Behavioral Interventions
Behav. Intervent. (2015)
Published online in Wiley Online Library
(wileyonlinelibrary.com) **DOI**: 10.1002/bin.1421

TRAINING STAFF TO IMPLEMENT A PAIRED-STIMULUS PREFERENCE ASSESSMENT USING VIDEO MODELING WITH VOICEOVER INSTRUCTION

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A key component of successful early intervention programming is the identification of stimuli that may function as reinforcers. One common direct method used by behavior analysts to determine preference is the paired-stimulus (PS) preference assessment. Although effective at identifying potential reinforcers, the PS procedure is only useful if staff are trained on the steps necessary to conduct the assessment. The current study examined the effectiveness of video modeling with voiceover instruction to train staff to conduct a PS preference assessment. Three staff were trained to do the following: (i) identify items to use during the PS assessment; (ii) conduct a PS preference assessment with a simulated consumer (i.e., an adult acting as a child); and (iii) score and interpret the results of the PS assessment. Generalization was assessed with an actual consumer (i.e., a child with an autism spectrum disorder). The results demonstrated that video modeling was effective, and staff demonstrated high levels of integrity up to 2 months following training. These results support a growing body of literature supporting the use of video modeling as an approach to training. Copyright © 2015 John Wiley & Sons, Ltd.

Survey data suggest that approximately 89% of Board Certified Behavior Analysts and Board Certified Assistant Behavior Analysts regularly use at least one direct measure of preference in their clinical work (Graff & Karsten, 2012a). Behavior analysts also overwhelmingly report that the paired-stimulus (PS) preference assessment (Fisher et al., 1992) is the most commonly used direct method of determining preference as 70% of respondents reported using this measure (Graff & Karsten, 2012a). As these data suggest that the PS assessment is the most commonly

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This article is based on a thesis submitted by the first author, under the supervision of the second author, at Caldwell University in partial fulfillment for the requirements of the Master of Arts in Applied Behavior Analysis.

used direct measure of preference in clinical settings, the current study focused on the PS preference assessment.

First described by Fisher et al. (1992), the PS assessment consists of presenting a group of stimuli in pairs to an individual. When presented with a pair of stimuli, the individual is provided the opportunity to select one of the stimuli. The individual is then provided a brief period of time (e.g., 5 s) to interact with or consume the selected stimulus. Trials continue in this fashion until each stimulus is paired with every other stimulus at least once. A preference hierarchy is created by ranking each stimulus based on the percentage of trials that a stimulus was selected when presented.

Although effective at identifying potential reinforcers, the PS procedure is only useful if staff are trained on the steps necessary to conduct the assessment. We were able to identify nine studies that have evaluated procedures to train staff to implement the PS (Fisher et al., 1992), brief PS (Mason, McGee, Farmer-Dougan, & Risley, 1989), single-stimulus (Pace, Ivancic, Edwards, Iwata, & Page, 1985), multiple-stimulus without replacement (MSWO; Carr, Nicolson, & Higbee, 2000; DeLeon & Iwata, 1996), and/or free operant (Roane, Vollmer, Ringdahl, & Marcus, 1998) preference assessments (Bishop & Kenzer, 2012; Graff & Karsten, 2012b; Lavie & Sturmey, 2002; Lerman, Tetreault, Hovanetz, Strobel, & Garro, 2008; Lerman, Vorndran, Addison, & Kuhn, 2004; Roscoe, Fisher, Glover, & Volkert, 2006; Roscoe & Fisher, 2008; Pence, St. Peter, & Tetreault, 2012; Weldy, Rapp, & Capocasa, 2014).

The majority of previous studies involved training staff to implement preference assessments using approaches that required the presence of a staff trainer. These training methods often included antecedent-based and consequence-based approaches (Bishop & Kenzer, 2012; Lavie & Sturmey, 2002; Lerman et al., 2004; Lerman et al., 2008; Pence et al., 2012; Roscoe & Fisher, 2008; Roscoe et al., 2006). It seems worthwhile to explore alternative training methods that do not require the presence of a staff trainer as these methods may be more practical to implement in clinical settings. One potential option is a self-instructional training package. Graff and Karsten (2012b) trained 11 teachers to successfully conduct a PS or MSWO assessment using a self-instruction package (i.e., a detailed data sheet and step-by-step instructions written without technical jargon and supplemented with diagrams). One potential limitation of the self-instruction package is that staff must demonstrate a certain level of reading comprehension. Although Graff and Karsten did not specify the readability level of their enhanced written instructions, it is possible that other staff trainees may not have the skills necessary to complete the self-instruction package.

