Computer-Based Video Instruction to Teach Students with Intellectual Disabilities to Verbally Respond to Questions and Make Purchases in Fast Food Restaurants

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Abstract: Computer-based video instruction (CBVI) was used to teach verbal responses to questions presented by cashiers and purchasing skills in fast food restaurants. A multiple probe design across participants was used to evaluate the effectiveness of CBVI. Instruction occurred through simulations of three fast food restaurants on the computer using video captions, still photographs, and voice recordings. Generalization and maintenance of skills were measured within the three community fast food restaurants. Results indicate that verbal responses to questions and fast food restaurant purchasing skills can be taught to students with moderate to severe intellectual disabilities through CBVI.

The importance of acquiring functional community skills to promote independence is supported in the field of special education. These include such skills as: shopping, purchasing, travel and mobility, banking, and participation in recreational activities. The ability to access restaurants, including fast food, “sit down,” and family restaurants, is also reported as functional and meaningful for person with disabilities (Snell & Brown, 2000; Storey, Bates, & Hanson, 1984; Westling & Fox, 2000) and is a skill that can be used repeatedly and across multiple environments. A number of important sub-skills are necessary when using a restaurant including: ordering, paying, eating, travel, safety, and social etiquette. A limited number of studies have evaluated instruction of these skills with the majority focusing on fast food establishments (Berg et al., 1989-90; Cooper & Browder, 1998; Marholin, O’Toole, Torchette, Berger, & Doyle, 1979; McDonnell, 1987; McDonnell & Ferguson, 1988; Rotholz, Berkowitz, & Burberry, 1989; Sowers & Powers, 1995; Van Den Pol et al., 1981). In addition to fast food establishments, skills for using family restaurants (Bates, Guvo, Miner, & Korabek, 2001), concession areas (Schleien, Certo, & Muccino, 1984; Test, Howell, Burkhart, & Beroth, 1993) and vending machines (Browder, Snell, & Wildonger, 1988; Nietupski, Clancy, & Christiansen, 1984; Sprague & Horner, 1984) have also been evaluated. Ordering procedures implemented in each of these settings have included use of verbally ordering (Sowers & Powers; Van Den Pol et al.), written instructions (Berg et al.), augmentative communication devices (Doss et al., 1991; Rothloz et al.), sign language (Rothloz et al.), and picture cues (Cooper & Browder; McDonnell). Methods to teach these skills have focused on teaching through community-based instruction (Cooper & Browder; Marholin et al.; McDonnell; Rotholz et al.; Schlein et al.; Storey et al.; Test et al.), simulation (Van Den Pol et al.) and a combination of simulation and community-based instruction (Bates et al.; Berg et al.; McDonnell et al.; McDonnell & Ferguson).

When using simulation (teaching outside of the natural environment where skills will be used), the importance of closely replicating actual stimuli and responses found in natural settings (Browning, White, Nave, & Barkin, 1986) and use of multiple teaching examples (Neef, Lensbower, Hockersmith, DePalma, & Gray, 1990) are reported as important for promoting generalization of skills. One means for creating simulations with realistic, life-like scenarios, is through video technology. Use of
video recordings can provide multiple teaching examples, replicate stimuli in the environment, and allow repetitive practice of skills. A number of skills have been taught using this technology with students with intellectual disabilities including: assembly tasks ((Martin, Mithaug, & Frazier, 1992); reading community words (Cuvo & Klatt, 1992); shopping (Haring, Breen, Weiner, Kennedy, & Bednersh, 1995; Kyhl, Alper, & Sinclair, 1999); appropriate behaviors (Brown & Middleton, 1998); self-help skills (Lasater & Brady, 1995; Norman, Collins, & Schuster, 2001); requests for assistance (Morgan & Salzberg, 1992); fire safety (Tiong, Blampied, & Le Grice, 1992); and other community skills such as mailing letters, cashing checks, and crossing streets (Branham, Collins, Schuster, & Kleinert, 1999). Further, by combining video technology and computer-based instruction, interactive learning environments can be generated through software programs such as Hyperstudio 4.0 (Roger Wagner Publishing, Inc.) and PowerPoint (Microsoft) which access video recordings saved on the computer, an external drive, or compressed onto CD-ROM. Computer-based, video instruction (CBVI) has recently been evaluated as a medium for teaching skills to students with intellectual disabilities. Skills include: purchasing using the “next dollar” strategy (Ayres & Langone, 2002) or a debit card (Mechling, Gast, & Barthold, 2003); grocery shopping (Mechling, 2004; Mechling & Gast, 2003; Mechling, Gast, & Langone, 2002); choice making (Ellerd, Morgan, & Salzberg, 2002); photograph recognition (Mechling & Langone, 2000); and shopping in a convenience store (Wissick, Lloyd, & Kinzie, 1992). Although a body of research exists that supports video technology to teach verbal skills to students with disabilities, including autism, emotional and behavior disorders, and learning disabilities (Buggey, Toombs, Gardener, & Cervetti, 1999; Charlop-Christy, Le, & Freeman, 2000; Sherer et al., 2001; Taylor, Levin, & Jasper, 1999; Thiemann & Goldstein, 2001; Wert & Neisworth, 2003) none were identified which included teaching verbal skills to students with moderate to severe intellectual disabilities (Buggey, 1995; Hitchcock, Dowrick, & Prater, 2003; Mechling, in press). The current study expanded on available research by evaluating use of CBVI to teach verbal skills to students with intellectual disabilities within context of functional activities.

