

PREFERENCE ASSESSMENT TRAINING

Evaluation of a Self-Instructional Manual for Conducting Paired-Stimulus Preference

Assessment with Individuals with Developmental Disabilities

by

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Abstract

Ample research has shown that direct preference assessment is an effective method for identifying reinforcers for people with developmental disabilities with limited communication skills. Research has also shown that self-instructional manuals are an effective and efficient means for teaching individuals to implement a variety of procedures with individuals with developmental disabilities. I prepared a self-instructional manual to teach individuals to conduct a paired-stimulus (PS) direct preference assessment procedure. I used a concurrent modified multiple-baseline design across participants, combined with an unbalanced crossover design between groups, to evaluate the effectiveness of the manual to teach staff and university students to conduct the assessment. The manual was compared to a description of the assessment procedure adapted from the method sections of published research articles. Four university students and six staff members who work with individuals with developmental disabilities participated. None of the participants had previous experience conducting direct preference assessments. No participant met mastery criterion during simulated preference assessments before training. All participants met mastery criterion (80% correct or higher during a PS preference assessment) after studying the self-instructional manual. No participants met mastery after studying the method description adapted from published studies; participants subsequently met mastery criteria following study of the manual. Across all phases of the study, staff members performed with slightly higher accuracy than students. Training time required to master the self-instructional manual averaged 43 min. Participants' performance remained at high levels during follow-up and generalization sessions. Participants also rated the self-instructional manual more

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favourably than the method description on a social validity questionnaire. The self-instructional manual offers an efficient, low-cost alternative to face-to-face training for teaching individuals to conduct paired-stimulus preference assessments.

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PREFERENCE ASSESSMENT TRAINING

Dedication

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PREFERENCE ASSESSMENT TRAINING

Table of Contents

Abstract	i
Acknowledgements	iii
Dedication	iv
List of Tables	viii
List of Figures	ix
Introduction.....	1
Preference and Its Purpose	2
Two Broad Types of Direct Preference Assessments	3
Number of stimuli presented in discrete-trials assessments.....	4
Comparison of Preference Assessment Procedures	5
Training Individuals to Conduct Preference Assessments	8
One-to-one training studies	8
Self-instructional training studies.....	12
Self-Instructional Manuals	20
Statement of the Problem	21
Method	22
Participants and Setting.....	22
Materials.....	25
Research Design and Analyses	25
Procedure.....	28

PREFERENCE ASSESSMENT TRAINING

Dependent variable and target behaviors	28
Actor	29
Baseline simulated assessment	29
Method description intervention.....	29
Manual intervention.....	30
Post-intervention simulated assessment	30
Follow-up simulated assessment	31
Generalization assessment with a client	31
Reliability Checks	32
Interobserver agreement	32
Script adherence	32
Social Validity.....	33
Results.....	33
Social Validity.....	38
Training Time.....	39
Error Analysis	39
Discussion	43
References.....	52
Appendix A: Project Description and Consent Form for Students.....	60
Appendix B: Project Description and Consent Form for Staff	65
Appendix C: Project Description and Consent Form for Legal Decision Maker	70
Appendix D: Paired-Stimulus Evaluation Form	75

PREFERENCE ASSESSMENT TRAINING

Appendix E: Demographics Form for Students	76
Appendix F: Demographics Form for Staff	77
Appendix G: Paired-Stimulus Preference Assessment Data Sheet.....	78
Appendix H: Method Description for Paired-Stimulus Preference Assessment Procedure .79	
Appendix I: Table of Contents of Self-Instructional Manual	80
Appendix J: Behavior Checklist for Conducting Paired Stimulus Assessments	81
Appendix K: Sample Actor Script	82
Appendix L: Survey about the Study and Written Materials.....	83

PREFERENCE ASSESSMENT TRAINING

List of Tables

Table 1. Participant Characteristics	24
Table 2. Phases of the Study	27
Table 3. Percent Correct during Simulated Assessments at Baseline and Post- Intervention 1	35
Table 4. Mean Ratings (range) across Participants on the Social Validity Survey (1 = strongly disagree, 5 = strongly agree).....	40
Table 5. Time Spent (Minutes) by Participants Studying the Method Description, Manual, and Behavior Checklist	41
Table 6. Mean Error Rates (%) across Participants at Baseline, Post-Method, and Post- Manual Preference Assessments	42

PREFERENCE ASSESSMENT TRAINING

List of Figures

Figure 1. Mean percent correct during simulated assessments at Baseline and Post-Intervention 1 for the Method (unfilled bars) and Manual (filled bars) groups. Error bars represent plus and minus one standard deviation 34

Figure 2. Percent correct during preference assessments for each participant. Group 1 (left column) received Method training first and Group 2 (right column) received Manual first. All baseline, post-method, and post-manual assessments were simulated and involved leisure items. All generalization (Gen) assessments were conducted with a client and food items except for Participant 6 which was simulated. Horizontal dashed lines represent 80% correct (mastery criterion). Participants 1, 2, 7, and 10 are students; participants 3, 4, 5, 6, 8, and 9 are staff. 37

Evaluation of a Self-Instructional Manual for Conducting Paired-Stimulus Preference Assessment with Individuals with Developmental Disabilities

The use of strong reinforcers to consequence desirable behaviors is an essential component of teaching programs for people with developmental disabilities. An effective method for identifying reinforcers is through direct preference assessments (Graff & Karsten, 2012a; Hagopian, Long, & Rush, 2004; Karsten, Carr, & Lepper, 2011; LeBlanc, Cherup, Feliciano, & Sidener, 2006; Tullis et al., 2011). Despite ample research evidence supporting the effectiveness of preference assessments, research studies examining methods for training staff to implement preference assessments have only recently become more prominent in behavioral literature. A small number of studies have used one-to-one instructional methods for training staff to conduct preference assessments (e.g., Lavie & Sturmey, 2002; Pence, St. Peter, & Tetrault, 2012; Roscoe & Fisher, 2008; Roscoe, Fisher, Glover, & Volkert, 2006). While these training studies have been effective, they all involved direct training by an experienced instructor. More recently, a number of studies have examined self-instructional packages for training individuals to implement various preference assessments (e.g., Graff & Karsten, 2012b; Miljkovic, Kaminski, Yu, & Wishnowski, in press; Ramon, Yu, Martin, & Martin, 2015; Rosales, Gongola, & Homlitas, 2015; Weldy, Rapp, & Capocasa, 2014). Self-instructional packages offer a cost- and time-efficient alternative to face-to-face instruction. Further, a manual written for use by staff and caregivers can present procedures in user-friendly language, incorporate pedagogical components, and offer an unvarying training sequence across individuals. Therefore, I have developed a self-instructional manual to teach individuals to use the paired-stimulus (PS) procedure to

assess the preference of individuals with developmental disabilities. The purpose of this study was to evaluate the manual's effectiveness by comparing it to a procedural description of the same procedure adapted from the method sections of published research articles. In the following sections, I will review direct preference assessment methods and research, review relevant staff training research, describe the method and results of the current research project, and discuss the implications of the findings.

Preference and Its Purpose

Preference is a construct that is inferred from the behaviors of an organism. Preference has been defined as an individual's pattern of responding to stimuli in choice situations (Martin, Yu, Martin, & Fazzio, 2006). During choice situations when a person is presented with two or more alternatives or stimuli concurrently, preference may be operationalized as the proportion of time or trials one alternative is selected over others during a direct assessment.

Research has shown that stimuli identified as highly preferred in direct preference assessments typically function as reinforcers that can be used to increase desirable behaviors (Graff, Gibson, & Galiatsatos, 2006; Hagopian et al., 2004). The effectiveness of preference assessments in identifying reinforcers makes them a valuable tool for staff and caregivers working with individuals with developmental disabilities; preferred items identified through such assessments have been used to increase a variety of target skills, including communication skills (Cummings, Carr, & LeBlanc, 2012), daily living skills (e.g., using the toilet for eliminations; LeBlanc, Carr, Crossett, Bennett, & Detweiler, 2005), and early academic skills (e.g., labelling items, putting picture cards in proper sequence; Karsten & Carr, 2009). In addition to identifying items that can be used as

reinforcers, preference assessments have also been employed to identify client preferences for different staff members (Jerome & Sturmey, 2008, 2014).

Incorporating choice situations and preferred items into daily routines has been shown to lead to decreases in levels of inappropriate behavior for individuals with developmental disabilities (Cannella, O'Reilly, & Lancioni, 2005; Vollmer, Marcus, & LeBlanc, 1994) and increases in levels of engagement in activities for individuals with cognitive impairment (LeBlanc et al., 2006) and autism (Watanabe & Sturmey, 2003). The act of making choices is an important aspect of self-determination; Wehmeyer (1996) provided the following definition of self-determination: "acting as the primary causal agent in one's life and making choices and decisions regarding one's quality of life free from undue external influence or interference." A number of studies have demonstrated a strong link between self-determination and increased quality of life for individuals with intellectual and developmental disabilities (Lachapelle et al., 2005; Wehmeyer & Schwartz, 1998).

Two Broad Types of Direct Preference Assessments

Direct preference assessments may be categorized into two broad categories: free operant and restricted operant or discrete-trial. In a free operant preference assessment (Roane, Vollmer, Ringdahl, & Marcus, 1998), stimuli are presented either singly or in an array, and an individual has access to the item(s) at any time during a given time period (e.g., 10 min). The total duration of engagement with each stimulus is used to create a preference hierarchy in which the stimulus with the longest engagement is deemed the most preferred. In a restricted operant or discrete-trial preference assessment, one or more stimuli are presented for brief intervals (e.g., 10 s), with each interval referred to as a

trial. The stimuli which has been approached or chosen most frequently across trials is considered the most preferred. For all types of direct preference assessments, approaching or selecting a stimulus has been defined in previous research as a participant either physically contacting or pointing to a stimulus (Conyers et al., 2002; DeLeon & Iwata, 1996; Raetz, LeBlanc, Baker, & Hilton, 2013; Roane et al., 1998; Virues-Ortega et al., 2014).

In order to confirm that items chosen during preference assessments act as reinforcers, a reinforcer assessment may be completed (Graff & Larsen, 2011; Piazza, Fisher, Hagopian, Bowman, & Toole, 1996). Reinforcer assessments may utilize a reversal (ABAB) design; baseline or A phases consist of recording the rate of some target response when it is followed by no programmed consequences, while B phases consist of recording the rate of the target response when it is followed by a particular stimulus (Hagopian et al., 2004). If the rate of the target behavior increases when it is followed by the stimulus (i.e., in the B phases) relative to when it is not followed by the stimulus (i.e., in the A phases), it can be concluded that the stimulus acts as a reinforcer.

Number of stimuli presented in discrete-trials assessments. In discrete-trials preference assessments, the number of stimuli presented on each trial of a preference assessment has been found to affect the effectiveness and efficiency of the procedure. The single-stimulus procedure involves presenting each stimulus of an array individually and in random order across a number of discrete trials. On each trial, the participant is given the opportunity to approach the stimulus (Pace, Ivancic, Edwards, Iwata, & Page, 1985). The PS procedure involves presenting stimuli from an array in pairs on each trial and providing the participant the opportunity to select one of the stimuli. Each stimulus is

paired with every other stimulus in the array (Fisher et al., 1992). In the multiple-stimulus with replacement procedure, or MSW (Windsor, Piche, & Locke, 1994), all stimuli from an array are presented on every trial of an assessment and the participant is given the opportunity to select one item each trial. In the multiple-stimulus without replacement procedure or MSWO (DeLeon & Iwata, 1996), all stimuli from an array are presented on the first trial of an assessment and the participant is able to select one item on each trial; once an item is selected, it is removed from the array and is not replenished on subsequent trials.

Comparison of Preference Assessment Procedures

The free operant preference assessment procedure was described, evaluated, and compared to a discrete-trials (PS) procedure by Roane et al. (1998). In experiment one, 10 individuals with moderate to profound intellectual disabilities participated in daily free operant preference assessments, followed by reinforcer assessments. For all participants, the free operant procedure identified preferred items that functioned as reinforcers during the subsequent reinforcer assessment sessions. In experiment two, 17 individuals with moderate to profound intellectual disabilities participated in daily preference assessments, either free operant or discrete-trials (using the PS procedure described by Fisher et al., 1992). Stimuli identified as most preferred in each procedure were compared; for 8 of 17 participants, the same stimuli were identified as most preferred. For the remaining 9 participants, the assessment results did not identify the same stimuli as most preferred. All free operant assessments lasted 5 minutes; the average length of the PS procedure was reported to be 21.67 minutes. A potential drawback to the free operant method is that participants may interact solely with one item for the entire assessment period, meaning

that relative preference among different items may not be determined. Further, unrestricted access to certain items (e.g., food), even for short periods of time, may not be desirable.