Another training option that does not involve the presence of a staff trainer or reliance on the reading skills of staff trainees is video modeling (VM) with voiceover

DOI: 10.1002/bin

instruction (VMVO). VMVO involves showing individuals a video representation of a target behavior that they should imitate and demonstrate in the appropriate context (Catania, Almeida, Liu–Constant, & Reed, 2009). In addition, voiceover instruction is provided to highlight specific aspects of the video. VMVO has been used to successfully train staff to implement problem-solving interventions (Collins, Higbee, & Salzberg, 2009) and discrete-trial instruction (Catania et al., 2009; Vladescu, Carroll, Paden, & Kodak, 2012). Previous research has used VMVO as a component of a training package to train staff to implement preference assessments (Bishop & Kenzer, 2012; Lavie & Sturmey, 2002). More recently, Weldy et al. (2014) successfully trained nine staff to implement a brief MSWO and brief free operant assessments using VMVO in a group setting. Weldy et al. created a PowerPoint presentation consisting of voiceover instruction and video clips that were approximately 30 min in duration. All participants demonstrated mastery-level responding within two sessions for each preference assessment trained.

To date, however, no study has evaluated the use of VMVO to train staff to conduct a PS assessment. Additionally, no previous studies have trained staff to select items to use during a preference assessment and only five (Bishop & Kenzer, 2012; Graff & Karsten, 2012b; Roscoe & Fisher, 2008; Roscoe et al., 2006; Weldy et al., 2014) included training on summarizing and/or interpreting preference assessment data. Therefore, the purposes of the current study were to extend previous research through the following: (a) evaluating the effectiveness of VMVO to train staff to select items to use during a PS assessment, implement a PS assessment, and summarize/interpret PS assessment data; (b) assessing whether the skills necessary to implement a PS assessment generalize to implementing the procedure with an actual consumer from an early intervention clinic; and (c) assessing whether these skills maintained up to 2 months following training. The current study also collected multiple measures of social validity to evaluate the acceptability of the procedures and outcomes.

METHOD

Participants

Elisa, Maya, and Victoire were three female undergraduate students who worked at a private center for individuals with autism and who served as participants (hereafter referred to as staff trainees). The staff trainees ranged in age from 21 to 25 years old and had 8 to 84 months experience working with individuals with autism. This experience included observation and training related to assessment and intervention technique based on the principles of applied behavior analysis (although specific procedures observed and trained on were not documented, however, some prior

DOI: 10.1002/bin

exposure to preference assessment is likely). Each staff trainee completed a pretest (available from second author) consisting of 19 multiple-choice questions about preference assessments. Individuals who performed at 50% or lower were considered for participation ($M = 39\%$; range, 32% to 47%). Informed consent was obtained prior to participation.

The first author served as the simulated consumer during baseline, training, and maintenance sessions and as the actual instructor during the generalization sessions. Twenty-two other staff members (7 men and 15 women) served as simulated instructors during baseline, training, and maintenance sessions. The sole role of the actual and simulated instructors was to complete the survey related to the items to be used during the PS assessment.

Two children with an autism spectrum disorder served as actual consumers during generalization sessions. Child 1 was a 6-year-old girl and Child 2 was a 5-year-old. Both actual consumers had a history of participating in preference assessments. Both individuals were selected to participate in the current study because on their diagnosis, availability, and the appropriateness of the PS preference assessment given their characteristics (e.g., neither consumer demonstrated a position bias). The actual consumers' caregivers signed consent forms for their children to participate in the study and for use of their data for the purposes of presentations and publications.

Setting and Materials

All sessions were conducted in a private autism center at a suburban university. Each room contained a table, chairs, and the materials (e.g., data sheets, writing utensil, and calculator) necessary for the session. The simulated instructor and the simulated client were seated on one side of the table, and the materials necessary to conduct the assessment were placed on the other side of the table. Twenty-four toys were present during sessions with simulated consumers. These toys consisted of four exemplars drawn from six categories (vehicles, books, dolls/action figures, toys that produced sound or light, toys used to build structures, and toys with different textures). Three lists of stimuli consisting of one toy from each category were created and used during sessions with simulated consumers. One list was randomly selected prior to each session and was used to complete the instructor survey. In addition to the toys from the three lists, an additional six toys (one toy from each category) were present in the room. These toys served as distracter toys and should have never been selected for use during a preference assessment administration. Additionally, another group of six toys (one toy from each category) was used in the training video. These toys were never present during sessions.

During sessions with consumers, actual instructors generated lists of toys or edibles specific to each consumer. The toys used during sessions with simulated

DOI: 10.1002/bin

consumers were not present during sessions with consumers. The rooms also contained a video camera that recorded all sessions and a laptop that was used to show the video during the training phase.

