Teaching Play Skills to Children with Autism through Video Modeling: Small Group Arrangement and Observational Learning

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Abstract: The purpose of the present study was to examine if video modeling was an effective way of teaching sociodramatic play skills to individuals with autism in a small group arrangement. Besides maintenance, observational learning and social validation data were collected. Three 9 year old boys with autism participated in the study. Multiple probe design across behaviors was used to examine the effectiveness of video modeling. Results of the study revealed that participants acquired their own roles via video modeling. They also maintained the skills they learned two weeks after the training sessions were completed. Observational learning data were also very positive with all participants. As a result, it can be said that video modeling was effective in teaching sociodramatic play skills to children with autism. Based on the results of the study, it can be recommended that the study be replicated with writing different scenarios and with children with different kinds of disabilities.

Play is one of the most important learning opportunities in every child’s life. For many children, play fills most of their spare time. Individuals with autism, like their typically developing peers, can manage to fill their spare time with some play activities. But it is observed that children with autism who have limited social and communication areas have some limitations in learning play skills and playing with peers (Terpstra, Higgins, & Pierce, 2002). Often they will withdraw from social situations due to their lack of appropriate skills (Liber, Frea, & Symon, 2008). Some of the reasons effecting the development of playing in children with autism include having limited social relationships, expressive language skills, and displaying stereotype behaviors (Hobson, Lee, & Hobson, 2009; Honey, Leekam, Turner, & McConachie, 2007). Usually, systematic procedure needs to be used to teach them these skills (Coyne, Nyberg, & Vandenburb, 1999; D’Ateno, Mangiapanello, & Taylor, 2003; Hine & Wolery, 2006; Leaf & McEachin, 1999; MacDonald, Clark, Garrigan, & Vangala, 2005).

Teaching role playing skills is seen as an important area in children with autism for decreasing the effects of these characteristics on children’s role playing. Role playing is also important for children with autism for developing the playing skills repertoire and for providing an opportunity for interacting with others in their daily environments (D’Ateno et al., 2003; Hine & Wolery, 2006; Ingersoll & Schreiman, 2006; MacDonald, Sacromone, Mansfield, Wiltz, & Ahearn, 2009). In our study, expanding the participants’ skills in sociodramatic play was targeted. Sociodramatic play is in-vivo pretend play. In this play type, the child pretends that s/he is a particular character, possibly one that is written in a script for the players (Brown & Murray, 2001; Smith, 2001; Weiss & Harris, 2001).

In the literature, there are still research studies being conducted for examining effective and efficient teaching techniques and evidence-based practices in the area of teaching different skills such as play skills to children with autism. One of the evidence-based prac-
tices suggested for teaching skills to individuals with autism is visual support systems. Children with autism are visual learners. Visual materials should be used for teaching targeted behaviors and skills to these children. For example, pictures (Pierce & Schreibman, 1994), computer technology (Campbell, Lison, Borsook, Hoover, & Arnold, 1995), activity schedules, written scripts (Dettmer, Simpson, Smith-Myles & Ganz, 2000; Rao & Gagie, 2006) and videos (Charlop & Milstein, 1989) have been successfully used.

In the literature, it is also seen that video modeling alone and/or video modeling with one of the teaching strategies in applied behavior analysis is being frequently used for meeting the educational needs of children with autism in recent years (Nikopoulos & Keenan, 2006). In video modeling, a model is provided on video, but there are no living models in front of the participants during the training sessions (Grant & Evans, 1994). Video modeling only requires the participants to look at the screen and model the skills they see on it. Thus, it is a one-way interaction, which may be beneficial for children with autism.

Reviewing the recent literature it was found that there were a number of studies conducted on teaching play skills through video modeling to children with autism. In these studies, purchasing and tea party role playing skills (D’Ateno et al., 2003), gardener and preparing meal skills as role play (Hine & Wolery, 2006), fireman, doctor, cowboy, and teacher role playing skills (Reagon, Higbee, & Endicott, 2006), role playing in country yard, ship and school settings (MacDonald et al., 2005), role playing skills in the airport, zoo and barbecue party scenarios (MacDonald et al., 2009) were taught through video modeling. The results of these studies showed that video modeling was an effective way of teaching play skills; the participants successfully acquired the verbal and motor skills sought by the method.

