

*TEACHING GENERALIZATION OF PURCHASING SKILLS ACROSS
COMMUNITY SETTINGS TO AUTISTIC YOUTH
USING VIDEOTAPE MODELING*

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Three young autistic adults were trained to purchase items. Training was conducted in one setting with concurrent generalization probes taken in three community stores. Training in one setting failed to produce generalization to the three probe settings. Generalization training, which consisted of viewing videotapes of models who purchased items in the probe settings and answering questions about the models' responses, was then introduced. Training with the videotapes resulted in generalization to the three community stores. Results of the use of videotapes as a cost-effective means to program generalization in community training programs are discussed.

DESCRIPTORS: autistic youth, community survival skills, generalization, videotape modeling, shopping skills

A major purpose of instruction for students with autism and other severe handicaps is to develop functional skills in natural home and community environments (Brown et al., 1983). Skills acquired through school-based instruction often fail to generalize to natural environments (Koegel, Rincover, & Egel, 1982). One method to promote generalization across settings has been to train critical skills in additional settings until skills emerge in yet-to-be-trained settings (e.g., McDonnell, Horner, & Williams, 1984; Stokes, Baer, & Jackson, 1974), a strategy known as training sufficient exemplars (Stokes & Baer, 1977). Unfortunately, this strat-

egy can be inefficient when teaching community referenced skills, such as shopping behaviors, because considerable travel may be necessary between settings.

One strategy to promote generalization without the costs and inconvenience of teaching in multiple community settings involves the use of simulation techniques such as slides (e.g., McDonnell et al., 1984), scale models (e.g., Marchetti, McCartney, Drain, Hooper, & Dix, 1983; Neef, Iwata, & Page, 1978), and photographs (e.g., Sowers, Verdi, Bourbeau, & Sheehan, 1985). The use of videotapes of models performing functional skills in the student's surrounding community appears to be an expedient method of providing multiple exemplars across a variety of settings.

Two sources of data suggest that videotapes of models may be an effective treatment strategy with autistic youth. First, several studies have found that autistic students (e.g., Egel, Richman, & Koegel, 1981) and mentally retarded students (e.g., Rauer, Cooke, & Apolloni, 1978) are capable of observational learning from peer models. Second, a variety of studies have found that mentally re-

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tarded students can effectively imitate motion picture and videotape models (e.g., Baran, 1973). Perhaps surprisingly, one study found videotape modeling to be more effective than live models (Stephens & Ludy, 1975).

The purpose of our investigation was to test the effectiveness of videotaped modeling as a means of promoting generalization across settings. Students were first trained in one environment to make simple purchases and produce social responses. The effects of viewing videotapes of nonhandicapped peers modeling purchasing behavior on the generalization of shopping and social skills in relevant settings in the students' communities were assessed.

METHOD

Participants

Three youths, whose classification conformed to standards for diagnoses of autism and developmental delay with autistic characteristics (Ritvo & Freeman, 1978), participated in the study. The students were selected for inclusion in the study because informal observations indicated that they could not independently purchase items and because of histories of poor generalization from training settings to community settings. The students attended two public school programs for severely handicapped youth in integrated settings. All of the participants were capable of independently performing basic self-help skills such as dressing, street-crossing, and grooming.

Susan, who was 20 years old, was estimated to be functioning at the 5-year-old level of the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984). Her functional vocabulary consisted of attempts to request items, label items, and express basic needs. Most of her speech, however, consisted of delayed echolalic phrases. Mark, who was 20 years old, was estimated to be functioning at the 4-year-old level of the Vineland Adaptive Behavior Scales. His expressive language largely consisted of delayed echolalic phrases; however, he did have functional use of yes/no responses. He could accurately follow one-step di-

rections. The third student, Jim, was 20 years old and was estimated to be functioning at the 5-year-old level of the Vineland Adaptive Behavior Scales. He used complete sentences to request and comment on objects and events, and could respond to complex three-step requests.

