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Using Microsoft Powerpoint© to conduct a Paired Stimulus Preference Assessment

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Using Microsoft PowerPoint© to Conduct a Paired Stimulus Preference Assessment

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Abstract

There are two categories of preference assessments, indirect (e.g., student and teacher surveys) and direct (e.g., multiple stimulus, multiple stimulus without replacement, paired stimulus and single stimulus) preference assessments. Although indirect assessments are less time consuming, direct assessment methods are better predictors of both preference and reinforcing value. While there is a growing body of research demonstrating the advantages of direct preference assessments, little has been done to incorporate technology efficiently into the preference assessment process. The present study proposed the use of PowerPoint© as a way of use efficiently use technology in the preference assessment process. To validate the use of Microsoft PowerPoint©, the study compared the outcomes of the preference assessment using Microsoft PowerPoint© to a tangible preference assessment. Finally, participants completed a picture-to-object discrimination task as a way of demonstrating that participants had the skills required to complete a picture preference assessment. There was high agreement between the tangible and the PowerPoint© preference assessments; especially for higher and lower ranked items. Both participants also did well on the discrimination task demonstrating they had the skills needed to accurately complete the picture preference assessment. Results are discussed in terms of directions for future research as well as ways to incorporate the use of Microsoft PowerPoint© into daily preference assessments.

Keywords: PowerPoint©, Preference assessments,, developmental disabilities, discrimination skills, Paired Stimulus Preference Assessment
Using Microsoft PowerPoint© to Conduct Paired-Stimulus Preference Assessment

**Introduction to preference assessments**

Preference refers to a subjective liking or disliking of a particular outcome (Cannella, O'Relly, & Lancioni, 2005; Keary & McKnight, 1997). The higher the value of an outcome, the more likely a person is to choose that option. Even though preference is not synonymous with reinforcing value (i.e., an item can be preferred while not functioning as a reinforcer), there are several advantages in determining a client's preference for various outcomes. First, individuals with disabilities have often had their ability to make choices restricted, which takes away their autonomy (Keary & McKnight, 1997). Allowing clients to indicate their preferences is one way to allow for greater autonomy. A second benefit to the use of preference assessments is that allowing clients the opportunity to make their own choices can reduce the occurrences of problem behavior (Cannella et al., 2005; Shogren, Faggella-Luby, Bae, & Wehmeyer, 2004;). Finally, even though preference and reinforcing value are not synonymous, often times items identified as preferred do have some reinforcing value. Knowing which items might serve as reinforcers can have a positive impact on treatment outcomes. For example, Ahearn, Clark, DeBar, & Florentino (2005) found that just having access to highly preferred items was an effective treatment for reducing the student's rates of stereotypic behaviors. By reducing stereotypy behaviors, clinicians are able to spend to spend more time teaching students functional and academic skills.
There are a number of studies evaluating the efficacy of choice procedures with a wide range of populations (Hagopian, Long, & Rush, 2004; Kang, O’Reilly, Lancioni, Falcomata, Sigafoos, & Xu, 2013; Logan & Gast, 2001;). Hagopian et al. (2004) conducted a review of the literature to categorize the types of preference assessments currently in use. The first type of preference assessments involved indirect preference assessments. Most indirect assessments involved making a list of items available to the clients and then having people familiar with the client (e.g., parents, caregivers, or teachers) rate the preference of each item using a Likert scale. Although most indirect methods are informal and involve the practitioner making a list of items, there are two comprehensive indirect surveys designed to evaluate a wide range of items. The first is the Reinforcer Assessment for Individuals with Severe Disabilities (RAISD) developed by Fisher, Bowman, & Amari (1996). The second indirect assessment is the Choice Assessment Scale developed by Matson, Bielecki, Mayville, Smalls, Bamburg, and Baglio (1999). Both types of interviews are designed to collect information on how likely caregivers believe various food/tangible, social, and sensory (e.g., auditory and tactile stimulation) likely to be preferred by the clients. Matson et al. found the test-retest validity of the Choice Assessment Scale to be $r = .54$ indicating a high correlation with three weeks between each administration. The test-retest validity of the RAIS was not quite as high ($r = .32$), but Fisher et al. found the RAISD an effective way to identify potent reinforcers.