The single-stimulus (SS) procedure described by Pace et al. (1985) evaluated 16 different stimuli with six participants with developmental disabilities, and was found to be effective at identifying reinforcers as demonstrated in a subsequent reinforcer assessments using stimuli from the preference assessments. However, one drawback to the SS procedure is that it may result in undifferentiated preference hierarchies and in high rates of false positives (i.e., identifying items as reinforcers when they are not). This may happen because participants are able to approach every item on every trial. If a participant responded in this way, it would not be possible to determine the preference of each item relative to other items in the array.

Fisher et al. (1992) compared the SS procedure to a PS procedure using the same 16 stimuli as Pace et al. (1985). Four participants with developmental disabilities were assessed using both methods. Both procedures identified the same stimuli as highly preferred, but the SS procedure identified more stimuli as preferred than the PS procedure (resulting in a less differentiated preference hierarchy). Further, the stimuli that were identified as most preferred in both procedures functioned as potent reinforcers in subsequent reinforcer assessments. Roscoe, Iwata, and Kahng (1999) compared SS and PS procedures and also found that the PS procedure produced more distinct rankings of stimuli that corresponded with reinforcing effectiveness. The SS procedure resulted in approaches by most participants to most items that were presented.

Windsor et al. (1994) compared the PS procedure to a MSW procedure that

consisted of presenting six items on each trial. The authors found that similar preference hierarchies were identified for eight individuals with developmental disabilities using both procedures, but the PS presentation produced more consistent preference rankings across repeated assessments. The MSW procedure took about half the time ($M = 7$ min) to administer as the PS procedure ($M = 16$ min). One drawback to the MSW method is that it may result in undifferentiated preference hierarchies and in high rates of false negatives (i.e., identifying items not as reinforcers when they actually are). This may happen because participants are able to approach the same item on every trial. If a participant responds in this way, it is difficult to determine the preference of each item relative to other items in the array, and whether the items that are not chosen are preferred items, perhaps to a lesser degree than others in the array.

DeLeon and Iwata (1996) developed the MSWO procedure in an attempt to address the potential high rate of false negatives in the MSW procedure. The MSWO method is the same as the MSW method except that chosen items are not replaced on subsequent trials; the participant is not able to repeatedly choose the same stimuli. Seven items were assessed with seven participants with developmental disabilities using the PS, MSW, and MSWO procedures. The three procedures yielded similar results for the most preferred stimuli, but the PS and MSWO procedures identified more reinforcers than the MSW procedure, and produced more consistent rankings of stimuli across assessments. The MSW and MSWO procedures required considerably less time to administer ($M = 17$ and 22 min, respectively) than the PS procedure ($M = 53$ min).

The above research demonstrates the differential effectiveness of direct preference assessment procedures. The free operant procedure has been successful at

identifying preferred items, but may not be conducive to creating a hierarchy of preferences among a number of items (individuals are able to interact with the same item or no item at all for the entire assessment period). The SS method may be prone to high rates of false positives because the participant can approach every item on every trial. Conversely, the MSW method may be prone to high rates of false negatives as the participant can select the same item on every trial. The PS and MSWO procedures have been found effective at identifying reinforcers and producing consistent preference hierarchies across successive administrations. Although the MSWO procedure requires less time to administer, the PS procedure may be more appropriate for people who lack the scanning and discrimination skills necessary to select from an array with six to eight items (Virues-Ortega et al., 2014).

Training Individuals to Conduct Preference Assessments

Direct preference assessments provide valuable information to staff and caregivers working with individuals with developmental disabilities and can be implemented in a relatively small amount of time. While the importance and utility of assessing preferences is recognized, training studies have historically been lacking (Cannella et al., 2005; Graff & Karsten, 2012a). To date, four studies have examined one-to-one methods for training individuals to conduct preference assessments, and five recent studies have examined self-instructional methods for training. These studies are reviewed below.

One-to-one training studies. Four published studies have examined training individuals to conduct preference assessments using one-to-one training methods that include instruction, role-play, modeling, feedback, and contingent reinforcement (Lavie

& Sturmey, 2002; Pence et al., 2012; Roscoe et al., 2006; Roscoe & Fisher, 2008).

Lavie and Sturmey (2002) is the earliest published study to evaluate a behavioral training procedure to teach individuals to conduct preference assessment; the authors examined a training package in a multiple-baseline design across three staff members who worked with children with autism spectrum disorders. The staff members were trained to implement PS procedures using instruction, modeling, and feedback. The PS procedure was task analyzed into nine components that covered presenting items, providing appropriate consequences for different client responses, and recording data. Training consisted of seven steps: (1) the trainers briefly described the skills involved to the staff members, (2) staff members were given a checklist describing the skills, (3) the trainer verbally described the skills on the checklist, (4) staff members viewed a videotape that modeled the skills on the checklist, (5) staff members practiced the skills with a child and were observed, (6) the trainer provided appropriate feedback, and (7) staff members repeated the last three steps until they performed at a minimum of 85% accuracy for two consecutive preference assessments with a child. Following training, all three staff members showed a large improvement in performance; baseline performances of staff were 16%, 23%, and 20% and improved post-training to 98%, 100%, and 100%, respectively. Training required an average of 80 min per participant. One limitation of the study noted by the authors was that the staff members were trained on certain elements of the PS procedure, but were not taught to interpret and use the assessment results (i.e., staff were not asked to identify which items from the preference assessment could be used as potential reinforcers for intervention). Further, training was not compared to another intervention (e.g., instruction alone).

Roscoe et al. (2006) evaluated the effects of feedback versus contingent reinforcement to teach four adults to conduct PS and MSWO preference assessments. Preference assessments were conducted with simulated clients (research assistants trained to play the role of a client with developmental disabilities) and probe sessions were conducted with children with developmental disabilities. The feedback condition consisted of the experimenter spending 5 to 10 min reviewing with the participants their videotaped performance from the preceding session (i.e., a video of that individual conducting a preference assessment with a simulated client). Feedback consisted of stating whether the behavior was performed correctly or incorrectly, and explaining why behaviors were incorrect in a neutral tone of voice. The contingent money condition consisted of the participant receiving a sum of money proportional to the percent of correct responses they demonstrated, up to a maximum of \$10. For example, if the participant completed 60% of the steps correctly, they would receive \$6. Participants did not view videotapes or receive feedback during the contingent money condition. Performance accuracy increased for all participants from baseline to post-feedback and reached criterion levels (90% correct or higher across three consecutive preference assessments) regardless of preference assessment procedure (i.e., PS or MSWO). The contingent money condition did not result in any participant meeting criterion level of performance, regardless of the assessment procedure. However, the addition of feedback resulted in all participants performing at a minimum of 90% accuracy for at least three consecutive sessions. The results of the study indicate that feedback was effective for training the individuals to conduct preference assessments while contingent money did not improve performance. Further, participant performance during probe sessions with

actual clients was similar to performance with simulated clients. The total training time was not reported.

Roscoe and Fisher (2008) examined feedback and role-play as methods to train individuals to conduct PS and MSWO assessments. Eight adults with bachelor's degrees in Psychology and some experience working with individuals with disabilities participated. Feedback consisted of a 15 to 20 min session that included the experimenter reviewing the videotape and data sheet from the previous session and providing feedback on each component, similar to the Roscoe et al. (2006) study. Role-play consisted of the experimenter role-playing each potential client response and asking the participant to provide consequences; after they provided consequences, participants received feedback on whether they responded correctly. Both procedures were effective in improving performance accuracy during assessments to at least 80%, as measured during simulated assessments. The authors noted that results could have been strengthened had performance been evaluated with actual clients, in generalization probes. All participants completed two baseline and four training sessions, although the total time of training was not reported.

Pence, St. Peter, and Tetreault (2012) evaluated a pyramidal training procedure to teach staff members to conduct PS, MSWO, and free operant preference assessments. The pyramidal training procedure consisted of three previously trained "first-tier" teachers training six "second-tier" teachers, five of whom then trained 18 "third-tier" teachers. The participants were special education and preschool teachers. The pyramidal training procedure included modeling, role-play and feedback and it was effective at increasing 24 trainee's performance during three types of preference assessments: PS,

MSWO, and free-operant. For the “second-tier” teachers who conducted generalization sessions in their classrooms, performance remained at high levels. The teachers who acted as trainers demonstrated high levels of procedural integrity. Training time averaged 90 min (range, 60 min to 120 min). Although training was relatively efficient, the training did require face-to-face instruction from a trained professional. Further, the “first-” and “second-tier” teachers were enrolled in a behavior analytic program, and may have had previous knowledge of conducting preference assessments. Also, some of the “third-tier” teachers had received some previous instruction on preference assessments. It is unclear if the training procedure would have been as effective if it were used with individuals who had no previous exposure to behavior analytic procedures and/or preference assessments.

Self-instructional training studies. More recently, five studies have examined self-instructional methods for training individuals to conduct preference assessments. These studies have utilized written materials (Graff & Karsten, 2012b), video training (Miljkovic et al., in press; Rosales et al., 2015; Weldy et al., 2014), and a self-instructional manual (Miljkovic et al., in press; Ramon et al., 2015).

Graff and Karsten (2012b) examined a self-instructional package for teaching staff members to conduct PS and MSWO preference assessments using eight edible items. A multiple baseline across the two assessment procedures was completed with 11 teachers who worked at a school for children with developmental disabilities. During preference assessments, participants were evaluated on five components for each trial: stimulus presentation (i.e., placing the correct number of stimuli on the table), stimulus position (i.e., stimuli were positioned correctly relative to each other), post-selection

response (i.e., removing the item not selected), response blocking (e.g., if the consumer approached two stimuli), and trial termination (e.g., if the consumer did not approach any stimuli). Participants were also evaluated on accuracy in recording data during trials, summarizing assessment results, and interpreting the results (i.e., identifying the most preferred stimulus). During baseline, participants were provided with written instructions describing how to conduct either the PS or MSWO assessment procedure that were taken from methods sections of published literature. Following baseline, the 11 teachers were split into two groups: six teachers received enhanced written instructions (step-by-step instructions written in user-friendly language, with added diagrams and examples) plus a detailed data sheet, and five teachers received the detailed data sheet and the baseline written instructions. In the enhanced instruction group, five teachers met the mastery criterion for both assessments in two sessions and the sixth teacher required one additional session for the MSWO assessment to meet mastery. For the group who received the data sheet only, performance accuracy improved after adding the data sheet, but none of the teachers met the mastery criterion. Following the addition of the enhanced instructions, all five teachers met mastery criterion within four sessions. Generalization probes with students conducted between 1 week and 1 month following mastery showed that performance for all 11 teachers remained high. On a survey, all participants favoured the enhanced written instructions over the baseline written instructions and indicated that they would be more likely to use and recommend the enhanced instructions. Overall, results indicated that the enhanced instructions were effective in teaching unexperienced individuals to conduct PS and MSWO preference assessments. The authors noted several limitations and areas for future research in the

study. The authors identified that the introduction of written materials in baseline phases may have contributed to possible carry-over effects to later treatment phases. That is, participants' performance during post-baseline phases may have been inflated due to learning that occurred from studying the written materials in baseline. Further, it is not clear if there were specific aspects of the enhanced instructions that were responsible for the participants' increase in performance (the instructions included diagrams, step-by-step instructions and examples). If one or more components were found to be sufficient to teach the assessment procedure, the efficiency of future training could be further improved.

Weldy et al. (2014) evaluated group training using video presentations (that included modeling and instruction) to teach nine behaviorally-trained staff members to conduct MSWO and free operant preference assessments with children and adolescents with autism. Participants were randomly assigned to Group 1 (receiving training on MSWO procedure first) or Group 2 (receiving training on free operant procedure first). Within each group, a nonconcurrent multiple probe across the two assessment procedures was conducted. During baseline assessments, staff members were told which assessment procedure to conduct, and provided with items to assess (food items if it was a MSWO assessment, and leisure items if it was a free operant assessment). Performance for both groups in baseline remained low. Following baseline, training was provided to each group in a 30-minute group training session. The video consisted of a PowerPoint® slideshow; each slide described (through audio) one step of the task analysis for the relevant assessment, and was followed by a video showing an individual completing that step. In Group 1 ($n = 4$) three participants performed at or above 90% performance after

one training session, while one participant performed slightly lower. This participant received a second video training session, and subsequently performed at 90% correct. Group 1 received video training on conducting free operant assessments after being trained on MSWO assessments. Following the video session for free-operant, all participants performed at or above 90% correct during assessments with clients. In Group 2 ($n = 5$), following the video training for free operant, all participants performed at or above 90% accurate during assessments with clients. Following the MSWO video training session, four participants performed at or above 90% performance after one training session, while one participant performed slightly lower. This participant received a second video training session, and subsequently performed at 90% correct. Training time was 30 minutes per assessment for seven staff; two staff members required 60 minutes of training for MSWO (i.e., the two participants who received a second training session) and 30 minutes of training for the free operant procedure. The video training sessions were shown to be an effective and time-efficient method for training the staff to conduct both MSWO and free operant preference assessments with clients. The authors identified several limitations to the study. First, it is unclear whether the video group training sessions would have been effective for individuals with little or no behavior-analytic experience. Staff members in their study had at least one year of experience working within a program that utilized behavior-analytic methods, and seven out of nine participants had a bachelor's degree in a field related to applied behavior analysis. Second, generalization to other settings and with other clients was not assessed; staff members were evaluated while conducting preference assessments with assigned clients in the clients' regular therapy rooms.

