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Scene video modeling and point of view video modeling : a direct comparison of procedures and an investigation of possible video modeling pre-requisite skills

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Scene Video Modeling and Point of View Video Modeling: A direct comparison, and an investigation of video modeling pre-requisite skills.

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Table of Contents

Abstract

Video modeling has been used to teach individuals with developmental disabilities and autism to complete various tasks such as play (Hine & Wolery, 2006), self-help (Shipley-Benamou, Lutzker, Taubman, 2002) leisure (Stromer, Kimball, Kinney, & Taylor, 2006) and academics (Charlop & Milstein, 1989). Research suggests video modeling may be more effective than other methods for teaching a variety of skills (Charlop-Christy, Le, & Freeman, 2000). The purpose of this paper is to compare the use of two common forms of video modeling to teach a play skill routine. Additionally, the author sought to identify pre-requisite skills associated with effective learning from video modeling procedures.

Scene Video Modeling and Point of View Video Modeling: A direct comparison

Children with autism and other developmental disabilities often rely on prompts to complete self-help tasks or engage in social interactions (Charlop-Christy, & Milstein, 1989). These prompts may include but are not limited to full physical prompts (hand over hand assistance), partial physical prompts (also known as manual or graduated guidance), gestural, and model prompts (having the individual imitate an appropriate behavior from a model), and verbal cues. These prompts can be helpful in teaching new skills; however many individuals with autism may become dependent upon these forms of prompting (MacDuff, Krantz & McClanahan, 1993). One type of procedure that has been proposed to diminish prompt dependence in these areas is video modeling.

Video modeling is a teaching technique that involves a target skill being modeled by another individual while the actions and language are videotaped. A person watches a videotape of the targeted skill(s) and then is expected to imitate the behavior of the model that they observed in the video. (D'Ateno, Mangiapanello, & Taylor, 2003). In video modeling, the video is used to establish the skill and then its presentation is faded as the individual completes the task or activity independently.

In order to implement video modeling procedures, the instructor must make a video of the task or activity that they want the student to learn, and then have the student watch the video. After viewing the video model an opportunity to perform the observed skill is provided. There are several variations of video modeling procedures that have been described in the literature; they can be broadly categorized in the following manner:

Perspective variations and Model variations. The two main perspective variations are Point of View (POV) Video Modeling and Scene Video Modeling (SVM).

1. *Scene video modeling (SVM):* These procedures involve one or more adults, peers, or siblings shown on a video demonstrating the targeted skill. The video is recorded from the perspective of someone observing from a short distance away. This perspective allows the observer to view the whole "scene" of the actions being modeled.

2. *Point of view video modeling (POV):* These procedures involve using a video camcorder that is filming from over the shoulder of the person who is completing a task (such as pretend play skills). The participant viewing the video sees the actions from the perspective (point of view) of the person performing the task.

The other form of variation in video modeling procedures involves variation of the model. These procedures include Video Self-Modeling (VSM), Peer Video Modeling (PVM) and use of other models. These variations can be presented from either POV or SVM perspectives.

1. *Video Self Modeling (VSM):* In these procedures the individual who will be performing the skill is used as the model. Typically they are taped multiple times performing the target skill with some forms of support (verbal prompting) and then the video is edited so that the skill is able to be presented in a manner that shows independent correct performance of the skill.

2. *Peer video modeling (PVM):* These procedures involve one or more peers shown on a video demonstrating the targeted skill. The peer used is often of the same general age and possess other similar characteristics, although this is not required.

3. Other Models: In these procedures, the model can be a familiar or unfamiliar person; they may or may not vary in age, gender or other personal characteristic. In fact the model can be a cartoon character. These procedures may be selected when there is clear evidence that the learner attends to and imitates video models and that the responses that are imitated are a function of the format not the stimulus characteristics of the model.