Design and Measurement

A concurrent multiple-baseline-across-participants design was used to evaluate the effectiveness of VMVO to train staff to implement a PS preference assessment. Data for each session were collected from video using data sheets created for the current study. The dependent variable was the percentage of step opportunities implemented correctly by the staff trainees on the 18-step task analysis (see Appendix A for the lists of steps and the definitions of each step for the PS preference assessment using toy and edibles). For each session, the percentage of opportunities implemented correctly was calculated by dividing the number of opportunities completed correctly by the number of total opportunities and multiplying by 100.

The task analyses were created based on the procedures described by Fisher et al. (1992). However, these procedures were also modified to account for specific additional responses not described in sufficient detail in the original text. For example, Fisher et al. provided only limited information regarding how staff should respond if an individual attempted to select stimuli sequentially (i.e., the individual selects one stimulus, then immediately selects the second stimulus) or simultaneously (i.e., the individual selects both stimuli at the same time). To address this, a rule was created that specified that if an individual attempted or selected stimuli sequentially or simultaneously, the staff trainee should attempt to block the response, remove both stimuli from the table, and represent the trial with the instruction. Additionally, as the procedures described by Fisher et al. were specific to a PS preference assessment using toys, several changes were made to account for variations when sessions with edibles were conducted. For example, the staff trainees were required to wear gloves when touching edibles, and the step 'remove the selected item' was omitted as it was not applicable in this circumstance (i.e., the actual consumer ate the edible). Certain additions were also made to the procedures originally described by Fisher et al. (1992) to account for steps necessary for staff to independently conduct PS assessments. More specifically, steps related to identifying stimuli to include in the assessment and to score and interpret PS assessment data were added.

Interobserver Agreement and Procedural Integrity

A secondary observer independently collected data from video for 61% of Elise's, 56% of Maya's, and 50% of Victoire's sessions. The second observer's data were compared point by point with the primary observer's data. An agreement

DOI: 10.1002/bin

was defined as both observers scoring the same response. A disagreement was defined as the observers scoring a different response. The number of agreements was divided by the number of agreements plus disagreement and multiplied by 100. The mean interobserver agreement (IOA) scores were 97% (range, 91% to 100%) for Elise, 99% (range, 97% to 100%) for Maya, and 98% (range, 95% to 100%) for Victoire.

Procedural integrity data were collected from video for 33% of training sessions for Elise and Maya (one session) and 100% of training session for Victoire (two sessions). Data were collected using a checklist that listed the components of the VM condition (i.e., video shown without interruption; session initiated with appropriate instruction within 10 min of viewing video using script; all materials provided; no written instructions, feedback, or questions answered). The percentage of correctly implemented steps was calculated by dividing the number of steps the experimenter completed correctly by the total number of steps and multiplying by 100. Procedural integrity was 88% for Elise and 100% for Maya. The mean procedural integrity was 94% (range, 88% to 100%) for Victoire.

A second observer also collected treatment integrity data during 100% of Elise's (one session), 100% of Maya's (one session), and 50% of Victoire's (one session) procedural integrity sessions for IOA purposes. The number of agreements was divided by the number of agreements plus disagreements and multiplied by 100. Procedural integrity IOA was 100% for Elise, 100% for Maya, and 88% for Victoire.

General Procedure

Prior to each session, the experimenter placed a folder containing the data sheets necessary for each session (contact second author for a copy of these data sheets), a pencil, a timer, a calculator, and a clear plastic bin on the table. The instructor was positioned in a chair opposite the consumer. Next, the staff trainee was escorted into the room and provided the instruction, 'Do your best to implement the assessment and please let me know when you are done'.

To identify which stimuli to use during the assessment, the staff trainee was required to select the appropriate data sheet from the folder and ask the instructor to complete the survey. The survey asked the instructor to specify six stimuli they think the consumer would work for based on their observation of the consumer over the past 2 h. If the staff trainee asked the simulated instructor to complete the survey, the simulated instructor completed the survey by transcribing responses from a list that was created prior to each session. If the staff trainee did not engage in a correct response for 1 min (e.g., select the inappropriate data sheet, not ask the simulated instructor to complete the survey), the simulated instructor gave the staff trainee a survey that was completed prior to the beginning of the session. The purpose of

DOI: 10.1002/bin

providing staff trainees with a completed survey was to create the opportunity for them to correctly retrieve these stimuli and begin the preference assessment even though they did not correctly administer the survey to the consumer's instructor.

If the staff trainee did not select the stimuli based on the instructor-completed survey within 1 min of obtaining the survey, the instructor escorted the staff trainee outside of the room. During this time, the experimenter selected the six stimuli specified on the survey, placed them in the clear plastic bin, and placed the bin on the table all out of the view of the staff trainees as to not expose them to the correct response. The staff trainee was then escorted back into the room and allowed the opportunity to conduct the PS assessment.

