

Use of Video Modeling to Teach Extinguishing of Cooking Related Fires to Individuals with Moderate Intellectual Disabilities

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Abstract: This study evaluated the effectiveness of video modeling to teach fire extinguishing behaviors to three young adults with moderate intellectual disabilities. A multiple probe design across three fire extinguishing behaviors and replicated across three students was used to evaluate the effectiveness of the video-based program. Results indicate that video modeling was effective in teaching fire extinguishing skills. Skills were further generalized to novel examples and levels of performance were maintained up to 52 days.

For decades preparing students with disabilities for living in public communities has been considered essential (Freagon et al., 1983). Instruction and intervention for persons with disabilities includes planning and programming for the greatest degree of independence attainable for entry into community, domestic, employment, and recreational settings. As independence increases, less supervision and adult support are provided, leading to possible exposure to unsafe situations (Collins, Schuster, & Nelson, 1992). Due to these increased risks, emphasis on preparation for transitioning from school to community requires safety skill instruction to be a component of the school curriculum (Taber, Alberto, Hughes, & Seltzer, 2002) to help ensure that persons with disabilities have skills to avoid and manage dangerous situations as they prepare for independence in least restrictive environments (Collins, Wolery, & Gast, 1992).

Clees and Gast (1994) define social safety

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skills as being verbal or nonverbal behaviors that serve to avoid potential danger, escape, or terminate presently occurring harm. Safety skills may be: a) preventative (recognition and avoidance) such as walking during daylight hours; or b) reactionary (safe responses to situations when they happen) such as walking away from a barking dog (Collins & Griffen, 1996; Collins, Wolery, & Gast 1991). A number of community risks have been identified in the literature and addressed through safety skill instruction including: safe response to lures of strangers (Collins, Schuster et al., 1992; Gast, Collins, Wolery, Jones, 1993; Haseeltine & Miltenberger, 1990; Watson, Bain, & Houghton, 1992); safe response when lost in the community by emergency use of pay phones (Collins, Stinson, & Land, 1993) or cell phones (Taber et al., 2002) to call for assistance; and community pedestrian movement and street crossing (Horner, Jones, Williams, 1985; Matson, 1980; Page, Iwata, & Neef, 1976; Sowers, Rusch, & Hudson, 1979).

Prevention of ingesting harmful substances by reading and understanding product warning labels (Collins & Griffen, 1996; Collins, & Stinson, 1994–1995); handling broken materials (Winterling, Gast, Wolery, & Farmer, 1992) and safe storage of potentially danger-

ous household materials (Feldman & Case, 1999) have also received research attention. Safe responses to personal injuries and first aid skills have been effectively taught to persons with disabilities including: treatment of minor cuts, burns, and insect bites (Gast, Winterling, Wolery, & Farmer, 1992); abrasions (Marchand-Martella, Martella, Christensen, Agran, & Young 1992); and first aid for choking (Spooner, Stem, & Test, 1989). Responding to fire alarms and exiting homes has also been identified and taught as crucial skills for persons with disabilities (Collins et al., 1993; Freagon et al., 1983; Haney & Jones, 1982; Jones, Sisson, & Van Hasselt, 1984; Rae & Roll, 1985; Tiong, Blampied, & Le Grice, 1992), however, to date no studies have measured generalization using actual small, contained, fires. Further, although the importance of young adults with disabilities to have access to working fire extinguishers and to know how to use them is recognized (Kelly, 2006), no studies have evaluated extinguishing common kitchen fires or use of a fire extinguisher.

A range of instructional strategies for teaching safety skills have been identified along with limitations and recommendations for future research. Reading stories and scenarios, with guided discussion and verbal responding, have been effective (Mazzucchelli, 2001), as well as adding audio visual materials (Feldman & Case, 1999) and behavioral strategies [e.g. Behavioral Skills Training (Bevill & Gast, 1998)] that include the features of modeling, rehearsal, and role playing (Watson et al., 1992). Katz and Singh (1986) used verbal instructions, modeling, rehearsal and feedback to teach adults with intellectual disabilities to report fires, exit a building, and extinguish a fire on self and others using the "stop, drop, and roll" technique.

Errorless learning procedures have also been recommended when teaching safety skills that may pose potential harmful scenarios. Of these errorless procedures, time delay has received the greatest amount of attention for teaching safety skills (Collins & Griffen, 1996; Collins, Schuster et al., 1992; Collins & Stinson, 1994–1995; Collins et al., 1993; Gast et al., 1992; 1993; Winterling et al., 1992).