Video modeling used to increase play

Hine and Wolery (2006) evaluated the use of POV video modeling procedures to teach preschoolers with autism how to play using materials during sensory bin activities. Hine and Wolery created video clips by using a digital camera and the video was shown on a laptop computer. The video that the children watched consisted of adult hands playing appropriately with the sensory material. The video was done in such a way that when the children watched the video, they saw exactly the actions they were expected to perform. A multiple baseline across settings design was used to assess treatment effects. During baseline, the children knelt in front of the bin and no further instructions were given. During the video modeling condition, the children were shown a video of a pair of hands appropriately manipulating the toys in the bin. After the children viewed this video, they were instructed to play with the toys that had been used in the video. The results of this study indicated that during baseline, the children performed no more than two types of actions. When the video modeling was implemented, the number of actions performed increased to four. Maintenance checks were completed without the video model and the number of actions performed during the play situation remained high

(ranging from 4-6). This study had a number of limitations including the lack of a comparison condition, and the relatively limited measures of generalization.

Kalaigian, Kinney, Stromer, and Spinato (2002; as cited in Stromer, Kimball, Kinney & Taylor,2006) taught a 6-year-old girl to follow computer schedules within her classroom. The computer schedule consisted of three items. The activities were presented in SVM format. One activity consisted of independent play, the second consisted of dramatic play with a model engaging in pretend play with puppets and the third activity consisted of social play (asking a peer to play a game). When the participant heard the cue, "Time for your activity schedule," she began the computer activity schedule. The participant clicked on a button to advance the slides, and one of the three activities appeared along with the teacher's audio recording (such as "book on tape"). The participant heard a script stating, "I like to listen to books being read" followed by a video clip of the activity. The video clip of the activity was then shown to the participant. Once that activity ended, the participant clicked on another activity and the procedure was followed in the same manner as discussed above. Results indicated that the participant completed the activities that were shown in her computer program. She also learned to advance the slides in her computer program, view videos of play routines, and attend to scripted dialog. The participant demonstrated generalization from the computer activity schedule to a notebook picture activity schedule. It is unclear in this study whether the video clips were responsible for the positive outcomes or her extensive history of reinforcement for following activity schedules.

Video Modeling used to increase social play

Taylor, Levin, and Jasper (1999) used SVM procedures to increase the number of play related statements directed to siblings made by two boys with autism. When the video model was put in place, one boy viewed the video of his sibling making comments during play. After the boy viewed the video, his play comments directed towards his sibling increased immediately. The other boy viewed a video of his sibling as the model along with an adult. The video consisted of the pair playing with materials while commenting. The child then viewed this video and he practiced the play routine using the same play materials that were shown in the video model. Results indicated that his comments increased when he played with his sibling. Additionally, play related comments were noted to increase when he played with different materials, suggesting that these skills may have generalized to non-training settings.

Leblanc et al. (2003) assessed the use of SVM procedures and reinforcement to teach perspective taking skills to children with autism. The perspective taking skill taught in this study involved observing the behaviors of an individual in a particular situation and then predicting the individual's subsequent behavior (Leblanc et. al). For example, one task that the participants were shown was called *hide and seek*. During this task, the participant was shown a video that of a puppet that left footprints when it walked and placed a treasure in a chest that was marked "1". The puppet also put a treasure in a chest marked "2", however, the puppet did not leave footprints. The experimenter paused the video and asked the participant where he thought someone would look for the treasure. The correct answer was in chest "1" because that is where the footprints lead to. Correct responses resulted in the delivery of praise and edibles. The results of this study indicated that the target skills were acquired through the use of video modeling and reinforcement.

Charlop and Milstein (1989) assessed the effectiveness of SVM on acquisition, generalization, and maintenance of conversation skills. Three boys (ages 6, 6 & 7) participated in this study and were considered to be high functioning, but rarely asked questions. Five scripted conversations on the topic of specific toys were used to assess whether each child could hold a brief conversation. Two types of conversations were used. One of the conversations consisted of the therapist and child talking about a toy that was preferred with the child (conversation A). Another conversation consisted of an abstract conversation (conversation B). Each conversation consisted of three lines for the child and four lines for the conversant so that the child's last question would be answered. A video for each of the conversation was used. Each video consisted of familiar adults (different adults for the different conversations) engaging in a particular conversation. The child watched the videotape of a conversation and immediately following the viewing, the therapist said, "Let's do the same". The results of this study indicated that during baseline, all three children failed to reach criterion on any of the conversations. Child 1 met criterion on conversation "A" after 20 presentations of the videotaped conversation, Child 1 met criterion on conversation "B" after 9 presentations. Child 2 met criterion on conversation "A" after 3 presentations of the videotaped conversation. Child 2 also met criterion in all probes for generalization.