Settings and Materials

Training settings. The students' teachers identified the settings for training and generalization probes on the basis of student needs, proximity to school, and proximity to the students' homes. Mark and Susan were trained to purchase food in their high school cafeteria. The sequence of purchasing responses in the cafeteria was the same as the sequence of responses in the community settings. Jim was trained to purchase food items in a convenience store located within walking distance of his school. The students were taught money handling and purchasing in their classrooms. Videotape generalization training for Mark and Susan occurred in the school library. Videotape generalization training for Jim occurred in his home.

Generalization settings. Jim's purchasing skills were probed for generalization in three community settings: a bookstore, a drug store, and a grocery store. Susan's and Mark's skills were probed in a grocery store, a drug store, and a convenience store.

Materials. Generalization training was conducted with the use of VHS videotapes of familiar same-aged nonhandicapped peers making purchases in the generalization settings. The videotaped episodes (i.e., one complete purchase) ranged in duration from 1.5 min to 3 min and showed standard sequences of purchasing behaviors that included entering the store, selecting item(s) for purchase, walking to the checkout stand, placing item(s) on counter, greeting the cashier, paying for item(s), receiving change, thanking the cashier, and leaving. Each videotape training episode varied in terms of the exact content of the social responses. For example, the following greeting responses were modeled: "Hi," "How are you?" and "Hello." The students used dollar bills for purchasing in the training and generalization settings. During each training session the student viewed four episodes

that modeled purchasing skills in one setting. The episodes varied slightly from each other, as they were separately taped sequences.

Task Analysis of Shopping and Purchasing Responses

Table 1 shows a task analysis of purchasing that differentiates between "social" steps and "operational" steps (i.e., the nonsocial responses in the purchasing sequence). Those operational steps that are judged to be critical to the successful completion of a purchase are shown in Table 1. The task analysis sequences were developed to be "generic" across a wide variety of community settings—the same sequence was sufficient to make purchases successfully in both the training and generalization settings. Jim's task analysis for purchasing consisted of the "one dollar more" payment strategy (e.g., Haring, Breen, Pitts-Conway, & Gaylord-Ross, 1986). The trainer gave Mark and Susan a sufficient number of dollar bills to pay the clerk for the item they had selected.

Procedures

Baselines. Baseline sessions in both generalization and training settings began when the students entered the store. Mark and Susan were guided into the appropriate sections of the store and given the opportunity to select an item of their choice. Jim was verbally prompted to choose an item before entering the store as he was already capable of independently locating the appropriate section.

The sequence of responses from the task analysis was followed during each baseline session. If a student did not perform a step, the conditions necessary for the next step of the task analysis were set up with a minimum amount of guidance or prompting from the instructor. For example, if a student did not choose an item within 15 s, the instructor selected an item and placed it in the student's hand; if a student did not locate a check-out stand within 5 s, the instructor gave the student the minimal amount of physical guidance necessary to find a checkout stand. The instructors gave no feedback or rewards during baseline probes; however, the participants did consume the pur-

Table 1
Task Analysis for Purchasing Behavior

Participant	Steps in the task analysis
Jim	<ol style="list-style-type: none"> 1. Enters store** 2. Locates specified item(s)** 3. Stands at end of line** 4. Moves up with line** 5. Puts item(s) on counter 6. Uses appropriate social response* 7. Gets wallet out** 8. Hands cashier money using the one dollar more strategy** 9. Receives change** 10. Uses appropriate social response* 11. Exits store**
Mark and Susan	<ol style="list-style-type: none"> 1. From aisle, goes to front of store** 2. Locates open check-out stand** 3. Gets in line** 4. Waits in line** 5. Moves up in line** 6. Approaches pay area** 7. Puts item(s) or basket on counter 8. Uses appropriate greeting response* 9. Replies to cashier's greeting* 10. Replies "Yes" to "is that all?"* 11. Gets out wallet** 12. Gives money to cashier** 13. Gets change** 14. Gets receipt 15. Replies "Yes" to "Do you want a bag?"* 16. Says "Thank you"* 17. Moves to end of counter 18. Puts change in wallet** 19. Puts wallet away** 20. Gets item(s)** 21. Leaves store**
(optional)	9. Replies to cashier's greeting*
(optional)	10. Replies "Yes" to "is that all?"*
(optional)	15. Replies "Yes" to "Do you want a bag?"*

* Social step.