The primary questions addressed were: 1. Would CBVI increase the percentage of correct verbal responses made by students following questions by cashiers in fast food restaurants? 2. Would CBVI increase the percentage of steps completed correctly by students using a fast food restaurant?

Method

Participants

Three students (two male and one female), ages 17 to 20 years participated in the study. Each was enrolled in a high school class for students with moderate to severe intellectual disabilities and was selected based on age, intellectual disability, need for community skills, and interest in using fast food restaurants. The school had a strong community-based program in which students traveled to community settings approximately three times per week using a city bus, school transportation, or walking. Instruction in the community focused on social skills, mobility, purchasing, and recreation. Students were screened for the following entry level skills prior to the study: (a) visual ability to make selections on the computer screen; (b) physical ability to make selections on the computer screen and complete steps at restaurants; (c) wait response of 3 s; (d) ability to make verbal requests; (e) generalized verbal imitation to make requests in response to computer audio prompts. Students were screened for verbal imitation using a commercial software program. All three students had received instruction using constant time delay (CTD) and computer-based instruction.

David was a 17-year, 2 month old male diagnosed with autism and a moderate intellectual disability (IQ 46, Stanford-Binet Intelligence Scale, Fourth Edition). He communicated verbally in short sentences, but needed wait time to process his thoughts. He frequently chose not to speak when questioned and rarely initiated conversation. In unfamiliar situations he would look at his teacher or an adult to communicate for him. He breathed heavily when in stressful situations and exhibited physical aggression when upset including throwing objects and destroy-
ing materials. He traveled in the community with assistance and was learning to pay for items independently. He was able to locate many departments within stores and read most prices. He was able to care for most of his personal hygiene needs and dress and undress himself. He enjoyed using the computer and was able to type his personal information. His needs included: (a) selecting preferred items to purchase; (b) completing toileting skills; (c) refraining from “dissecting” food (take apart and eat one item at a time); (d) increased task endurance; (e) appropriate reaction to stress; and (f) decreasing reliance on an adult to speak for him. At fast food restaurants he relied on an adult to place his order or to verbally prompt him to speak.

Joseph was a 20-year, 2 month old male diagnosed with Down syndrome and a moderate intellectual disability (IQ 36, Stanford-Binet Intelligence Scale, Fourth Edition). He spoke in short sentences, exhibited some articulation difficulties pronouncing blends, and frequently held his head down and “mumbled” unintelligibly. He demonstrated some aggressive behavior when upset (some classmates exhibited behaviors to increase the probability that he would become agitated), was involved in a behavior support plan, and took psychotropic medication to decrease aggression and disruptive behavior. He was described as being very “neat” and organized. He was able to wash, dry, fold, and iron clothing with minimal assistance. He used most kitchen appliances with assistance and enjoyed preparing foods for himself using visual cues for settings and recipes. He also enjoyed talking to friends and family on the telephone and watching sporting events on television and in the community. His needs included: (a) purchasing in stores; (b) making bank deposits; (c) carrying a wallet; (d) telling time; (e) recognizing coins; and (f) using digital appliances. In fast food restaurants he relied on pointing to choices on the display board and answering, “yes”/“no” to questions from the cashier or looking at an adult for assistance. On occasions he would also say a number such as “one” while pointing to the display board.

