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Assessment Of Preferences For Individuals With Severe Disabilities

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ASSESSMENT OF PREFERENCES FOR INDIVIDUALS WITH SEVERE DISABILTIES

FOSTER

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Assessment of Preferences for Individuals with Severe Disabilities

BY

Meghan Foster

THESIS

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Abstract

Identifying preferences for individuals with disabilities is a big challenge for behavior analysts, teachers, and parents. Some individuals with disabilities lack the ability to verbally communicate their likes and dislikes, or wants and needs on a daily basis. When a loved one or teacher mistakes an indication of preference and produces an undesirable stimulus, this frequently causes aberrant responses. For these reasons, it is important that an efficient means of identifying preferences for individuals with disabilities is devised. The following pages examine areas of research into the study of individual preferences for specific stimuli and the different means of assessing these preferences. This research will allow parents and teachers to implement interventions to combat challenging behaviors or develop workable programs that will allow all individuals to succeed in their lives.

Introduction

Assessment of Preferences for Individuals with Severe Disabilities

Behavior analysts have had a significant impact on the analysis and intervention of challenging behaviors in persons with mental retardation and other developmental disabilities. However, challenging behavior is still one of the most significant clinical issues in the field of mental retardation and other developmental disabilities (Hastings & Brown, 2000). Challenging behavior encompasses a wide array of behaviors that may eventually cause harm to the disabled individual or others. Some common behaviors that may be described as challenging include self-injurious behaviors (SIB), physical and verbal aggression, sexually inappropriate actions, stereotyped mannerisms, screaming and crying. Individuals who engage in challenging behaviors often experience negative consequences from caregivers, family members, and other members of the public. For this reason, there has been phenomenal growth in research of reinforcement contingencies impacting challenging behaviors of individuals who have moderate, severe, or profound mental retardation and other developmental disabilities. Researchers have assessed the extent to which different types of reinforcement contingencies have been effective in decreasing challenging behaviors displayed by these individuals and they have found that positive reinforcement has been quite successful for individuals with mental retardation.

An ongoing challenge for professionals working with individuals who have mental retardation and other developmental disabilities is the identification of potent reinforcers (Wacker, Berg, Wiggins, Muldoon, & Cavanaugh, 1985). Many of these individuals have communication deficits that hinder them from expressing which stimuli

within their environment may be reinforcing. Over the last decade, researchers have examined and experimentally tested different procedures designed to assess and predict the reinforcing effects of stimuli within these individuals' immediate environment. These procedures have been referred to as stimulus preference assessments. During a stimulus preference assessment, an individual's preferences are evaluated by presenting stimuli to the individual and measuring his or her response to that stimulus. Stimulus preference assessments have proven to be a time efficient method of identifying reinforcing stimuli because of the simplicity of the method of presentation (e.g., giving the stimulus to the client) and the method of measurement of the dependent variable (e.g., measuring whether the client reaches for the stimulus) (Fisher, Piazza, Bowman, & Amari, 1996).

Successive Choice Procedure

Researchers have typically used a variation of the successive choice procedure, commonly known as the single stimulus method (SS), to identify preferences for individuals with severe disabilities (Pace, Ivancic, Edwards, Iwata, & Page, 1985). In the Pace et al. study, six individuals with profound mental retardation participated. All were completely dependent on others to meet their daily needs, had no obvious sensory impairments, and some were nonambulatory. All of the participants were presented with sixteen different stimuli that had been chosen for their general accessibility and ease of presentation (e.g., mirror, light, flower, coffee, swing). The method for assessing stimulus preference consisted of measuring approach responses to each of the sixteen stimuli (e.g., reaching, looking, asking, or raising hand). In the single stimulus method, one stimulus at a time was presented to the individual and the presence or absence of the approach behavior, such as reaching for or looking at the stimulus, was recorded. There

were eight assessment sessions, and each session consisted of 20 trials, during which four predetermined stimulus items were presented a total of 10 times over the eight assessment sessions. Stimuli approached more than 80% of the presentations were considered preferred stimuli, whereas non-preferred stimuli were defined as those stimuli approached on 50% or less of the presentations. The data from the Pace et al. study indicated that all participants differentially approached the assessment stimuli. There was no consistent between-child approach to any of the sixteen stimuli, which suggests a formal means of individually identifying reinforcers for profoundly retarded individuals.