Although there have been many studies conducted about video modeling, there still is a need for more studies to be conducted in different arrangements. For example, small group arrangements have an advantage both for the trainers and the participants, and both during research studies and in daily routines in the classrooms. The National Research Council’s Committee on Educational Interventions for Children with Autism recommended that developmentally appropriate small group instruction should be a part of the education of children with autism (National Research Council, 2001). One benefit of small group instruction is the opportunity for observational learning, the acquisition of new responses as a result of observing the behavior of a model (Bandura, 1977; Ledford, Gast, Luscre, & Ayres, 2008). There are many research studies showing the importance, effectiveness and efficiency of group arrangements in their studies (Fickel, Schuster, & Collins, 1998; Griffen, Wolery, & Schuster, 1992; Keel & Gast, 1992; Ledford et al., 2008; Stinson, Gast, Wolery, & Collins, 1991, Tekin-Iftar & Birkan, 2010). The literature reveals no study which used video modeling and observational learning together to teach various skills to individuals with autism. Our study related to this literature on small group arrangements is extended by using video modeling with a group of individuals with autism.

The purpose of our study was to examine (a) whether video modeling was effective in teaching sociodramatic play skills to children with autism, (b) whether the participants maintained the skills they learn two weeks after the training was completed, (c) whether the participants learned the target behaviors of their peers, and (d) the opinions of the participants about taking part in the study.

Method

Participants

Three children with autism who were all nine years old participated. All participants were male. The prerequisite skills to participate were to be able: (a) to pay attention to visual and verbal stimuli for at least 20 minutes, (b) to imitate motor and verbal skills, (c) to take turns during group activities, (d) to follow verbal instructions, (e) to read written scripts, and (f) to memorize what is read.

Osman attended the Small Steps Early Intervention Program between ages 3–5. Since he was six years old he was taking individual support courses from a special education teacher, and also was a full time student of a
fourth grade regular class with 32 students for two and a half years. He had problems with attending to play activities with his peers during school and out of school times. He also had difficulties speaking with appropriate grammar, and initiating and continuing communication with others.

Cemil also attended the Small Steps Early Intervention Program between ages 4–5. He was also attending a third grade regular class with 25 students for one and a half years as a full time student. He had difficulties speaking with appropriate grammar, and initiating and continuing communication with others. He also had problems with attending to play activities with his peers and his twin brother.

Uzan was Cemil’s twin brother. Like his brother, he also attended the Small Steps Early Intervention Program between the ages 4–5. Since he was six years old he was taking individual support courses (four sessions a week) from a special education teacher, and also was a full time student of a third grade regular class with 22 students for a year. Like the other participants, he also had difficulties with attending play activities with his peers and twin brother. He had difficulties initiating and continuing communication with others.

Settings
The video modeling sessions were conducted in the audio-visual room of the Unit for the Children with Developmental Disabilities of the Research Institute for the Handicapped, in Anadolu University, Eskisehir, Turkey. In the room there was a television, a video recorder, an office table, a small student table, six chairs, and ten cupboards full of teaching materials.

For role playing sessions, all the play scenarios were conducted in a different setting. For the canteen scenario, a canteen was built. As the canteen, the cafeteria of the university unit was used on weekends. In the cafeteria, there were four circle tables and four chairs around each table. There was a kitchen counter with a wash basin, tea machine, toaster and at the canteen stand, there were different kinds of biscuits, milk boxes, juice boxes, coke boxes, tissues, a calculating machine, a till, price stickers, pens and pencils.

For the teacher scenario, one of the classes of the unit was used at the weekends. In the class, there were four square student desks, ten small student chairs, one teacher chair, five cupboards full of teaching materials, a chalkboard, two notice boards, a one-way mirror, and student work on the walls.

