Behavioral Interventions
Behav. Intervent. **19**: 263–274 (2004)
Published online in Wiley InterScience (www.interscience.wiley.com). **DOI**: 10.1002/bin.165

USING VIDEO MODELING TO TEACH A DOMESTIC SKILL WITH AN EMBEDDED SOCIAL SKILL TO ADULTS WITH SEVERE MENTAL RETARDATION

Melissa A. Bidwell and Ruth Anne Rehfeldt*
Southern Illinois University, Carbondale, IL, USA

We assessed whether three adults with severe mental retardation would acquire a domestic skill (making coffee) with an embedded social skill (serving coffee to and sitting down beside a peer) via video modeling procedures. Training was conducted in a classroom in the participants' day treatment setting. The intervention consisted of (i) watching a video of an adult with a developmental disability making coffee and initiating a social interaction with a peer; and (ii) receiving verbal praise for each step of the task that was performed correctly. All three participants mastered the task and demonstrated generalization across settings, stimuli, and people. Two participants performed with 100% accuracy on maintenance probes conducted 1 month following mastery, and one participant did so following booster training.

INTRODUCTION

Adults with mental retardation and other developmental disabilities must learn a variety of social, domestic, and leisure skills in order to function independently in integrated community settings. Video modeling, defined as the viewing of a videotape of a peer or instructor successfully performing a chained task (LeGrice & Blampied, 1994), has been shown to be one effective strategy for developing such skills. Typically, an individual is asked to view the videotape at the beginning of an instructional session and to then attempt the task independently. Video modeling has proven to be an effective intervention for teaching a variety of skills to persons with developmental disabilities, including conversation skills (Charlop & Milstein, 1989; Taylor, Levin, & Jasper, 1999; Wert & Neisworth, 2003), self-help or daily living skills (Lasater & Brady, 1995; Norman, Collins, & Schuster, 2001; Shipley-Benamou, Lutzker, & Taubman, 2002), complex play sequences (D'Ateno, Mangiapanello, & Taylor, 2003), simple meal preparation skills (Rehfeldt, Dahman,

*Correspondence to: Ruth Anne Rehfeldt, Ph.D., Mail code 4609, Rehabilitation Services Program, Rehabilitation Institute, Southern Illinois University, Carbondale, IL 62901-4609, USA. E-mail: rehfeldt@siu.edu

Young, Cherry, & Davis, 2003), and perspective taking (Charlop-Christy & Daneshvar, 2003).

There are a number of advantages of using video modeling procedures to establish new skills in academic and habilitation settings. First, it may be a more efficient means of instruction than other instructional strategies, as revealed by Charlop-Christy, Le, and Freeman (2000), who showed that video modeling resulted in more rapid acquisition of developmental skills by children with autism than in vivo modeling. Second, several learners can benefit at one time from watching the same video, which may also reduce the amount staff training time involved. Third, learners can repeatedly watch the model perform the skill in the same way, a potential limitation of in vivo modeling, where the model may never repeat each step exactly the same. Fourth, the required staff training skills for using video modeling interventions are minimal. Video modeling reduces the need for knowledge of sophisticated prompting and prompt reduction strategies. These advantages may be accentuated when the skills established generalize across novel settings, stimuli, and people. Several studies have in fact demonstrated generalization of daily living skills acquired via video modeling procedures: For example, Norman et al. (2001) showed that self-help skills such as cleaning sunglasses, putting on a wrist watch, and zipping a jacket generalized across novel stimuli and people in elementary school children with moderate and severe disabilities. Similarly, Lasater and Brady (1995) showed the generalization of self-help skills such as making lunch and doing laundry in two individuals with developmental disabilities and behavioral disorders. Finally, Rehfeldt et al. (2003) showed the generalization across settings of sandwich-making skills in adults with moderate or severe mental retardation. Skills established by video modeling also appear to be well maintained at follow-up (Charlop & Milstein, 1989; Lasater & Brady, 1995; Rehfeldt et al., 2003).

A particularly impressive outcome from evaluations of video modeling interventions is the establishment of social skills, which are often a challenge to establish in individuals with developmental disabilities. For example, Haymes (1995) taught children with autism to initiate conversations with peers via video modeling, and Nikopoulos and Keenan (2003) established simple social interactive play in children with developmental delays using video modeling. Several studies have shown video modeling to be effective in establishing conversation skills in children with autism (Charlop & Milstein, 1989; Taylor et al., 1999; Wert & Neisworth, 2003). Adults with severe developmental disabilities are also likely to display deficits in social initiation (Greenspan & Love, 1997), and such skills are often difficult to establish in this population (see Williams & Dattilo, 1997). Lovett and Harris (1987) reported that adults with mental retardation rated social skills and relationship-building training as one of the most important areas of instruction for successful community living. Thus, an important extension of video modeling research is to the

establishment of simple social interaction skills in adults with severe developmental disabilities.