Hanna was a 17-year, 1 month old female diagnosed with partial agenesis of the corpus callosum with associated lipoma of the corpus callosum and a moderate intellectual disability (IQ 40, WISC-III). She was able to speak in complete sentences, however, her verbalizations were often inappropriate for the context or social situation. She would also make inappropriate exclamations such as “ouch,” giggle, or obsessively talk about a topic. She was described as being both pleasant and cooperative and enjoyed social interactions. She was able to write her first name in manuscript, recognize letters of the alphabet and some basic sight words. She could count to 20 with manipulatives and write numerals 1-5. Hanna was able to complete most personal management skills including dressing and undressing, but needed assistance with grooming. Her needs included: (a) walking independently without reminders and without leaning on walls and furniture; (b) using a napkin; (c) setting a table; (d) carrying a tray; (e) throwing items away; (f) refraining from staring; (g) simple food preparation; (h) using a telephone; and (i) operation of dials for cooking. In fast food restaurants she stood in front of the cashier and giggled, looked to an adult for prompting, failed to order, or ordered inappropriate items for the setting.

**Settings and Instructional Arrangements**

All instructional sessions were implemented using the computer-based video program. Sessions were conducted individually in a secluded room in the library of the students’ high school. Generalization probe sessions were conducted in three community fast-food restaurants: McDonald’s, Wendy’s, and Hardee’s. The restaurant chains were chosen due to their frequency of use by participants and range of stimulus and response requirements (Table 1). In addition, the particular store within each chain was selected due to its proximity to the students’ high school. Generalization sessions in the community were conducted before the lunch rush hour (10:30-11:00 a.m.).

During instructional sessions, a laptop computer with touch screen was placed on a table in front of the student. The instructor sat to the right and slightly behind the student with a clipboard to record data, provide intermittent reinforcement and error correction, and to advance the computer program following verbal response by students. A digital video camera was positioned on an adjacent table during reliability data collection sessions.
**Materials and Equipment**

*Equipment.* A Dell Latitude laptop computer with zip drive and CD player was used to deliver instruction along with a *TouchWindow* (Edmark Corporation) for direct selection on the computer screen. The software program, *Hyperstudio 4.0* (Roger Wagner Publishing, Inc.) was used to create and deliver the multimedia instructional programs. Video captions were made using a *Sony* digital video camera and still photographs of items in the fast food restaurant were made using a *Sony* digital camera. Video recordings were burned to a compact disk, downloaded to the computer hard drive, and then accessed through the *Hyperstudio 4.0* program. Digital photographs were stored directly in *Hyperstudio 4.0*, which was used to create a visual simulation of ordering at a fast food restaurant through use of these still photographs and video recordings. Computer-based video programs were made for each fast food restaurant. Programs were individualized for each participant by including photographs of the student eating at the restaurant or by varying food orders based on student’s individual preferences, resulting in two different computer-based video programs developed for each student. Food and drink preferences were determined before the study by asking students, parents, and teachers.

Students paid for food orders by giving the cashier a prespecified amount of money ($10 or $20 bill) that was large enough to pay for the order. The bill was placed in a wallet with a zipper closure. During CBVI, students responded to the video simulation and computer prompt by removing the single bill from the wallet and placing it on the table. Change from the cashier during generalization sessions or the instructor during CBVI was placed back into the wallet by the student.

*Video Models.* Video recordings were made depicting the entire process for verbally ordering and using a fast food restaurant. Video recordings served as models and specific segments were delivered by the computer-based program as stimuli to elicit a response by the student or following a student response. An adult familiar to the students and actual employees at the restaurants appeared in video recordings. Students viewed video segments of the adult model performing steps they would later perform in the restaurant or the restaurant cashier making verbal requests (e.g. “Is this for here or to go?”) and performing tasks (stimuli) that the student would respond to in the restaurant (e.g. giving change).

### General Procedures

Students received individual instruction using a 3 s CTD procedure and computer-based video program. Instruction occurred 1-2 times per day (morning and/or afternoon), 4-5 days per week. Each session lasted approximately 15 min, with delivery of 3 trials (1 trial per restaurant) in total task format. Criteria was reached when each student performed 100% unprompted corrects for 4 of 5 trials.