However, the reinforcing properties of a stimulus cannot solely be determined on the basis of preference alone. In order to determine the reinforcement value of a preferred stimulus, the preferred stimulus must also be associated with an increase in the frequency of a response on which it is contingent. Therefore, Pace et al. conducted a second procedure in which all of the same six participants were presented a vocal request and a motor gesture for a target response, "reaching". All participants were taught the same target response. Initially, the therapist would ask the participant to "reach" and simultaneously would model the target response of reaching for a stimulus. After all participants learned this target response, eight sessions consisting of 10 trials each were conducted. Three conditions, baseline, preferred stimuli, and non-preferred stimuli were arranged in a reversal design, with the order of conditions varying across participants. The baseline condition consisted of the therapist simply presenting each request with an intertrial interval of approximately 10s and no systematic consequences were provided for complying with the request. During the preferred condition, the preferred stimulus was provided for 5s contingent upon the request. The non-preferred condition was the

same, except that the non-preferred stimulus was made contingent on the requested response. Results for the second part of the Pace et al. study demonstrated that the contingent use of preferred stimuli increased the occurrence of target behaviors relative to baseline and non-preferred conditions. Thus, the preference assessment used by Pace et al. was effective in identifying reinforcing stimuli for the profoundly retarded individuals who participated in their study.

Forced Choice Procedure

Although the Pace et al. study was successful in identifying the usefulness of using a successive choice procedure to predict the reinforcing effect of stimuli for individuals with profound mental retardation, investigators have researched different methods of performing preference assessments. One limitation of the procedure is that it takes a long time to complete and may not be applicable in situations were time is a factor. Moreover, although the procedure is effective, other alternatives conceivably could be more so. Another method that has been found to successfully identify reinforcers for persons with severe to profound mental retardation and other disabilities is the forced-choice procedure, also commonly known as the paired stimulus method (PS) (Fisher et al., 1992). Fisher et al. conducted a study that compared Pace et al's. successive choice procedure with the forced-choice procedure. The participants were four children with moderate to profound mental retardation and other disabilities, such as seizure disorder, organic brain syndrome, left hemiparesis, Down Syndrome, and hypothyroidism. The Pace et al. successive choice procedure was first conducted with all of the participants, as described in Pace et al. (1985). The forced-choice procedure involved two phases. During the first phase, the 16 stimuli used in the Pace et al. study

(e.g., mirrors, coffee, juice, and swing) were presented in pairs. Each stimulus was paired once with every other stimulus in a randomized order, for a total of 120 stimulus-pair presentations. During each stimulus-pair presentation, if a participant approached one of the stimuli, then he or she was allowed access to that stimulus for 5s and the other stimulus was removed. If the participant did not approach either stimulus, then he or she was prompted to sample each stimulus for duration of 5s. After the participant sampled both items, the two stimuli were again presented together for an additional 5s. If the participant still did not approach either item within 5s, the items were removed, a "no approach" was scored for each item, and the next trial began. All stimuli approached between 80-100% of the time were considered to be highly preferred, those approached 60-79% of the time were considered to be moderately preferred, and all the other stimuli approached below 60% of the time were considered to be neutral or non-preferred. Results of phase one of this study showed that (a) all of the items identified as highly preferred on the forced-choice assessment were also identified as highly preferred on the successive choice assessment and (b) for all the stimuli on which the two assessments disagreed, the successive choice assessment identified the items as highly preferred and the forced-choice assessment identified the items as low to moderately preferred. These results suggest that the forced-choice procedure has good concurrent validity and that the successive choice procedure more often identifies stimuli as highly preferred.

After some time had elapsed, Fisher et al. conducted the second phase of the study, in which stimuli that were approached on at least 80% of trials on both the successive choice and the forced-choice assessment (high-high stimuli) were compared with stimuli that were approached on at least 80% of successive choice trials and 60% or

fewer forced-choice trials (SP-high stimuli). A concurrent operants paradigm involving presenting the opportunity to engage in one of two alternative behaviors was used. The participants were trained to emit appropriate in-seat and in-square behavior. In-seat behavior was defined as the participants' buttocks touching the chair and the in-square behavior was defined as the participant having any body portion inside the square. Then two high-high stimuli and two SP-high stimuli were selected and either the two high-high stimuli were placed in the square and the two SP-high stimuli were placed in the chair, or vice versa. The participant could gain access to either the two high-high stimuli or the two SP-high stimuli by engaging in independent in-square or in-chair behavior corresponding to the square or chair on which the stimuli were placed. For example, if two high-high stimuli consisted of coffee and juice and the two SP-high stimuli consisted of hot chocolate and soda pop, and the coffee and juice were placed in the square and the hot chocolate and soda pop were placed on the chair, then the participant could choose which stimuli he or she wanted by going to the corresponding square or chair. However, that participant did not gain assess to the corresponding stimuli until the appropriate target response was emitted (i.e., in-seat or in-square behavior). Results of phase two showed for all of the participants that greater increases in responding occurred with high-high stimuli than with SP-high stimuli, indicating that the forced choice procedure better predicted which stimuli would function as potent reinforcers when a concurrent operants paradigm was used as the criterion (i.e., the forced-choice assessment had better predictive validity).