Recommendations further include use of realistic teaching materials that closely resemble stimulus and response requirements that

are identical or similar to those that will be found in natural settings where safety skills will be used (Clees & Gast, 1994). Use of teaching exemplars which closely resemble those encountered in "real life" situations increase the probability that students will generalize use of skills to untaught or novel examples (materials, persons, verbal stimuli) and settings (Branham, Collins, Schuster, & Kleinert, 1999; Collins & Griffen, 1996). Further, multiple exemplars of stimuli that will be encountered in natural environments is recommended (Clees & Gast, 1994; Horner et al., 1985; Mazzucchelli, 2001) and has been shown to be effective in teaching generalized safety skills (Gast et al., 1993; Watson et al., 1992; Winterling et al., 1992). Although community-based instruction and community referenced stimuli have been shown to be effective in providing natural teaching examples, money and time constraints may limit in vivo instruction (Branham et al., 1999; Collins et al., 1993). To address these constraints, simulated materials and settings, as an adjunct to in vivo instruction, have been effective in teaching generalized safety skills. Simulations have included the use of: adult "actors" to teach safe response to lures from strangers (Gast et al.); costume makeup to simulate cuts, burns, and insect bites (Gast et al., 1992); puppets for application of first aid procedures (Marchand-Martella et al., 1992); and heating pads on door knobs to simulate household fires (Haney & Jones, 1982).

Although relatively unexplored, another means for simulating safety skills is the use of video instruction. Carroll-Rowan and Miltenberger (1994) and Poche, Yoder, and Miltenberger (1988) used video tape models of child actors and behavior rehearsal to teach abduction prevention skills to young children without disabilities, while Branham et al. (1999) evaluated videotape modeling to teach street crossing to three students with moderate intellectual disabilities, and Tiong et al. (1992) used video prompting of individual steps of a task analysis to teach four adults with moderate intellectual disabilities to exit their bedrooms in response to a fire alarm. Video instruction has been effectively used to teach a wide range of skills to persons with disabilities (Mechling, 2005) including: food preparation (Graves, Collins, Schuster, & Kleinert,

2005); ordering at fast food restaurants (Mechling, Pridgen, & Cronin, 2005); play-related statements (Taylor, Levin, & Jasper, 1999); play sequences (D'Ateno, Mangiapanello, & Taylor, 2003); purchasing with a debit card (Mechling, Gast, & Barthold, 2003); spontaneous requesting (Wert & Neisworth, 2003); grocery shopping (Mechling & Gast, 2003); self-care (Hagiwara & Myles, 1999; Norman, Collins, & Schuster, 2001); daily living skills (Cannella-Malone et al., 2006; Van Laarhoven & Van Laarhoven-Myers, 2006); augmentative and alternative communication device use (Mechling & Cronin, 2006); and transitioning between activities (Schreibman, Whalen, & Stahmer, 2000).

In addition to the issue of providing appropriate teaching examples of difficult to simulate community environments, potentially dangerous situations may pose challenges due to the need to provide safe environments while teaching these skills (Collins & Griffen, 1996; Collins, Stinson, & Land, 1993). Use of video instruction to simulate unsafe environments has been recommended when teaching persons with disabilities (Clees & Gast, 1994) yet remains relatively un-researched. The purpose of the current study was to measure the effects of video modeling to teach fire safety skills to young adults with moderate intellectual disabilities.

The primary research question was: Will video modeling be effective in teaching extinguishing of cooking related fires to young adults with moderate intellectual disabilities? A second question was: Will participants generalize their behavior to novel materials for extinguishing fires?

Method

Participants

Three students (two females and one male) with moderate intellectual disabilities participated in the study and were selected based on their IEP objectives for cooking and development of independent living skills. Students were screened for the following entry level skills: (a) visual ability to see video images on the portable DVD screen; (b) motor ability to perform each of the three tasks; (c) ability to imitate a video model. Students were enrolled

in a local high school Transition Program for Young Adults (TPYA) designed to support transition from school to community. All students had a history of video-based instruction, use of visual prompting systems such as pictorial task analyses, and demonstrated generalized motor imitation of video and live models.

Melissa was a 19-year, 3 month old female diagnosed with a moderate intellectual disability (IQ 52, Kaufman Assessment Battery for Children: Kaufman and Kaufman, 1983). She spoke in complete sentences with some grammatical errors and difficulty staying on topic. She worked two days a week at the local YMCA folding towels and filling soap dispensers and was applying to work at McDonalds. She sometimes became distracted or anxious to quickly complete a task when other activities were being implemented in her vicinity. She was reported to read 10 personal care words and recognized 32 survival signs. She could rote count to 100 with visual cues and tell time on the hour and half hour. She could write her personal information, basic 2-3 letter sight words, and had some phonemic skills. She could make simple meals from memory and required picture and text cues with verbal prompting when preparing multi-step recipes. Her needs included: (a) writing 3-4 letter words; (b) writing simple notes to friends; (c) completing familiar tasks without saying, "I don't know"; (d) preparing simple meals (including use of the stove, oven, and microwave); (e) reading and ordering from simple menus; (f) using the city bus; and (g) crossing streets and parking lots. She reported that she enjoyed working at the YMCA, shopping, eating out, and watching television.