The other category of preference assessments includes direct preference assessments. There are two broad types of direct assessment methods: engagement-
based and approached-based preference assessments (Hagopian et al., 2004; Kodak, Fisher, Kelley, & Kisamore, 2009). Engagement-based preference assessments measure the clients preference for a stimuli based on duration of the clients interactions with various stimuli while the approach-based assessments determine preference based on the frequency with which clients point to or touch various items. The difference is that with engagement-based preference assessments, the researcher is measuring how long the client interacts with an item, of items, before putting the item down and playing with a new item. With selection based preference assessments, the researcher may ask the client to, select an item out of an array and after the client selects an item the client is allowed to interact with the item for a fixed amount of time. In this case, the number of times an item is selected determines the client's preference for that item.

There are two types of engagement-based preference assessments, a free-operant (FO) preference assessment and a single-stimulus engagement (SSE) preference assessment. The FO preference assessment involves allowing the clients access to all the stimuli for a pre-determined period of time (e.g., 10-15 min) and then using a 10-s partial interval recording method to measuring the percentage of intervals in which clients interact with one or more of the items (Roane, Vollmer, Ringdahl, & Marcus, 1998). The preference hierarchy is created based on the percentage of intervals the client spends engaged with a stimulus (i.e., the more time spent engaged with a stimulus, the more preferred the stimulus). The SSE preference, on the other hand, involves presenting the stimuli to the student, one at a time, for a predetermined duration and then recording the amount of time the
student interacts with the item (DeLeon & Iwata, 1996). Again, clinician’s determine a rank order of preference based on the duration with which clients spend engaged with the various stimuli.

The second category of direct assessment methods are approached based assessments (Hagopian et al., 2004; Kodak et al., 2009). There are four types of approached-based preference assessments; the single-stimulus (SS) preference assessment, the paired-stimulus (PS) preference assessment, the multiple-stimulus (MS) preference assessment, and the multiple-stimulus-without-replacement (MSWO) preference assessment.

The earliest direct preference assessment was the SS preference assessment first conducted by Pace, Ivancic, Edwards, Iwata, and Page (1985). The SS preference assessment involved presenting the stimuli to the participants, one at a time, and recording whether the participants reached for the stimulus. Since the initial research by Pace et al. there have been a number of variations to the SS preference assessment. For example, Logan and Gast (2001) suggest not only recording approaches to the stimulus, but also recording avoidance responses, no responses, and in cases when the individual is non-ambulatory recording positive and negative affect (e.g., facial expressions and body movement).

The next preference assessment discussed in the literature is the PS preference assessment developed by Fisher, Piazza, Bowman, Hagopian, Owens, and Slevin (1992). The PS preference assessment involves presenting items two at time, counterbalancing for order of presentation and side bias, and then ranking the items based on the percentage of times the client choses the item. Windsor, Piche’, and
Locke (1994) were the first to a MS preference assessments. During the MS preference assessment, the researchers identify a variety of potentially preferred items (based off direct observations or indirect preference assessments) and presenting the items in an array to the clients. The researcher then records the number of times the client selects an item from the array. A variation of the MS preference assessment is the MSWO preference assessment developed by DeLeon and Iwata (1996) and involves presenting an array of items in the same manner as the MS preference assessment, except once an item is selected, that item is removed from the array while other items remain.

There are also assessment methods that do not fit neatly into either the direct or indirect assessment categories. Because of the difficulty in presenting certain preferred stimuli to participants (e.g., going to the playground or specific social interactions), a number of studies have used verbal surveys or pictorial preference assessments (e.g., Graff & Gibson, 2003; Northup, George, Jones, Broussard, & Vollmer, 1996; Wilder, Ellsworth, White & Schock, 2003). Verbal surveys are indirect because the practitioner asks a client what they prefer without actually presenting the outcomes to the client, but verbal preference assessments are often conducted in a manner similar to PS preference assessments. First, the practitioner creates a list of items and then presents the stimuli, verbally and in pairs to the client (e.g., “Do you prefer item A or item B?”) The researcher then goes through the list of stimuli and pairs every stimulus with every other stimulus in the same way PS preference assessments are conducted.
Pictorial surveys are more direct than verbal surveys in that the practitioner will present pictures of the items, but that actual items (or outcomes) may not be present (see Nuernberger Smith, Kelly, Czpapar, & Klatt, 2012 for an example of a picture preference assessment and Horrocks & Morgan, 2009 for an example of a video preference assessment). Again, these methods are indirect because the clinician is not directly comparing the items of interests themselves, but rather comparing pictures or videos of the outcomes. The picture and video assessment formats are more similar to the direct preference assessments because the outcomes are presented to the client using any of the direct assessment methods (i.e., either in an array, one at a time, or in pairs).