Child 3 met criterion for conversation "A" after 6 presentations of the videotaped conversation. Child 3 met criterion for conversation "B" after 9 presentations of the videotaped conversation. Conversation "A" was then generalized to other settings with Child 1. Follow up probes were conducted for conversations that were taught via video modeling and all three children demonstrated the target responses during these probes.

Reagon, Higbee, and Endicott (2006) assessed the effects of SVM procedures using a sibling as a model and a play partner. A four year-old boy diagnosed with autism participated in this study. He had a variety of skills such as receptive and expressive labeling of objects, and greeted others. However, he did not demonstrate pretend play with his peers and siblings. An AB design was used to assess pretend play. Four pretend play scenarios (firefighter, cowboy, teacher and doctor scenario) were taught in this study. Each scenario also contained five to seven scripted statements and actions. During baseline, the participant and his sibling were instructed to "Go play". Materials were available for each scenario. During the video modeling phase the participant and his sibling were instructed to "watch TV" and were then shown a video model of one of the four play scenarios. After viewing the video, they were instructed to "Go play". A follow up phase was then implemented in the participant's home (the same play scenarios were used) instead of the participant's school. Also, a different sibling and the participant's mother were used as play partners. Results indicated that participation in the steps of all four play scenarios and scripted statements increased once the video modeling procedure was implemented. This study had a few limitations. First the sample size was limited to one participant and although the effectiveness of the intervention was replicated across four play scenarios, the study lacked a formal experimental design to enable a demonstration of experimental control.

Video Modeling used to increase adaptive behavior

Shipley-Benamou, Lutzker, and Taubman, (2002) used POV video modeling procedures. They assessed whether a video of a functional task filmed from the participant's eye level (as if the participant was doing the task) could produce skill

acquisition in children with autism. A multiple probe design across tasks and replicated across participants was used. A total of five tasks were selected for each of the three participants. Tasks included making orange juice, preparing a letter to be mailed and setting the table. Segments of each task were recorded and the participants viewed the task. After viewing the tape, the participants were told to complete the task they had just watched. The results of this study indicated that instructional video modeling was effective in promoting skill acquisition with all three participants. It is unclear if the skills generalized to the participants' natural environment.   Follow-up data were collected after one-month, and these data indicate that the taught performances were maintained.

Video modeling to teach developmental skills

Charlop-Christy, Le, and Freeman, (2000) examined the use of two forms of modeling procedures. They compared SVM procedures to in -vivo modeling. In-vivo modeling involves the use of a live model demonstrating the actions rather than a video tape of the actions. There were five children in this study with ages between 7 and 11. Each of the children was presented with two tasks of similar response topography and response effort from their curriculum. One of the tasks was used for the SVM condition and the other task was used for the in vivo condition. In the video modeling condition, each child watched a videotape of models performing a task. Also during this condition, there were different models used for the different target behaviors. This was done so the child was not influenced by certain characteristics of the models. The in-vivo condition consisted of the child watching live models performing another task of equal difficulty. The models used in this study were familiar adults that worked as therapists at the after-

school program. A multiple baseline across children was used as well as a multiple baseline within child across the two modeling conditions.

During the in-vivo condition subject One acquired the skill of demonstrating the emotions happy and sad after six presentations. In the video modeling phase subject One demonstrated the emotions tired and sad after four presentations. Subject Two demonstrated coloring in the in-vivo condition after eleven presentations. Subject Two demonstrated a similar task after two presentations during the video modeling phase. Subject Three demonstrated a spontaneous greeting of "Good Bye" after two presentations during the in-vivo condition. Subject Three demonstrated a spontaneous greeting of "Hello. How are you?" after two presentations thus, showing no difference in the rate of acquisition. Subject Four acquired the skill of a scripted conversation after seven presentations during the in-vivo condition. During the video modeling condition, subject Four acquired the skill of a similar scripted conversation after three presentations. Subject Five demonstrated the skill of "washing face" during the in-vivo condition. Subject Five demonstrated the skill of "brushing teeth" after three presentations during the video modeling phase. The results of this study indicated that SVM led to quicker acquisition of skills than in-vivo modeling. The skills that were taught generalized outside of the experimental sessions with the video modeling condition. However, skills taught using in-vivo modeling were not demonstrated in non-training settings.