Jeff was a 19-year, 4 month old male diagnosed with a moderate intellectual disability (IQ 46, *Wechsler Intelligence Scale for Children – Third Edition*: Wechsler, 1997). He was able to participate in simple conversations with reminders to refrain from repeating questions about the same topic. He independently completed all of his personal care needs, made simple snacks, and completed simple household tasks (i.e. sweeping and dusting). He could write his personal information, fill out job forms with minimal assistance, and write using capitalization and punctuation. He counted and made change up to \$1.00 and used a calculator to add prices. He was re-

ported to read on a first grade level with sight words, but unable to decode words. His needs included: (a) refraining from asking for assistance when not needed; (b) using a schedule for time management of daily activities; (c) making purchases and identifying the cheaper of two items; (d) budgeting, and managing a checkbook; and (e) completing first aid skills. He reported that he enjoyed listening to music, watching DVDs, playing basketball, working on the computer, and swimming.

Eileen was a 21-year, 3 month old female with a moderate intellectual disability (IQ 45, *Differential Ability Scales – Second Edition*: Elliot, 2000). She was very social and verbal with peers, but completed minimal conversations with adults, answering in short phrases. She was able to follow simple directions, but often nodded her head, “yes” when she did not understand a direction. She had difficulty staying on task when other peers were in the area. She could ride the city bus and use transfers, make a bed with verbal cues, and wash and dry clothes. She prepared simple microwave snacks. She was able to count bills to \$10 and add sums of money to \$90 using a calculator. Her needs included: (a) answering questions with an appropriate tone of voice; (b) remaining on task until a job was completed; (c) following 4-step recipes including using measuring cups and spoons; (d) washing, rinsing, and drying dishes; (e) storing food in appropriate containers; and (f) reading prices and labels on packages and clothes. She reported that she enjoyed going out to lunch, shopping, listening to music, dancing, talking on the telephone and being with friends.

Settings

Probe and individual instructional sessions were conducted either in the kitchen or barbeque area of the apartment rented by the school system for delivering home living instruction to young adults with disabilities. The 8.5ft x 9ft kitchen area contained the stove, microwave oven, and toaster oven. The microwave and toaster ovens were positioned on a counter to the left of the stove. Items for extinguishing fires (flour, lid, and fire extinguisher) were placed in different locations. The flour was placed in the refrigerator that was to the left of the counter and the lid was

located in the cabinet directly below the microwave and toaster ovens.

The barbeque area was located in the yard behind the apartment and was shared by multiple units. The storage container with the fire extinguisher was to the right of the picnic table within the barbeque area (the grill, fire pit, deep fat fryer and metal trash can were placed in the center of the area at least 6ft from the picnic table). The portable DVD player was positioned on a table in the dining area. The dining area was adjacent to and visible from the kitchen (open floor plan). Students watched the video DVD model and then walked approximately 3ft to the kitchen or 30ft to the barbeque area.

When students were watching the video, the investigator stood to the left of the student. When students were given the opportunity to extinguish the fire, the investigator stood approximately 3ft behind the student. An additional fire extinguisher was in the kitchen during all sessions and a first aid kit was also available. The reliability data collector stood beside the table with the DVD player or barbeque area during video modeling and probe sessions.

Target Behaviors, Materials, and Equipment

Three behaviors for extinguishing fires were targeted for instruction: (a) scooping and releasing flour; (b) placing a lid on a pot or pan; and (c) using a fire extinguisher. The three behaviors were selected based on observation and evaluation of current environments and daily cooking routines, interviews with teachers supervising cooking routines, interviews with parents, and consultation with the local fire department. Water was not used because kitchen fires caused by grease are not readily extinguished with water. Simulated fires were made using ethanol gel and salt (extinguished with flour); cooking sherry (extinguished with a lid), and newspaper (extinguished with fire extinguisher). Three teaching stimuli were used to teach each extinguishing behavior and one additional example was used to evaluate generalization of each response across novel materials (Table 1).

A separate video model was created for each extinguishing task. Video captions were made using a SONY digital DVD-RW 1.4 GB video

TABLE 1

Fire Extinguishing Tasks and Stimuli

<i>Extinguishing with Lid</i>	<i>Extinguishing with Flour</i>	<i>Extinguishing with Fire Extinguisher</i>
1. 10 in. skillet	1. Stove top burner	1. Metal fire pit
2. Double boiler	2. Microwave oven	2. Charcoal grill
3. 8 in. pan	3. Stove oven	3. Deep fat fryer
4. Novel stimuli: wok	4. Novel stimuli: toaster oven	4. Novel stimuli: metal trash can

camera. Video models of each task were recorded directly onto DVD-RW, 30 minute discs. A *TOSHIBA* portable DVD player with battery pack and 7 in. screen was used to deliver video models. The DVD video models were made using an adult model or model's hand completing a step. Each DVD video model was made showing the complete task analysis from beginning to end and included verbal descriptions corresponding to each step of the task analysis. For example, the video showed a simulated fire in the skillet followed by the adult model opening the cabinet and taking out a lid. While doing this, the person operating the video camera said, "Get a lid out of the cabinet." Duration of the videos ranged from 10s to 20s.