For the doctor scenario, the office of the physiotherapist was used. In the room was an office table, computer table, two chairs, two small student chairs, a square student desk, a patient bed, materials used for physiotherapy, a computer, a telephone, a stethoscope, an othoscope, and a tongue depressor.

Observational learning data were collected in the same settings as where the role playing was conducted. Therefore, the same materials were used during observational learning sessions. During all the sessions, a handy camera was used to record the data.

Materials

Preparation of scenarios. In this study, three different scenarios were written. The scenarios were written by the first author and then were controlled by two independent professionals in special education in order for them to have equal numbers of steps for each role. The professionals reported that the scenarios were appropriate for teaching the targeted skills to the participants. For the canteen scenario, there was a cashier, a customer, and a canteen worker; for the school scenario, there was a teacher, a student, and an inspector; and for the hospital scenario, there was a doctor, a patient, and a nurse. The canteen scenario consisted of 18 steps for the cashier, 20 steps for the canteen worker and 15 steps for the customer, whereas the school scenario consisted of 19 steps for the teacher, 14 steps for the inspector, and 18 steps for the student. The hospital scenario consisted of 17 steps for the patient, 20 steps for the nurse and 21 steps for the doctor (see Table 1 for an example). Other materials used were a handy camera and data recording sheets.

Preparation of the video models. Three senior students of the special education department played the roles of the participants for each scenario. For canteen scenario, there was a cashier, a customer, and a canteen worker; for school scenario, there was a teacher, a student, and an inspector; and for the hospital
scenario, there was a doctor, a patient, and a nurse. During video modeling, the senior students acted their roles with the criteria determined for the participants before (e.g., make eye contact, behave appropriately to the words they have been saying, etc.) depending on the scenarios. The video model recordings were prepared by recording the roles of the senior students.

Trainers and Observer
The first and the third author were the trainers of the study. The second author was the observer. They were all assistant professors and had 10–12 years of experience working with students with developmental disabilities.

Procedure
During the study, full probe, training and maintenance sessions were conducted. Training sessions were conducted once a week on the weekends. During training sessions, data were collected simultaneously. Maintenance sessions were conducted two weeks after the criterion was met by the participants.

Full probe sessions. Full probe sessions were conducted in the same settings where the training sessions were conducted for each scenario. The first full probe session was conducted in order to collect the participants’ baseline data for three of the scenarios. Other full probe sessions were conducted after participants met the criterion for each scenario. All full probe sessions were conducted in the group environment with all participants. If participants had a problem with playing the scenario, no feedback was provided to them, and the probe session was completed without any praise or correction. The other full probe sessions were conducted after participants met the criterion (i.e., 80% correct responses in three consecutive training sessions for all three participants) in the scenarios (i.e., canteen scenario).

During the full probe sessions, correct responses of participants were marked with plus (+). For responses to be correct participants should: (a) make an eye contact, (b) behave according to the utterances he has been saying, (c) add appropriate emotions to the utterances he has been saying, (d) use his voice appropriately, (e) speak so everybody can understand, (f) behave appropriate to the scenario, and (g) say the words on the scenario or similar words to the scenario. If any of these criteria was not met by the participant, the step was marked with minus (−).

Full probe sessions were conducted in the following order: (a) to place materials related to the scenario, (b) to present an attentional cue to the participants (i.e., “Is everybody ready to work? Shall we start?”), (c) to present the task direction (i.e., “Now play the canteen scenario.”), (d) to wait for 5 s for participants to respond to the direction, and (e) to reward