Recently, Ramon et al. (2015) compared a self-instructional manual (Ramon & Yu, 2010) to a written method description for teaching 18 university students to conduct MSWO preference assessments with persons with developmental disabilities. A live modeling procedure was also implemented for participants who did not reach mastery performance while completing an MSWO assessment following either the manual or method description. All 18 students were completing undergraduate studies (in a variety of fields) and had no previous experience with, or training on conducting preference assessments. A group comparison (using an unbalanced crossover design) was used to compare the effectiveness of the self-instructional manual with the method description. A modified concurrent multiple baseline design across the first four subjects in each group was also used. In baseline, participants were asked to do their best to find out the actor's preferences. Following baseline, Group 1 participants received training with the self-instructional manual, and Group 2 participants received training with the method description. The manual (written in nontechnical language) consisted of an introduction to structured preference assessment, step-by-step instructions for conducting an MSWO assessment, and instructions for summarizing and interpreting assessment results. Exercise questions were embedded in the manual at the end of each section, and participants were asked to complete exercises to 100% correct before moving on to subsequent sections. The method description consisted of participants reading a written description of the MSWO procedure, adapted from the method sections of published papers. No participants met mastery criterion (85% accurate) following study of the written method description alone; four participants met mastery criterion after studying the manual alone, and an additional seven participants met mastery criterion after first

studying the method, followed by the manual. Six participants did not meet mastery criterion following method and manual training; these participants received a live modeling demonstration, and subsequently met mastery criterion during a simulated preference assessment. Overall, the manual was demonstrated to be a more effective training intervention than the method description. During retention and generalization simulated assessments, 14 out of 16 participants performed at or above mastery criterion. All seven participants who completed an assessment with an actual client exceeded mastery criterion during their assessment. Social validity questionnaires (that were completed following manual and method training) indicated that participants found the manual easier to follow and understand than the method description. The authors report average training times of 10.9 minutes for the method description, 59.8 minutes for the self-instructional manual, and 8.5 minutes for live modeling. Several limitations and areas for future research were identified by the authors. An important finding was that study of the self-instructional manual did not produce mastery level performance during MSWO preference assessments for all participants; the authors suggest that an error analysis may provide areas in the manual that could be expanded or improved for future use. Also, participants in the study included university students from a variety of fields. In order to increase the generality of the findings, the authors note that the manual should be tested with other populations (e.g., staff members, parents of individuals with developmental disabilities) who may benefit from learning the MSWO procedure. Finally, the manual was written to teach only the MSWO procedure; the delivery of training materials in this format should be examined with other preference assessment procedures.

Miljkovic et al. (in press) extended Ramon et al.'s study by examining video modeling alone as an intervention to teach MSWO preference assessment, and adding Ramon and Yu's (2010) manual as a training tool only if participants did not meet mastery following the modeling intervention. Participants were six undergraduate university students, none of whom had any prior experience with preference assessments. A multiple baseline design (using a multiple probe technique) across the participants was used to evaluate the effectiveness of the modeling and manual interventions. All preference assessments were conducted with an actor who was playing the role of an individual with developmental disabilities and no language skills. No participant met mastery criterion of 85% correct after the video modeling alone; all participants subsequently received the manual plus video intervention, after which all participants met mastery criterion. Performance remained high, averaging 94% across the six participants, during the retention assessment. The authors reported that the average training time for the video only intervention was 17 minutes; the average training time for the manual plus video intervention was 12 minutes. Social validity questionnaires that were completed by all participants at the end of the study indicated that participants felt more confident and that they had all the necessary information after the manual plus video intervention (compared to the video alone). The authors identified several limitations to the study including a small number of participants, a lack of generalization probes (i.e., assessments with individuals with developmental disabilities were not completed), and the fact that the manual plus video intervention was always preceded by the video intervention (i.e., receiving the video intervention first may have contributed to higher levels performance following the manual plus video intervention).

Rosales et al. (2015) examined video modeling with embedded instructions to teach three different preference assessment procedures (PS, MSWO and free operant) to three teachers who worked with children with autism. A multiple-baseline design across the three teachers was used to evaluate the effectiveness of the training intervention. Baseline and training preference assessments were conducted with a confederate learner, and probe assessments with children with autism were conducted during baseline, training, and at a follow-up for two of the teachers. Prior to baseline assessments, teachers were provided with an excerpt from published research describing the relevant preference assessment procedure, the task analysis of the steps involved in the relevant procedure, and any other materials necessary to complete the assessment (data sheet, leisure items, etc.). Before each training assessment, teachers were given time to review a video specific to the assessment procedure. Videos were created with Movie Maker, and depicted a teacher completing the relevant preference assessment with a child with autism, accompanied by text describing what they were doing (the text expanded on the steps in the relevant task analysis). Overall, the video modeling with instructions intervention was shown to be an effective training tool for the three teachers (performance increased to 85% accurate or higher during all three preference assessment procedures following training). The authors identified a few limitations to the study. First, confederate learners did not respond according to a script during assessments; therefore, there is the potential that improvement in performance could be due to changes in confederate responses rather than the teachers learning the correct steps to follow. Second, all participants received training in the same order: PS, followed by MSWO, followed by free operant. The rapid acquisition for all three teachers of the skills involved

in the MSWO and free operant procedures may have been due to sequence effects, especially considering that some of the skills involved in the task analyses for each assessment procedure overlapped with other procedures. Finally, PS and MSWO assessments were limited to 10 trials in this study; the ability of the participants to generalize their skills to a full assessment, including interpretation and application of the results is unknown.

Self-Instructional Manuals

A substantial body of research exists that supports the effectiveness of self-instructional manuals for teaching staff and caregivers of individuals with developmental disabilities or university students to assess adaptive behaviors (Yu, Martin, Hardy, Leader, & Quinn, 1985), discrimination skills (DeWiele, Martin, & Garinger, 2000), and to conduct discrete-trials teaching (Arnal et al., 2007; Fazzio, Martin, Arnal, & Yu, 2009; Summers & Hall, 2008; Thiessen, Fazzio, Arnal, Martin, & Keilback, 2009). A key feature of these manuals is that they are based on the instructional method referred to as programmed learning or programmed instruction first proposed by B.F. Skinner in the 1950s (Skinner, 1954). This method uses the principles of shaping, chaining, and differential reinforcement to teach novel behaviors. Typically, materials for learning are presented in small units and in a logical and ordered manner. Students must master each unit of material before moving on to new material. Immediate feedback (e.g., in the form of the correct answer) is provided, which reinforces the student's correct responses. If an error occurs, the student is prompted to restudy the unit. Fred Keller (1968) described a system of instruction based on similar tenets, which he called a personalized system of instruction. The basic features of this system include: (1) it allows students to proceed

through instructional materials at their own pace, (2) course material is presented in a pre-determined order and earlier material must be mastered before students can move on to new material, (3) lectures by the instructor are to be used for motivational purposes rather than as a primary source of information, (4) the use of written material, and written communication between the student and instructor, and (5) the use of human proctors to both permit immediate scoring and feedback to students, as well as to provide social reinforcement to students (Keller, 1968).

Self-instructional manuals offer a cost-efficient method for training staff. Self-instructional manuals require less resource than face-to-face training situations, and also avoid scheduling and travel difficulties that may be encountered in the latter situations. Further, an effective training manual offers a predetermined and unvarying training sequence that increases consistency in training across staff. These advantages are especially important when considering the high rate of staff turnover in many service programs for individuals with developmental disabilities. For example, turnover rates of support-staff working with individuals with intellectual or developmental disabilities have been estimated at an average of 52% annually in the United States, resulting in an annual potential cost of \$784 million to replace support-staff who leave their positions (Hewitt & Larson, 2007). The development of training procedures that are cost- and resource-efficient is essential.

Statement of the Problem

Direct stimulus preference assessments have been found to be an effective method for identifying reinforcers for individuals with developmental disabilities and with little or no verbal communication skills. Identifying reinforcers is an essential component of

many training programs and incorporating these reinforcers into daily teaching activities also enhances quality of life for these individuals. Ideally, every staff member working with individuals with developmental disabilities should be proficient in implementing direct preference assessments. A small number of studies (i.e., four) have examined preference assessment training methods using direct, face-to-face training sessions; recently, five additional studies have examined the use of self-instructional materials to teach preference assessments. To date, only one self-instructional manual based on the principles of programmed learning or programmed instruction has been evaluated; Ramon and Yu's (2010) manual to teach individuals to conduct the MSWO preference assessment procedure. Ramon et al. (2015) and Miljkovic et al. (in press) demonstrated the manual to be an effective and efficient training tool for teaching individuals to implement the MSWO assessment procedure.

The PS assessment has been demonstrated to be an effective, sensitive, and reliable method for identifying preference hierarchies, particularly with individuals with severe and profound developmental disabilities with less developed discrimination skills. The purpose of the current study was to evaluate a self-instructional manual based on programmed learning principles for teaching individuals to use the PS procedure to assess preference with individuals with developmental disabilities. The effectiveness and time-efficiency of the manual as a training tool was compared to a description of the PS procedure found in published research articles.

Method

Participants and Setting

Four undergraduate university students and six staff members who worked with

individuals with developmental disabilities participated. The university students were males, with a mean age of 22.8 years (range, 21 to 25 years). All participants in the student group attended University of Manitoba and majored in geology, agriculture science, pharmacy, and psychology, respectively. They were recruited via posters that advertised the study and were placed in public buildings on the University of Manitoba campus. The staff members were females, with a mean age of 33.5 years (range, 28 to 38 years). All staff members worked at a residential and community resource centre, located in Winnipeg, which serves individuals with developmental disabilities and their families. A brief description of the study was presented to staff at a regular staff meeting, and staff were provided the contact information of the author if they were interested in participating. Five of the staff members also had post-secondary education. Table 1 provides characteristics for the student and staff participants, including group assignment for the study (method versus manual). Each participant was provided with an honorarium of \$10 for each session they attended, to a maximum of \$40 for participation in the study. The \$10 was provided to participants when they arrived for each session.

One adult with developmental disabilities with limited speech was recruited from the same residential resource centre as the staff members, to participate in the generalization assessment phase. This study was approved by the University of Manitoba Psychology/Sociology Research Ethics Board. All participants (or legal decision maker for the client participant) provided written consent before their participation began (see Appendices A through C for consent forms for students, staff, and legal decision maker). All study sessions were conducted in an assessment room at the St. Amant Research Centre. The assessment room had a table and three chairs.

Table 1

Participant Characteristics

Participant	Sex	Age	Occupation	Education	Group
1	Male	25	University student	Current major: Geology	1 Method-Manual
2	Male	22	University student	Current major: Agriculture	1 Method-Manual
3	Female	29	Staff member	Completed: Bachelor of Arts	1 Method-Manual
4	Female	37	Staff member	No post-secondary	1 Method-Manual
5	Female	28	Staff member	Completed: Health Care Aide Certification	1 Method-Manual
6	Female	32	Staff member	Completed: Music Therapy Degree	2 Manual-Method
7	Male	23	University student	Current major: Pharmacy	2 Manual-Method
8	Female	37	Staff member	Completed: Diploma in Education	2 Manual-Method
9	Female	38	Staff member	Completed: Educational Assistant Course	2 Manual-Method
10	Male	21	University student	Current major: Psychology	2 Manual-Method

Note: Group 1 received method training followed by manual training. Group 2 received the interventions in the reverse order.

Materials

A variety of food and leisure items were used during preference assessments. For each baseline, post-intervention, and follow-up assessment, four leisure items were selected from a bin with 10 items and used for the assessment. All preference assessment sessions were recorded using a video camera. Training materials included the self-instructional manual and the method description (described later). Participants were also provided with datasheets, a pencil, a stopwatch, and a calculator for each preference assessment.

Research Design and Analyses

The research design was a combined unbalanced crossover design and a concurrent modified multiple-baseline design across participants. A balanced crossover design exposes participants to multiple interventions in succession and in counterbalanced order (Hedayat & Afsarinejad, 1978). Since the target behaviors that were taught in this study are non-reversible once learned, participants received the second intervention only if they failed to meet the mastery criterion (at or above 80% accuracy) after receiving the first intervention. Following their baseline or pre-intervention assessment participants were randomly assigned to Group 1 or Group 2; a coin was flipped to assign the first participant, and subsequent participants were assigned to Group 1 or 2 in an alternating fashion. Group 1 (Method-Manual) received the Method description first, followed by the self-instructional Manual. All participants received both interventions in this group since no one met the mastery criterion following the Method intervention. Group 2 (Manual-Method) received the self-instructional Manual first, after which all participants met mastery criterion; therefore, no participants in Group 2

received the Method intervention.