**Evaluating Preference Assessment Procedures**

Before conducting a preference assessment, practitioners should consider the pros and cons of each preference assessment method. The indirect preference assessment methods are quicker (taking only a few minutes to complete) and easier to conduct but the results from indirect methods often do not correspond to the outcomes of direct assessment methods (Hagopian et al., 2004; Logan & Gast, 2001; Kang et al., 2013). Also, researchers do not recommend using indirect assessments alone as a measure of preference. Three studies compared the results of surveys completed by teachers to actual SS preference assessments and found little agreement between the two types of assessments. Green, Reid, White, Halford, Brittain, and Gardner (1988) found that items ranked high based on the SS preference assessment but low based on staff interviews served as effective reinforcers; in contrast, items ranked low on the SS preference assessments but high by staff were not likely to serve as reinforcers, a finding
replicated by Green, Reid, Canipe, and Gardner (1991). Cote et al. (2007) also compared systematic assessment outcomes to the outcomes of a teacher survey but instead of using the SS preference assessment the researchers used a PS preference assessment. They found a positive correlation between the indirect and direct assessment for only four of the nine participants. Resetar and Noell (2008) compared the MSWO preference assessment to a teacher’s opinion of students’ preferences and found results similar to previous research: in no case was an item ranked high on the MSWO preference assessment also ranked high by the teacher, and items ranked low by the teachers were ranked high in the MSWO preference assessment. Regardless of the type of direct preference assessment used, there seems to be little agreement between direct and indirect methods.

Although direct assessment methods are a more accurate measure of preference, there are a number of factors researchers should consider when selecting a direct preference assessment method. The SS preference assessment seems to have the lowest predictive validity due to the way clients interact with most of the items (Fisher et al., 1992). Fisher et al. compared the results of the SS preference assessment to the PS preference assessment and found little agreement between the two. The researchers also found that the SS preference assessment did a poor job at producing a hierarchy of preference for the various stimuli presented. On the other hand, the SS preference assessment does seem to be the most appropriate for clients who are very low functioning (e.g., 6-month-old range with limited mobility; Logan & Gast, 2001). The MS procedures are the least time consuming to conduct, but like the SS preference assessment, do not do
well at developing a preference hierarchy due to clients’ interacting with only one or two preferred stimuli (e.g., DeLeon & Iwata, 1996).

The most effective procedures, in terms of developing a preference hierarchy, predicting which items will serve as reinforcers, and test-retest reliability, seem to be the MSWO and PS preference assessments (Kang et al., 2013). The PS and MSWO often agree with each other and outperform the other types of preference assessments at producing a preference hierarchy. Regarding the consistency of the results over time, preference assessments in general seem to have a high level of agreement between preferred stimuli, but low agreement when comparing preference of moderately ranked or low-ranked items. According to Hagopian et al. (2004), the PS preference has the highest level of test-retest reliability, with high agreement occurring up to 4 months after the initial preference assessment (Windsor et al., 1994). Unfortunately, the PS assessment is also one of the longest assessments to conduct and takes considerable time to prepare. On average, the PS assessment takes about 30-min to complete (Kang et al, 2013). The PS assessment also takes a considerable amount of time to set up because a practitioner should present the items in a random order, and the order of the items should be counterbalanced to prevent a side bias or order effects.

The results involving the use of pictures, verbal surveys and student surveys also seems mixed in regards to which assessment methods are most accurate and for which clients their uses are appropriate. For example, Northup, Jones, Broussard, and George (1995) found no agreement between a verbal survey, a tangible assessment, and a paired choice questionnaire completed by children diagnosed with ADHD. Cohen-Almeida, Graff, and Ahearn (2000) on the other hand, found reasonable agreement between the
verbal and tangible preference assessments; but only for students with higher I.Q. scores. Wilder, Therrien, and Wine (2008) compared the outcomes of a reinforcer survey in which items were ranked on a scale of 0 – 4 with 4 being most preferred to a verbal preference assessment in which clients (typically developing adults employed at a university) were asked whether they would like option A or option B. Then they conducted a reinforcer assessment to determine which items would actually serve as reinforcers for the participants. The researchers found that although there was some agreement between the two assessments, the survey did a better job at predicting which items would likely serve as reinforcers.