| TABLE 1 |
| A Part from the Hospital Scenario |

| Patient: (Knocks on the door) | Patient: Hello. |
| Nurse: Come in please. | Nurse: Doctor, your patient has come. |
| Doctor: Here you are, have a seat please. | Patient: (Sits on the chair) |
| Doctor: What are your complaints? | Patient: I have a cough, I can’t sleep because of the coughs, and my throat aches. |
| Doctor: For how long have you been coughing? | Patient: For one week. |
| Nurse: Doctor, sorry, can you sign the previous patient’s prescription? | Doctor: (Signs) |
| Nurse: (Takes the signed prescription) | Doctor: (Turns to the nurse) Can you take the patient to the stretcher and prepare the utensils? |
| Nurse: Sure doctor. | Patient: (Goes to the stretcher with the nurse) |
| Nurse: (Helps the patient go to the stretcher, and prepares the utensils for the doctor) | Nurse: Have a seat, sit on stretcher please. |
| Patient: (Sits on the stretcher) | Nurse: (Prepares the utensils on the table next to the stretcher) |
| Nurse: (Turns to the doctor) Doctor, your patient is ready. | Doctor: (Comes to the stretcher) |
| Doctor: Please turn your back. | Patient: (Turns his back) |
| Nurse: (Helps the patient to open his shirt) | Doctor: Please take deep breath. |
| Patient: (Breaths) | Nurse: (Gives the stethoscope to the doctor) . . .
the correct responses, or (f) to ignore the incorrect responses.

Training sessions. Participants were given the first scenario after the first full probe session was conducted. They were asked to memorize their own roles, which were determined for them by the trainers previously.

During training sessions, participants were first told about the importance of the study. After the introduction, the video modeling was conducted. Participants watched the scenario of the day, prior to each training session during video modeling. While they were watching, verbal prompts were provided (i.e., “Pay attention”) when needed. Also, if the participants were watching appropriately, verbal praise was provided (i.e., “good looking”).

After they watched the scenario of the day, participants were told about criterion for them to get pluses (+) for their performances. The criterions were: (a) make an eye contact, (b) behave appropriate to the words he has been saying (e.g., acting excited while saying “Oh, the cakes are so fresh!”), (c) add appropriate emotions to the words he has been saying (e.g., acting sad while saying “Mmmm, you have a real bad cough”), (d) use his voice appropriately (e.g. not talk very loud or as a whisper), (e) speak so everybody can understand, (f) behave appropriate to the scenario (e.g., act as what is written in the scenario), and (g) say the words on the scenario or similar words to the scenario. Then participants were asked to practice the skills they watched from the video. Participants received verbal praise and feedback for their correct responses and error correction for their incorrect responses.

Maintenance sessions. Maintenance sessions were conducted two weeks after the training sessions were completed. Maintenance sessions were conducted the same as the full probe sessions. For their cooperation, participants were provided verbal praise by the trainers.

Observational learning sessions. During the study, each participant was given a role as their responsibility. After training and full probe sessions were completed with a scenario, participants were asked to play a role different from their own, for the observational learning data collection. Data collection for observational learning was conducted using pre-and post-test design. Pre-tests for each scenario were conducted after the first full probe session. After participants met the criterion for each scenario and the full probe sessions were conducted post-tests were conducted. The pre and post test sessions were conducted the same as the full probe sessions.

During the observational learning sessions, participants played a role other than their own roles for each scenario. They played roles of their partners as a result of observing their roles during training and full probe sessions. None of the participants received any training for their roles that they played for observational learning.

Social Validity

Participants were asked if they were willing to work with the researchers for the present study and also what were the social benefits of this study for their daily lives. These questions were asked before each training session and also at the end of the study. Participants replied orally and responses were recorded by the handy camera.

Experimental Design

A multiple probe design across behaviors was used to examine the effectiveness of video modeling on teaching sociodramatic play skills and replicated with three participants with autism. During the study three scenarios (i.e., canteen, school, and hospital) and three roles in each scenario (i.e., canteen: cashier, customer, and canteen-worker; school: teacher, student, and inspector; hospital: doctor, nurse, and patient) was established. Each participant was given a role in each scenario. While establishing the target behaviors, the prerequisite characteristics of the behaviors’ being functionally similar and being independent from each other was provided in this study (Tawney & Gast, 1984). The dependent variable of the study was the percent of correctly performed steps in the scenarios. The independent variable was video modeling.

