video model included a clear narration of the correct tasks, such as saying hello or playing with others. The narration was developed to encourage/ enable the participants to attend to the visual and auditory input from the video.

Experimental Design

An A-B baseline design across participants and settings was used to evaluate the impact of video modeling. Baseline measurements of the social skills of each student participant were made before they were shown the video modeling. During intervention, each student first viewed the video model and was then directed by the teacher to imitate the model. Each student then had to demonstrate the ability to imitate the social skill behaviors observed in the video of social skills with an 80% or greater accuracy in four response types (social initiation, conversational skills, appropriate nonverbal communication, and answering/asking informational questions). As in any A-B design, skill levels at baseline and intervention phases were compared. A comparison between participants was made by noting the changes in the percentage of the correctly completed tasks.

Baseline

During the baseline assessment, the teacher observed the students in different situations. The children's social initiation, conversational skills, appropriate nonverbal communication, and answering/asking informational questions were assessed. One of the researchers documented the number of correct tasks completed by the participant.

Video Modeling Procedure

In this study, technological equipment for the viewing and recording of a video was required. Prior to the study, a training video of a special education teacher modeling the appropriate social skills behavior was created. The social skills training sessions were selected in consultation with the psychologists, social workers, counsellors and a centre supervisor and incorporated into the free-play times available during breaks from instructional time.

Each script regarding the four responses (social initiation, conversational skills, appropriate nonverbal communication, and answering/asking informational questions) was modelled on the video tape At the beginning of each session, the child was asked to sit quietly and watch the television. The experimenter sat next to the child to ensure that the child attended to the video. If the child looked away from the video, the experimenter would say "pay attention". Two sessions were conducted each day for six weeks. Each session was scheduled to last 3-5 minutes. During that time, the experimenter's behavior was similar to the behaviors which have been shown in the videotapes.

Results

The results of this study indicate that the use of video modeling is effective in improving the social skills of children with autism. Table (1) displays the students' scores at pre-intervention (baseline) and post-intervention.

Table 1- Students' scores on pre-intervention (baseline) and post (intervention).

Test	Ali	Salem	Hossien	Falah	Mohamed
Pre-intervention (baseline)	27	29	25	24	28
Post-intervention	38	40	37	35	39

As can be seen in Table 1,the results indicate that the post-test (intervention) group mean of 37.60 is substantially greater than the pre-test (baseline)group mean of 26.60.

A Wilcoxon test was carried out to compare mean difference of the two tests (pre-and-post) for significance. The results were summarized in table 2.

Table 2- Means, standard deviations of pre & post intervention scores and (Z) score.

Test	Mean	SD	Z	α
Pre-	26.60	1.92		
Post-	37.60	2.30	-3.52	0.52

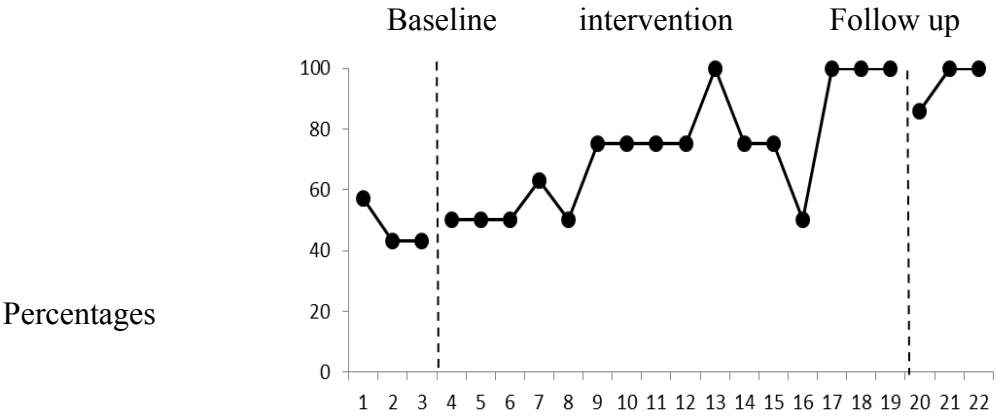
The results of the Wilcoxon test indicate the post-intervention score is significantly higher ($p<$ .05) level than the mean of the pre-intervention score, since Z equals -3.52
[What is α here?]