Pre- and post-intervention preference assessments using leisure items with an actor were conducted. Follow-up assessments using leisure items with an actor were conducted for nine participants a minimum of one week following their post-intervention assessments (Participant 4 was unavailable to conduct a follow-up assessment). In addition, a generalization preference assessment using food items with a client was conducted for all participants except two: Participant 7 was unavailable to conduct a generalization session, and Participant 9 conducted a generalization assessment with a research assistant with food items due to the unavailability of the client. Generalization assessments were completed on the same day as follow-up assessments for all participants except for Participant 4 who completed his generalization session 28 days after the follow-up assessment due to scheduling difficulties. The phases of this design are summarized in Table 2.

Within each group, a modified multiple-baseline design across participants using the multiple-probe technique was implemented (Horner & Baer, 1978). This design is similar to a multiple-baseline design in that an intervention is introduced sequentially across several concurrent baselines (Johnston & Pennypacker, 2009; Martin & Pear, 2015). However, for behaviors that are unlikely to change over time without intervention, the multiple-probe technique reduces the frequency of data sampling during baseline to increase practicality and to prevent participants from becoming frustrated by being asked repeatedly to perform a task they could not perform during baseline. This modified multiple-baseline design has been used successfully in previous research to evaluate the emergence of expressive communication in deaf children (Allgood, Heller, Easterbrooks,

Table 2

Phases of the study

Pre- Intervention	Random Assignment	Post- Intervention		Post- Intervention		Follow- up	Generalization
		1	1	2*	2*		
Assess actor	Group 1	Method	Assess actor	Manual	Assess actor	Assess actor	Assess client
	Group 2	Manual		N/A			

* Intervention 2 and Post-Intervention 2 were only completed with Group 1, as all participants in Group 2 met criterion following Intervention 1.

& Fredrick, 2009), to teach safety skills to children (Padgett, Strickland, & Coles, 2006), to teach preference assessment (Miljkovic et al., in press; Ramon et al., 2015), and to evaluate self-instructional manuals for teaching staff to conduct discrete-trials teaching with children with autism (Fazzio et al., 2009; Thiessen et al., 2009).

A 2 x 2 repeated measures analysis of variance (RM ANOVA) was used to evaluate the results with Intervention (Method vs. Manual) as the between group factor, and Time (Baseline vs. Intervention 1) as the within group factor. A *t*-test was used for post-hoc comparisons. All tests were evaluated with $p = .05$, two-tailed. For the multiple-baseline design, results were evaluated using visual inspection guidelines suggested for single-subject designs (Martin & Pear, 2015, pp. 221).

Procedure

Dependent variable and target behaviors. The dependent variable in the study was the participant's performance accuracy while conducting the PS preference assessment with the actor and the client. Accuracy was measured using the Paired-Stimulus Evaluation Form, a checklist consisting of 24 target behaviors (see Appendix D). The checklist includes: four responses for preparing for the assessment session, four responses for providing antecedents, four to seven behaviors for providing consequences for the client's response, and one response for calculating preference values. The four responses for preparing for the session and the one response for calculating preference values were scored once for the entire preference assessment session (although sampling and calculating values were computed for each stimuli separately), whereas all other responses were scored on each trial. Each item was recorded as correct, incorrect, or not applicable.

The author and a research assistant scored each participant's performance via videotapes of the preference assessments. Participant's percent accuracy was computed for each session by dividing the number of correct responses by the total number of possible responses and multiplying by 100%. The time required to complete each preference assessment and to study the materials was also recorded.

Actor. The author served as the actor role-playing an individual with developmental disabilities during pre- and post-intervention and follow-up preference assessment sessions. At the time the sessions were completed, the actor had worked as a research assistant on a variety of projects with individuals with developmental disabilities for six years, and had completed more than 200 PS preference assessments. The actor's responses during these sessions were scripted (described below).

Baseline simulated assessment. Participants were asked to fill out a demographics form before beginning their baseline assessment (see Appendices E and F). Participants were asked to conduct an assessment with an actor role-playing an individual with developmental disabilities. Each participant received the following written instructions, adapted from Ramon (2013):

Thank you for participating in this study. Today you are going to assess the client's preferences by conducting a preference assessment for four items. I can't answer any questions or provide any additional information about the assessment. Please try your best to find out what the client likes and doesn't like. You can start the assessment whenever you are ready. You will have up to 15 minutes to conduct the assessment, or you can let me know when you would like to stop. Please let me know when you are ready to begin.

Participants were given four leisure items to assess, a PS Preference Assessment Datasheet (see Appendix G), a pencil, calculator, and stopwatch.

Method description intervention. During the Method description intervention, participants were given a description of the PS procedure, adapted from the method sections of published articles by DeLeon and Iwata (1996) and Fisher et al. (1992) (see Appendix H). Minor changes that were made to the description for the purpose of this study included describing the procedure in the present tense, changing the number of items for assessment from 16 to 4, replacing the word “participant” with “client” and replacing “experimenter” with “you”.

Manual intervention. During the Manual intervention, participants were given the self-instructional manual (Chand & Yu, 2010) for conducting PS preference assessments. The manual includes five units totalling 24 pages: an introduction to preference (1 page), preparations for a preference assessment (2 pages), how to present the items for assessment (2 pages), how to consequence the client’s responses during the assessment (3 pages), and how to determine the preference value of each item (1 page). The manuals’ Table of Contents is shown in Appendix I. A review exercise with study questions is included at the end of each unit to allow the reader to assess his/her own mastery of the material. An answer key to the exercise is provided on the next page after each exercise. The manual instructs the reader to re-read the relevant section if any of the questions is answered incorrectly; however, there were no contingencies in place during this study to ensure that participants did re-study a section.

Except for the difference in the study materials (Method vs. Manual), participants received the same instructions in both interventions as in the baseline phase. Participants were told to take as much time as they like to study and let the experimenter know when they were finished.

Post-intervention simulated assessment. The post-intervention simulated assessment with the actor took place once the participant had finished studying the method description or the self-instructional manual. For each assessment, participants were given the same instructions as in the baseline simulated assessment and four leisure items were selected randomly from the bin of 10 items.

Follow-up assessment. All participants were asked to conduct a preference assessment with the actor a minimum of seven days after the post-intervention assessments. Scheduling was done based on each participant's availability. The average interval across participants was 23 days, ranging from 7 to 56 days. Before the follow-up assessment, participants were given the opportunity to review the behavior checklist from the self-instructional manual (see Appendix J). The procedures for the follow-up assessment were the same as in baseline.

Generalization assessment with a client. All but two participants completed a generalization assessment using food items with a client with developmental disabilities. Participant 4 was unavailable to conduct a generalization assessment and Participant 9 conducted a generalization assessment with a new actor and with food items due to the unavailability of the client. Before the generalization assessment, participants were given the opportunity to study the behavior checklist from the self-instructional manual. Participants were given the following instructions at the beginning of the generalization assessment:

Thank you for participating in this study. Today you are going to assess the client's preferences by conducting a preference assessment using four items. I can't answer any questions or provide any additional information about the assessment procedures at this time. Please do your best to find out what the client likes and doesn't like among the items. If the client indicates that they would like to stop the assessment at any time, we will stop, take a break, and attempt to start

the assessment again in 5 minutes. You are not expected to deal with challenging behaviors if they arise. If the client shows any challenging behaviors during the assessment, the researcher(s) will intervene. You can start the assessment whenever you are ready. You will have up to 15 minutes to conduct the assessment, or you can let me know when you would like to stop. Please let me know when you are ready to begin.

Four food items were nominated by a staff member familiar with the client for use during the assessment; this staff member did not participate in the training interventions in the study. The same four items (Smarties®, Cheezies®, peas, and pretzels) were used in each generalization session with the client. Generalization assessments were completed on the same day as follow-up assessments for all participants except for Participant 6 who completed the generalization assessment 28 days following the follow-up assessment due to scheduling difficulties. The client did not emit any challenging behavior during any of the generalization assessments.

Reliability Checks

Interobserver agreement. An observer scored 100% of all preference assessment trials and for all participants from videotapes. Scoring was completed independently (i.e., the observer scored each participant's performance from the videotape, and subsequently compared their scoring to the experimenter's, and computed an agreement score). An agreement between the observer and the experimenter was defined as both individuals scoring a behavior on the Paired-Stimulus Evaluation Form (see Appendix D) identically as either correct or incorrect. A disagreement was defined as the observer and the experimenter scoring a behavior on the evaluation form differently. The percentage of agreements for each session was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100% (Martin & Pear,

2015, pp. 212). Percent agreement averaged 99% (range, 95% to 100%).

Script adherence. To ensure consistent actor behavior across participants, the actor followed a script detailing the response(s) she should perform on each trial of each assessment (see Appendix K). A different script was used for each phase of the study and the scripted responses were randomly arranged in a different order for different phases. An observer scored all simulated preference assessment sessions from videotapes to evaluate the actor's adherence to the script. For each session, the total number of steps performed correctly by the actor was divided by the total number of steps applicable for that session. Actor script adherence averaged 99% (range, 94% to 100%) across sessions.

Social Validity

All participants were given a brief survey, adapted from Ramon (2013), following each intervention they received (see Appendix L). The survey consisted of six statements aimed at gathering participants' views on the goal of the intervention, ease of use of the written materials, effectiveness of the written materials, and whether they would recommend the written materials to others. Each statement was rated on a 5-point scale, ranging from strongly disagree (1) to strongly agree (5). The questionnaire was completed by five participants following method training, and completed by all 10 participants following manual training.

Results

Figure 1 shows the mean percent correct during simulated assessments for each group during baseline and at the first post-intervention. Group 1 received the Method description as the first intervention (unfilled bar) and Group 2, the self-instructional manual (filled bar). Error bars represent plus and minus one standard deviation. Mean

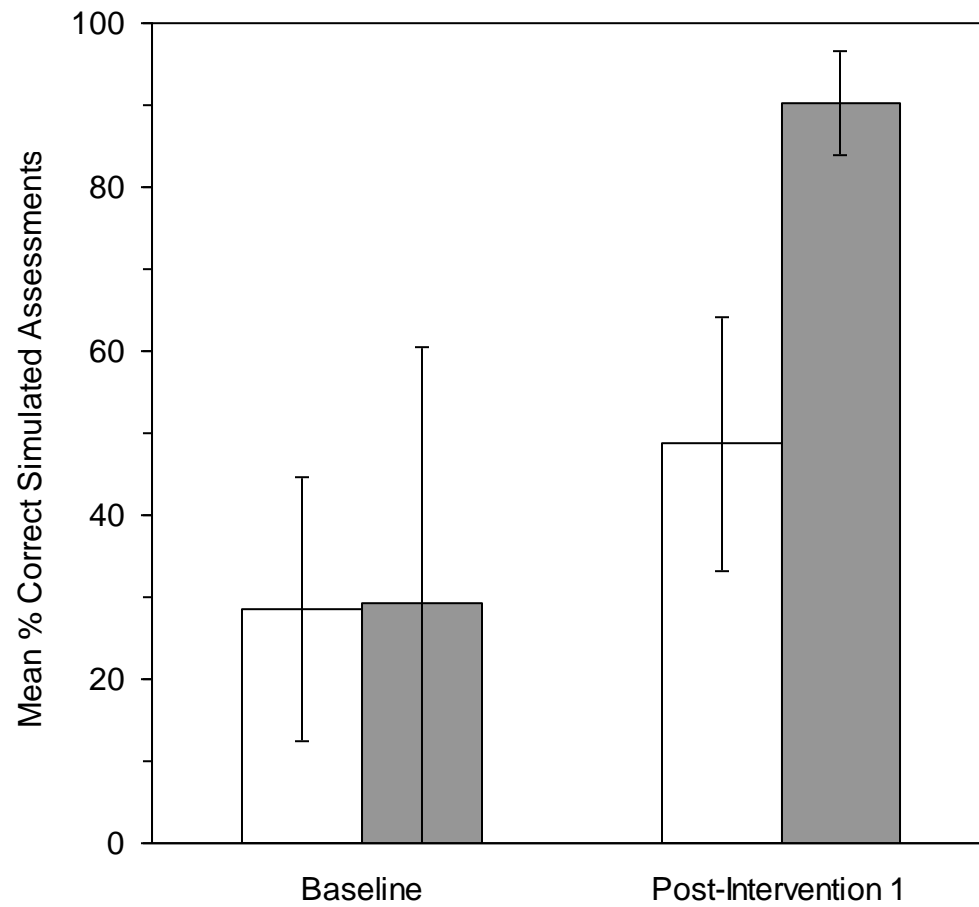


Figure 1. Mean percent correct during simulated assessments at Baseline and Post-Intervention 1 for the Method (unfilled bars) and Manual (filled bars) groups. Error bars represent plus and minus one standard deviation.