### TABLE 1

| Task Analysis for Verbal and Motor Response Requirements Across Three Restaurants |
|---------------------------------|----------------|----------------|
| McDonald’s                      | Hardee’s       | Wendy’s        |
| “sandwich name”                 | “sandwich name”| “here”         |
| “small french fry”              | “small french fry”|              |
| “small” “name of drink”         | “small” “name of drink”|          |
| “here”                          | “here”         |                |
| unzip wallet and give bill      | unzip wallet and give bill |          |
| take change, put in wallet      | take change, put in wallet |        |
| obtain tray                     | obtain tray    |                |
| obtain drink                    | obtain drink   |                |
| obtain napkin                   | obtain napkin  |                |
| locate table and sit down       | locate table and sit down |       |
| throw away trash                |                | throw away trash |

50 / Education and Training in Developmental Disabilities-March 2005
Prior to the first student receiving CBVI, generalization probe measures were taken one time at each of the three restaurants to determine each student’s ability to verbally place orders and to complete the steps for using a fast food restaurant. In addition, probe data were collected at each fast food restaurant immediately prior to the second and third student receiving CBVI. Students traveled together to each of the fast food establishments. Upon entering the restaurant, students were seated at a back table farthest away from the counter to prevent modeling responses. The instructor then told the first student, “It’s your turn to order your food.” The instructor waited 3 s for the student to initiate a response. Table 2 describes stimulus and response requirements for one restaurant. Students were scored on the following verbal steps: (a) say, “here” (to indicate location for consuming items); (b) say name of sandwich; (c) say “small french fries”; and (d) say “small” and the name of the drink. Students were also scored on the following motor steps: (a) unzip wallet and give bill to cashier; (b) take change and place in wallet; (c) pick up tray; (d) walk to and obtain drink from drink machine; (e) walk to and obtain a napkin; (f) locate a table and sit down; and (g) place trash in trash can.

Students could perform each step correctly, incorrectly, or not respond. Incorrect verbal responses included requesting an item not on the menu, requesting a wrong size, requesting an item not identified as preferred, pointing to the menu display, or saying “to go.” Incorrect motor responses were obtaining an item or completing a step out of sequence, and obtaining too many or incorrect items. A no response was defined as failing to verbalize, or failing to obtain an item or complete a step within 3 s of completing a prior step. A correct response (unprompted correct) was defined as completing a motor response within 3 s of completing the prior step or verbally responding within 3 s of a cashier’s question. Incorrect or no verbal responses resulted in the instructor holding up a 3” × 5” index card with the correct written response for the cashier to read. Incorrect or no motor response resulted in skipping the step (e.g., not obtaining a napkin) or the instructor performing the step out of view of the student (e.g., paying for item, obtaining a drink).

Students received non-specific verbal praise and pats on the back on the back on the average of every third step (VR3) for general attending and attempts to perform the task. Students received natural reinforcement of eating and drinking items obtained at the restaurant.

Following instruction with the computer-based video program, students returned to the fast food restaurants and were evaluated on their ability to generalize verbal responding and completing steps for using the restaurant. Students who reached criteria with the computer-based video program and completed the generalization condition were evaluated for skill maintenance in subsequent probe sessions at fast food restaurants.

Computer-Based Video Instruction (CBVI)

CBVI was conducted with the first student immediately following the first generalization probe condition. Each session began with the instructor gaining the attention of the student and delivering a task direction such as, “Let’s practice going to Wendy’s.” Following the task direction, the computer-based video program began with a video segment of the adult model entering the restaurant and walking to the counter. A video segment then showed the employee asking a question such as, “May I take your order?” (Table 2) followed by a still photograph of the employee “waiting for the answer.” Intervention began with a 0 s delay. Each student remained at 0 s until he/she had 100% correct wait responses (correct responses after the computer or instructor prompt) for three trials. For steps requiring a verbal response, the controlling prompt was a photograph of the correct answer paired with the correct verbal response (e.g., photograph of student eating at the restaurant paired with a recorded voice saying, “here” or photographs of food items paired with a recorded voice saying the item names) (Figure 1). Correct verbal responses, after the computer prompt, were defined as the student saying: (a) say, “here” (to indicate location for consuming items); (b) say name of sandwich; (c) say “small french fries”; and (d) say “small” and the name of the drink. Students were taught to say a generic name for a sandwich (e.g., “cheeseburger”), which could be ap-
TABLE 2