** Critical step.

chased item a half hour after the probe during a social-leisure break in the special education classroom.

Shopping training. The same procedures were followed as during baseline with the following exceptions. First, any independent correct responses were rewarded with verbal praise. Once a criterion of 80% correct for a session was attained, the frequency of verbal praise was reduced to every other

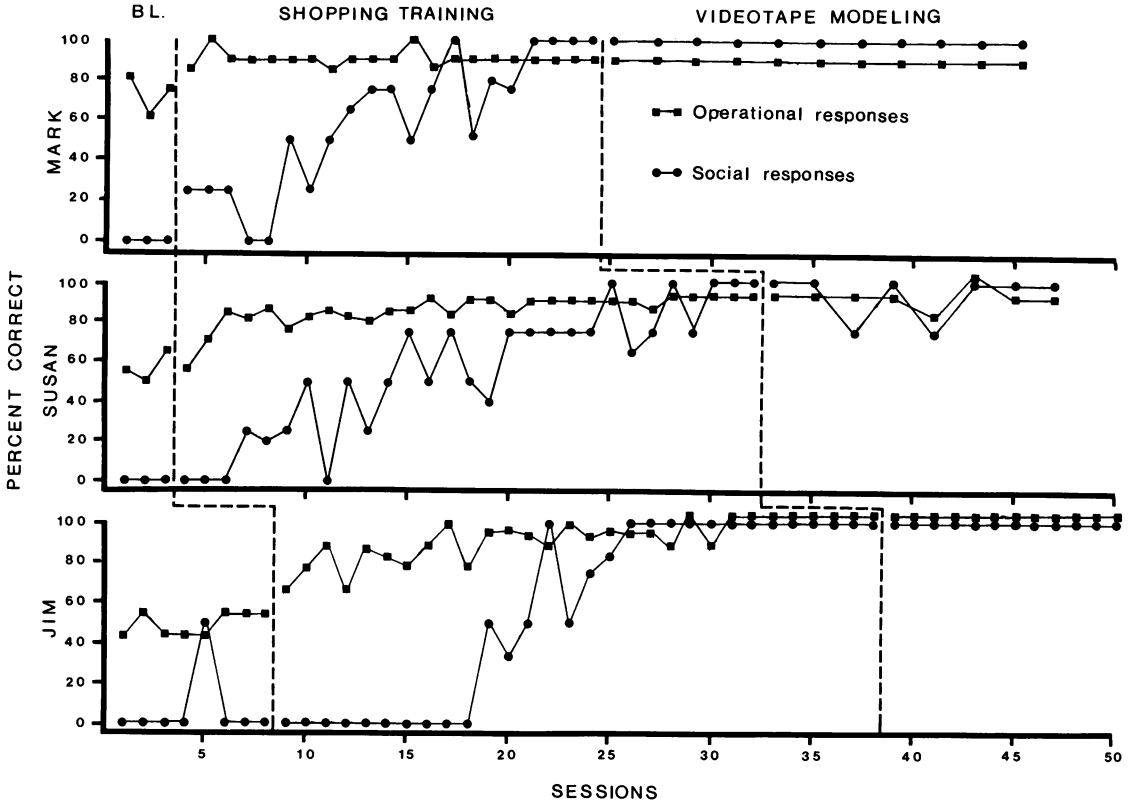


Figure 1. Percent correct total task analysis steps (both social and operational responses) across baseline, shopping training, and maintenance conditions in the training setting.

correct step. Second, responses that were not independently initiated within 3 s were prompted using less intrusive prompts (verbal and gestural) first, followed by partial physical guidance if necessary. Correct responses to less intrusive prompts were followed by praise (e.g., "That was great"), but were given only minimal feedback after a more intrusive prompt (e.g., "O.K.").