The purpose of this study was to determine whether adults with severe mental retardation would acquire, generalize, and maintain a domestic skill with an embedded social initiation by observing a model on a computer video demonstrating the chained task. Specifically, video modeling was used to teach three adults to make coffee, serve a cup of coffee to a peer, and sit down and drink coffee with their peer. Generalization across stimuli, peers, and settings was evaluated. A favorable outcome was thus for the participants to use different equipment, serve and drink coffee with different peers, and make coffee in different settings.

METHOD

Participants and Setting

Three adults diagnosed with severe or profound mental retardation participated in the study. All participants were receiving day treatment services at an adult rehabilitation center in southern Illinois.

Marcy was a 72-year-old Caucasian female diagnosed with severe mental retardation, with a reported IQ of 25 and a mental age of 2 years, 11 months. Marcy took 50 mg of vitamin B-6 and 12.5 mg of hydrochlorothiazide daily throughout the duration of the study. Marcy assisted with household chores such as setting the table, emptying the trash, and making her bed, but required assistance in almost all areas of daily living, including minimal assistance with personal hygiene. Marcy exhibited disruptive behaviors such as yelling, crying, arguing, complaining, and profanity.

Stacy was a 33-year-old Caucasian female diagnosed with severe mental retardation and Down syndrome. She had a reported IQ of 29 and a mental age of 8 years. Stacy did not take any medications. She was largely nonverbal and used gestures to communicate. Stacy had difficulty completing a number of chained tasks involving more than several steps.

Mindy was a 48-year-old African American female diagnosed with profound mental retardation. She had a reported IQ of 25 and mental age of 3 years, 10 months. Mindy took 100 mg of levothyroxine, 325 mg of ferrous sulfate, and 500 mg of naproxen daily throughout the duration of the study. Mindy's speech was usually unintelligible. She had difficulty performing almost all daily living tasks and often walked away when others were speaking to her. She displayed disruptive behaviors such as yelling, and often refused to participate in group activities.

All sessions were conducted in the participants' day treatment setting. Baseline and intervention probe sessions and instructional sessions took place in a classroom

Table 1. Task analysis for making coffee and materials used.

Steps in the task analysis
1. Open water door
2. Pour water into measuring cup
3. Stop pouring water at least ½ inch from the top
4. Pour water into open water door
5. Measure a second cup of water into the measuring cup
6. Stop pouring water at least ½ inch from the top
7. Pour water into open water door
8. Close water door
9. Pull out door on the coffee pot
10. Put one filter in cup
11. Take lid off coffee grinds
12. Put a full scoop of coffee in filter
13. Level off scoop one
14. Put a second full scoop of coffee in the filter
15. Level off scoop two
16. Shut the coffee door (snap)
17. Plug in the coffee pot
18. Push the on button
19. Close the lid on the coffee grinds
20. Pour one cup of coffee
21. Hand a cup of coffee to peer
22. Pour a second cup of coffee
23. Sit down at the table
Materials
1. Coffee pot
2. Measuring cup (1 cup)
3. Pitcher
4. Coffee filter
5. Two styrofoam cups
6. Coffee grounds
7. Measuring spoon (1 tablespoon)

containing three tables of 4 ft (1.22 m) × 6 ft (1.83 m), a chalkboard of 8 ft (2.44 m) × 7 ft (2.13 m), a trashcan that stood 3 ft (0.91 m) tall, and ten chairs. One table was used for making coffee. During all sessions, the peer sat at one of the other tables directly across from where the participant was to sit after preparing the cups of coffee.

Generalization probe sessions took place in a kitchen located at the participants' day treatment setting. This room served as the site for a coffee club for the consumers at the facility. The purpose of the coffee club was for consumers to drink coffee and socialize with one another for an hour each morning. The room included a circular table with ten chairs, a sink, microwave, stove, oven, and a refrigerator. The sink was located to the left of the doorway and the table was placed in the middle of the room.

Tasks, Materials, and Social Peer

The task analysis for making coffee and serving a peer is shown in Table 1. Table 1 also shows the materials that were used to make coffee. An individual with mild mental retardation who was proficient in making coffee was observed demonstrating the task so as to create the task analysis.