Stimulus, Response Requirements, and Controlling Prompt of Computer-Based Video Program Using Hyperstudio 4.0 for Hardee’s Restaurant and David’s Response

<table>
<thead>
<tr>
<th>Stimulus (video)</th>
<th>Stimulus (photo)</th>
<th>Response</th>
<th>Controlling Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult model enters restaurant and walks to counter</td>
<td>Cashier waiting for response</td>
<td>“Cheeseburger, small french fry, small Sprite”</td>
<td>3 photos: cheeseburger, small French fry, small Sprite with Hardee’s wrappers Recording: “cheeseburger, small french fry, small Sprite”</td>
</tr>
<tr>
<td>Cashier says, “Hi, can I help you?”</td>
<td>Cashier waiting for response</td>
<td>“here”</td>
<td>Photo of David eating at Hardee’s Recording: “here”</td>
</tr>
<tr>
<td>Cashier says, “Is that for here or to go?”</td>
<td>Cashier waiting for response</td>
<td>Unzip wallet and place bill on table</td>
<td>Video model of adult giving bill to cashier</td>
</tr>
<tr>
<td>Cashier gives change to adult model</td>
<td></td>
<td>Take change and place in wallet</td>
<td>Video model of adult taking change</td>
</tr>
<tr>
<td>Instructor gives change to student</td>
<td>Napkin dispenser, Table with chairs, Tray on counter</td>
<td>Touch photo of tray</td>
<td>Photos remain on screen</td>
</tr>
<tr>
<td>Adult model picks up tray</td>
<td>Napkin dispenser, Table with chairs, Drink machine, Napkin dispenser</td>
<td>Touch photo of drink machine</td>
<td>Photos remain on screen</td>
</tr>
<tr>
<td>Adult model walks to drink machine, obtains: ice, Sprite, straw</td>
<td>Napkin dispenser, Trash can, Table with chairs</td>
<td>Touch photo of napkin dispenser</td>
<td>Photos remain on screen</td>
</tr>
<tr>
<td>Places lid on cup</td>
<td>Drink dispenser, Trash can, Table with chairs</td>
<td>Touch photo of table and chairs</td>
<td>Photos remain on screen</td>
</tr>
<tr>
<td>Adult model walks to napkin dispenser pulls out napkin, places napkin on tray</td>
<td>Napkin dispenser, Trash can, Table with chairs</td>
<td>Touch photo of trash can</td>
<td>Photos remain on screen</td>
</tr>
<tr>
<td>Adult model walks to table, pulls out chair and sits down</td>
<td>Napkin dispenser, Trash can, Table with chairs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult model walks to trash can, puts trash in can, places tray on top of trash can, walks out of restaurant</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

plied to any restaurant, rather than a specific name such as “Big Mac.” For drink and french fry orders, students were taught to say “small” rather than “regular,” “medium,” or “biggie.” For steps requiring a motor response, the controlling prompt was the instructor pointing to the correct photograph representing the correct step in the sequence of the task analysis (pick up tray, obtain drink, obtain napkin, sit at table, or throw away trash); or demonstrat-
ing the step (removing $10 or $20 bill from the wallet and placing it on the table and taking change and putting it in the wallet). Correct motor responses were defined as: (a) touching a correct photograph on the computer screen to indicate correct step in sequence of the task analysis (pick up tray, obtain drink, obtain napkin, sit at table, and throw away trash); (b) removing $10 or $20 bill from the wallet and placing it on the table; and (c) taking change from instructor and putting it in the wallet. Following 0 s delay trials, CTD trials implementing a 3 s delay interval were provided after the question was delivered by the cashier or completion of the previous step. Using the CTD procedure, a student response was recorded as: (a) unprompted correct (initiating and completing a correct verbal or motor response within 3 s of a question or completion of a previous step and before delivery of the controlling prompt); (b) unprompted incorrect (incorrect verbal or motor response within 3 s of a question or previous step; (c) prompted correct (correct verbal or motor response after the computer or instructor prompt); (d) prompted incorrect (incorrect verbal or motor response after the computer or instructor prompt); and (e) no response (failure to initiate a verbal or motor response within 3 s of the computer or instructor prompt). An unprompted or prompted correct verbal response was followed by the instructor advancing the computer-based program to the next video segment. Unprompted incorrect verbal response or no response was followed by the instructor advancing the program to show the controlling prompt (e.g., photograph of food items paired with the correct verbal response) (Table 2) (Figure 1). Prompted incorrect verbal response or no response after the prompt was followed by the instructor saying the correct response. For steps requiring a motor response, students were required to interact