Table 3

Percent Correct during Simulated Assessments at Baseline and Post-Intervention 1

	Baseline <i>Mean (SD)</i>	Post-Intervention 1 <i>Mean (SD)</i>	Δ score, <i>p</i>
Group 1: Method (<i>n</i> = 5)	28.59 (16.09)	48.70 (15.53)	20.11, <i>p</i> = .001
Group 2: Manual (<i>n</i> = 5)	29.39 (31.04)	90.22 (6.37)	60.83, <i>p</i> = .008

Repeated Measures ANOVA (group x time) – Significant main effects of time: Wilks' λ = .163; $F(1, 4) = 41.08$, $p < .001$; partial $\eta^2 = .837$; and significant interaction: Wilks' λ = .445; $F(1, 4) = 9.98$, $p = .013$; partial $\eta^2 = .555$.

baseline performances were similar for both groups (28.6% and 29.4%). RM ANOVA showed a significant main effect for time and a significant group by time interaction (Table 3). There was no statistically significant difference between groups in mean performance accuracy during baseline; $t(8) = -.169, p = .133$. However, both groups showed statistically significant improvement at Post-Intervention 1 and the manual group showed a much larger improvement than the method group (60.8% vs. 20.1% mean increase from baseline, see Table 3).

Figure 2 shows the performance accuracy across preference assessment sessions for each participant. Group 1 (left column in Figure 2) received Method training first, and followed by Manual training if the 80% mastery criterion (horizontal dashed lines in the Figure) was not met after Method training. Group 2 (right column) received the Manual first, and followed by Method if necessary. All assessments were simulated and involved leisure items except for the generalization assessments, which were conducted with a client (person with developmental disabilities) and food items. For Group 1, baseline performance accuracy ranged from 3.7% (P2) to 43.8% (P4) and was relatively stable across sessions for Participants 2, 4, and 5. All participants in Group 1 improved after receiving Method training but none met the mastery criterion (performance accuracy ranged from 22.4% to 61.1%). All participants in Group 1 showed further improvement after Manual training, with all participants exceeding the mastery criterion ranging from 83.3% (P1) to 100% (P3). For Group 2, baseline performance accuracy ranged from 1.1% (P7) to 72.2% (P8) and was stable for P8 and P9, and decreasing for P7. All participants in Group 2 exceeded mastery criterion following Manual training [range 83.3% (P7) to 97.2% (P8)]; no participants received training with the Method description.

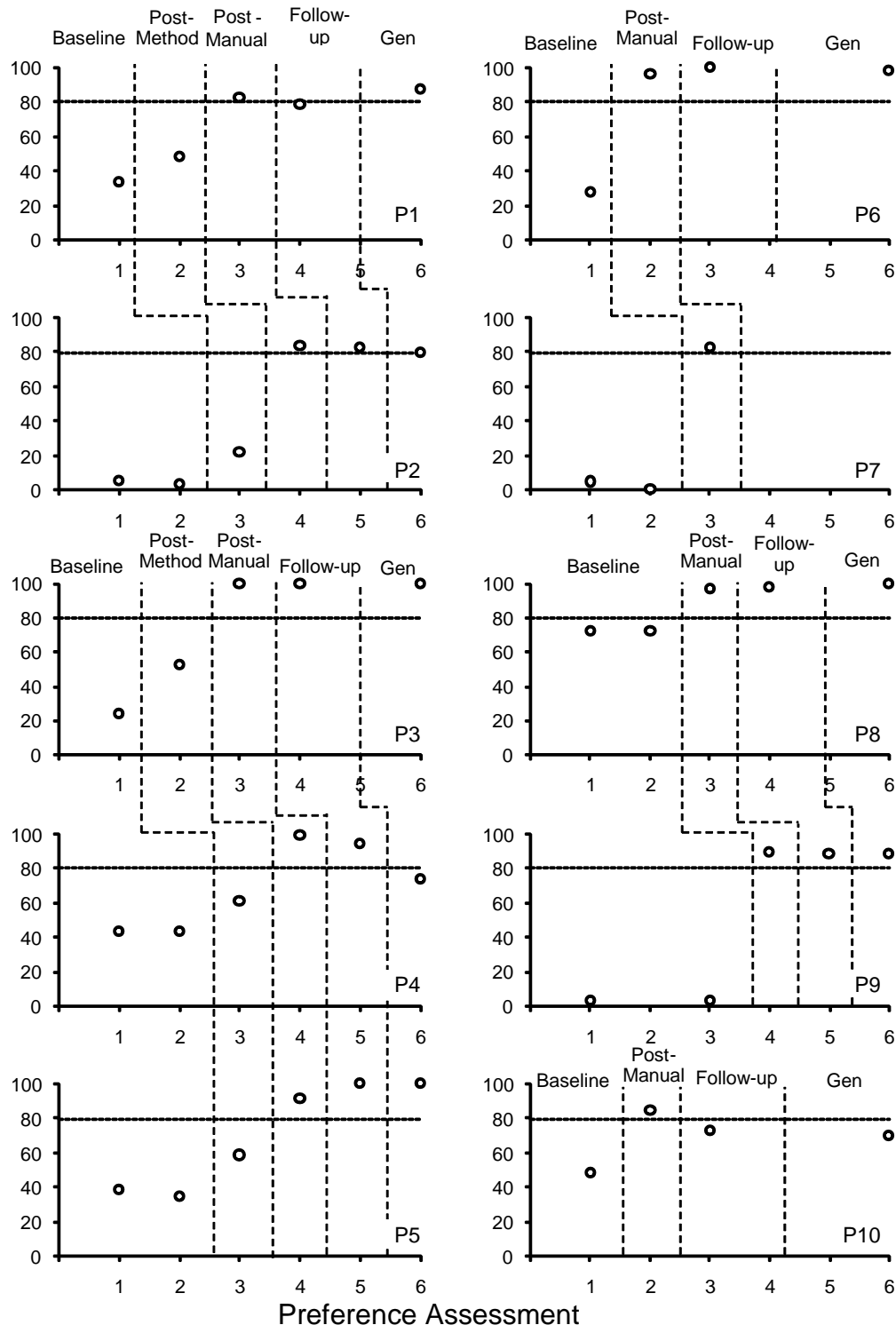


Figure 2. Percent correct during preference assessments for each participant. Group 1 (left column) received Method training first and Group 2 (right column) received Manual first. All baseline, post-method and post-manual assessments were simulated and involved leisure items. All generalization (Gen) assessments were conducted with a client and food items, except for Participant 6 which was simulated. Horizontal dashed lines are drawn at 80% accurate (mastery criterion). Participants 1, 2, 7, and 10 are students; participants 3, 4, 5, 6, 8, and 9 are staff.

Nine participants conducted a follow-up assessment, ranging from 7 to 56 days ($M = 23$ days) after meeting mastery criterion in a post-training assessment. Participant 7 was no longer available to continue with the study. Performance during follow-up assessments remained at or above mastery level for seven of the nine participants, ranging from 83.3% (P2) to 100% (P3, P5, and P6). Participants 1 and 10's performance was slightly below the mastery criterion (78.7% and 73.1%, respectively).

Eight participants also conducted generalization assessments using food items with a client after meeting mastery criterion in a post-training assessment and one participant (P4) conducted a generalization assessment using food items with a research assistant due to the unavailability of the client. Participant 7 was unavailable to conduct the generalization assessment. The average percent correct during generalization assessments across the nine participants was 88.8%, ranging from 70.1% (P10) to 100% (P3, P5, and P8). Performance remained at mastery level or higher for seven participants (P1, P2, P3, P5, P6, P8, and P9); the remaining two participants (P4 and P10) performed at near mastery levels. Additionally, all eight participants who completed the PS assessment with the same client found the same preference hierarchy (e.g., identical rankings for each of the four items assessed were obtained).

In summary, although performance increased following Method training, none of the five participants in Group 1 met mastery criterion following Method training. However, all 10 participants' performance increased immediately and sizeably following Manual training. Moreover, all participants met mastery criterion following Manual training in both groups. Similar results were observed for both students and staff, although mean performance among staff members was higher than for students at post-

manual (student $M = 83.9\%$; staff $M = 95.6\%$), follow-up (student $M = 78.4\%$; staff $M = 96.9\%$), and generalization (student $M = 79.4\%$; staff $M = 93.5\%$).

Social Validity

On the social validity questionnaire, on average, participants rated the manual as easier to understand, were more confident at conducting a preference assessment following the manual training, and were more likely to recommend the manual rather than the method training to others. Table 4 shows the average and range of ratings for each questionnaire item.

Training Time

The time participants spent studying the method description, the self-instructional manual, and the behavior checklist are shown in Table 5. Participants spent an average of 5.4 min (range, 2 to 12 min) to study the method description, 43.1 min (range, 33 to 58 min) to study the manual, 3 min (range, 2 to 5 min) to study the checklist prior to follow-up assessments, and 1.2 min (range, 0 min to 4 min) to study the checklist prior to generalization assessments.

Error Analysis

Table 6 shows the mean percentage of errors across participants for each step on the Paired-Stimulus Evaluation Form (Appendix D) during baseline, post-method, and post-manual simulated assessments of the study. Error rate for each step on the evaluation form was calculated by summing the number of times a step was scored incorrect across all participants, and dividing this sum by the number of times the step was scored as either correct or incorrect across all participants. Error rates were high during Baseline assessments across the majority of steps on the Paired-Stimulus Evaluation Form; percent

Table 4

Mean Ratings (range) across Participants on the Social Validity Survey (1 = strongly disagree, 5 = strongly agree)

Items	Post-Method (<i>n</i> = 5)	Post-Manual (<i>n</i> = 10)
1. It is important for people working with individuals with developmental disabilities to learn to conduct preference assessments.	4.6 (4 – 5)	4.7 (4 – 5)
2. The written material was easy to follow and understand.	3.4 (2 – 4)	4.7 (4 – 5)
3. The written material provided all the necessary information for me to do the assessment.	2.8 (2 – 3)	4.7 (4 – 5)
4. I believe I have successfully learned how to conduct the paired-stimulus preference assessment from studying the written material provided.	2.6 (2 – 4)	4.5 (4 – 5)
5. I feel confident and ready to conduct paired-stimulus preference assessment with clients after studying the written material provided.	2.8 (2 – 4)	4.3 (3 – 5)
6. I would recommend the written material to others who wish to learn how to conduct paired-stimulus preference assessment.	2.8 (1 – 4)	4.7 (4 – 5)

Table 5

Time Spent (Minutes) by Participants Studying the Method Description, Manual, and Behaviour Checklist

Participant	Method	Manual	Behavior Checklist before Follow-up	Behavior Checklist before Generalization
1	12	44	5	1
2	3	50	3	0
3	5	47	3	1
4	2	34	3	1
5	5	51	3	4
6	-	33	3	2
7	-	58		
8	-	33	3	1
9	-	48	2	0
10	-	33	2	1
Average	5.4	43.1	3.0	1.2

Table 6

Mean error rates (%) across participants at baseline, post-method, and post-manual preference assessments

Target Response	Baseline (<i>n</i> = 10)	Post- Method (<i>n</i> = 5)	Post- Manual (<i>n</i> = 10)
1. Fill out name, client and date on datasheet	81.3	60.0	20.0
2. Label items to be assessed	18.8	0	0
3. Items to be assessed are available on side table	81.3	100	10.0
4. Samples item with the client (for each of 4 items)	39.1	60.0	25.0
5. Hold up each item and ensure client is attending to items	70.9	78.3	0
6. Present items one at a time in front of the client	86.5	76.6	11.7
7. Present items in the correct positions	46.9	18.3	0.8
8. Say “Pick one” and wait 15 s for a response	46.9	6.7	1.7
<i>Following a Selection Response:</i>			
9. Praise the client	94.7	87.5	22.9
10. Provide client with the item and allow time to consume	85.7	45.7	12.9
11. Remove unselected item	75.9	23.2	11.1
12. Record client’s response	48.2	22.5	0
<i>If a Client Does Not Select an Item:</i>			
13. Wait 15 s for a response, then repeat “Pick one”	84.4	80.0	10.0
14. Wait additional 15 s	81.3	70.0	5.0
15. Remove all items and record response	77.7	30.0	0
<i>If a Client Selects Both Items:</i>			
16. Gently block the attempt	92.9	80.0	50.0
17. Remove any items from client and table	89.3	100	25.0
18. Re-present the trial	85.7	90.0	10.0
19. Once client selects one or neither item, record clients response	67.9	40.0	0
20. Preference values correctly calculated (for each of 4 items)	93.8	60.0	5.0

error was above 50% on 15 out of 20 steps. The highest error rates were observed on the following steps: praising the client (after a selection response), gently blocking the client (if they attempt to select both items), and calculating preference values correctly. During Post-Method assessments, error rates decreased overall, but were still above 50% on 12 out of 20 steps. The highest error rates were observed on the following steps: items to be assessed are available on a side table, removing items from the client/table (if a client attempts to select more than 1 item), and re-presenting the trial (if a client attempts to select more than 1 item). Error rates during Post-Manual assessments decreased on all steps compared to baseline and post-method assessments; error rate was 50% on only one step, and was 25% or lower on all remaining steps. The highest error rates were observed on the following steps: gently blocking the client (if they attempt to select more than one item), removing items from the client/table (if a client attempts to select more than 1 item), and sampling items with the client.