Sessions were conducted with a simulated consumer to expose the staff trainees to a variety of responses that may occur when conducting a PS preference assessment. During each 15-trial session (some sessions may have been fewer than 15 trials if the termination criterion was met), the simulated consumer engaged in appropriate responses (picking one stimulus among the two presented during the trial) during eight trials and additional responses during seven trials. The additional responses included the following: (i) attempting to select both stimuli simultaneously (touching both stimuli presented at the same time) and consecutively (touching one stimulus and then touching the other stimulus); (ii) not selecting an item (not selecting a stimulus within 5 s of the presentation of the stimulus pair and instruction); (iii) engaging in problem behavior (e.g., becoming aggressive, refusing to give the item back, and screaming); (iv) engaging in stereotypy (e.g., hand flapping and body rocking); (v) attempting to select a stimulus that was not presented during the trial (e.g., the pen and the timer); and (vi) engaging in non-attending behavior (e.g., body oriented away from the staff trainee). The experimenter created six scripts that specified a random sequence of the appropriate and additional responses (available from the second author). The experimenter randomly selected one of the scripts to use prior to each session. The implementation portion of the session was terminated if the staff trainee did not engage in any correct behavior for 1 min. Following the implementation portion of the session, the staff trainee was provided the opportunity to calculate selection percentages and specify an item to use during subsequent instruction based on data collected during their administration of the PS assessment. However, if the implementation portion of the session was terminated (see previous discussion), staff trainees were unable to score and interpret data from their session because the data sheet would be incomplete. In this situation, to provide staff trainees the opportunity to score and interpret data, the experimenter provided the staff trainee with a folder containing a data sheet containing hypothetical data from a PS preference assessment and a calculation data sheet. The experimenter then provided the instruction, 'Do your best to calculate the results from the paired-stimulus

DOI: 10.1002/bin

preference assessment and let me know when you are done'. The experimenter scored the staff trainees' performance with these hypothetical data if such data were provided during a session.

Baseline. Baseline sessions were conducted as described earlier. The experimenter did not answer staff trainee questions or provide feedback based on staff trainee performance.

Video modeling with voiceover instruction. Prior to each VMVO session, the staff trainees were escorted into a room, instructed to sit in a chair, and viewed a video on a laptop computer that included three adults (one playing the role of the instructor, one the simulated consumer, and one the individual administering the preference assessment) demonstrating of the steps necessary to identify stimuli to use during the PS preference assessment, implement a PS preference assessment, and calculate selection percentages for each item as well as how to select an item to use for instructional purposes. The video also included a depiction of a full PS preference assessment involving the experimenter and a simulated consumer. The video was 18 min and 36 s in duration and included voiceover instruction (the voiceover script is available from the second author) that provided an explanation of each step and highlighted important aspects of the video. No voiceover instruction was provided during the portion of the video that depicted the full PS preference assessment administration. During the portion of the video showing the full PS assessment, the simulated consumer engaged in appropriate and additional responses as described earlier. Within 10 min of viewing the video, the staff trainee was escorted to the session room, and sessions were initiated as described earlier. The experimenter did not provide feedback on performance and did not answer questions. Staff trainees continued to watch the video prior to each session until they implemented the PS preference assessment steps at 90% correct or better for two consecutive sessions.

Generalization

Staff trainees completed single session probes with an actual consumer during baseline and after meeting the mastery criterion with a simulated consumer. Two types of probes were conducted to evaluate the extent to which the skills necessary to conduct a PS preference assessment generalized to actual consumers using toys and edibles. The generalization sessions were conducted as described in baseline, except the sessions were conducted in the actual consumers' classroom and the staff trainee was required to survey the consumer's actual instructor. The staff trainees did not watch the video prior to the session, and the experimenter did not answer questions or provide feedback based on the staff trainees' responding.

DOI: 10.1002/bin

Maintenance

Maintenance data were collected 1 week, 2 weeks, and 2 months after the staff trainees met the mastery criterion with a simulated consumer. The maintenance sessions were conducted as described in baseline. The staff trainees did not have access to the training video following mastery and did not view the video prior to maintenance sessions.

Social Validity

The validity of the training procedures was evaluated by having the staff trainees anonymously complete a questionnaire modified from the Treatment Acceptability Rating Form-Revised (Reimers & Wacker, 1988). Additionally, to evaluate the validity of the study's outcomes, seven graduate students not involved with the study but familiar with PS preference assessments (all had taken graduate-level classes that addressed preference assessments and have worked in educational settings where preference assessments are used to evaluate consumer preferences) watched two 2-min video clips from baseline and treatment sessions for each staff trainee. These clips were presented in random order. After viewing the clips, the viewers were asked to select the clip in which the staff trainee was more competent conducting the PS preference assessment.