In 1987, Haring, Kennedy, Adams, and Pitts-Conway assessed the use of SVM procedures to teach purchasing skills. The authors noted that often times when individuals with autism are taught purchasing skills via one to one instruction in a "training" environment, the skills do not automatically transfer to the community based

setting where the performance is ultimately desired. The purpose of their study was to test the effectiveness of video modeling while promoting generalization across settings. Three young adults with autism participated in this study. The students were taught money handling and purchasing in their classrooms. Following this, a generalization phase was implemented. Generalization assessments took place for two students in their school cafeteria. A local convenience store was used for the third student. When purchasing skills were not acquired, the experimenters implemented a SVM phase. The students viewed a video that contained typically developing familiar peers making a complete purchase and social responses such as "Hi", or "How are you?" Baseline indicated that all three participants showed near zero social responses. After the video modeling procedure was implemented, an immediate increase in purchasing and social responses occurred within the generalized natural environment.

<div align="center">Summary</div>

A number of types of video modeling procedures have been shown to be effective in teaching wide variety of skills in a broad range of contexts to children with autism. The use of video based interventions as an instructional tool for children with autism may have several advantages. First, the skills learned in one setting may generalize more readily to other settings than traditional one to one instructional procedures (Charlop-Christy et al., 2000; Harring, et al., 1987). Moreover, video modeling also has the advantage of being a permanent product and thus after it is used with one student it may be available for use with other children that need to build the same skills (Corbett & Abdullah, 2005). A potential advantage that other researchers have suggested is that video modeling may generate rapid acquisition because it may increase motivation

(Charlop-Christy). Charlop-Christy et al. also suggest that video modeling is a better method of teaching new skills than in-vivo modeling. They posit that video based instruction may be effective because it presents concepts in a systematic way in a relatively simple format and that it keeps the child's attention.

Video modeling may also have some disadvantages. First, the cost of buying a video camcorder can be expensive. Second, if the user is not familiar with a video camcorder and video editing software, they would then require training on its use. Lastly, the amount of time it takes to videotape a target behavior and edit the clip for use can be time consuming (Stromer et al. 2006). The cost of buying a video camcorder can be expensive. However, when weighed against the number of skills that can potentially be taught to a child with autism and other developmental disabilities, it may be cost effective. While there are clearly some promising efficacy data related to using video based instructional procedures, many questions with regard to these procedures remain unanswered. Rayner, Denholm, and Sigafoos, (2009) summarized the main questions to be answered as; "Who would benefit from these procedures?, What kind of model and perspective should we use?, What other procedures should be combined with the presentation of video footage?, and How would the video footage be presented?" It is clear that an increasing number of researchers are conducting studies using a variety of forms of video modeling and applying video modeling procedures to a range of skill development areas. However, at this point in time there are limited data on the relative efficacy of the different types of video modeling procedures. Furthermore, there is also no clear information on who is a good or a poor candidate for the use of video modeling procedures. The absence of such information may lead to its use with individuals who may not benefit from the procedures

and it not being used to its maximum benefit for those who would gain much of these procedures. Further investigation of these video modeling procedures is clearly needed.

This study had two objectives. First, to investigate whether exposure to POV or SVM procedures would result in differences in the production of pretend play skills in children with autism. Second, to attempt to identify potential pre-requisite skills associated with increased production of video modeled responses. The identification of pre-requisite skills may enable practitioners to determine appropriate and inappropriate candidates for video based instructional procedures.

<div align="center">Method</div>

Phase 1

Participants

18 participants ranging from ages 2-10 diagnosed with Pervasive Developmental Disorder- Not Otherwise Specified and autism that had Vineland Adaptive Behavior Scales (VABS): Parent Rating Form (Sparrow, Cicchetti, & Balla, 2005) completed within 30 days prior to participation in the study.