Response Definitions and Data Collection

During probe and video modeling the investigator collected data on each student's ability to perform each step of the task analyses for extinguishing cooking related fires (Table 2). During probe conditions student responses were recorded as unprompted correct, incor-

rect, or no response. An unprompted correct response was defined as initiating a step within 3s and completing a step independently within 5s of the start of the fire or previous step. An incorrect response was defined as either (a) incorrect topography of a response (topography error) or (b) not completing the step within 5s of the start of a fire or the previous step (duration error). No response was defined as failing to initiate a response within 3s after the start of a fire or the previous step (no response error).

Experimental Design and General Procedures

A multiple probe design across behaviors (i.e. three different behaviors to extinguish cooking related fires) (Tawney & Gast, 1984) and replicated with three students was used to evaluate the effectiveness of video modeling. The fire extinguishing tasks were individually instructed to each student through video DVD modeling. Sessions took place 2-3 times per week. Prior to instruction, data were collected respectively on each of the three fire extinguishing behaviors and on the generalization

TABLE 2

Task Analysis for Extinguishing Cooking Related Fires

<i>Extinguishing with Flour</i>	<i>Extinguishing with Lid</i>	<i>Extinguishing with Fire Extinguisher</i>
1. Remove flour from refrigerator	1. Remove lid from kitchen cabinet	1. Remove fire extinguisher from patio closet
2. Open flour	2. Place lid over flame	2. Place hand over release valve
3. Scoop out one handful of flour	3. Release lid	3. Squeeze release valve
4. Throw flour over flame		4. Spray foam over flame
5. Scoop out one handful of flour		5. Release when flame is extinguished
6. Release flour over flame		

exemplar for each target behavior. This condition was followed by video modeling on the first set of fire extinguishing behaviors. When criteria was met (100% corrects on three sessions) for a student, probe measures were again taken across all three sets of fire extinguishing behaviors and novel generalization behaviors followed by video modeling instruction on the second set of fire extinguishing behaviors. Subsequent probe sessions for mastered sets served as maintenance data and were conducted for one session. The order of behaviors taught varied across students.

Probe Condition Procedures

Prior to video modeling, each student's ability to perform each of the three different fire extinguishing behaviors was evaluated in a one-to-one arrangement for a minimum of three sessions or until data stabilized (Probe 1). One novel example, which was not depicted in the video, was used to assess stimulus generalization for each behavior set. Immediately following mastery of a fire extinguishing behavior, each behavior example was evaluated once during one session. This was followed by one generalization session evaluating a student's performance using novel materials. Each session consisted of three trials (one exemplar of fire locations for each behavior - Table 2) in the kitchen or barbeque area of the apartment. After criteria was reached for extinguishing one set of cooking related fires, one probe session was again conducted to evaluate the student's completion of the mastered task and remaining tasks without the video model prior to introduction of the second fire extinguishing behavior. Trials began with the investigator starting the fire out of view of the student and waiting 3s for the student to initiate the first step of the task analysis. Students could perform each step correctly, incorrectly, or not respond. An incorrect or no response resulted in termination of the task. At the end of a trial the investigator provided verbal praise for general attending and attempts to put out the fire.

Video Modeling Condition Procedures

The purpose of the Video Modeling condition was to evaluate each student's ability to extin-

guish a set of fires after watching a video model. During instructional sessions, the student first sat at the dining room table that held the portable DVD player. The student was directed to, "Watch the video to see how to put out a fire". The investigator then turned on the portable DVD player and the student watched the first video model (e.g. placing a lid over a flame in a skillet). All tasks were taught in a total task sequence.

After the video was finished, the investigator selected the "pause" button and the student was immediately taken to the kitchen or barbeque area. The investigator then lit the fire (out of view of the student) and waited 3s for the student to initiate the first step of putting out the fire. Students could perform each step correctly, incorrectly, or not respond. Incorrect or no response resulted in termination of the task. At the end of a trial the investigator provided verbal praise for general attending and attempts to put out the fire. The student then returned to the table and watched the second video example of putting out a fire within the same fire extinguishing behavior set (i.e. placing a lid over a flame in a double boiler), was taken the kitchen or barbeque area and repeated the above procedure. This video model, test procedure continued for three trials (one trial for each behavior). Video modeling continued until criteria were met (100% corrects for three sessions).