RESULTS

Figure 1 depicts the percentage of PS preference assessment step opportunities correctly implemented by the three staff trainees. During baseline, Elise (top panel) and Maya (middle panel) consistently implemented a low percentage of opportunities correctly during sessions with a simulated consumer using toys. Although Victoire (bottom panel) performed up to 54% of opportunities correctly during baseline sessions with a simulated consumer using toys, her responding was variable and well below minimally acceptable levels of correct implementation. The staff trainees demonstrated low levels of correct implementation during the baseline probe with an actual consumer using toys. During the baseline probe with an actual consumer using edibles, Elise implemented a low percentage of opportunities correctly, whereas Maya and Victoire demonstrated higher levels of correct implementation.

Following VM, all staff trainees demonstrated immediate and substantial increases in correct implementation. Elise (Figure 1, top panel), Maya (Figure 1, middle panel), and Victorie (Figure 1, bottom panel) met the mastery criterion in three, three, and two sessions, respectively. Elise and Victorie demonstrated high levels of

DOI: 10.1002/bin

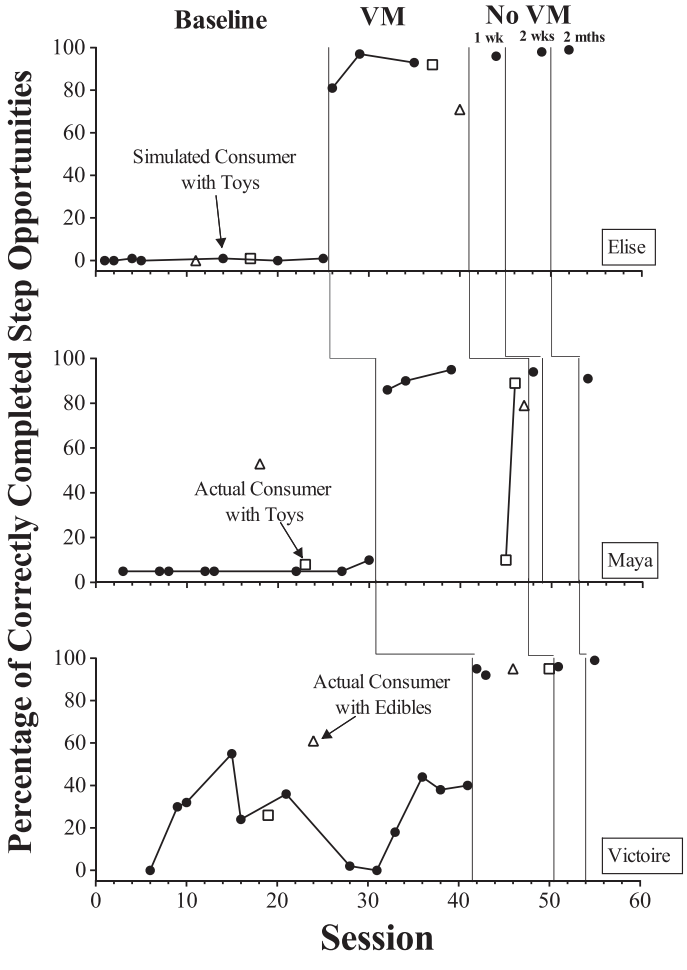

Figure 1. Percentage of opportunities to engage in steps necessary to conduct a paired-stimulus preference assessment for Elise, Maya, and Victoire during baseline, video modeling, and maintenance phases. VM, video modeling.

performance during post-training probes with an actual consumer using toys. Maya demonstrated a low percentage of correctly implemented step opportunities during her initial probe with an actual consumer using toys. Thus, a second session was conducted in which she implemented a high percentage of opportunities correctly. Although all staff trainees demonstrated substantial increases in performance during the probe with an actual consumer using edibles, only Victoire demonstrated mastery-level responding.

Follow-up data were collected 1 week following mastery for Elise and Maya. Both staff trainees demonstrated responding at or above 90%. Elise and Victoire

DOI: 10.1002/bin

demonstrated mastery-level responding during the 2-week follow-up. Finally, a 2-month probe demonstrated all staff trainees maintained responding at 90% correct or better.

All staff trainees completed the modified Treatment Acceptability Rating Form-Revised questionnaire. The questionnaire involved rating 10 items on a 5-point Likert scale (e.g., 1 = *not at all*; 5 = *very much*). Staff trainees indicated that they appreciated the training they received ($M = 4.7$, range, 4–5), that the training procedure was clear ($M = 4.7$, range, 4–5), acceptable ($M = 5$), and that they did not experience too much discomfort during the study ($M = 1.7$, range, 1–3). Staff trainees also indicated that they would be willing to implement the training they received ($M = 5$), the training was likely to lead to permanent improvement in their behavior ($M = 4.7$, range, 4–5), disadvantages to this procedure were unlikely ($M = 2.7$, range, 2–3), and they were confident that the training will be effective to train staff to implement a PS preference assessment ($M = 5$). Although the staff trainees' ratings indicated that the training would be somewhat difficult to implement ($M = 3.7$, range, 1–5), they viewed the intervention as incurring relatively little cost ($M = 2.3$, range, 1–3).