Figure 1. Hyperstudio “card” with controlling prompt of photographs and verbal recording of item names. Correct and incorrect buttons advanced the program by the instructor dependent on student response.
with the computer-based program by touching photographs on the computer screen using the TouchWindow. Three photographs appeared across the bottom of the screen and the instructor asked, “What do you do next?” (Figure 2). An unprompted or prompted correct response activated an invisible “button” positioned on the photograph which advanced the computer program to show a video segment corresponding to the photograph (e.g., selection of napkin dispenser photograph followed by video segment of adult model obtaining a napkin at the fast food restaurant) (Table 2). An unprompted incorrect motor response or no response resulted in the photographs remaining on the screen. If the student made a prompted incorrect response or no response after the computer prompt, the instructor pointed to the correct photograph.

Experimental Design

A multiple probe design across three students (Tawney & Gast, 1984) was used to evaluate effectiveness of the computer-based video program to teach verbal responses and use of fast food restaurants. Verbal and motor skills for using three fast food restaurants were taught using constant time delay (CTD) and the computer-based video program. Experimental conditions included generalization probes in the natural environment (three fast food restaurants) prior to and following instruction, CBVI, and maintenance probes across the three fast food restaurants. Prior to instruction, probe measurements were conducted for all three restaurants. Probe measures were followed by CBVI for the first student. When criteria (100% unprompted corrects, 4 of 5 trials) was reached for a particular student, generalization probe measures were again collected at the three restaurants followed by instruction for the second student. Subsequent generalization probe sessions served as maintenance checks for each student. This generalization probe and CBVI format continued until each student reached criteria.

Reliability Measures

Interobserver agreement and procedural reliability data were collected simultaneously on 100% of generalization probe and maintenance sessions and 33% of all CTD, CBVI sessions. During probe sessions in the community, one instructor and one reliability observer were present, whereas videotapes were made during CBVI sessions and independently evaluated by the reliability observer. Interobserver agreement was reported for each step of the task analysis using the point-by-point method in which number of instructor and observer agreements was divided by number of agreements plus disagreements and multiplied by 100. Procedural reliability agreement was determined by dividing number of observed instructor behaviors by number of opportunities

Figure 2. Hyperstudio “card” with photographs selected by student to indicate correct motor response in sequence of the task analysis.
to emit the behaviors, multiplied by 100 (Billingsley, White, & Munson, 1980).

Results

Reliability

Mean interobserver agreement was 99.4% across all participants and conditions, 100% for generalizations sessions in fast food restaurants, and 99.2% during CBVI (range = 81.8-100). Disagreement during CBVI occurred due to Joseph mumbling his response on two occasions resulting in difficulty interpreting his response. Mean procedural agreement was 98.1% across all participants and conditions, 97.4% for generalization sessions in fast food restaurants (range = 83.3-100) and 98.2% during CBVI (range = 66.7-100). Procedural disagreement during CBVI was due to the computer program failing to advance when the student touched the correct photograph on the screen. The instructor manually advanced the program with the computer mouse on these occasions. Disagreement during generalization probe conditions at the restaurants was attributed to the cashiers failing to direct questions to students or verbally prompting student answers.

Effectiveness

Figure 3 shows the effectiveness of the computer-based video program in teaching students to verbally respond to questions and make purchases in fast food restaurants. Data are reported for generalization probe sessions in each of the three fast food establishments, instruction with CBVI, and maintenance of skills. Data are separated into verbal and motor responses. Closed circles represent the percentage of correct verbal responses for each trial during generalization and the mean response per session during CBVI. Results indicate increased correct verbal responses for each student immediately following CBVI. Prior to CBVI, none of the students verbally responded more than 25% correct on any trial. Correct verbal responding was 0% for David and Joseph. Hanna randomly ordered items such as “hot dog,” “cheese sandwich,” and “kids meal” or failed to order an item, while Joseph pointed to the display board and David did not attempt to make a verbal response. Following CBVI, mean correct verbal responding increased to 100% for David, 75% for Joseph and Hanna. Furthermore, students maintained their ability to verbally respond correctly in the fast food restaurants. David performed 100% mean correct verbal responses after 30 and 56 days while Joseph averaged 91.7% correct after 26 days and Hanna averaged 75% correct after 17 days. David reverted back to pointing to the display during one session and failed to answer “here” during two sessions following CBVI while Hanna did not order a chicken sandwich as taught during CBVI, but rather ordered a cheeseburger during each of the generalization and maintenance sessions in the actual fast food restaurants.