The results for each of the participants are discussed and graphically represented in figures individually, followed by an overall summary of the group results.

Ali. Ali was selected as the first participant to begin the intervention phase because his baseline data showed a stable level (see Figure 1). During baseline assessment, 48% of tasks were correctly completed. During intervention the overall mean percentage of correct tasks completed was 73%, with an increasing trend and level. Ali reached the mastery criterion in 16 sessions. Since Ali demonstrated 100% correct tasks completed in intervention sessions 10, 14, 15, and 16, it might be inferred that he was able to learn the skill due to the video modeling

intervention. The potential effectiveness of the intervention is exemplified by the increasing trend level during the intervention and by Ali's ability to successfully generalize his use of the social skills learned in a natural setting during the follow up phase.

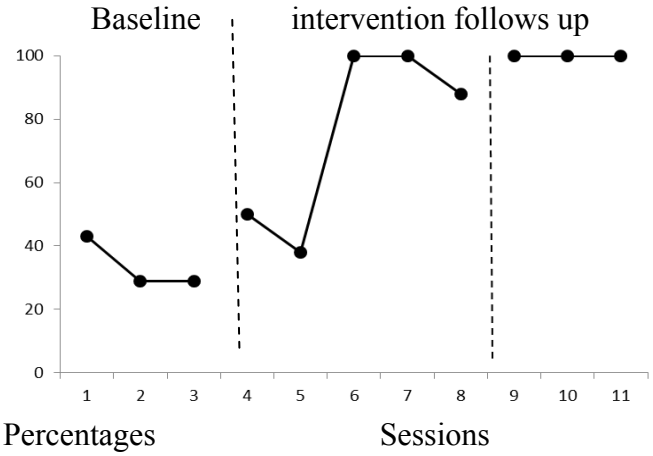
Figure (1). Ali's performance during the baseline, intervention and follow up



Salem

Salem completed 34% correct tasks during baseline assessment. In 5 sessions he reached the mastery criteria for the intervention and had an overall mean of 75% of tasks correctly completed during intervention. Salem correctly completed 100% of target tasks in intervention sessions 3 and 4, and 88% in intervention session 5. He was able to complete the follow up tasks 100% correctly, indicating that he was able to use these skills in novel settings.

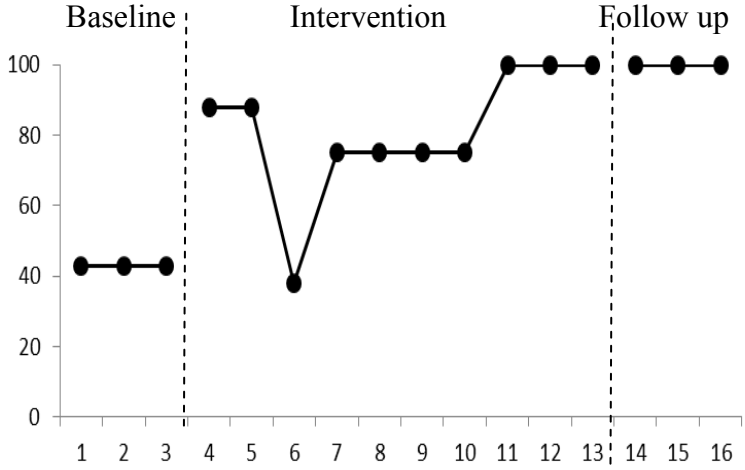
Figure (2). Salem's performance during the baseline, intervention and follow up



Hossien

During baseline assessment, Hossien completed 43% of target tasks correctly. He showed substantial improvement during the intervention phase and over 10 sessions his mean percentage of correctly completed target tasks increased to 81%. His performance in the second intervention session dropped markedly because he was playing (peeking through his hands at the teacher). However, for the remainder of the intervention sessions (4 to 10), his mean score of correctly completed tasks was 86% which is above the mastery criterion. His three subsequent scores of 100% in the follow up sessions show Hossien was effectively trained to learn a new skill in a natural setting using this method.