Researchers have also examined the possibility of using pictorial preference assessments and have found a high level of agreement between picture and tangible preference assessments as long as clients had the appropriate discrimination skills (Coyners, Doole, Vause, Haraplak, Yu, & Martin, 2002). Coyners et al. first assessed the discrimination skills of nine individuals with developmental disabilities using the Assessment of Basic Learning Abilities (ABL; an assessment used to assess object, verbal, and pictorial discrimination skills). The researchers found that if the participants lacked the discrimination skills required for the assessment (e.g., verbal discrimination for the verbal assessment), then the outcomes of the preference assessment were not accurate. On the other hand, Wilder et al. (2003) compared a pictorial assessment, survey, and verbal assessments in their ability to predict reinforcers in typically developing adults with schizophrenia. In this case, the researchers found that all three assessments were equally effective.
Overall, the indirect methods (e.g., surveys and questionnaires) tend to be very brief, but are also poor predictors of what items the clients actually prefer (Green et al., 1988; Green et al., 1991). Of the direct methods available, both the PS and MSWO preference assessments seem to be the best at creating a hierarchy of preference for items while having a high level of test-retest validity (Kang et al., 2013). The PS preference assessment has good test-retest validity for up to 4 months, but the average length of time to conduct a PS preference assessment is a little over 30 min. The MSWO, on the other hand, also has good test-retest validity, but only takes about 15 min to conduct. Researchers have also found that using pictures of items or activities may be just as effective as the tangible preference assessments, but only if the clients have the appropriate discrimination skills (Coyners et al., 2002). Both Coyners et al. (2002) and Clevenger and Graff (2005) found that if clinicians use pictures in place of items, they needed to assess the client’s object-to-picture and picture-to-object skills before hand.

The use of Technology in Conducting Preference Assessments

The earliest studies incorporating technology into the preference assessment process involved the use of microswitches (Dattilo, 1986; Tam, Phillips, & Mudford, 2011; Wacker, Berg, Wiggins, Muldoon, & Cavanaugh, 1985;). Wacker et al. used microswitches with five clients with physical and developmental disabilities. The clients activated the microswitches by either raising their arm or lifting their head to activate the microswitches that would then activate various battery-operated toys. Using a multiple baseline across participants design, and measuring response rates, the researchers were able to demonstrate that using microswitches attached to various stimulus outcomes could aid in determining potential reinforcers for children with severe and multiple
disabilities. Dattilo (1986) provided further evidence for the use of microswitches in preference assessments by demonstrating that children with severe motor and cognitive impairments could use a computer to show a preference for tactile, visual, or auditory stimuli by using a computer. By selecting a microswitch, a computer program would open a file that would allow access to either songs, or video scenes, or would activate a vibrating pad. Using a multiple baseline across subjects design, in conjunction with a multiple treatments design, Dattilo was able to assess the preference for one of three stimulus conditions (visual-auditory, visual-tactile, tactile-auditory). The researchers then presented the clients three switches, two of which would allow access to one of the three conditions, while a third switch was used to control for a side bias. The researchers found that each of the participants demonstrated a clear preference for one of the three conditions.

Although earlier studies demonstrated the efficacy of using microswitches in assessing preference for children with multiple disabilities, researchers have also found ways to use various devices in order to assess preference for outcomes not easily presented using tangible preference assessments. For example, Horrocks and Higbee (2008) used tape players to assess the preference for auditory stimuli (i.e., various songs) in 7 adolescents’, ages 13 to 15, diagnosed with autism, intellectual, or multiple disabilities, as defined by the Individuals with Disabilities Education Act (IDEA). The researchers conducted a PS preference assessment similar to Fisher et al. (1992) using two identical CD players placed side-by-side. First, the researchers played one song, and then the next. After the clients heard each option, they were asked to pick the one they
liked the most. The researchers also conducted a reinforcer assessment, which found that
the most preferred songs served as the strongest reinforcers.