Settings and Materials

Baseline data collection and the treatment interventions were conducted in the students' home or school. Higglytown Hero's ™ slide, swing and character were used, along with a Computer with a video disc containing two 27 s videos of POV and SVM of identical play scenarios.

Response Definition and Measurement

During baseline and intervention sessions the dependent variables were the completion of motor action steps which were defined as picked up toy figure, moved

figure around towards the slide, went to stairs of slide, put figure down slide, had figure land, walked figure toward swing, put figure on swing, pushed swing two times, took figure off swing. Dependent variables also included the completion of isolated verbal responses which were defined as stating, "I'm at the playground", "wow a slide", "up, up, up" "and down", "wee that was fun", "a swing", "on swing" "wee, wee", "that was fun".

Data Collection

Data were collected on motor and verbal behavior by individuals and displayed by condition (baseline or treatment) and by procedure (POV or SVM). Both baseline and treatment data were graphed by the number of correct actions completed and the number of correct verbal responses produced.

Design

A group design was used with quasi-random assignment to each experimental condition. The groups were matched in terms of age and functioning level.

Results Phase 1

The results are displayed in Figures 1, 2, 3, & 4 below. These data indicate that a majority of the subjects made gains in the area of motor responses. In the POV condition 88% of subjects made gains in motor actions (see Figure 1.). In the SVM condition 80% of the participants increased their demonstration of motor responses after viewing the video model (see Figure 2.) Additionally, gains were made by some participants in vocal responses in both conditions. In the POV condition 63% of the subjects made gains in vocal responses (see Figure 3.) compared with just 40% in the SVM group (see Figure 4.). In the POV condition there were two (out of eight) participants who did not imitate any additional motor responses after viewing the model. One of these participants (CC)

demonstrated fewer responses after viewing the POV video. In the SVM condition two participants did not make gains and one participant demonstrated fewer responses after exposure to the video model. In the POV condition three participants did not demonstrate any vocal responses after viewing the model while in the SVM condition 6 out of 10 participants did not demonstrate an increase in vocal responding after viewing the model.

Phase 2

Participants

The participants in Phase II were the same as in Phase I. They were individuals ranging from ages 2-10 diagnosed with Pervasive Developmental Disorder- Not Otherwise Specified and autism that had Vineland Adaptive Behavior Scales (VABS): Parent Rating Form (Sparrow et al. 2005) completed within 30 days prior to participation in the study.

Pre-Requisite Analysis

Students who were identified as making significant gains from baseline performance or who did not demonstrate any new skills after exposure to video models were grouped. Data from the VABS were evaluated to assess if there may be a correlation between their scores and positive or negative responding to exposure to video modeling procedures. The experimenters selected sections of the VABS to be used based upon age and hypothesized potential relationship to the desired performances. The sections that were selected were *Listening and Understanding* (#1-20), *Talking* (#1-54) *Relating to Others* (1-38) and *Playing and Using Leisure Time* (1-31).

Procedure

Participants from Phase I were separated into two groups. The first group (the "Gain Group") involved only those participants who made gains on both motor and vocal responses. The second group (the "No Gain Group") contained only participants who did not make gains in either category. The "Gain Group" consisted of a total of three participants. The "No Gain Group" consisted of a total of six participants.

Method

A Vineland Adaptive Behavior Scales (VABS), Second Edition Caregiver Rating Form were completed on all subjects within 30 days or less prior to participation in Phase I. The VABS is an assessment tool used to evaluate an individual's overall level of adaptive functioning. It is used for individuals ranging in age from birth through adulthood. The assessment contains a total of 433 individual items grouped into 13 categories. The assessment is used to identify areas of relative strength and weakness to target skill acquisition programs as well as to measure changes in the participant over time.

For the purpose of this study the experimenters identified categories and items that were thought to have relevance to video modeling performances. All items that involved skills in the repertoires of individuals over age 13 were omitted as all participants were significantly under this age and thus should not have had the performance in their repertoire. An Item analysis of selected skills for all participants was conducted in these areas and a total of 143 individual items were analyzed.