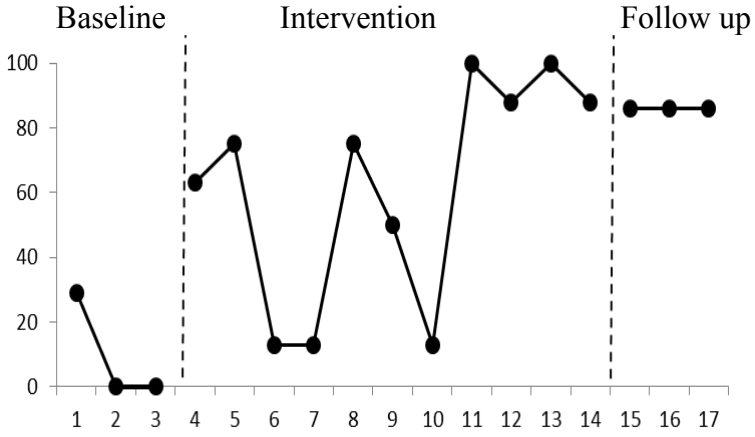
Figure 3. Hossien's performance during the baseline, intervention and follow up



Falah

Although Falah's baseline scores decreased, sessions 2 and 3 were consistent at 0% of correctly completed tasks, as he refused to imitate some behaviors. After viewing the video, the mean scores for intervention sessions 1 and 2 were 69% for correctly completed tasks. However, performance in intervention sessions 3 and 4 dropped to 13%, and after an improvement to 13% in intervention session 5, his performance again dropped to 13% in intervention session 7. The four subsequent intervention sessions averaged 94% for correctly completed tasks. Data from the overall intervention phase showed great variability. The fluctuations from 13% to 100% of correctly completed tasks between intervention sessions 7 and 8 are unlikely to be due to a skill deficit, but more probably explained by Falah's poor concentration and possible efforts to gain attention from the other students or the teacher.

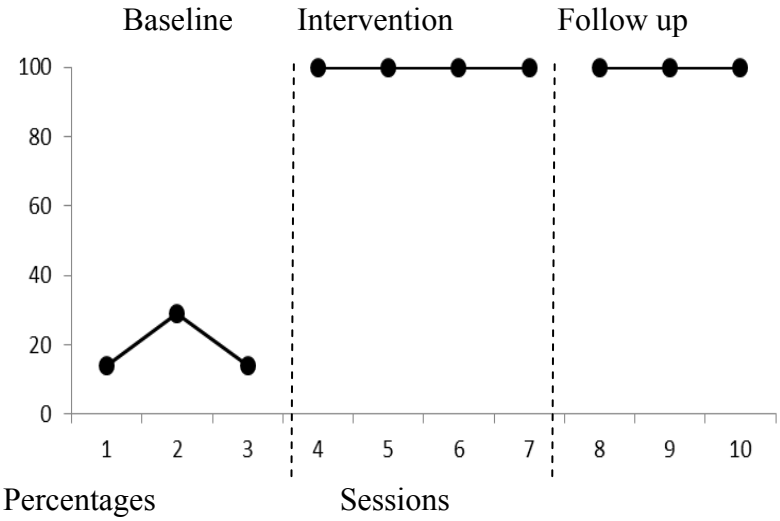
Figure (4). Falah‘s performance during the baseline, intervention and follow up



Mohamed

Mohamed‘s baseline scores were stable with a mean of 19% of correctly completed tasks. After his initial viewing the video model, Mohamed repeated many of the words from the narration. His performance increased significantly to 100% correctly completed tasks for all the intervention and follow up sessions, suggesting this was a very effective method of teaching Mohamed social skills.

Figure 5. Mohamed‘s performance during the baseline, intervention and follow up



Discussion

The main objective of this study was to examine the impact of video modeling on teaching children with autism social skills. The results show that video modeling may be an effective procedure for improving and promoting social skills for all five participant students with autism. All the children in this study reached the mastery criterion for the acquisition of the target

skills/behaviors. These results are similar to some extent to those in previous studies (Shukl-Mehta, & Callahan, 2010; MacDonald, et al., 2009; Cloak, 2007).