Each student was trained one-to-one with an instructor. One session was conducted per day. For Jim, each session contained two repetitions of the task and required 35 min to leave school, conduct the session in the community, and return to school. For Mark and Susan, each session contained eight repetitions of the task and lasted for approximately 25 min.

Videotape generalization training. Generalization training began after the student had achieved a criterion of at least 90% correct across

3 consecutive days during shopping training. While the student viewed the videotaped models performing the same sequence of behaviors they had been taught, the instructor would ask the student a series of questions such as (a) "What store is this?", (b) "What is he doing?", (c) "What will she do next?", (d) "What will he say?", and (e) "How much will he pay?". Students received praise for correct answers. Incorrect answers resulted in the teacher temporarily stopping the videotape, modeling a correct answer, and then requiring the student to repeat the correct response. After viewing each videotape, the students received a maintenance trial in the training environment using the same reinforcement conditions as described under "Shopping Training."

Generalization probes. Generalization probes were identical to baseline sessions. For Jim, the trainer (and reliability observers) observed him from

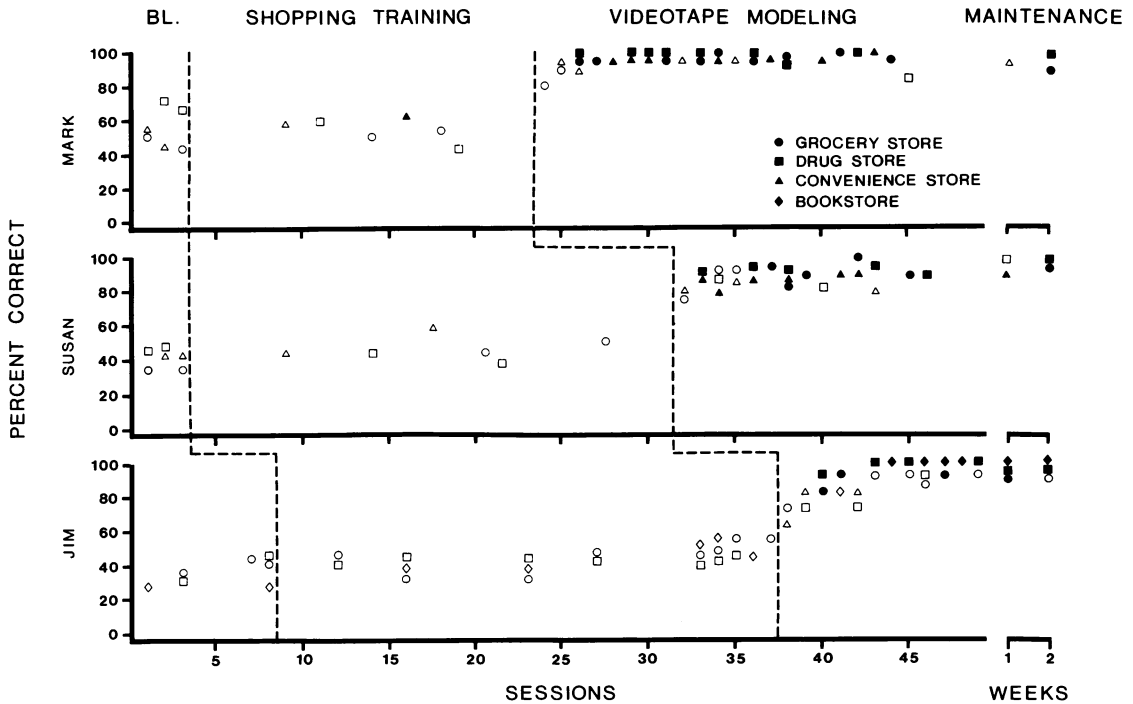


Figure 2. Percent correct in probe settings of total task analysis steps (operational and social) across baseline, shopping training, videotape modeling, and unreinforced maintenance conditions. The open symbols represent trials during which the student did not produce all of the critical steps necessary for a purchase. The closed symbols represent trials during which the student produced all of the steps that are critical for completing a purchase.