Discussion

The current study demonstrated the effectiveness of a self-instructional manual for teaching paired-stimulus preference assessments to both university students and staff members working with individuals with developmental disabilities. No participant met mastery after studying the method description, but all participants met mastery criterion after studying the self-instructional manual with or without it being preceded by the method description. Results from the multiple-baseline design strongly support the internal validity of the manual intervention. Although there was a slight performance decline for some participants during follow-up and generalization, seven of the nine

participants performed at or above the mastery criterion. Further, for the eight participants who completed a Generalization session with the same client, an identical preference hierarchy was obtained. The fact that all participants obtained the same hierarchy of preferences provides strong support for the validity of the assessment procedure described in the self-instructional manual.

The manual (given its length) understandably required more time to study than the method description. The mean study time for the manual in this study (43 min), however, compares favorably to previous training studies that involved face-to-face instruction, which reported mean training time of 80 min (Lavie & Sturmey, 2002) or times ranging from 60 to 90 min (Pence et al., 2012). The existing research that has examined self-instructional training methods has reported average training times of 59 minutes for a manual on the MSWO procedure (Ramon et al., 2015), 17 minutes for a video intervention (Miljkovic et al., in press) and times ranging between 30 to 60 minutes for video modeling and instruction (Weldy et al., 2014). An additional benefit of the manual, in comparison to face-to-face instruction, is that it is a permanent resource that can be accessed and referenced as needed by individuals.

All participants rated the manual higher than the method description on a social validity questionnaire that was completed immediately following each training procedure (see Table 4). Participants agreed with the importance of the goals of the study regardless of which intervention they had recently received (i.e., the first item on the questionnaire was rated highly and similarly following both method and manual training), but rated the manual on average as easier to use and a more effective training tool. Moreover, participants rated on average that they were more likely to recommend the manual to

others than the method description.

A number of factors may account for the higher social validity ratings for the manual. First, although the same behaviors are described in the manual and method description, the manual presents a logically ordered task analysis of the behaviors to be learned, while the method description presents the same information in paragraph form and was intended for a scientific journal. Second, the manual is meant to act as a tool that develop the appropriate behaviors in readers by describing the correct behaviors, prompting the reader to practice these behaviors, and asking study questions and providing differential consequences to the reader's responses (by directing the reader to move ahead in the case of correct answers, or re-study in the case of incorrect answers). The method description does not incorporate the above features. Third, the manual directs readers to first master the component behaviors of the task analysis individually, and then chain these behaviors together to perform an entire preference assessment with high accuracy. The method description does not prompt the reader to learn the behaviors in the same progression.

The effectiveness and efficiency of the self-instructional manual as a training tool adds to the body of research supporting self-instructional training methods based on behavior analytic principles and extends previous research in several ways. First, in the current study, the multiple-baseline within groups combined with the crossover between groups design allowed for a comparison of performance following no instructions (baseline), the method description, and the self-instructional manual. Second, participants in the current study consisted of experienced staff as well as university students with no previous experience working with individuals with developmental disabilities. Three

previous studies (Graff & Karsten, 2012b; Rosales et al., 2015; Weldy et al. 2014) evaluated their training package with experienced teachers or staff members and Ramon et al. (2015) and Miljkovic et al. (in press) evaluated their manual with only university students. The effectiveness of the manual in the current study with university students adds support for the utility of the manual with newly hired staff, or other inexperienced populations (e.g., parents or caregivers). Finally, Weldy et al. (2014) examined video instructions and modeling for teaching MSWO and free-operant preference assessments, while Ramon et al. (2015) and Miljkovic et al. (in press) evaluated training methods for teaching MSWO assessment procedures. This study, along with Graff and Karsten (2012b) and Rosales et al. (2015), are the only three that have examined self-instructional methods for teaching individuals to conduct PS preference assessments. Further, this study is the first to examine a manual based on programmed instruction to teach PS assessment.

The current study evaluated both leisure and edible items during preference assessments. Leisure items were used during baseline, post-intervention, and follow-up assessments, and edibles were used during generalization assessments. While the manual describes what to do for both leisure and edible items, the examples and practices contained in the self-instructional manual all reference edibles as the items to be assessed. Leisure items were chosen for baseline, post-intervention, and follow-up assessments to evaluate generalization (i.e., to assess whether participant's would be able to successfully conduct the assessment with leisure items after having practiced with edibles). Participants were able to successfully generalize the skills they had practiced with edibles to using leisure items during assessments.

The mastery criterion (at or above 80%) is lower in the current study than in the previous literature (85-90% or above). The criteria was set at 80% in this study after considering what percent accuracy an “experienced” preference assessor would likely score while conducting a preference assessment, and after considering what score an individual would receive if they consistently erred on one or two steps of the evaluation form. That is, the evaluation form used in this study (the Paired-Stimulus Evaluation Form or PSEF) consists of 8-11 steps to be scored per trial, depending on the client’s response. A selection response by the client results in steps 5 through 12 being scored on the PSEF (a total of 8 steps), a client not selecting either item would result in steps 5 to 8 and 13 to 19 being scored (a total of 11 steps), and a client attempting to select both items would result in steps 5 to 8 and 20-23 being scored (a total of 8 steps; see Appendix D). A consistent error or two per trial (which is feasible, even for experienced assessors) would result in an overall accuracy score around 80%.

Applying a mastery criterion of 90% accurate or higher in this study would have resulted in 5 out of 10 participants reaching mastery criterion Post-Manual, 5 out of 9 participants remaining at mastery criterion during follow-up assessments, and 4 out of 9 participants remaining at mastery criterion during generalization assessments. While less than half of participants would have performed at mastery level during generalization sessions, all participants who performed the generalization assessment in this study obtained the same preference hierarchy while completing the assessment with a client. Future research should examine what level of performance by an assessor is necessary to produce socially relevant results (i.e., at what level of performance is an assessor reliably able to identify a client’s true preferences). Further, once a client’s preferred items are

identified, their reinforcing value or capacity should be evaluated in subsequent reinforcer assessments. If items are demonstrated to be reinforcers, an additional level of social validation may include evaluating staff use of these items during daily teaching programs or activities with their clients.

In the current study, Participant 8 performed with high and stable accuracy during baseline assessments (72% accuracy during both sessions). Although baseline performance was high, the participant reported that she had not received any prior training on preference assessments, and would like to receive training with the self-instructional manual. For these reasons, the participant was included in the study and received manual training. An improvement (to 97%) was seen following Manual training. This participants' performance would indicate that the manual may be useful even for individuals who perform well during preference assessments prior to training, or have some previous knowledge of preference assessments.

A number of limitations exist in the current study. The research design consisted of a combined unbalanced cross-over design between groups and concurrent multiple-baseline design across participants within each group. The original conception of the study included a multiple-baseline design across all five participants in each group. Due to practical reasons (i.e., scheduling of participants to complete preference assessments), the multiple-baseline design was completed across two pairs of participants within each group. Although the design was modified, an experimental effect is seen across all participants in the study and all participants' performance improved only after studying the manual.

There were no contingencies in place in this study to ensure that participants were

completing the programmed learning activities in manual as they were intended (e.g., answering study questions, re-reading sections if answers to study questions were incorrect, or completing the role-play exercises). Future research should examine whether including contingencies to manage participant study behavior would result in increases in participant performance during subsequent preference assessments.

Generalization across settings or situations was not addressed in this study. All assessments took place in the same testing room. Future research should examine whether participants who learn to conduct PS preference assessments using the self-instructional manual are able to generalize their performance to new settings and situations (namely, in the setting where they would typically be interacting or working with clients). Further, future research should incorporate probe generalization sessions with clients in baseline or pre-training phases, to allow for comparisons of pre- and post-training performance during assessments with clients.

Finally, although the manual was effective at improving participant's performance to mastery level, there is still room for improvement (participants did not score at 100% accuracy following their study of the manual). The error analysis was completed in an attempt to identify which areas of the self-instructional manual may need to be revised and/or expanded in order to be a more effective training tool. Two of the most common errors after studying the manual involved responding after a client had approached or attempted to select more than one item. This indicates that participants may need more practice with responding to this client behavior; additional study questions and prompts for the reader to "stop and practice" may be included in future editions of the training manual to improve participant responding. Other common errors included not sampling

(or not sampling properly) each of the items to be assessed, and forgetting to praise the client following a selection response. Participants' comments on the social validity questionnaire offered additional suggestions for improvement. Two of the suggestions offered by participants included adding flow charts or diagrams to the manual, and including more practice trials in the manual.

An additional important area for future research to examine is whether the manual could be streamlined for use with certain populations (e.g., experienced staff members). After studying the manual, one of the staff participants commented that she was familiar with task analyses, and that studying the behavior checklist at the end of the manual would have been sufficient for her to learn to complete the assessment. Using only the behavior checklist would increase the efficiency of the self-instructional training, although it may not be suitable for individuals with less experience.

Future research should also examine whether staff who are trained to complete preference assessments are using them in daily work with individuals with developmental disabilities. While the purpose of the self-instructional manual is to train individuals how to conduct preference assessments, it also contains a brief introductory section that explains why preference and assessing preference regularly is important. An obvious goal of training staff members to complete preference assessments is that they are conducting them in their daily work with clients.

This study adds to the growing body of literature supporting self-instructional training methods based on behavior analytic principles. Self-instructional manuals have a number of advantages over face-to-face training that are especially important considering turnover rates of staff working with individuals with developmental disabilities: self-

instructional manuals require less resource than face-to-face training situations, the use of manuals avoids scheduling and travel difficulties that may be encountered in these situations, and an effective training manual offers a predetermined and unvarying training sequence that increases consistency in training across staff and provides a permanent resource that can be revisited as needed over time.

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Appendix A: Project Description and Consent Form for Students

UNIVERSITY
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Research Project Title:	Evaluation of a Self-Instructional Manual for Conducting Paired-Stimulus Preference Assessments with Individuals with Developmental Disabilities
Principal Investigator:	Carly Chand, PhD student, Psychology Department, University of Manitoba. Ph: 256 4301 x5444; email: umthi223@cc.umanitoba.ca
Supervisor:	Dr. C.T. Yu, Professor of Psychology, University of Manitoba, & Director, St. Amant Research Centre. Ph: 474-9453; email: yud@cc.umanitoba.ca
Sponsor of Research:	Canadian Institutes of Health Research

This study is being conducted by Carly Chand as her doctoral thesis, supervised by Dr. Yu. This project description and consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

What is the purpose of the project?

The purpose of this study is to evaluate the effectiveness of a training manual for teaching parents, staff, and undergraduate university students to conduct preference assessments with individuals with developmental disabilities. The training manual will be compared to a written description of the procedure adapted from published research papers.

What are the project procedures and how long will the project take?

Your sessions will consist of reading either a training manual and/or written description of how to conduct preference assessments with individuals with developmental disabilities. After reading the materials provided, you will conduct an assessment with a

simulated client. If you perform at or above 85% accuracy with the simulated client, you will also conduct an assessment with a real client.

You will be asked to attend several sessions, as follows:

Sessions 1: study a brief description of the preference assessment procedure and conduct an assessment with a simulated client (approximately 30 minutes).

Sessions 2: repeat the procedure in Session 1 (approximately 30 minutes), and answer a brief feedback questionnaire with 6 questions (1-2 minutes).

Session 3: study either a written description (approximately 1 hour) or a training manual (approximately 2 hours) of the preference assessment procedure and conduct an assessment with a simulated client (approximately 30 minutes). Answer a brief feedback questionnaire with 6 questions (1-2 minutes). Depending on your results during the preference assessment following the first set of training materials, either move straight to Session 4, or study the training material that you have not yet studied (between 30 minutes to 2 hours). Conduct an assessment with a simulated client (approximately 30 minutes). Answer a brief feedback questionnaire with 6 questions (1-2 minutes).

Session 4: repeat the assessment with a simulated client *or* conduct an assessment with a real client (approximately 30 minutes). Whether you assess a simulated client or a real client will depend on your assessment results in Sessions 3.

The 4 sessions will be spread out over 1 to 2 months.

Will the participant's personal information be kept confidential?

All information obtained about you will be handled in compliance with Section 24 of the Personal Health Information Act (PHIA). Your identity will be coded on all research files. All information will be kept confidential and stored in a locked office at St. Amant Research Centre. Only the research staff will have access. Any public presentations, reports, or publications resulting from this project will not contain any identifying information. The key to decode your identity will be destroyed in a confidential manner within 6 months after the completion of the project (approximately March 2013).

Videotaping

All assessment sessions will be videotaped to facilitate reliable observation. Videotapes will be stored in a locked office at St. Amant Research Centre and they will be erased in a confidential manner within 6 months after the completion of the project (approximately March 2013). However, videotaping is not a requirement and you can still participate if you choose not to be videotaped.

What if abuse is discovered during the course of this project?