Due to previous exposure, each student was able to correctly perform some motor skills in the fast food restaurant during baseline probe prior to CBVI. Each was able to consistently locate a table to sit down and Joseph was able to consistently take his change, take his tray, and obtain a drink from the drink machine. David’s mean performance was 35% correct during the initial probe sessions while Joseph’s mean performance was 70% correct and Hanna’s mean performance was 55% correct. Each student demonstrated an increase in his/her ability to perform the motor steps correctly immediately following CBVI. David maintained his ability to perform motor steps after 30 days, but failed to obtain a napkin 56 days following CBVI. Likewise, Joseph only obtained a napkin during one session and Hanna never obtained a napkin in the restaurant.

Efficiency

Measures of efficiency were calculated for number of instructional trials to criteria with CBVI. David needed the least number of instructional trials (16) while Joseph needed 37 trials and Hanna needed 41. Joseph demonstrated the greatest difficulty acquiring the sequence of motor skills while Hanna demonstrated more difficulty learning verbal responses. An adaptation to the original computer-based video program was needed for each student. Following the question, “May I take your order?” or “How may I help you?” students failed to initiate a verbal response prior to delivery of the controlling prompt by
the computer. It appeared that students did not understand that they were expected to respond to the question prior to seeing the screen with photographs of three items paired with the verbal recording naming each item. After 12 trials for each student, a verbal direction, “What do you say?” was inserted by the instructor following the cashier’s question. Figure 3 indicates an immediate increase in percentage of correct responses for each student following the adaptation (indicated by two slash marks on the graph).

Number of errors after the prompt was also calculated. During 0 s delay, no errors oc-
curred after the prompt. During 3 s delay, 3.5% errors were committed after the prompt for David, 7.1% for Hannah, and 11.3% for Joseph. Joseph had difficulty responding to the controlling prompt for motor responses while Hannah’s errors occurred following the controlling prompt for verbal responses.

Discussion

Results indicate that verbal skills and fast food restaurant purchasing skills can be taught to students with moderate to severe intellectual disabilities through CBVI. Each student learned to respond correctly to requests of cashiers and complete motor skills for obtaining items across three restaurants. Although the study supports the computer-based, video program as an intervention for teaching verbal skills, these skills were limited to ordering three generic food and drink items and answering the location for consuming items (“here”). Generalization sessions in the community, following CBVI, demonstrated the need for additional verbal skills, including: rejecting items incorrectly suggested by the cashier; canceling part of an order; and naming specific items. In addition to extending students’ verbal repertoire, future research should continue to evaluate use of computer-based instruction as a “stand alone” means to deliver instruction. Using a constant time delay procedure, the current computer program delivered the controlling prompt and for motor responses, the computer program independently advanced the program dependent on student responses. However, during verbal responses, the instructor advanced the program to a subsequent screen, which then provided reinforcement to the response or delivered the controlling prompt. To increase the usefulness of computer-based programs to deliver instruction, features such as speech recognition may be incorporated and evaluated in future research.

Further, some motor skills may not be as effectively taught using observation alone through computer-based instruction. For example, only David was able to locate a napkin following CBVI. Unlike paying for items and putting change in the wallet, the computer-based, video program required students to touch a photograph on the screen to indicate which motor skill to perform next, however, students did not actually perform the motor task during CBVI. Future research may examine use of simulation plus community-based instruction to teach skills requiring specific motor responses not readily replicated through computer-based simulation.

In addition, future research should evaluate CBVI to teach skills across more formal or complex restaurants. Additional skills such as social behaviors (e.g., using a napkin) and social communication skills (e.g., appropriately entering a conversation) should be included thereby teaching a chain of independent skills needed within restaurant and community settings.

When faced with limited ability to travel to community settings to teach skills, and the need for repetitive practice, presentation of instruction through multimedia programs appears to be an effective means for replicating life-like scenarios within a simulated, classroom environment. Of interest will be the application of more advanced technology features as they become more readily available and incorporated into special education programs.

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