concealed positions in the stores. For Mark and Susan, the trainer was visible, but stood 4 m away from the participants. No prompts, feedback responses, or rewards were given during probes.

Maintenance probes. After students displayed correct responses in the generalization settings (i.e., 90% correct responses over three settings), the videotape training was discontinued. One and 2 weeks after training, follow-up probes were conducted in generalization settings using procedures identical to those used in generalization probes. Mark's and Susan's responses were also probed in three novel settings to further assess generalization across settings.

Design, Measurement, and Reliability

A multiple baseline across participants design (Barlow & Hersen, 1984) was used. After initial baselines, shopping training was sequentially introduced, followed by videotape generalization train-

ing. The dependent measure was the percentage of total steps, operational steps, and social steps from the task analysis that were independently and correctly performed. Interobserver-agreement data were collected 38 times (27% of the sessions) by five independent observers (in pairs with the instructor). The point-by-point reliability formula (Kazdin, 1982) was used to calculate the percentage of agreements on the occurrence ($M = 95.8\%$ with a range of 82% to 100%), and nonoccurrence ($M = 89\%$ with a range of 0% [representing just one disagreement] to 100%) of correct steps.

RESULTS

Results for shopping training across both social responses and operational responses are presented in Figure 1. These data show that the baseline level for social responses was zero or near zero for all three participants. When training was introduced,