The individual scores of each item for each group were aggregated and a mean was established. The means of each group on each item were compared. A two sample t-

test was then conducted to determine if the variance between the Gain Group means and the No Gain Group means was statistically significant on any of the assessed items.

Phase 2 Results

Overall of the 143 items assessed, 6 items were identified as being statistically significantly different between the Gain Group and the No Gain Group. In the category of Listening and Understanding three items were found to be statistically significantly different between the Gain Group and the No Gain Group. These items were: *Listens to a story for at least five minutes, follows instructions with one action and one object, and points to at least 5 minor body parts when asked.*

In the category of Talking, one item was found to be statistically significantly different between the Gain Group and the No Gain Group. The item was: *Repeats or tries to repeat common words immediately upon hearing them.*

In the category of Relating to others two items were found to be statistically significantly different between the Gain Group and the No Gain Group. These items were: *Makes or tries to make social contact, and imitates simple movements such as clap hands.*

In the category of Playing and Using Leisure Time there was a negative correlation between the Gain Group and the No Gain group scores. With the exception of the above-identified items little difference was found between the groups and overall there was a slight, but not statistically significant positive correlation between success in video modeling and VABS scores for the participants. However there was one category where the Gain Group had generally lower scores than the No Gain Group. This negative

correlation was only seen in the area of cooperative play. It should be noted that the overall play skills were not different between the two groups; however the cooperative play skills differed. These data suggest that having higher scores in the area of cooperative play may be predictive of not being a good candidate for VM procedures.

Discussion

The purpose of this study was to identify if POV or SVM was more effective in producing imitation of modeled responses and if there were pre-requisite skills associated with effective responding to video modeling procedures. The data indicate that exposure to both POV and SVM procedures resulted in increases in the targeted motor performances. Additionally, the data suggest that verbal responses were more readily acquired through the use of POV video modeling than from SVM.

This is an interesting finding with several possible explanations. It may be possible that the perspective difference is important as it relates to production of verbal responses. The "routine" of POV is more consistent with vocal production routines found in such procedures as the Picture Exchange Communication System (PECS) and object naming tasks where the objects and actions are labeled in the context of routine. The action occurs and the label is spoken. In POV the labeling occurs as the model completes the actions. However, the perspective makes it appear as if the person viewing the POV video is labeling their actions. This differs from SVM procedures where "others" engage in language and the student is supposed to infer that he/she should perform the language. It is possible that this additional level of abstraction or "translational step" may reduce the likelihood that individuals with autism imitate the verbal responses. Another

potential explanation may involve the distance from the modeled language. Perhaps there is a threshold distance from which language is less likely to be imitated. POV videos minimize the distance from the actions and language while SVM procedures may impose greater distances from the actions and language.

The six skills that were identified as being differing between the Gain and No Gain Group and thus potential pre-requisite skills for success in responding to video modeling procedures were; 1) *listens to a story for at least five minutes*. This skill is defined as "remains relatively still and directs attention to the storyteller or reader". The ability to demonstrate better skills in attending to auditory information would seem logically correlated with success in VM procedures as failure to attend to the relevant stimuli seem unlikely to result in successful imitation to stimuli that were not discriminated.

The second skill that was found to be a potential video modeling pre-requisite skill is *follows instructions with one action and one object*. For example, "bring me the book", "Close the door". It is not immediately clear what the relationship following a verbal direction has with imitating visual and verbal actions. However, it is possible that in order to be successful in VM procedures the ability to follow instructions is associated with strength in attending to environmental stimuli.

The third skill that was found to be a potential video modeling pre-requisite skill is that the individual *points to at least five minor body parts when asked*. This is an interesting finding in that it seems highly unlikely that knowledge of body parts is a pre-requisite skill to success in VM procedures. However, the ability to point and the number of instructions to be followed may be representative of higher levels of attending and

discrimination responding explaining why this item is potentially predictive of VM success.

The fourth skill that was found to be a potential video modeling pre-requisite skill is that the individual *repeats or tires to repeat common words immediately upon hearing them (for example, ball, car, go, etc.).* The skill of immediate imitation of the vocal behavior of others seems logically likely to be a predictor of increased responsiveness to VM procedures. The implication of this skill could be that if an individuals' latency to imitation is brief they may be more likely to respond to VM procedures. This could be empirically evaluated by identifying differences in response latency and assessing response to VM procedures. Additionally, procedures to reinforce shorter latencies could be implemented and subsequent response to VM procedures assessed.