All researchers and assistants working on this project have a legal responsibility to immediately report any instance of abuse to the Manitoba Child and Family Services (CFS) authority, as specified by The Vulnerable Persons Living with a Mental Disability Act of Manitoba and the Child Protection Act. We would report abuse even if doing so conflicted with our confidentiality obligations.

What are the risks and benefits in taking part in the project?

The procedures of this project present no risks to you beyond what you might encounter in everyday activities.

Learning to do this assessment may be useful to you if you choose to work with clients with developmental disabilities who are unable to express themselves verbally. Also, what we learn from this project may help others who might benefit from learning how to carry out this procedure.

Will I receive the results of the project?

If you wish to be informed of the results, please check YES in the appropriate box at the end of this form. We will send you a 1-page summary of the study's findings by approximately March 2013.

Is there any payment or cost for participating?

You will receive \$10 for each of the sessions you participate in (described above), up to a maximum of \$40. Students will not receive monetary compensation for any sessions they have not participated in. We will also cover the cost of parking at St. Amant Research Centre for your visits.

Is participation voluntary?

Participation is voluntary. Whether you give consent to take part in the project will not affect your status in course(s) that you are taking at the University of Manitoba now or in the future.

Moreover, even after you give consent, you can stop any time and for any reason by simply calling the principal investigator. Again, your decision to stop will not affect your status in courses at the University of Manitoba now or in the future.

Signing the Consent Forms

Signing this *Project Description and Consent Form* on the next page indicates that you have understood to your satisfaction the information regarding participation in the

research project and agree to participate. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the project at any time, and/or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba Research Ethics Board(s) and a representative(s) of the University of Manitoba Research Quality Management / Assurance office may also require access to your research records for safety and quality assurance purposes.

The Psychology/Sociology Research Ethics Board has approved this research. If you have any concerns or complaints about this project, you may contact any of the following persons

Carly Chand, M.A., Principal Investigator, at 256-4301 ext. 5444
(umthi223@cc.umanitoba.ca)

Dr. C.T. Yu, Research Supervisor, at 256-4301 ext. 5399 (yud@cc.umanitoba.ca)

Margaret Bowman, Human Ethics Secretariat, at 474-7122
(margaret_bowman@umanitoba.ca)

Signatures		
I _____ here by consent to participating in the project , _____ titled "Evaluation of a Self- (please print your name)		
Instructional Manual for Conducting Paired-Stimulus Preference Assessments with Individuals with Developmental Disabilities."		
I understand that I can revoke or amend this consent at any time and for any reason.		
Please check YES or NO for the following items:		
<ul style="list-style-type: none"> I would like to receive the results of this project. 		YES NO
If you responded Yes to the above, please write your email or mailing address here:		
<ul style="list-style-type: none"> The researchers may contact me directly for future studies 		YES NO
<ul style="list-style-type: none"> I allow the researchers to make confidential video records of sessions to improve the reliability of their observations. 		YES NO
_____ Signature of Consenting Individual		
_____ Date		

_____ Name of Researcher/Delegate	_____ Signature of Researcher/Delegate	_____ Date
--------------------------------------	--	----------------------

Please return all pages of this *Project Description and Consent to Participation Form* in the enclosed stamped envelope to the researcher. A copy will be given to you for your records. Thank you.

Appendix B: Project Description and Consent Form for Staff

UNIVERSITY
OF MANITOBA

Department of Psychology

190 Dysart Road
Winnipeg, Manitoba
Canada R3T 2N2
Phone (204) 474-9338

Research Project Title: Evaluation of a Self-Instructional Manual for Conducting Paired-Stimulus Preference Assessments with Individuals with Developmental Disabilities

Principal Investigator: Carly Chand, PhD student, Psychology Department, University of Manitoba. Ph: 256 4301 x5444; email: umthi223@cc.umanitoba.ca

Supervisor: Dr. C.T. Yu, Professor of Psychology, University of Manitoba, & Director, St. Amant Research Centre. Ph: 474-9453; email: yud@cc.umanitoba.ca

Sponsor of Research: Canadian Institutes of Health Research

This study is being conducted by Carly Chand as her doctoral thesis, supervised by Dr. Yu. This project description and consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

What is the purpose of the project?

The purpose of this study is to evaluate the effectiveness of a training manual for teaching parents, staff, and undergraduate university students to conduct preference assessments with individuals with developmental disabilities. The training manual will be compared to a written description of the procedure adapted from published research papers.

What are the project procedures and how long will the project take?

Your sessions will consist of reading either a training manual and/or written description of how to conduct preference assessments with individuals with developmental disabilities. After reading the materials provided, you will conduct an assessment with a

simulated client. If you perform at or above 85% accuracy with the simulated client, you will also conduct an assessment with a real client.

You will be asked to attend several sessions, as follows:

Sessions 1: study a brief description of the preference assessment procedure and conduct an assessment with a simulated client (approximately 30 minutes).

Sessions 2: repeat the procedure in Session 1 (approximately 30 minutes), and answer a brief feedback questionnaire with 6 questions (1-2 minutes).

Session 3: study either a written description (approximately 1 hour) or a training manual (approximately 2 hours) of the preference assessment procedure and conduct an assessment with a simulated client (approximately 30 minutes). Answer a brief feedback questionnaire with 6 questions (1-2 minutes). Depending on your results during the preference assessment following the first set of training materials, either move straight to Session 4, or study the training material that you have not yet studied (between 30 minutes to 2 hours). Conduct an assessment with a simulated client (approximately 30 minutes). Answer a brief feedback questionnaire with 6 questions (1-2 minutes).

Session 4: repeat the assessment with a simulated client *or* conduct an assessment with a real client (approximately 30 minutes). Whether you assess a simulated client or a real client will depend on your assessment results in Sessions 3.

The 4 sessions will be spread out over 1 to 2 months.

Will the participant's personal information be kept confidential?

All information obtained about you will be handled in compliance with Section 24 of the Personal Health Information Act (PHIA). Your identity will be coded on all research files. All information will be kept confidential and stored in a locked office at St. Amant Research Centre. Only the research staff will have access. Any public presentations, reports, or publications resulting from this project will not contain any identifying information. The key to decode your identity will be destroyed in a confidential manner within 6 months after the completion of the project (approximately March 2013).

Videotaping

All assessment sessions will be videotaped to facilitate reliable observation. Videotapes will be stored in a locked office at St. Amant Research Centre and they will be erased in a confidential manner within 6 months after the completion of the project (approximately March 2013). However, videotaping is not a requirement and you can still participate if you choose not to be videotaped.

What if abuse is discovered during the course of this project?

All researchers and assistants working on this project have a legal responsibility to immediately report any instance of abuse to the Manitoba Child and Family Services (CFS) authority, as specified by The Vulnerable Persons Living with a Mental Disability Act of Manitoba and the Child Protection Act. We would report abuse even if doing so conflicted with our confidentiality obligations.

What are the risks and benefits in taking part in the project?

The procedures of this project present no risks to you beyond what you might encounter in everyday activities.

Learning to do this assessment may be useful to you in your work with clients with developmental disabilities who are unable to express themselves verbally. Also, what we learn from this project may help others who might benefit from learning how to carry out this procedure.

Will I receive the results of the project?

If you wish to be informed of the results, please check YES in the appropriate box at the end of this form. We will send you a 1-page summary of the study's findings by approximately March 2013.

Is there any payment or cost for participating?

You will receive \$10 for each of the sessions you participate in (described above), up to a maximum of \$40. Participants will not receive any monetary compensation for components of the study which they have not participated in. We will also cover the cost of parking at St. Amant Research Centre for your visits.

Is participation voluntary?

Participation is voluntary. Whether you consent to participate in the project will in no way affect your employment at St. Amant now or in the future.

Even after you give consent, you can stop any time and for any reason by simply calling the principal investigator listed at the end of the consent form. Again, your decision to stop will not affect your employment at St. Amant now or in the future.

Signing the Consent Forms

Signing this *Project Description and Consent Form* on the next page indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and

professional responsibilities. You are free to withdraw from the project at any time, and/or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba Research Ethics Board(s) and a representative(s) of the University of Manitoba Research Quality Management / Assurance office may also require access to your research records for safety and quality assurance purposes.

The Psychology/Sociology Research Ethics Board has approved this research. If you have any concerns or complaints about this project, you may contact any of the following persons

Carly Chand, M.A., Principal Investigator, at 256-4301 ext. 5444
(umthi223@cc.umanitoba.ca)

Dr. C.T. Yu, Research Supervisor, at 256-4301 ext. 5399 (yud@cc.umanitoba.ca)
Margaret Bowman, Human Ethics Secretariat, at 474-7122
(margaret_bowman@umanitoba.ca)

Signatures		
I _____ here by consent to participating in the project , _____ titled "Evaluation of a Self- (please print your name)		
Instructional Manual for Conducting Paired-Stimulus Preference Assessments with Individuals with Developmental Disabilities."		
I understand that I can revoke or amend this consent at any time and for any reason.		
Please check YES or NO for the following items:		
• I would like to receive the results of this project.	YES	NO
If you responded Yes to the above, please write your email or mailing address here:		
• The researchers may contact me directly for future studies		
• I allow the researchers to make confidential video records of sessions to improve the reliability of their observations.		
_____ Signature of Consenting Individual		
_____ Date		

_____ Name of Researcher/Delegate	_____ Signature of Researcher/Delegate	Date
--------------------------------------	--	-------------

Please return all pages of this *Project Description and Consent to Participation Form* in the enclosed stamped envelope to the researcher. A copy will be given to you for your records. Thank you.

Appendix C: Project Description and Consent Form for Legal Decision Maker

UNIVERSITY
OF MANITOBA

Department of Psychology

190 Dysart Road
Winnipeg, Manitoba
Canada R3T 2N2
Phone (204) 474-9338

Research Project Title: Evaluation of a Self-Instructional Manual for Conducting Paired-Stimulus Preference Assessments with Individuals with Developmental Disabilities

Principal Investigator: Carly Chand, PhD student, Psychology Department, University of Manitoba. Ph: 256 4301 x5444; email: umthi223@cc.umanitoba.ca

Supervisor: Dr. C.T. Yu, Professor of Psychology, University of Manitoba, & Director, St. Amant Research Centre. Ph: 474-9453; email: yud@cc.umanitoba.ca

Sponsor of Research: Canadian Institutes of Health Research

This study is being conducted by Carly Chand as her doctoral thesis, supervised by Dr. Yu. This project description and consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

What is the purpose of the project?

The purpose of this study is to evaluate the effectiveness of a training manual for teaching parents, staff, and undergraduate university students to conduct preference assessments with individuals with developmental disabilities. After studying the manual, we will ask each trainee (parent, staff and students) to conduct a preference assessment with a simulated client (someone playing the role of a person with developmental disabilities). If a trainee achieves a minimum of 85% accuracy on this assessment, we will ask the trainee to conduct an assessment with a real client.

We are seeking your consent for the client listed at the end of this consent form to participate in this study.

What are the project procedures and how long will the project take?

The client will receive up to 5 preference assessments over a period of 1-2 months, to be scheduled at your convenience. The number of assessments that each client will receive is your choice, and may depend also on the availability of trained participants. Each assessment will be conducted by a trainee on separate days and will last no more than 30 minutes. The assessment session will be held either at St.Amant or your residence, whichever is more convenient. The Principal Investigator will be present to supervise all assessments and you are also welcome to be present to observe the assessment.

During the assessment, the client will be given opportunities to choose from among various food or leisure items, presented two at a time. If the items are toys/activities, the client will interact briefly with them as they are chosen. If the items are edibles, the client will receive a small portion to consume when chosen. We will discuss with you or the client's caregivers to identify a variety of items for the assessments. By tracking the choices the client makes, we will be able to determine his/her preferences.

Will the participant's personal information be kept confidential?

All information obtained about the client will be handled in compliance with Section 24 of the Personal Health Information Act (PHIA). His/her identity will be coded on all research files. All information will be kept confidential and stored in a locked office at St.Amant Research Centre. Only the research staff will have access. Any public presentations, reports, or publications resulting from this project will not contain any identifying information. The key to decode the client's identity will be destroyed in a confidential manner within 6 months after the completion of the project (approximately March 2013).

Videotaping

All assessment sessions will be videotaped to facilitate reliable observation. Videotapes will be stored in a locked office at St.Amant Research Centre and they will be erased in a confidential manner within 6 months after the completion of the project (approximately March 2013). However, videotaping is not a requirement and you can still participate if you choose not to be videotaped.

What if abuse is discovered during the course of this project?

All researchers and assistants working on this project have a legal responsibility to immediately report any instance of abuse to the Manitoba Child and Family Services (CFS) authority, as specified by The Vulnerable Persons Living with a Mental Disability Act of Manitoba and the Child Protection Act. We would report abuse even if doing so conflicted with our confidentiality obligations.

What are the risks and benefits in taking part in the project?

The procedures of this project present no risks to the client beyond what he/she might encounter in everyday activities.