Reliability

Inter-observer agreement and procedural reliability data were collected simultaneously by the investigator and university student on 36.2% of all sessions across conditions. Inter-observer agreement was recorded for each step of the fire extinguishing task analyses during probe and video modeling sessions. The point-by-point method was used to calculate inter-observer agreement by dividing number of investigator and observer agreements by agreements plus disagreements and multiplying by 100. Inter-observer agreement ranged from 91.7% to 100% with a mean of 98.8%

The measured investigator behaviors were: (a) turning on and presenting the video model; (b) all materials present and in correct locations; (c) lighting the fire; and (d) deliv-

ery of reinforcement. Procedural reliability agreement was determined by dividing number of each observed investigator behaviors by the number of opportunities to emit that behavior, multiplied by 100 (Billingsley, White, & Munson, 1980). Procedural reliability ranged from 88.9% to 100% with a mean of 98.6%. One error occurred when the fire extinguisher was empty and another occurred when the flame went out prematurely in the skillet. Another error was recorded when the lid was left on top of the stove between trials.

Results

Figures 1-3 present performance data for three behaviors for extinguishing cooking related fires (scooping and releasing flour, putting on a lid, and using a fire extinguisher). Data indicate the effectiveness of the video modeling procedure in teaching three young adults with moderate intellectual disabilities who had generalized motor imitation skills to extinguish simulated fires and to generalize the behavior to novel examples of materials with flames. Performance levels, prior to video modeling instruction, remained at 0% for all students across all behaviors. When video modeling was introduced, an immediate increase in level of performance occurred with all three sets of behaviors for each student. Melissa was the only student who required more than three video modeling sessions, the minimum, to reach criteria on a set of behaviors. During use of the fire extinguisher she required five sessions to criteria. Two of the three students demonstrated 0% errors across the three fire extinguishing behaviors using video modeling, and reached criteria in a total of nine sessions, the minimum (3 sessions per behaviors). Melissa required 11 total instructional sessions (2 above minimum), and emitted 10.26% errors across the three sets of behaviors. She was errorless on the first two sets of behaviors, but on the third behavior (fire extinguisher) she emitted 21.3% errors. The most difficult step for her was placing her fingers correctly on the release valve. She committed errors on this step for 100% of the trials during the first video modeling session and for 33.3% of the trials during the second session.

Generalization

Results also support generalization to novel examples of cooking related fires without use of video modeling. After using video modeling to teach across three examples of a behavior, students were presented with a novel fire representing an example within the set of behaviors (Table 2). No video model was used with the generalization example of a fire. All students were able to generalize the three fire extinguishing behaviors across novel examples.

Maintenance

Each subsequent probe session, following acquisition of a set of fire extinguishing behaviors, evaluated student's ability to perform behaviors without immediately viewing the video model. During follow-up sessions all students maintained performance levels with both training and novel fire extinguishing behaviors from 22 to 52 days following video modeling.

Discussion

Results of the current study provide support for previous research using video technology to teach persons with intellectual disabilities (Ayres & Langone, 2005; Bellini & Akullian, 2007; Delano, 2007; Mechling, 2005). Results extended use of video technology to teach a difficult to simulate skill. Through use of video modeling, acquisition of fire extinguishing skills was immediate, generalized to novel examples, and levels of performance were maintained when video modeling was no longer present.

During the first probe condition, students expressed fear and misunderstandings for extinguishing fires. When presented with fires, students made comments such as: "It's getting bigger," "It's going to burn down the apartment," and "The fire will kill me." Jeff stated that he should, "blow on it" (to put out the fire), Eileen stated she should put water on the fire, and Melissa screamed during one probe trial. Following the last maintenance probe sessions, students were asked, "What would you do if there was a fire in the trash can?" All students stated that they would get a