Horrocks and Morgan (2009) used two computers to assess individual preferences
for daily jobs. The clients in the study were three individuals (two females and one male)
ages 18-22 diagnosed with significant intellectual disabilities who were part of a
vocational program on a university campus. The researches began by interviewing the
clients’ teacher to obtain a list of 3 high preference and three low preference jobs. The 3
participants then completed a video preference assessment in which two computes were
placed side-by-side. All videos were presented twice to each participant, once on each
side, to control for order effects and side bias. The stimuli in the video preference
assessment were presented in the PS preference assessment format. Before making a
choice, participants were asked to watch 2 to 4 min clips of both job options. Then the
videos were paused and the researcher asked the clients to make a choice. Then the
researchers compared the results of the PS preference assessment to the results of a
MSWO preference assessment. During the MSWO preference assessment, researchers
presented clients with items related to the job task. The clients completed three MSWO
preference assessments as a test of reliability for the MSWO preference assessment.
Horrocks and Morgan did find agreement between the high preference and low
preference job options.

Snyder, Higbee, and Dayton (2012) conducted a similar study but using DVD
players to assess preferences of stimulus options. The participants were ages 3 to 5 years
diagnosed with autism. The researchers first played a video on the left, and then paused it
and played a video on the right. After the clients viewed each option, the researchers
asked the clients to pick which one they liked the most. The researchers also compared the results of the video preference assessment to a tangible PS preference assessment. The researchers found that the video preference assessment was able to determine a hierarchy preference for items and the correlation between the tangible and video preference assessments ranged from 0.35 to 0.97 with the correlations being significant for 4 of the 6 participants.

Although the use of video equipment and C.D. players seems to be effective, setting up the equipment and creating stimuli can be very consuming. To simplify the process, researchers have used PowerPoint® presentations to present various stimuli to participants. For example, Mechling and Moser (2010) used Microsoft PowerPoint® to assess client’s preferences for watching themselves, peers, or adults completing a task. The clients were students’ diagnosed with autism and a moderate intellectual disability and were between the ages of 11 and 13 years. The clients were first shown the three videos they could choose between. Next, the researchers showed the three videos in an array and the clients were asked to choose which one they wanted to see. In total, the clients made 10 choices per session for a total of 10 sessions. Although there were some individual differences, the clients’ typically chose to watch either himself or herself or a peer complete a task over an adult completing a task. Although the study did demonstrate a way to incorporate Microsoft PowerPoint® into the preference assessment process, the study used a restricted array of items limiting the ability to determine the procedures ability to produce a hierarchy of preference. While not stated by the researchers, the study used a preference assessment format similar to a MS preference assessment, which tends to over select 1 or 2 items to the exclusion of the rest.
Purpose of the Present Study

The purpose of the present study is to expand on the research by expanding on past research using Microsoft PowerPoint© by demonstrating how the software can be used with younger students in a special education classroom. The study used a PS preference assessment because of the high test-retest reliability, the ability of the assessment to predict an item’s reinforcing value, and the ease of creating and presenting stimuli. Because research demonstrates that whether participants have the relevant discrimination skills can influence the outcome of preference assessments using pictures, (e.g., Coyners et al., 2002) participants completed a picture-to-object and object-to-picture matching task similar to Snyder et al. (2012). Finally, as a way to further validate the use of Microsoft PowerPoint©, I compared the PowerPoint© assessment to a tangible SP preference assessment. A high degree of agreement between the two assessments should provide evidence for the use of Microsoft PowerPoint© as a tool to conduct preference assessments.

Method

Participants and Setting

The researcher coded participants P-1 and P-2, based on the order they completed the preference assessments. P-1 was a 6-year-old Hispanic male diagnosed as intellectually disabled with speech and language impairment. P-1’s Verbal Behavior-Milestone Assessment and Placement Program (VB-MAPP) assessment placed him level 3 in the areas of expressive and receptive language, play skills, social language, imitation, group instructions, reading, writing, and math. P-1 was also fluent in Spanish and English. P-2 was a six-year-old African American female diagnosed with an intellectual
disability, a developmental delay, and a speech and language impairment and as having a weak eye muscle. P-2 was also assessed at level 3 of the VB-MAPP assessment in the areas of expressive/receptive skills, social skills and on level 2 for play and visual perception.