Tom, a 50-year-old Caucasian man diagnosed with severe mental retardation and autism served as the peer to whom participants would serve coffee throughout the duration of the study. Tom had a reported IQ of 36 and a mental age of 5. Tom took 5 mg of glyburide and 45 mg of pioglitazone daily for diabetes. Tom talked to himself frequently; his speech was typically quiet and unclear. Tom frequently chuckled for no identifiable reason.

A lap top PC computer was used to display the video of a model completing the task of making coffee and serving a peer. The model was a 36-year-old Caucasian female diagnosed with mild mental retardation. She had a reported IQ of 56 and mental age of 7 years and had learning disabilities of dyslexia and aphasia. All of the participants knew the model. The screen on the computer was a 12.5 in (31.75 cm) $\times$ 10 in (25.4 cm) screen. Windows Media Player was used to play the video.

Design

The effects of an intervention consisting of video modeling and verbal praise were assessed in a multiple baseline design across three participants. Baseline and intervention data were collected in the training setting. Generalization probe data were collected in the generalization setting. Generalization across stimuli and people was also assessed during generalization probes. Immediately after a participant demonstrated criterion performance during training, the participant was tested in the generalization setting. Maintenance probes took place approximately 1 month following the demonstration of criterion performance during training.

Procedure

Baseline

During baseline, a multiple-opportunity method was used to probe the participants' abilities to complete the chained task of making coffee and serving a peer. The verbal instruction 'Make coffee' was used to alert the participant to begin the chained task. Three seconds were allowed per step. If the participant did not respond within the 3 s, the instructor completed the next step of the chained task so that the participant would have the opportunity to complete each subsequent step of the chain. A participant was reminded to 'make coffee' if she became distracted from

the task. During baseline, no feedback or prompts were given to the participants, but if an error prevented the completion of the next step of the chain, the instructor corrected the error. Participants continued baseline sessions until their data were judged to be visually stable. One generalization probe session, per participant, was also completed during baseline in which generalization across settings, stimuli, and people was examined. No feedback or prompts were delivered during the generalization probes, but if an error prevented the completion of the next step of the chain, the instructor corrected the error. The steps in the chained task of making coffee were identical during the generalization probe except that the skill was conducted in a different setting, using a different coffee maker, and serving a different peer.

Video Modeling Intervention

During the intervention, the session began with an intervention probe, which was identical to baseline trials. After the participant completed the chained task of making coffee during the intervention probe, she then watched a 5 min video clip of another individual making coffee and serving and sitting down with a peer. The model performed the task in the training setting, and Tom served as the peer in the video. If the participant became distracted during the video, she was reminded to watch the video and was praised for viewing. After viewing the video, the participant was then told to 'make coffee'. For each step that the participant completed correctly, the instructor praised the participant with verbal praise that was specific to each step (e.g. 'Nice job taking the lid off the coffee grounds'). The participant was given 3 s to perform each step. If the participant did not respond within the given time, the instructor completed the next step of the chain. If the participant made errors during the training trials, no corrective feedback was delivered, but if an error prevented the completion of the next step of the chain, the instructor corrected the error. If the participant completed 100% of the steps correctly during practice, the session was terminated for that day. If the participant did not earn 100% during practice, the video was viewed for a second time and the participant was given one more opportunity to practice. The intervention continued until the participant performed 100% of the steps correctly during three consecutive intervention probe sessions.

Generalization Probes

Generalization probes across settings, stimuli, and people were conducted. Participants were tested making coffee using a different coffee maker, serving a different peer, and making coffee in a different setting. The coffee maker that was used for generalization probes differed from that used in training in that the filter container opened differently, the size and location of the opening in which water was

to be poured was different, and the 'on/off' button was in a different location. A different individual with a developmental disability served as the peer. This particular peer was more talkative than Tom and used a wheelchair. The setting used for generalization differed in that it contained a sink, refrigerator, microwave, stove, oven, and a circular table located in the middle of the room. The tables in the training room were rectangular.

Maintenance

Maintenance probes were identical to baseline probes. They were conducted approximately 1 month after the participant demonstrated criterion performance during training.

Dependent Measures and Interobserver Agreement

The dependent measure was the percentage of steps performed accurately during baseline sessions and on intervention, generalization, and maintenance probes. For each step on the task analysis that the participant performed correctly a (+) was recorded and a (−) was recorded for each step that the participant performed incorrectly. If the participant failed to respond, the step was recorded as incorrect. Steps did not have to be performed in the same order as presented on the task analysis in order to be scored as correct, as long as it was still possible to successfully complete the chained task.

Interobserver agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying this value by 100. Agreement data were collected during 31 of Marcy's 96 sessions (32%). The mean interobserver agreement for Marcy was 97% (range, 91–100%). Agreement data were collected during 12 of Stacey's 35 sessions (34%). The mean interobserver agreement for Stacey was 100%. Agreement data were collected during 24 of Mindy's 72 sessions (33%). The mean interobserver agreement for Mindy was 100%.