Finally, the social validity of the outcomes were assessed by having seven graduate students watch two video clips of the staff trainees implementing the PS preference assessment pre-training and post-training and indicating in which clip the staff trainees were more competent. Six raters selected the post-treatment videos as demonstrating more competent implementation of the PS preference assessment. One rater, however, selected Maya's and Victoire's pre-training video clips as demonstrating more competent implementation of the PS preference assessment.

DISCUSSION

Due to the reliance on reinforcement in interventions for consumers with disabilities, assessing the preferences of these individuals is an important part of effective programming. The failure to identify stimuli that function as reinforcers may compromise skill acquisition and behavior reduction programs. Therefore, identifying and implementing effective training procedures are essential to increasing the likelihood that staff will conduct preference assessments and use data from these assessments to guide their selection of consequences during subsequent programming.

The current study successfully trained three staff to survey simulated instructors to generate stimuli to use during a PS preference assessment, implement the assessment with a simulated consumer, and score and interpret data collected during the assessment using VM. In addition, the staff trainees demonstrated moderate to high levels of generalized responding during sessions with actual consumers and responding that maintained up to 2 months following training with a simulated consumer.

DOI: 10.1002/bin

Additionally, staff trainees provided ratings that indicated high acceptability of the VMVO training, and raters generally indicated that the staff trainees were more proficient following VMVO.

These results are particularly important for two reasons. First, the presence of a staff trainer was not required while participants viewed the video. This is a unique aspect of the current study given that the majority of previous studies, with the exception of Graff and Karsten (2012b) and Weldy et al. (2014), have relied on the presence of a trainer during all aspects of training staff to conduct preference assessments. The identification of training approaches that reduce the necessity of staff trainers is important, as some applied settings (e.g., public schools) may have only limited access to qualified trainers.

The second important aspect of the current evaluation is that staff trainees successfully acquired the targeted skills in the absence of performance feedback or programmed reinforcement. Although performance feedback is typically considered an important component of training staff (Reid & Fitch, 2011), the current evaluation adds to the small body of literature that suggests performance feedback may not be a necessary component of training staff in certain circumstances (Catania et al., 2009; Collins et al., 2009; Vladescu et al., 2012; Weldy et al., 2014). Future studies are needed to further evaluate the conditions under which feedback is and is not necessary. Such research will be helpful in guiding clinicians in the selection of training approaches under a variety of circumstances.

The findings of the current study support the findings of previous studies (Catania et al., 2009; Collins et al., 2009; Vladescu et al., 2012; Weldy et al., 2014) that demonstrate VM can be an effective way to train staff. The results of the current study also extend these previous evaluations by demonstrating that the staff trainees' responding maintained up to 2 months following training with a simulated consumer, demonstrating that VMVO produced durable outcomes. Previous VM studies did not include such lengthy follow-up measures. Additional studies should continue to evaluate the applicability of using VMVO to train staff to implement other behavior analytic procedures and the maintenance of skills acquired during training.

Additionally, the current study contributes information related to the acceptability of VM as a training procedure. To our knowledge, no published study has surveyed staff trainees in regard to their options of VMVO as a training approach. In the current study, the staff trainees all provided favorable and positive ratings of VMVO. These findings are encouraging as they suggest staff may not only benefit from this training approach but also enjoy it as well. More research is needed to evaluate the acceptability of VMVO as an approach for training staff, as well as the relative acceptability of this methodology when compared with other staff training approaches.

DOI: 10.1002/bin

In evaluating the findings of the current study, it is important to note that the majority of previous studies only trained staff to conduct one or more preference assessments but did not train the additional components required to implement these preference assessments independently. At minimum, the independent implementation of preference assessments would require staff be able to select the appropriate preference assessment based on specific consumer characteristics, identify stimuli to use during the selected preference assessment, conduct the selected preference assessment, and score and interrupt data collected during the preference assessment. The current study trained staff to select stimuli to use during a preference assessment, conduct a preference assessment, and score and interpret data collected during the administration of the preference assessment.

Although the staff trainees in the current evaluation acquired these components, they were not trained to select an appropriate preference assessment to administer. It seems best that the selection of a preference assessment be tied to consumer characteristics. For example, a consumer that demonstrates a position bias would contraindicate the administration of a PS preference assessment. In this situation, the staff should select another, more appropriate assessment (e.g., the single-stimulus preference assessment). To continue the progression of training staff, future studies should also include training on the selection of preference assessments given a range of consumer characteristics. Such training would increase the independence with which staff can independently conduct preference assessments. Additionally, although several studies indicate that the PS preference assessment reliably identifies preferred items, it remains unknown which steps or combinations of steps are critical in producing a reliable outcome or what level of accuracy in conducting the procedures is required. Therefore, the results of the current study may actually underestimate or overestimate the effectiveness of the VMVO.