Literature shows that children with autism typically lack social skills (e.g. Zrigat & Amam, 2009; Soliman, 2008). The prognosis for the development of these children is related to their acquisition of good social skills. It is important, therefore, that any treatment program for children with autism includes the teaching and promotion of valuable social skills, as this study aimed to do with the participants.

The positive results of this study could be explained if video modeling incorporated a reinforcing element during teaching. Children often enjoy watching videos. If watching a video is in itself a rewarding activity, then children with autism may be more motivated to learn to imitate the modelled activity from a video. Furthermore, it has been well documented that children with autism may have enhanced ability in processing visual stimuli (e.g. Wang et al., 2011; Palechka et al., 2010; Macdonald et al., 2009; Akmanlog, 2008; Nikopoulos & Keenan, 2007).

There are several reasons why video modeling may be helpful in the acquisition of social skills in children with autism. Firstly, video modeling incorporates an acceptable activity into teaching; children often enjoy watching TV and videos. If watching a video is an enjoyable activity, then children with autism may be more motivated to attend to the video and more likely to learn or imitate the modelled activity (MacDonald, et al., 2009; Wang, et al., 2011). Secondly, video modeling takes advantage of the visual processing strengths of children with autism (Shukl-Mehta and Challahan, 2010; Wang, et al., 2011). It has been documented that children with autism can greater enhance their abilities by processing visual stimuli such as video modeling than by traditional methods of teaching (Hine & Wolery, 2006; Reichow & Volkmar, 2010). Thirdly, video modeling can draw a child's attention to the most relevant cues. Children with autism often have difficulty attending to more than one stimulus at a time, and if they attend to wrong or irrelevant stimulus, acquisition of the target behavior may be delayed (MacDonald, et al., 2009; MacMcCoy & Hermansen, 2007). In the present study, the video modeling helps students to focus only on the important information.

The present study may be viewed as a relatively pure intervention in that no other treatment procedures such as promoting or additional reinforcements were used. The only rewards used were in effect the natural reinforcement that occurred as a function of the child's behaviors.

There were a number of limiting factors to this study; the small sample size, the limited research on the competencies and cognitive processes which may influence social skill development, limited resources and the difficulty in crafting a video model to avoid the inclusion of extraneous variables that might distract viewers from the modelled behavior.

The results of this study have several implications for special education teachers and specialists: Firstly, children with autism who can attend to a videotape for several minutes without exhibiting disturbed behavior may respond very well to video modeling. Secondly, video modeling often facilitates rapid skill acquisition across settings, people and materials. This is particularly important to note because generalization is rarely attained by children with autism using promoting methods. Thirdly, the use of adult models has been shown to be effective in

teaching social skills to children with autism and may simplify the process of making videotapes. Fourthly, video modeling tapes are relatively easy to create. Lastly, video modeling may be useful in treating some of the core deficits found in children with autism (e.g. communication skills, and challenging behaviors).

In conclusion, researchers have successfully used video modeling interventions to improve social skills (Bellini & Akullian, 2007; D'Ateno, Mangiapanello, & Taylor, 2003; MacDonald et al, 2009; Shukl-Mehta and Challahan, 2010; Wang, et al., 2011). The acquisition of these skills is vital for children with autism. Researchers are beginning to examine the use of video modeling to address deficits in social skills and improve these skills. The present study adds to the literature by demonstrating that social skills can be taught to children with autism using video modeling. Furthermore, based on the results of this study, teachers, psychologists, and social workers working with children with autism might consider using video modeling as reinforcement when teaching social skills to these students. Additionally, video modeling may be preferred for students with whom traditional teaching methods are ineffective. More research needs to be conducted by using larger samples.

Future research into the social validity of video modeling interventions should involve teachers, psychologists and social workers. In addition, a comparative analysis should be conducted to determine whether video modeling is limited in its capacity to teach these or other behaviors (e.g. academic, communication and language skills).

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