RESULTS

Figure 1 displays the three participants' performances on baseline, intervention, generalization, and maintenance trials. The figure shows that Marcy was not able to complete the task prior to the intervention, completing no more than 30% of the steps correctly. Marcy demonstrated criterion performance after 30 training sessions and showed generalization across settings, stimuli, and people immediately following mastery. She was reminded to attend to the video two or three times during each video

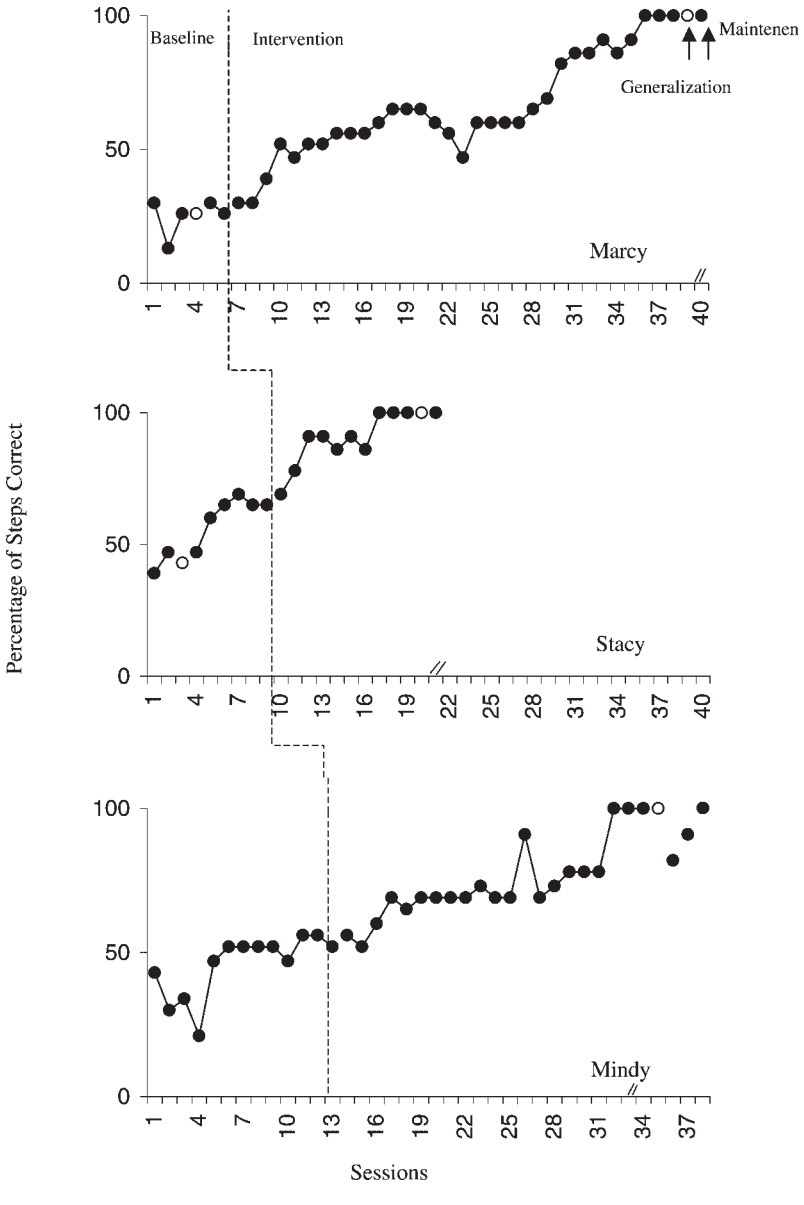

Figure 1. Percentage of steps performed correctly during baseline, intervention, generalization, and maintenance probes for Marcy, Stacy, and Mindy.

viewing. On the 27th training session, Marcy was given verbal prompts immediately prior to one step that appeared twice in the task analysis that she consistently performed incorrectly (pouring the water into the measuring cup). Following that session, she demonstrated criterion performance during three consecutive intervention probes (without prompts). Marcy performed with 100% accuracy on her maintenance probe approximately 1 month following mastery.

Stacy was not able to complete the task with 100% accuracy prior to the intervention, completing no more than 69% of the steps correctly. She demonstrated criterion performance after eight training sessions and demonstrated generalization across settings, stimuli, and people immediately following mastery. Stacy performed with 100% accuracy on her maintenance probe approximately 1 month following mastery.