Reliability

Two kinds of reliability data were collected during the present study: dependent and in-
dependent variable reliabilities. Both reliability data were collected from the same sessions selected randomly, which were 20% of all the sessions conducted. Dependent variable (inter observer) reliability data were calculated with the formula of the number of agreements divided by the number of agreements plus disagreements multiplied by 100 (Tawney & Gast, 1984). Independent variable (procedural) reliability data were calculated with the formula of the number of trainer behaviors observed divided by the number of trainer behaviors planned multiplied by 100 (Billingsley, White, & Munson, 1980). Trainer’s behaviors observed were as follows: (a) controlling materials, (b) securing attention, (c) delivering task direction, and (d) giving feedback. Reliability data indicated 99% accuracy during full probe sessions, 99% accuracy during daily probe sessions, 100% accuracy during training sessions, and 99% accuracy during maintenance sessions.

Results

Instructional Data

Results of the study revealed that all participants met the criterion of the study. The data showed that video modeling was an effective way of teaching play skills to children with autism.

As shown on Figures 1, 2, and 3, all participants learned to play their roles according to the criterion determined by the researchers. Percentages of correct responses of participants during full probe sessions, training, and maintenance sessions can be seen on the figures. Figure 4 shows percentages of correct responses of participants during pre- and posttests of observational learning sessions.

In Table 2, each participant’s number of training sessions and training trials, and the number of correct responses and incorrect responses are shown. As can be seen the total number of training sessions was 48, and total number of training trials was 96. The total number of correct responses for all participants was 765 and the number of incorrect responses was 105 for all participants.

Maintenance Data

Maintenance data were collected two weeks after the training sessions were completed. As can be seen on the figures, participants maintained the skills taught during training sessions. During maintenance sessions, Osman maintained the skills taught 100%, Cemil maintained the skills taught 100%, and Uzan maintained the skills taught 85% (range = 80–100).

Social Validity

All participants mentioned that they were willing to work with the researchers during the study. When participants were asked what the social benefits of the study were for their daily lives, they mentioned that they would be more independent in the environments that they played roles. They also mentioned that they would be able to take part in such sociodramatic plays in the school with their peers.

Reliability Data

Reliability data indicated 99% accuracy during full probe, daily probe, and also maintenance sessions, and 100% accuracy during training sessions.

Discussion

Results of the study revealed that video modeling was effective in teaching sociodramatic play skills in a small group arrangement. Participants maintained skills learned two weeks after the training was completed and all participants exhibited the roles of their partners during the observational learning sessions. Furthermore, social validity data showed that participants were happy about taking part in the present study.

As in previous research, video modeling was found to be effective in teaching play skills to children with autism (D’Ateno et al., 2003; Hine & Wolery, 2006; Kroeger, Schultz, & Newsom, 2007; MacDonald et al., 2005; MacDonald et al., 2009; Nikopoulos & Keenan, 2003). Video-modeling provided many benefits for the researchers during the training sessions. The trainers did not need to play the roles for every training session, or they did not
need to arrange for senior students to be around to play their roles for the training sessions. Another benefit was that since the recordings were ready, the researchers and participants saved time watching the recordings from the video. Since children with autism like to watch TV, video modeling is thought to be a child friendly technique. This technique provides visual and attention seeking stimuli to the children; therefore, it maximizes the acquisition of targeted skills by participants.