All sessions took place in the students’ regular classroom. The student sat across from the researcher who was conducting the preference assessment. The researcher conducted both the tangible and PowerPoint® preference assessments. A trained undergraduate student collected procedural fidelity and Interobserver agreement. The PowerPoint® was presented to the students on a MacBook Pro 13” laptop. Items used in the assessment were determined based off the results of the RAISD as well as what items were available in the classroom. Both the classroom teacher and the paraprofessional in the classroom completed the RAISD and items that both teachers nominated were selected for the preference assessment. The items used were an Apple iPad, popcorn crisps, pretzels, a Texture book with pages that were rough, smooth soft, etc, a book with pictures of the planets, stuffed animals, toy instruments (symbols, bells, maracas, etc.), toy animals, toy trains, and a scrapbook the teacher made with pictures of each of the students in the classroom. Figure 1. shows a picture of each item as it appeared in the PowerPoint® PS preference assessment.

**Teacher Interviews and Tangible Paired Stimulus Preference Assessment**

Before conducting the preference assessments, the classroom teachers were interviewed to determine what items the students enjoy. Because teacher interviews tend to do poorly at selecting items likely to be reinforcers, both the classroom teacher and the paraprofessional assisting in the classroom completed the RAISD and items nominated
by both the teacher and the paraprofessional were thought to most likely serve as preferred items for the participants. Based on the results of the RAISD, both students enjoyed similar items so a list of 10 items was developed and used with both students.

The researcher presented the tangible PS preference assessment in a fashion similar to DeLeon and Iwata (1996). Items were presented two at a time with each item presented nine times. The researcher randomized the presentation of the items using the list randomizer on www.random.org. Before asking the participants to make a choice, the researcher allowed the student 15-s to 25-s access to the items, one at a time, before each trial. After the student interacted with each item, the researcher presented the two items in front of the student and said, “Pick one.” After asking the student to choose an item, the student had 15-s to make a choice. If the student did not respond within 15-s, the researcher represented the instruction, “Pick one,” and the student was given another 15-s to respond. If the student still did not make a choice, the researcher removed the items and record that neither item was selected. After the student made a selection, they were allowed 15-s to 25-s access to the item. After which, the items were removed and the therapist presented the next trial.

**Paired Stimulus PowerPoint® Presentation**

The PowerPoint® PS preference assessment was conducted similar to the tangible PS preference assessment. The items were presented on the screen two at a time. The items were presented in the same order for the PowerPoint® PS assessment as they were for the tangible PS preference assessment. The researcher turned the computer to the student and asked the student to, “Pick one.” The student selected an item by either touching or pointing to the item on the screen or by stating the name of the item. Again,
the student was allowed 15-s to 25-s access to the item, after which the researcher removed the item and began the next trial.

**Discrimination Assessment**

After completing both forms of the preference assessment, the researcher conducted the discrimination assessment. Both participants completed an object-to-picture and picture-to-object matching task. The same items from the preference assessment were used during the matching task. The researcher took pictures of the items used during the preference assessment so that the pictures of the items were the same as the pictures on the PowerPoint® PS preference assessment. The items were presented in an array of three and the student was asked to match each item to each picture and vice versa for a total of 60 trials.

**Interobserver Agreement and Procedural Fidelity**

All sessions were recorded using hand held camera so a second observer could collect Interobserver agreement (IOA). A second observer collected IOA for 50% of the tangible PS preference assessment and 50% of the PowerPoint® PS preference assessment. The second observer was a trained undergraduate student studying applied behavior analysis. The researcher calculated IOA by dividing the number of trials in agreement by the total number of trials and multiplying that by 100%.

The second observer also collected procedural fidelity data for 50% of the tangible PS preference assessment and 50% of the PowerPoint PS preference assessment. During both preference assessment, the second observer collected data on whether: (a) the therapist presented the pre-exposure trials for both items before asking the participant to make a choice, (b) the student was allowed 15-s to 25-s access after making a choice,
and (c) items were presented in the correct order during choice trials. Taking data on three of the therapists behaviors (presenting pre-exposure trials, allowing the correct duration of access to each item, and presenting items in the correct order) meant there were a total of 270 trials for the therapists behavior. Total procedural fidelity was calculated by taking the number of correct therapists behaviors and dividing it by the total number of therapist’s behaviors and multiplying that by 100% to calculate the overall procedural fidelity.