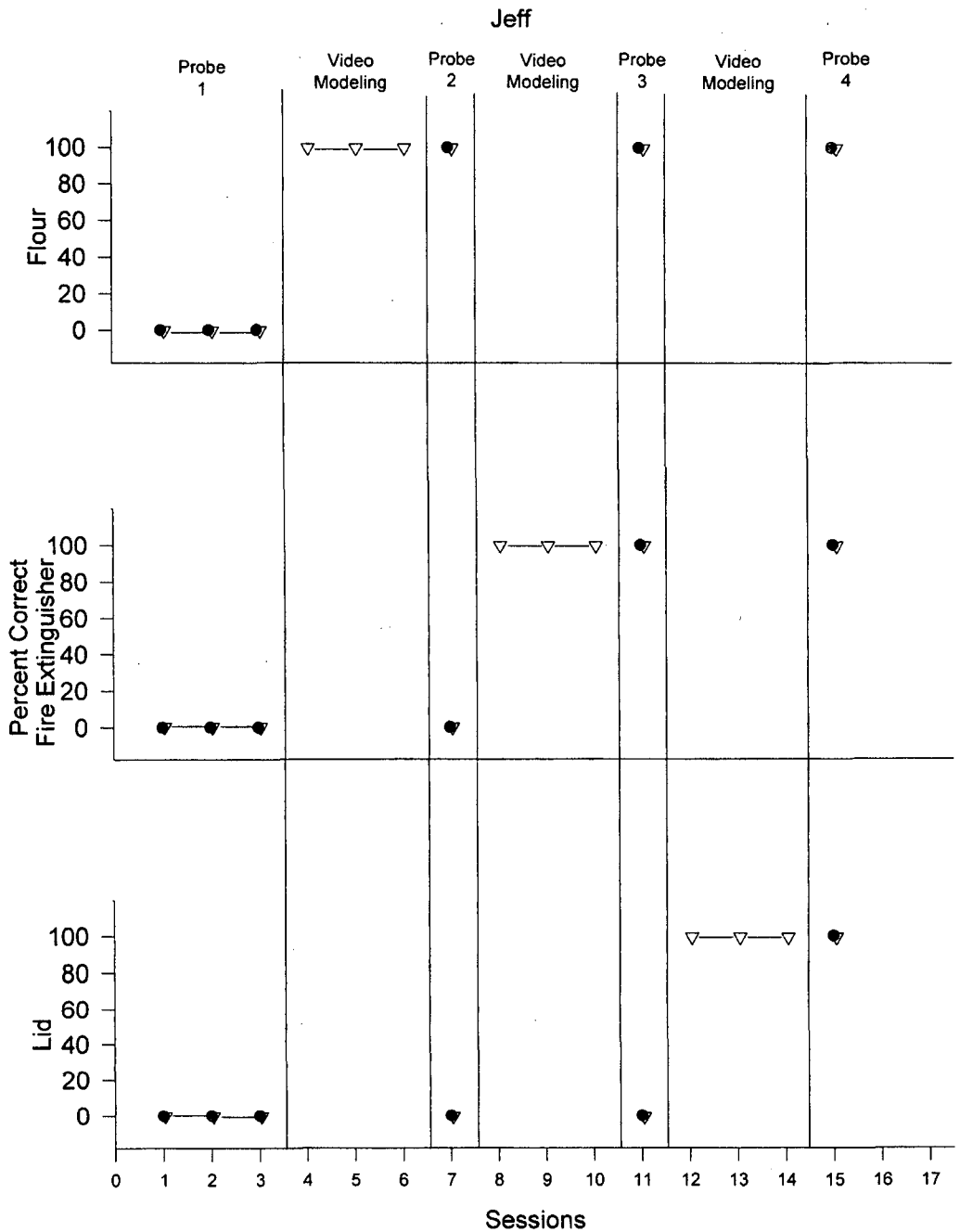


Figure 1. Graph of Jeff's performance, open triangles: fire extinguishing behaviors taught with video modeling; closed circles: novel fire extinguishing behaviors.

fire extinguisher. When asked, "What would you do if there was a fire on the stove?" all students stated they would put flour on it and

Jeff included that he would, "Put flour on it and it won't spread."