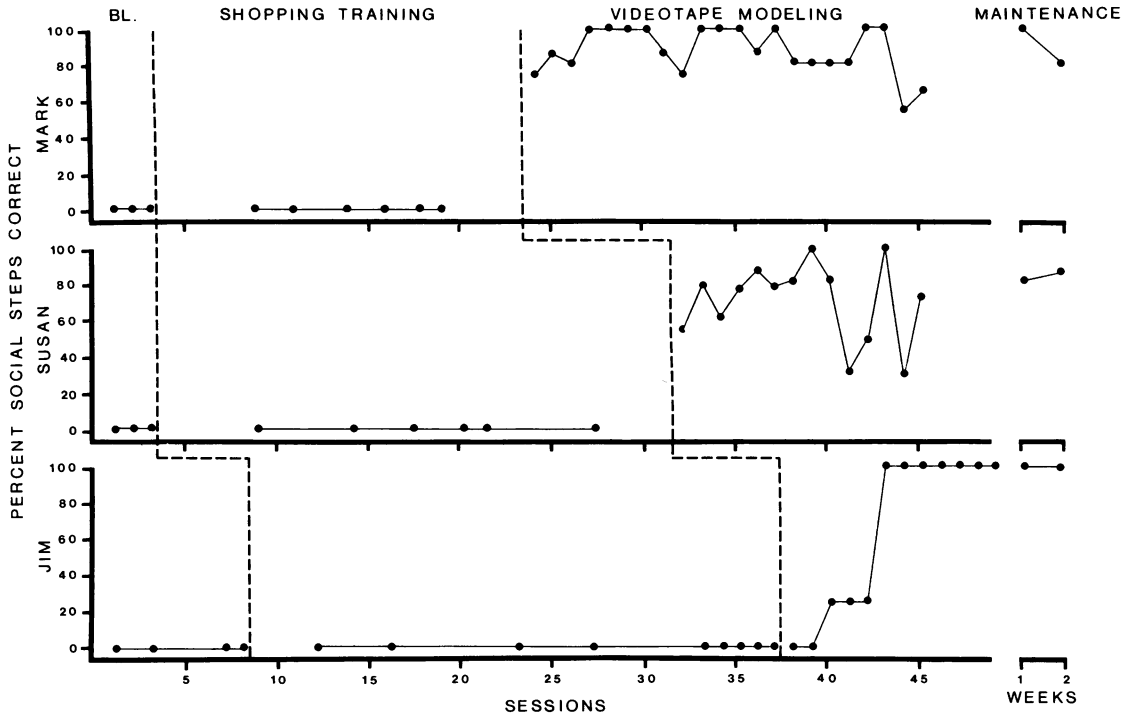


Figure 3. Percent correct social steps across baseline, shopping training, videotape modeling, and unreinforced maintenance conditions within the probe settings.

Mark and Susan showed a rapid increase in social responses while Jim showed a rapid increase after 2 weeks of training. Operational responses were at a comparatively higher baseline level for all three students. The introduction of training further increased the levels of correct operational responses for all three participants.

The probe data within the generalization settings are given in Figures 2 and 3. Baseline data across the three participants show that their performance of operational and social steps in the probe settings was comparable to their baseline performance in the training settings. As shopping training progressed in the training setting, performance in the probe settings did not improve substantially. With the introduction of videotape modeling (along with continued reinforced maintenance trials in the training setting), rapid and durable increases in performance of both operational and social responses within the probe environments were observed. Furthermore, videotape training was associated with an increase in the per-

centage of trials in which all critical operational steps were correctly performed. When videotape modeling was withdrawn (see "maintenance" in Figure 2), the students continued to independently purchase items on most occasions. Results of probing in three novel settings (a snack bar at the beach and two convenience stores) with Susan and Jim were successful (i.e., all critical steps were correct) on five of six occasions.

DISCUSSION

Results showed that the videotape modeling procedure, in conjunction with shopping training in one natural environment, was effective in promoting generalization of purchasing skills to community stores in the students' home neighborhoods. The videotape modeling procedure resulted in increased independent functioning and social responding for all three students. In Jim's case, as a result of participating in the study he could be given directions to go into a store and purchase an

item. Similarly, Mark and Susan could independently purchase items once the items had been located in a store.

Although the videotape simulation method seemed to be effective, simulation techniques (especially when used without concurrent training in a natural environment) have shown an inconsistent pattern of effectiveness (Coon, Vogelsberg, & Williams, 1981). Considerable caution is warranted in applying this technique to other students and behaviors. Following the cautionary suggestions by Coon et al., we noted that participants in our study had the following characteristics that may have affected the success of this procedure: (a) the participants spent approximately 50% of each school day in community settings; thus, they had familiarity with shopping and purchasing prior to the study, (b) the participants had relatively high baseline performance of the shopping skills, and (c) the students correctly answered a large percentage of simple questions concerning the actions of the models without specific question-answering training. Further research with videotape modeling methods is needed to identify student characteristics and instructional components that are associated with successful outcomes. Among the instructional components that appear most promising for further research are the necessity of including concurrent training in a community setting with the modeling procedure; the effects of variation in the range of peers, behaviors, and settings displayed on the videotape; and the role of active responding to the videotape.

Our investigation did not control for potential sequence effects, in that for all three participants the videotape modeling phase followed the training phase in one setting near the student's classroom. We did not control for the potential influence of sequencing effects because we believed that all of the students required direct instruction in at least one relevant environment in order to acquire the shopping skills. Thus, the potential educative effects of the modeling procedure were not assessed in this study.

Techniques that promote maximum generalization of training in a cost-effective manner are ur-

gently needed. Despite cautions necessary in interpreting the results of this experiment, videotape modeling procedures appear to be a promising addition to our repertoire of behavioral techniques for promoting generalization and warrant further systematic study.

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