**Results**

Figure 1 illustrates the results of both the PS tangible and PS PowerPoint® preference assessment results for P-1. For P-1, the tangible PS assessment was conducted first, followed by the PowerPoint® PS assessment. The tangible assessment only found one HP item, the iPad. During the tangible assessment, the iPad was ranked the highest. The instruments, toy animals, stuffed animals, planet book were all selected the same number of times and ranked slightly lower than the iPad. The texture book, scrapbook, and pretzels were the next preferred items. And the least preferred items for P-1 were the popcorn crisps and the toy trains. The results for the PS PowerPoint® were more differentiated but similar to the tangible PS preference assessment. Based on the PowerPoint® assessment, the toy instruments were the most preferred, followed by the iPad, the instruments, and the stuffed animals and texture book. There was a tie in preference for the toy animals, Planet book, and scrapbook. The three least preferred items were the pretzels, trains, and popcorn crisps.

Figure 3 illustrates the findings from the tangible and PowerPoint® PS preference assessments. In the case of P-2, the researcher conducted the PowerPoint® PS
preference assessment first. The results of the two preference assessments were much more similar for P-2 than for P-1. During the tangible preference assessment, the top three items were the pretzels, the iPad, and the scrapbook. There was a tie in preference for the instruments, trains, and texture book being ranked 4th in terms of preference. And the lesser-preferred items were the Planets book, the stuffed animals, toy animals, and popcorn crisps. Based on the PowerPoint assessment, the top two items were the pretzels and the iPad. The scrapbook of classmates and toy instruments were tied for third, followed by the toy trains. There was a tie in preference for the Planets book, stuffed animals, and toy animals. And the two least preferred items were the popcorn crisps and texture book.

In terms of no-choice trials, P-1 had zero no-choice trials during both the tangible PS preference assessment and the PowerPoint© PS preference assessment while P-2 had nine no-choice trials for the PowerPoint© PS preference assessment and one no-choice trial during the tangible preference assessment. All nine no-choice trials were spread between the lower ranked items.

**Discrimination Assessment, IOA, and Procedural Fidelity**

In general, both participants had no difficulties with the picture-to-object and object-to-picture assessment. P-1’s accuracy overall accuracy was 96.6% on the discrimination assessment scoring 96.6% on both the object-to-picture and picture-to-object assessment. P-2’s accuracy overall accuracy on the discrimination assessment was 94.5% with her accuracy being 93.3% on the picture-to-object assessment and 96.6% on the object-to-picture assessment. Interobserver agreement (IOA) was 99% (98% for
tangible preference assessment and 100% for the PowerPoint® preference assessment trials). Overall procedural fidelity was 96.67%.

**Discussion**

The purpose of this study was to compare the outcomes of the tangible PS preference assessment to the outcomes of a PS preference assessment using Microsoft PowerPoint® as well as discuss the findings within the context of the student’s ability to complete a picture-to-object discrimination assessment. In general, there was a high agreement between the two assessments. For P-1, the tangible and PowerPoint® PS assessments were in agreement in terms of the IPad, the toy instruments, and the stuffed animals being three of the higher ranked items. The two assessments were also in agreement with the trains and popcorn crisps being the least preferred items. Most of the variability observed between the two preference assessments was for moderately ranked items. For P-2, there was almost perfect agreement between the two preference assessments. The Pretzels, IPad, toy instruments, and stuffed animals were selected the same number of times during both preference assessments and the only two items that varied by more than two selections between the two assessments were the scrapbook of a class field trip and the texture book.