The current study also extends use of video

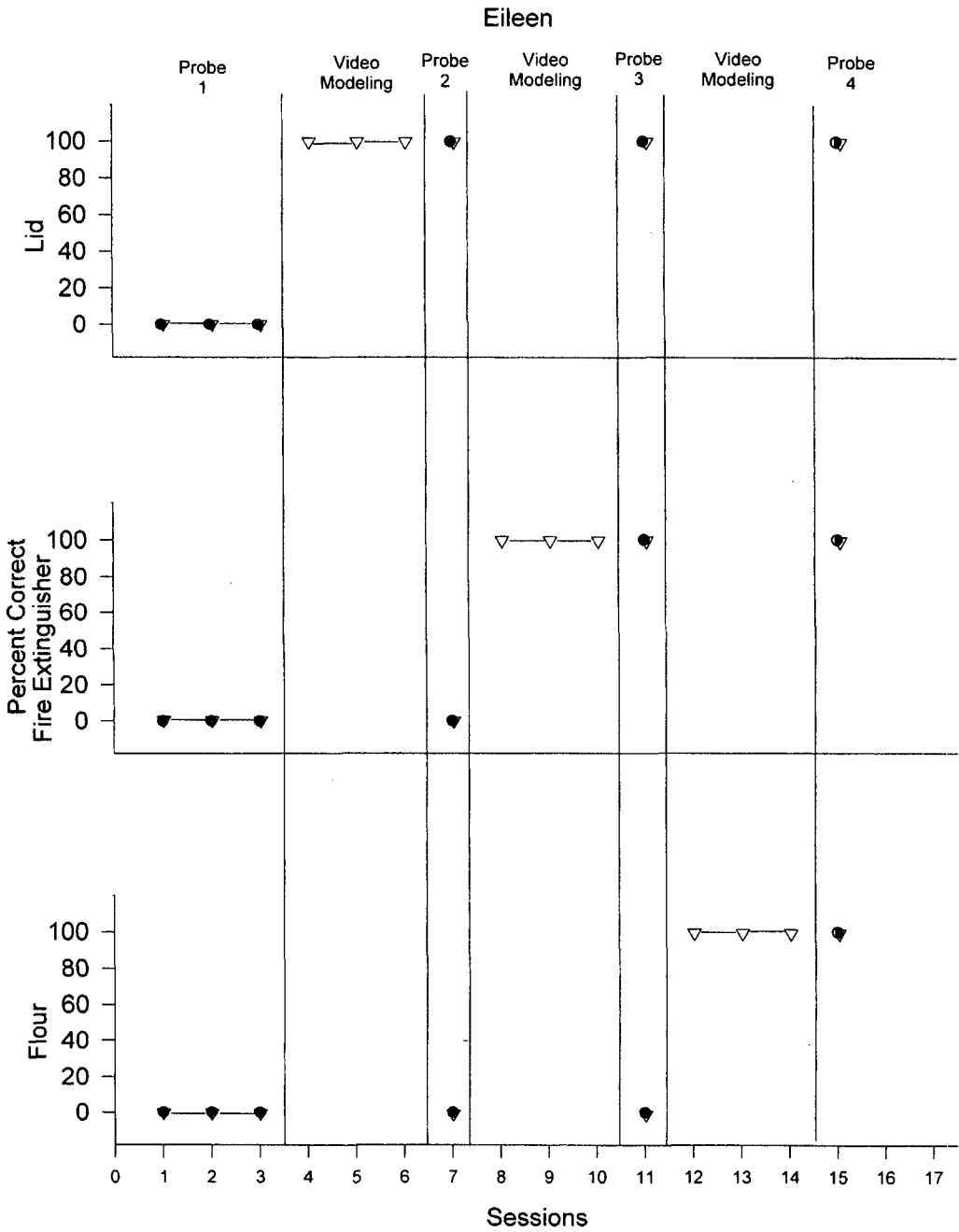


Figure 2. Graph of Eileen's performance, open triangles: fire extinguishing behaviors taught with video modeling; closed circles: novel fire extinguishing behaviors.

technology as a possible "priming" tool. Priming is a teaching method which allows a person to view or practice future events in order to increase the predictability of the events and

performance by the student (Schreibman, Whalen, & Stahmer, 2000; Zanolli, Daggett, & Adams, 1996). Priming has been presented using: a) real life peers to teach spontaneous