The findings from the current study align with previous evaluations that demonstrate generalized responding from simulated to actual consumers (e.g., Graff & Karsten, 2012b). Staff trainees demonstrated high levels of performance with actual consumers when conducting the PS preference assessment with toys. We took several steps to program for such generalized responding. Staff trainees were required to implement the PS preference assessment using stimuli from a variety of categories during sessions with simulated consumers. Additionally, the video included instruction related to a range of responses (including appropriate and additional responses) and exposed staff trainees to these responses during sessions with simulated consumers.

When evaluating the staff trainees' performance with actual consumers during sessions with edibles, lower levels of performance were observed. Although we attempted to program for responding that would generalize from sessions with simulated consumers with toys to actual consumers with edibles, the majority of staff

DOI: 10.1002/bin

trainees failed to perform at the mastery level during these sessions. Although there are a number of steps common to conducting the PS preference assessment with toys and edibles, the latter requires additional steps that were not included in training (e.g., using gloves and cutting the edibles into small pieces). To address this limitation, future studies could better program for generalization by conducting training that involves toys and edibles, rather than just toys.

It could be argued that the procedures used during baseline did not represent an appropriate comparison condition. The experimenter only provided a brief instruction at the onset of each session, and the data sheets contained what could be considered brief written instructions. This may have resulted in a high likelihood of incorrect responding, particularly during baseline. When evaluating the baseline condition arrangements in previous staff training studies (related or unrelated to training preference assessments), no consistencies are evident. Previous studies provided written descriptions prior to or during baseline sessions (e.g., Graff & Karsten, 2012b; Iwata et al., 2000; Vladescu et al., 2012), general vocal instructions (e.g., Lerman et al., 2004, 2008), or neither (e.g., Lavie & Sturmey, 2002). Studies have shown that providing written descriptions does not improve performance or leads to performance that is less superior than training that involves other components (see DiGennaro Reed, Hirst, & Howard, 2013, for further discussion), although see Iwata and colleagues (2000) for an exception. We chose to conduct baseline sessions in the absence of detailed written descriptions for two main reasons. First, it is uncommon for staff in our clinic to have access to written protocols during the administration of preference assessments. Thus, conducting sessions without written descriptions more closely resembles our clinical practices. Second, we did not want to obscure the effects of VMVO, and aimed to evaluate VMVO as a stand-alone procedure. Had we introduced written descriptions during baseline, a sequence of events may have been created that would require the provision of written instruction when using VMVO to train other staff. We wanted to avoid this approach.

An additional argument could be made that the termination criterion may have artificially deflated the staff trainees' performance, as the staff trainees were only given the opportunity to engage in correct responding for 1 min prior to the termination of that portion of the session.

Future studies could provide staff trainees a longer period of time to conduct sessions, regardless of performance. This could be arranged by determining a range of times it takes competent individuals to conduct a preference assessment and yoking the session time to the longest duration required by a component individual.

Future research should also examine optimal characteristics of training videos and VMVO arrangements. For example, studies could evaluate the effectiveness of VM with and without voiceover instruction, videos of different durations, and training

DOI: 10.1002/bin

groups of individuals simultaneously. Results of such studies will inform best practices for clinicians in using VM in their clinical practices.

ACKNOWLEDGEMENTS

We thank Julien Capestan-Guitton, Danielle Cicalese, and Heidi Spiegel for their assistance with data collection.