Figure 1. Percent of correct responses for Uzan during full probe, training, and maintenance probe sessions.
The effectiveness of small group arrangement was another point that has been supported by the previous research (Fickel et al., 1998; Griffen et al., 1992; Keel & Gast, 1992; Stinson et al., 1991). Conducting the study in a small group arrangement, the researchers...
and participants saved time, because the train-
ers did not need to use different times for
Teaching targeted skills to participants. Participants acquired the skills taught both from the
trainers and from their peers in the group. This can be seen in Table 2, participants played the roles of their partners mostly as good as the partners.
Apart from all the points mentioned above, there are some limitations. The first limitation was that the study criterion determined for participants varied because of the performance differences in the participants. While the criterion determined for Cemil and Osman was 100%, the criterion for Uzan was 80%. As can be seen in Figure 1, one of the participants (Uzan) met the criterion over a longer time than the others. The reason for that is his social communication skills were less than his partners. As a consequence Uzan acquired the skills taught in more training sessions than his partners.

Another limitation was that since two participants were coming from a nearby town and were attending a regular school in their hometown, the studies were conducted only on Sun-
days. Therefore, the generalization sessions were not conducted because of the time limitation. The maintenance sessions were conducted on the last weekend of the school year, and the parents of two participants mentioned that they would not be able to take their children for the study during the summer holidays. Thus, generalization sessions could not be conducted in the present study.

One of the most important limitations was the difference in the baseline data of the first scenario. Participants played their roles with an average of 40% correction during the first scenario’s baseline sessions. The reason for this was, the participants were given scenarios of the three plays at the beginning of the study. They tried to memorize the first scenario more willingly than the other two scenarios. Therefore, this resulted with an average of 40% correction. Since they did not have any more time to memorize the remaining scenarios, they did not perform any correct responses for the second and third scenarios.

A consideration to be kept in mind about the present study was that, although video modeling was found to be effective on teaching sociodramatic play skills to children with autism, participants still needed feedback and verbal prompts for being successful in their target behaviors. Another consideration was that during training sessions the entire video model of a scenario was watched at once by the participants. But when the participant was stuck in a step in the scenario, the entire scenario was shown to the participants several times. Instead only the step the participant was stuck on could have been shown. This can be a suggestion for future researchers.

This study extended the literature in a number of ways. First of all, since play skills and social skills are troublesome issues for children with autism, results of the study revealed that they can learn these effective prompting procedures through video modeling. Second, observational learning data were collected for the first time in a small group arrangement study. Third, social validity data were collected from participants.

Also, as it was mentioned before, in the literature, there are studies conducted with children with autism about teaching role playing skills. These were: purchasing and tea party role playing skills (D’Ateno et al., 2003), gardener and preparing meal role play skills (Hine & Wolery, 2006), fireman, doctor, cowboy, and teacher role playing skills (Reagon et al., 2006), role playing in country yard, ship and school settings (MacDonald et al., 2005). All of these studies were done with participants who played their roles by themselves alone. In only one study two participants played their roles in a reciprocal format after watching the video model where two adults modeled the target skills (MacDonald et al., 2009). In our study, three participants played their roles in a reciprocal format after watching the video model where two adults modeled the target skills (MacDonald et al., 2009). In our study, three participants played their roles in a reciprocal format after watching the adult models on the video and depending on the scripts provided for them. During the study, participants acted appropriate to the scenario and spoke appropriate verbal scripts according to the scenarios. Hopefully participants of this study would be able to take part in theatre plays in their classes in the regular schools with their normally developing peers.

It can be recommended that other researchers conduct such small group arrangements using video modeling with other groups of developmental disabilities. Also it can be recommended to conduct studies with

<table>
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<th>Name</th>
<th>Number of Training Sessions</th>
<th>Number of Training Trials</th>
<th>Correct Res. During Training</th>
<th>Incorrect Res. During Training</th>
<th>% of Incorrect Responses</th>
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<td>48</td>
<td>.96</td>
<td>765</td>
<td>105</td>
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different scenarios. Different studies can be designed by self-modeling and self-correcting of the participants. Other suggestions include peers as models, cartoons can also be used as models, comparing peer models with adult models, and comparing effectiveness of video modeling alone and/or video modeling with one of the teaching strategies in applied behavior analysis.

References


Pierce, K., & Schreibman, L. (1994). Teaching delay leaving skills to children with autism in unsuper-


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