Mindy was not able to complete the task prior to the intervention, completing no more than 56% of the steps correctly. Mindy demonstrated criterion performance after 21 training sessions and demonstrated generalization across settings, stimuli, and people immediately following mastery. Mindy was reminded to attend to the video two or three times during each viewing. During the 18th training session, Mindy was given verbal prompts immediately prior to four steps that she had been consistently performing incorrectly. Mindy immediately demonstrated criterion performance during three consecutive intervention probes (without prompts). Mindy performed with 83% steps correct on her maintenance trial approximately 1 month following mastery. Mindy then viewed the video and completed two training trials, and was retested for maintenance. On that probe she performed with 91% of the steps correct. After one more session of remedial training, she performed with 100% accuracy on her third maintenance probe.

DISCUSSION

These results confirm that an intervention consisting of video modeling and verbal praise was effective for teaching a domestic skill with an embedded social initiation skill to adults with significant disabilities. Moreover, the intervention was effective in establishing generalization across novel stimuli, settings, and social partners. Finally, the skill was maintained at approximately 1 month follow-up for two participants, and following brief remedial retraining was then displayed by a third participant. Thus, the participants will be able to use the skill of making coffee and serving a peer at a later date in different settings, using different equipment, and with different people: A long-term goal for the participants is to make coffee and initiate social interactions with peers in the coffee club at their day treatment center. The skill of making coffee and initiating social interaction can also be used in the individuals' residence, homes of relatives, and future employment settings.

This study differs from previous research in two important ways. First, while other studies have shown video modeling to be an effective intervention for teaching domestic and daily living skills (Lasater & Brady, 1995; Norman et al., 2001; Rehfeldt et al., 2003; Shipley-Benamou et al., 2002), this particular chained task included an embedded social initiation skill. Although our particular social skill was very basic and simple, the establishment of social interaction skills can be very difficult to establish with individuals with significant levels of retardation, for whom relationships with others are often few in number. The social skill established may serve as the foundation upon which future social skill instruction might build. In fact, over the course of the experiment Marcy and Mindy were eventually observed to display additional social initiation skills with Tom, the social peer: Marcy often greeted Tom and shook his hand at the beginning of each session, and Mindy came to say, 'here you go, Tom,' or 'drink your coffee, Tom,' while delivering Tom his coffee. Second, while a number of studies have demonstrated the generalization of skills established via video modeling across settings, stimuli, or people (e.g. Lasater & Brady, 1995; Norman et al., 2001; Rehfeldt et al., 2003), few have shown generalization across all three. This is an outcome that is often especially difficult to achieve all at one time in persons with severe developmental disabilities. That this was demonstrated in the present study illustrates the efficiency of teaching new skills using this approach.

One important methodological limitation is that the intervention consisted of video modeling and positive reinforcement, in the form of verbal praise, for each step completed correctly. Although this is similar to the treatment package used by other researchers (e.g. Charlop & Milstein, 1989), it is not completely clear whether the video modeling procedure, the verbal praise, or the combination of both components was responsible for the participants' skill acquisition. The video modeling procedure clearly affected performance, as the participants would never had performed a step correctly in the first instance were it not for the video. However, it is possible that verbal praise alone would have produced the same rate of acquisition. A second limitation is that Stacy's baseline was on an ascending trend. This makes it difficult to unequivocally conclude that the intervention was responsible for the change in her performance. A final limitation is that verbal prompts were presented once for a few of the steps that two participants consistently performed inaccurately; in fact, the prompts appeared to be necessary for mastery of the skill. The prompts may have been necessary because by that time the participants had practiced the steps incorrectly many times. Only one presentation of the prompts was necessary before the participants performed correctly, however. Thus, an advantage of this treatment package is that little staff training was required to implement the intervention. Very little formal knowledge of prompting and prompt reduction techniques is necessary.

In conclusion, video modeling appears to be an effective means for teaching domestic and social initiation skills to individuals with severe and profound mental retardation. Future research evaluating the effects of an intervention consisting of video modeling and verbal praise should include a component analysis to determine which components are most responsible for skill acquisition. Future research should also compare the effects of video modeling to that of other systematic prompting strategies on skill acquisition, generalization, and maintenance.

ACKNOWLEDGEMENTS

This project constitutes the master's thesis completed by the first author under the supervision of the second author in the Behavior Analysis and Therapy program at Southern Illinois University. The authors extend their gratitude to the Adult Rehabilitation Center at Franklin-Williamson Human Services, Inc. in West Frankfort, IL. We are particularly appreciative of the assistance and support provided by Pam Boyd and John Sobeck. Thanks are also extended to Christine Halvey and Jeff Dillen for support with the reliability data.

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