A number of studies found high agreement between preference assessments using the actual items and preference assessments using pictures (Coyners et al., 2002; Groskreutz & Graff, 2009; Northup et al., 1996). For example, Coyners et al. (2002) found that as long as student’s had the relevant discrimination skills (based on the ABLA) there would be high agreement between tangible preference assessments and picture preference assessments. The participants in the present study also demonstrated
the relevant discrimination skills based on a picture-to-object matching task. The present study, adds to the past literature by demonstrating a way of incorporating technology into the preference assessment process. The use of computers provides an easy way to keep files of the pictures of stimuli and create a PowerPoint® slide show providing a way of saving the items in the order to be presented; thus saving on preference assessment set up time. The downside is taking pictures of the items uploading the pictures, and creating the slides does add to the initial setup time. But if the assessments are conducted several times a week, the PowerPoint® could save time in the long run. Also, once made, changing out items becomes relatively easy to do (just inserting the new item in place of the previous item).

It is important to note that P-2 had a considerably large number of no-choice trials. As mentioned earlier, P-2 had only one no-choice trial during the tangible preference assessment, but nine no-choice trials during the PowerPoint® preference assessment. The large number of no-choice trials was most likely because the student preferred none of the items nominated by the teacher or the paraprofessional. The discrepancy between the ratings of teacher surveys and direct preference assessments is a robust finding in the literature though. For example, Cote et al. (2007) compared the results of a teacher survey to a PS preference assessment and found a strong correlation for only four of the nine participants. Resetar and Noell. (2008) compared the results of a MSWO preference assessment to teacher’s surveys and found no agreement between the two in terms of high preference or low preference items.

What is difficult to explain though is the difference in the number of no-choice trials between the tangible PS preference assessment and the PowerPoint® PS preference
assessment. The difference in the number of no-choice trials was likely due to changing motivating operations (MOs; Laraway, Snycerski, Michael, & Poling, 2003). The PowerPoint© PS preference assessment was conducted shortly after P-2 arrived to school. P-2 also arrived late to school that day and did not have her usual morning snack. The tangible PS preference assessment was conducted after lunch. Having eaten may have established interacting with a variety of items as more reinforcing relative to the values of the items during the PowerPoint© PS preference assessment.

Future researchers may also want to examine the effect of the pre-exposure trials on preference. Several studies have used pre-exposure trials when conducting preference assessments (e.g., Cote et al., 2007; DeLeon & Iwata, 1996; Higbee, Carr, & Harrison, 1999) and the typical pre-exposure sessions involved presenting the items to the participants before conducting the preference assessment sessions. The present study, on the other hand, presented the items to the participants immediately before each forced-choice trial. The advantages of presenting the items immediately before having participants make a choice are the immediacy of the experience with the items before making a choice. The down side is there is a lack of research on how pre-exposure trials in general affect the outcomes of preference assessments.

While the extra time with items, however brief, may serve as an abolishing operation in terms of preference for the items, there is some research suggesting brief exposure to items may actually serve as an establishing operation. For example, O’Reilly, Davis, Rispoli, Machalicek, Sigafoos, Lacioni, et al. (2009) examined the effects of pre-exposure trials on rates of problem behavior maintained by access to tangibles. The
researchers found that brief, five-min access to items actually served to increase rates of problem behaviors maintained by access to the items. The increase in the rates of problem behavior indicates that brief access to the items served as an establishing operation. In relation to the present study, if brief access served as establishing operation for the items, then the pre-exposure trials would serve to exacerbate the preference for items. Future research may want to further examine how per-exposure trials affect the outcomes of PS preference assessments.

While the use of Microsoft PowerPoint® does seem to be an effective way of conducting a picture preference assessment, the strongest potential for the use of PowerPoint® in the preference assessment process would be assessing preference for items that are difficult to present using tangible formats as well as assessing preference for activates that cannot be easily presented as pictures. Also, future researchers should examine whether people working with clients would prefer using something like the picture preference assessment using Microsoft PowerPoint® as opposed to a traditional tangible preference assessment. If so, the use of Microsoft PowerPoint® may actually increase the likelihood of clinicians conducting a preference assessment with clients.
References


Figure 1. Stimuli used during the preference assessment and the object-picture and picture-object matching assessment

<table>
<thead>
<tr>
<th>Toy Animals</th>
<th>Popcorn Crips</th>
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<td>Pretzels</td>
<td>Toy Trains</td>
<td>Stuffed Animals</td>
<td>Texture Book</td>
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<td>Toy Instruments</td>
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Fig. 2 Results from P-1’s PowerPoint© and Tangible Preference Assessment
Fig. 3 Results from P-2’s Tangible and PowerPoint® Preference Assessment