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DOI: 10.1002/bin

APPENDIX A: STEPS AND DEFINITIONS FOR PAIRED-STIMULUS PREFERENCE ASSESSMENT USING TOYS AND EDIBLES

Target behavior		Definition
1	Ask an instructor to identify stimuli	The staff trainee should give the instructor a data sheet and ask him or her to identify stimuli she or he thinks are preferred by the consumer.
2	Identify stimuli	The staff trainee should locate stimuli that have been identified by the instructor as preferred and place them into the bin before bringing them back to the table to start the assessment.
3	Select correct stimuli to use during the trial	Select item to use during the trial based on the data sheet titled 'paired-stimulus preference assessment'. The first stimuli will be selected by looking at the number in the left column and selecting the corresponding item for the trial. The second item will be selected by looking at the number in the right column and selecting the corresponding item for the trial.
4	Attending response	The consumer will place his hands on his laps before beginning a trial to be started. If the consumer does not have his hands on his laps, the staff trainee will prompt the consumer to do so. The consumer should not be chewing when the trial is presented (edibles only).
5	Put gloves on (edibles only)	The staff trainee should put gloves on before touching any food.
6	Arrange stimuli	The plastic bin should be opened, and two stimuli should be taken out as specified on the data sheet. For toys, two stimuli should be placed simultaneously on the table approximately centered in front of the consumer. The stimuli should be presented after the item selected in the previous trial has been removed. For edibles, a small piece of each stimulus should be placed in a plate, and both plates should be placed simultaneously on the table approximately centered in front of the consumer. The staff trainee can also present the boxes or bag containing the edibles and then give the student access to a small piece of the edible selected. The staff trainee should not move the stimuli once they have touched the table. The staff trainee should take his hands off the stimuli and place them close to his chest on the table. The step will be scored as incorrect if the staff trainee maintains contact with the stimuli or keep his hands on or close to the stimuli during the presentation. The two stimuli should not touch each other. Incorrect placement include stimuli placed out of reach of the consumer, not placed simultaneously or not placed at the same distance of the consumer (one item closer to the consumer than the other).
7	Bite size	The consumer should be given access to a piece of food that may be eaten in one bite (even if the consumer eat the piece in several bites)
8	Provide instruction	The consumer should be seated approximately 0.7 m (around 2.8 in.) from the stimuli, and the instruction 'pick one' should be delivered by the staff trainee.

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DOI: 10.1002/bin

Appendix A. (Continued)

Target behavior		Definition
9	Allow time for the individual to make a choice	The consumer should be allowed 5 s to make a choice. If no choice is made within 5 s, the consumer should be prompted to sample each of the stimuli for 5 s (the staff trainee should sequentially place the stimuli in the consumer's hand for 5 s) before the trial to be represented. If the consumer does not make a choice within 5 s or attempts to select the stimuli sequentially or simultaneously following the representation of the trial, the staff trainee should remove both stimuli and begin the next trial.
10	Remove unselected item	Immediately after the consumer selects an item, the other item should be removed and place back in the plastic bin.
11	Provide access to the selected item	The consumer should be given access to the selected stimulus for 5 s.
12	Record response	The number associated with the item that the consumer selected should be circled on the data sheet provided. Only one number should be selected on each line. If the consumer engages in behavior that should cause the staff trainee to represent the trial (e.g., attempt to select both stimuli simultaneously or consecutively and attempt to select another item), only the item selected at the second presentation will be considered as a correct response.
13	Remove selected item(toys only)	After 5 s, the item should be taken back by the staff trainee and placed back into the plastic bin. Inappropriate behavior should be ignored or treated as specified to the child's behavior plan.
14	Ignore problem behavior	Any inappropriate behavior such as stereotypy, disruption (e.g., sweeping the stimuli off the table, crying, or throwing stimuli on the floor) should be ignored or treated as specified in the consumer's behavior plan. Ignoring inappropriate behavior is defined as continuing the assessment without delivering verbal statements such as 'stop doing that' or changing facial expressions following the occurrence of the inappropriate behavior.
15	Block approach to both stimuli simultaneously	Approach to both stimuli simultaneously should be blocked, and the staff trainee should represent the trial and the instruction 'pick one'. If the consumer does not select an item at the second presentation of the trial, the trial should be terminated, and the trial should be scored as no response (NR). If the staff trainee lets the consumer engage with the stimuli for more than 3 s before representing the trial or if the staff trainee represents the stimuli in switching the stimuli place, the representation of the stimuli will be scored as the next trial.
16	Block approach to both stimuli consecutively	Approach to both stimuli consecutively should be blocked, and the staff trainee should represent the trial and the instruction 'pick one'. If the consumer does not select an item at the second presentation of the trial, the trial should be terminated, and the trial should be scored as NR. If the staff trainee lets the

(*Continues*)

DOI: 10.1002/bin

Appendix A. (Continued)

Target behavior		Definition
		consumer engage with the stimuli for more than 3 s before representing the trial or if the staff trainee represents the stimuli in switching the stimuli's place, the representation of the stimuli will be scored as the next trial.
17	Block approach to another item	Approach to item other than those presented during the trial should be blocked, and the staff trainee should represent the trial and the instruction 'pick one'. If the consumer does not select an item at the second presentation of the trial, the trial should be terminated, and the trial should be scored as NR.
18	Correct calculation	For each stimulus, the numerator (top of the fraction) is calculated by counting the number of times the stimulus was selected by the child. The denominator (the bottom of the fraction) is calculated by counting the number of times the stimulus was presented. The numerator should be divided by the denominator and multiplied by 100. The operation should be repeated for all the stimuli.
19	Rank stimuli	Stimuli should be ranked from more to most prefer based on selection percentage.
20	Identify item to use during teaching	The item with the highest selection percentage should be selected to be used during teaching.

DOI: 10.1002/bin