The fifth skill that was found to be a potential video modeling pre-requisite skill is that the individual *makes or tries to make social contact (for example, smiles, makes noises, etc*.). The initiation of social contact may be the important variable. In order to imitate a video model, the participant must initiate the imitative response. The failure to initiate would seem likely to preclude successful responding to VM procedures. Further investigation of the role of initiation and its relationship to success in VM procedures is clearly warranted.

Finally, the sixth skill that was found to be a potential video modeling pre-requisite skill is that the individual imitates simple movements. For example he/she waves good-bye and claps hands. It would seem obvious that if an individual does not imitate the actions of others, success in VM procedures would seem unlikely. However, it is possible that in selecting potential candidates for VM procedures we may simply rule out

those individuals who do not demonstrate imitation of simple motor movements, or perhaps require acquisition of this skill before attempting VM procedures.

The six potential pre-requisite skills involve listening, following simple directions, repeating, initiating social interaction, and imitation. The data from this study suggest that these skills may be associated with greater levels of successful response to VM procedures. It is possible that they can be used in the form of a screening process to determine if a particular individual may be a good candidate for the use of video modeling procedures. Further investigation to confirm, disconfirm or identify additional correlates is clearly necessary.

The identification of items that were negatively correlated with success in video modeling procedures was unexpected and potentially significant. The relationship between higher levels of cooperative play and poor initial response to video modeling procedures is intriguing and merits further study. In all of the six items that were identified as statistically significant, the scores of the Gain Group were higher than the No Gain Group. It is also true that in all but 4 of the 143 items the Gain Group scored equal to or higher (but not statistically significantly higher) than the No Gain Group. This stands in stark contrast to the data found in the Cooperative Play skills items. In this category the No Gain Group performed better on 4 items. While the amount of difference between the groups did not rise to the level of statistical significance that was required by the experimenters, the change in the direction of the scores bears further investigation.

This study did not assess learning over time, it identified whether the subjects imitated a video model of a play scheme without training or explicit reinforcement. It is possible that with training and reinforcement many if not all of the participants could

become effective learners from video modeling procedures. These results should not be interpreted to suggest that failure to respond to VM after only one presentation of a model is predictive of future inability to respond successfully to VM procedures.

Although the results of the current study were encouraging, there were a few limitations. The data were collected by teachers during home based instructional sessions as a result there were no Inter Observer Agreement data collected on the dependent measures. The POV and SVM videos were not recorded simultaneously so it is possible that there could have been some variability in the actions between the two videos. However, multiple independent observers did not detect differences in the motor or verbal responses in the two videos and they were of identical duration. Another potential limitation was the small sample size in the pre-requisite skills analysis. Future research should ensure that a larger sample size is used to compare the Gain and No Gain groups. The Vineland Adaptive Behavior Scales contains 433 item, the authors only evaluated 143 items. It is possible that other items that were not evaluated could be identified. Additionally, there are a number of other assessments tools that could be administered prior to conducting the VM condition. Some of these assessments may look at the items identified in this study in greater detail. Finally, it is not clear that the findings of this study comparing POV and SVM on "play skills" would hold if applied to other types of skills (e.g., academic, vocational). Future research should attempt to replicate these findings in other skill areas.

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Figure Captions

Figure 1. Depicts the number of correct actions performed by the participants BB, CC, EE, AA, DD, GG, HH, and FF in the POV condition.

Figure 2. Depicts the number of correct actions performed by the participants QQ, RR, SS, TT, UU, VV, WW, XX, YY, ZZ in the SVM condition.

Figure 3. Depicts the number of correct verbal responses performed by the participants AA, BB, CC, DD, EE, FF, GG, HH in the POV condition.

Figure 4. Depicts the number of correct verbal responses performed by the participants SS, WW, VV, RR, QQ, ZZ, TT, UU, YY, XX in the SVM condition.

Point of View Correct Actions

Point of View Correct Verbal Responses

Scene Video Modeling Verbal Responses