Clients with developmental disabilities often have difficulty expressing their preferences verbally. A direct preference assessment could help to find out what the client's preferences or likes and dislikes. We will share the assessment results with you, or with your permission with authorized staff who provide direct support for the client. Preferred activities/items may be provided to enrich the client's environment or used as reinforcers in teaching situations.

Also, what we learn from this project may help others who might benefit from learning how to carry out this procedure.

Will I receive the results of the project?

If you wish to be informed of the results, please check YES in the appropriate box at the end of this form. We will send you a 1-page summary of the study's findings by approximately March 2013.

Immediately following an assessment with your child/family member, I will share the results of the assessment with you.

Is there any payment or cost for participating?

There is no cost or payment for participating. We will cover the cost of parking at St. Amant if the assessment sessions are held there.

Is participation voluntary?

Participation is voluntary. Whether you give consent for the client to participate in this project will in no way affect any services the client may be receiving from St. Amant or the University of Manitoba now or in the future.

Even after you give consent, you can stop any time and for any reason by simply calling the principal investigator listed at the end of the consent form. Again, your decision to stop will not affect any services the client may be receiving from St. Amant or the University of Manitoba now or in the future.

Signing the Consent Forms

Signing this *Project Description and Consent Form* on the next page indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the project at any time,

and/or refrain from answering any questions you prefer to omit, without prejudice or consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

The University of Manitoba Research Ethics Board(s) and a representative(s) of the University of Manitoba Research Quality Management / Assurance office may also require access to your research records for safety and quality assurance purposes. The Psychology/Sociology Research Ethics Board has approved this research. If you have any concerns or complaints about this project, you may contact any of the following persons

Carly Chand, M.A., Principal Investigator, at 256-4301 ext. 5444
(umthi223@cc.umanitoba.ca)

Dr. C.T. Yu, Research Supervisor, at 256-4301 ext. 5399 (yud@cc.umanitoba.ca)

Margaret Bowman, Human Ethics Secretariat, at 474-7122
(margaret_bowman@umanitoba.ca)

Signatures		
<p>I, _____ here by consent to _____'s participation (please print your name) (please print client's name) in the project, <i>"Evaluation of a Self-Instructional Manual for Conducting Paired-Stimulus Preference Assessments with Individuals with Developmental Disabilities."</i></p>		
<p>By giving consent I allow the research project staff to:</p> <ul style="list-style-type: none"> Obtain personal health information about the client, including: age, diagnosis, and level of functioning, from me and if necessary, from the health records at St. Amant. Include the assessment results in public presentations, reports, and publications, so that others may learn from this project. The identity of the client, however, <i>will not</i> be disclosed. <p>I understand that I can revoke or amend this consent at any time and for any reason. The consent will otherwise remain in effect for a period of 12 months from the date it is received.</p>		
<p style="text-align: center;"><i>Please check YES or NO for the following items:</i></p>		
<ul style="list-style-type: none"> I would like to receive the results of this project. 	YES	NO
<p><i>If you responded Yes above, please write your email or mailing address here:</i></p>		
<ul style="list-style-type: none"> I allow the researchers to make confidential video records of sessions to improve the reliability of their observations. 		
<ul style="list-style-type: none"> I allow the researchers to share the participant's results with authorized St. Amant staff who works directly with the client. 		
<ul style="list-style-type: none"> The researchers may contact me directly for future studies 		

Signature of Consenting Individual	Date	
_____	_____	
Name of Researcher/Delegate	Signature of Researcher/Delegate	Date
_____	_____	_____

Please return all pages of this *Project Description and Consent to Participation Form* in the enclosed stamped envelope to the researcher. A copy will be given to you for your records. Thank you.

Appendix D: Paired-Stimulus Evaluation Form

Date: _____
Participant Name: _____

Observer: _____
Client/Actor: _____

Please record a "✓" for correct responses, and "X" for incorrect responses and n/a for not applicable

Before an Assessment:

1. Fill out name, client and date on datasheet
2. Label items to be assessed
3. Items to be assessed are available on side table
4. Samples item with the client (for each of 4 items)

Presenting Trials

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

ANTECEDENTS

5. Hold up each item and ensure client is attending to items												
6. Present items one at a time in front of the client												
7. Present items in the correct positions												
8. Say "Pick one" and wait 15 s for a response												

*CONSEQUENCES**Client Selects One Item*

9. Praise the client												
10. Provide client with the item and allow time to consume or interact (15 to 30 s)												
11. Remove unselected item												
12. Record client's response												

Client Does Not Select Either Item

13. Wait 15 s for a response, then repeat "Pick one"												
14. Wait additional 15 s												

If client does not respond:

15. Remove all items and record response												
--	--	--	--	--	--	--	--	--	--	--	--	--

If client selects item:

16. Praise the client												
17. Provide client with the item and allow time to consume or interact (15 to 30 s)												
18. Remove unselected item												
19. Record client's response												

Client Selects Both Items

20. Gently block the attempt												
21. Remove any items from client and table												
22. Re-present the trial												
23. Once client selects one or neither item, record clients response												

Determining Preference Values:

23. Preference values correctly calculated (for each of 4

--	--	--	--

 items)

Appendix E – Demographics Form for Students

Participant Code:

Information about you

Please fill out this form. You do not need to answer any questions that you do not want to. Please do NOT put your name anywhere on this form; the researcher will assign you a code and enter that code on this form. Let us know if you have any questions.

1. How old are you (years)? _____

2. What degree/program are you currently working on?

3. Do you have any formal education relating to working with individuals with developmental disabilities? If so, please describe

4. Have you received any prior training on how to conduct preference assessments? If so, please describe

Thank you!!

Appendix F – Demographics Form for Staff

Participant Code:

Information about you

Please fill out this form. You do not need to answer any questions that you do not want to. Please do NOT put your name anywhere on this form; the researcher will assign you a code and enter that code on this form. Let us know if you have any questions.

1. How old are you (years)?

2. What kind of work do you do with individuals with developmental disabilities, and how long have you worked with this population?

3. Do you have any formal education relating to working with individuals with developmental disabilities? If so, please describe

4. Have you received any prior training on how to conduct preference assessments? If so, please describe

Thank you!

Appendix G: Paired-Stimulus Preference Assessment Data Sheet

Date: _____ Tester: _____ Client: _____

Session 1:

Items to be Assessed:

A		C	
B		D	

Trial	Items		Choice	Trial	Items		Choice
	Left	Right			Left	Right	
1	D	B		7	B	C	
2	D	C		8	B	D	
3	A	C		9	C	B	
4	C	A		10	A	B	
5	A	D		11	B	A	
6	C	D		12	D	A	

Preference Values

A: $/6 = \underline{\hspace{1cm}} \times 100 = \underline{\hspace{1cm}}\%$ C: $/6 = \underline{\hspace{1cm}} \times 100 = \underline{\hspace{1cm}}\%$ B: $/6 = \underline{\hspace{1cm}} \times 100 = \underline{\hspace{1cm}}\%$ D: $/6 = \underline{\hspace{1cm}} \times 100 = \underline{\hspace{1cm}}\%$

Appendix H: Method Description for Paired-Stimulus Preference Assessment Procedure

Thank you for participating in this study. Today you are going to read and learn how to do a preference assessment. Take as much time as you would like to go over the written procedures below. Once you are finished I will ask you to do a preference assessment with a person who will play the role of a person with developmental disabilities. The written procedures will not be available to you during the assessment. Please let me know when you are done studying.

Procedures

Prior to the beginning of the session, clients are given a sample of each of the edible items and are given 30 s access to each of the leisure items.

In this assessment, items are presented to the client in pairs. Pair each item with every other item in a randomized order, for a total of 12 item-pair presentations. Items are randomly positioned (left or right) on each trial.

On each trial, place two items 0.7 m apart and approximately 0.7 m in front of the client. When the client is seated at the table, you will instruct the client to select one item. A selection response is recorded when the client makes physical contact with one of the presented items. If the client makes contact with more than one item, the first item contacted will be recorded as the selection.

If the client approaches one of the stimuli, allow them access to that item for 5 s and remove the other stimuli. If the client approaches both items simultaneously, block their attempt. If the client does not approach either item within 5 s, place the two items in front of the client for another 5s. If the client now approaches an item, allow them to access to that item for 5 s and remove the other item. If the client does not approach either item within 5 s, remove both items and begin the next trial.

Note. Adapted from “A Comparison of Two Approaches for Identifying Reinforcers for Persons with Severe and Profound Disabilities,” by W. Fisher et al., 1992, *Journal of Applied Behavior Analysis*, 2, p. 493, and “Evaluation of a Multiple-Stimulus Presentation Format for Assessing Reinforcer Preferences,” by I. DeLeon and B. Iwata, 1996, *Journal of Applied Behavior Analysis*, 29, p. 522.

Appendix I: Table of Contents of Self-Instructional Manual

Table of Contents

Section 1: Introduction to Preference	1
Review Exercise 1	2
Answers to Review Exercise	3
Section 2: Preparing to Conduct a Paired-Stimulus (PS) Preference Assessment	4
Review Exercise 2	6
Answers to Review Exercise 2	7
Section 3: Presenting Items during a Paired-Stimulus (PS) Assessment	8
Review Exercise 3	10
Answers to Review Exercise 3	11
Section 4: Providing Consequences for Client Responses	12
Review Exercise 4	15
Answers to Review Exercise 4	17
Section 5: Determining Preference Values	18
Review Exercise 5	19
Answers to Review Exercise 5	21
Behavior Checklist for Conducting PS Assessments	22-23
Final Review Exercise	23
Answers to Final Review Exercise	24

Appendix J: Behavior Checklist for Conducting PS Assessments

Choosing an Area and Setting Up

- Choose a room or area that is quiet and free of distractions
 - Set up a table and two chairs so that you will be seated across from the client
 - Place a small table beside your chair, and out of reach of the client
-

Gathering Your Materials

- Gather six food or non-food items to assess
 - If you are using food items, break food into small pieces and make sure that you have at least 11 pieces of each food item, placed on the small table
-

Bringing Your Client to the Room

- You and your client will be seated opposite each other at the table
-

Allowing the Client to Sample Items

- Present an item on the table in front of the client
 - Ask the client to look at the item (“Look”) and then ask them to take the item (“Take it”)
 - Allow the client enough time to consume a food item, or 15-30 seconds with a non-food item
 - If the client does not take an item, gently prompt them. If they still do not take the item, remove the item
 - Repeat the above steps with each item you are assessing
-

Presenting Items

- Check the data sheet to see which two items you should present
 - Hold one item in front of the client and say “Look”
 - Once the client has looked at the item, place it on the table in the correct position
 - Repeat the above two steps with the second item
 - Say to the client, “Pick one”, and wait up to 15 seconds for a response
-

After a Client Selects One Item

- Praise the client
 - Provide the client with the item selected and allow time for the client to consume (food) or 15-30 seconds to interact (non-food)
 - Remove other item from the table
 - Record the client’s response by writing the appropriate letter in the “Choice” column
-

After a Client Does Not Select Either Item

- After waiting 15 seconds for a response, repeat the instruction “Pick one”
 - Wait an additional 15 seconds. If the client has still not responded, remove both items from the table
 - Record the client’s response by marking a zero in the “Choice” column
-

After a Client Approaches Both Items

- Gently block the client
 - Remove any items in the client’s possession or on the table
 - Re-present the same trial
 - Once the client selects one item or does not select either item, record the client’s response as described above
-

Determining Preference Values

- Count how many times each item was chosen across all trials
 - Divide the number of times an item was chosen by the number of times it was presented
 - Multiply the above number by 100 to get a preference value for each item
-

Appendix K: Sample Actor Script

Trial	Attending (A) /Not Attending (NA)	Response 1	Response 2
1	A	Pick one item only	
2	A	Approach two items	Pick one item only
3	NA	Pick one item only	
4	A	Don't approach any items	Don't approach any items
5	NA	Approach one item, then approach a 2 nd item quickly	
6	NA	Pick one item only	
7	NA	Pick one item only	
8	A	Approach two items	Pick one item only
9	A	Pick one item only	
10	NA	Don't approach any items	Pick one item only
11	NA	Approach one item, then approach a 2 nd item quickly	
12	A	Pick one item only	

Appendix L: Survey about the Study and Written Materials

We would like to know what you thought of this study and the written material you have just used. Please indicate how strongly you agree or disagree with each statement by circling the number after each statement.

Your Name: _____ **Date:** _____

1. It is important for people working with individuals with developmental disabilities to learn to conduct preference assessments.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree

2. The written material was easy to follow and understand.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree

3. The written material provided all the necessary information for me to do the assessment.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree

4. I believe I have successfully learned how to conduct the PS preference assessment from studying the written material provided.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree

5. I feel confident and ready to conduct paired-stimulus preference assessment with clients after studying the written material provided.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree

6. I would recommend the written material to others who wish to learn how to conduct paired-stimulus preference assessment.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree

Other Comments: _____

Note. Survey adapted from “Evaluation of a Training Manual to Teach Multiple-Stimulus Preference Assessment” by Ramon (2013).