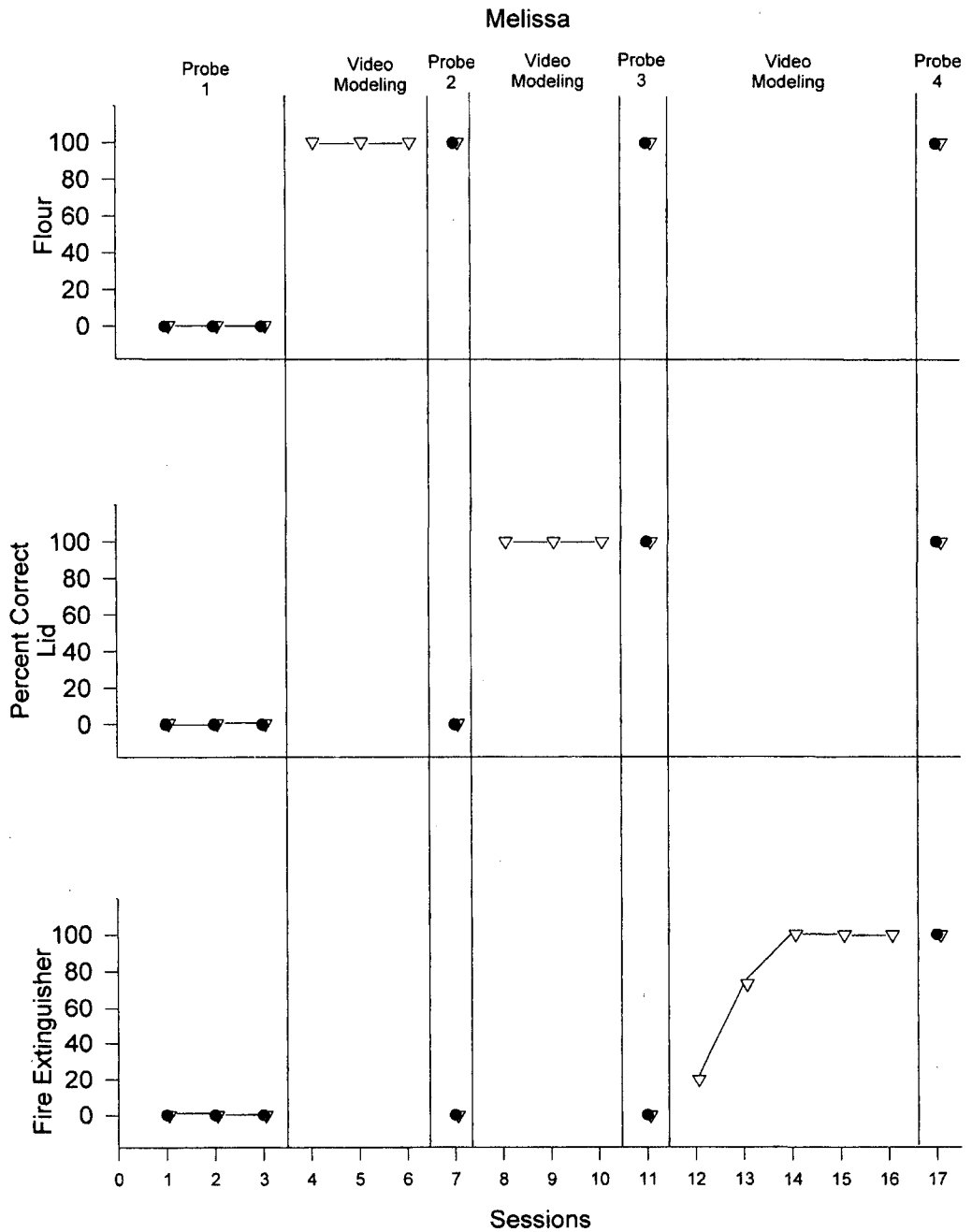


Figure 3. Graph of Melissa's performance, open triangles: fire extinguishing behaviors taught with video modeling; closed circles: novel fire extinguishing behaviors.

play initiations (Zanolli et al.); b) video models of transition scenarios (Schreibman et al.); c) video models of social story scenarios (Hagiwara & Myles, 1999); and d) toilet train-

ing videos (Bainbridge & Myles, 1999). Clees and Gast (1994) suggest that video taped models may be a means for providing safe models whereby students imitate the safe response

after viewing a video tape. Alcantara (1994) reports that videotapes provide a means to show students expected behaviors in advance of exposure to them in real life community situations. In the current study, students viewed a video model of a fire and the steps for extinguishing the fire prior to receiving simulated instruction with an actual fire. This procedure may provide a priming tool to expose students to unsafe or perhaps frightening situations prior to actual performance of the task.

Limitations of the study should be noted. First, due to ethical concerns and the potentially harmful nature of the tasks, the investigator remained in close proximity to the student at all times. The investigator presence may have therefore served as a discriminative stimulus for putting out the fire. Future research should evaluate student's ability to initiate and extinguish fires without the obvious presence of an adult while maintaining a safe learning environment. Second, although video modeling appeared to provide a realistic representation of unsafe scenarios and a means for students to recognize and extinguish cooking related fires, no generalization to actual fires (not set by the investigator) or untaught scenarios (i.e. burning pot holder) was included. Research supports the need for: effective teaching strategies to teach generalized safety skills (Collins and Griffen, 1996; Gast et al., 1992); teaching students to cope in a wide variety of situations; and use of multiple exemplars that will be found in natural environments (Mazzucchelli, 2001). Although use of multiple examples takes more teaching time, as students learn to respond to a class of stimuli rather than a single stimulus at one time (Collins, Schuster, et al., 1992), future studies should take care to provide a sufficient number of examples and to evaluate use to untaught scenarios.

Researchers and practitioners should be aware of the need for alternative assessment measures to verbal responses that may not adequately assess the ability of students to perform a skill in community settings (i.e. lure of stranger), yet ones they can use when they can not ethically subject students to some situations (scare them or put them in danger) (Haseltine and Miltenberger, 1990). Further, although results indicate that video modeling alone was effective in teaching extinguishing

of cooking related fires, the task analysis for each fire extinguishing behavior were relatively short (3-6 steps). Cannella-Malone et al. (2006) suggest that video modeling may be less effective when using longer duration video and found video prompting to be more effective for teaching multi-step tasks. Care should therefore be taken when interpreting the current results in relation to safety skill instruction of lengthier tasks.

Finally, although stringent criteria was included in the current study before termination of instruction (Collins & Griffen, 1996), it is recommended that acquisition, generalization, and maintenance levels be set high if the safety skill is to be functional (Collins, & Stinson, 1994-1995). Maintenance of skills that are not performed on a daily basis can be difficult (Spooner et al., 1989) yet, ramifications of a single error can be critical (Matson, 1980). Future investigations should extend follow-up sessions over several months to determine whether levels of performance can be maintained for skills infrequently encountered (i.e. those in emergencies) (Peterson, 1984) and video technology provides a potential means to present information as part of review and maintenance after time has elapsed (Tiong et al., 1992).

With the majority of safety skill studies being conducted in the 1980s, evaluation of technologies for teaching safety skills is a relatively unexplored area of research. Video-based instruction, interactive computer-based video programs, and virtual environments for simulation, may create new avenues to create real-life scenarios for teaching safety skills to persons with disabilities while maintaining a relatively safe learning environment. Future research should continue to evaluate the merits of these video-based programs for teaching difficult to simulate skills.

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