Since the forced-choice procedure closely approximates natural situations in which an individual chooses between potentially available stimuli through differential

responding, Fisher et al. (1992) have argued that the forced-choice presentation format may better differentiate preferred from non-preferred stimuli than the Pace procedure. This hypothesis was further investigated in another study (Paclawskyj & Vollmer, 1995) in which researchers assessed the applicability of the procedures described by Pace et al. and Fisher et al. to children with severe mental retardation, other developmental disabilities, and visual impairments. The results of this study confirmed that the forced-choice procedure resulted in greater differentiation of reinforcing stimuli than the successive choice procedure for all three participants. For example, when using the forced-choice procedure, participants had to choose between two different stimuli that were competing against each other, so when the participants chose one stimulus over the other, a hierarchy in preferences was formed with those selected on 100% of opportunities classified as highly preferred, those selected on 70% of opportunities classified as moderately preferred, and finally those selected between 0-69% of opportunities classified as least preferred. On the other hand, the successive choice procedure only identified highly preferred, those selected 90-100% of the time, and non-preferred stimuli which were only selected between 70-79.7% of the time. When using the successive choice procedure (items were presented singly), the participant would simply either engage with the stimulus or not. For this reason, the successive choice procedure was only able to differentiate between highly preferred stimuli (items participant engaged with) and non-preferred stimuli (items participant did not engage with). Moreover each participant selected every stimulus on 70% to 100% of the trials.

The results from the successive choice procedure may have been affected by a procedural alteration necessitated by the participants' visual impairments, namely a brief

period to first tactilely explore the stimulus. Thus, it was hard to determine in the successive choice procedure if they approached the stimuli because there was a preference for those stimuli, or because reaching for and tactilely exploring the item is the way in which these individuals learn about the stimuli in general. In the forced-choice procedure, preference was more likely to be indicated because items were placed in direct competition: one would be approached prior to the other immediately after the pretest exploring response.

During the second phase of this study, which occurred a few weeks later, the researchers tested the reinforcing value of the stimuli using a combination multiple baseline reversal design. This specific design was used to compare baseline performance, performance with a high-successive choice stimulus as a consequence, and performance with high-forced choice as a consequence. For the target behavior, the researchers used a behavior from the participant's current educational program that was inconsistently performed according to the teacher report (i.e., one step instructions and fine motor tasks). For each skill, the experimenter first gave a practice trial by verbally prompting and physically guiding the participant to complete the task (i.e., standing up or stacking blocks. The experimenter then immediately presented the consequence (i.e., high-choice stimulus, high-preference stimulus, or baseline with no consequence). A 5-min session then began that consisted of a verbal prompt presented every 30s. Compliance was scored if the participant completed the task within 10s of the verbal prompt. Each response that met criterion was followed by the scheduled consequence. No consequences were provided for noncompliance in any phase. Results confirmed that the forced-choice procedure identified reinforcing stimuli for all skill acquisition tasks for all

of the participants, but the successive choice procedure identified stimuli that resulted in more ambiguous responding. For example, some stimuli identified as preferred during the successive choice procedure did not prove to be reinforcing during skill acquisition tasks (some predictions of the successive choice procedure resulted in false positives). Therefore, this study found that the forced-choice procedure was superior to the successive choice procedure in identifying reinforcing stimuli for individuals with severe developmental disabilities and visual impairments.

In summary researchers have demonstrated that the forced-choice procedure is superior to the successive choice procedure. Fisher et al (1992) found it to be superior in identifying reinforcing stimuli for children with moderate to profound mental retardation and other disabilities and Paclawskyj and Vollmer (1995) found it to be superior in identifying reinforcing stimuli for children with severe mental retardation, other developmental disabilities, and visual impairments.

Multiple-Stimulus Preference Assessment With or Without Replacement

Research on the assessment of stimulus preference has examined other methods other than successive and forced-choice, two of which are known as multiple-stimulus preference assessment with replacement and multiple-stimulus preference assessment without replacement (MSW or MSWO, respectively). The multiple-stimulus preference assessment with replacement refers to a preference assessment in which stimuli are lined up in an array on a table and once a participant selects a particular stimulus it is then directly returned to the array of stimuli. For example, if a participant chose a leisure item (ball) amongst all the stimuli presented, than it is directly returned to the array of stimuli after the participant has had access with the stimuli for a predetermined amount of time.

If a participant chose an edible item, then the participant was allowed to eat the food and more of the edible item was returned to the array of stimuli on the table. In contrast, the multiple-stimulus preference assessment without replacement has the exact same stimulus arrangement, but once a participant chooses a particular stimulus amongst all the presented stimuli, it is not returned back to the array of stimuli after the participant had access to that stimulus. However, the sequencing of the remaining stimuli is rotated by taking the item at the left end of the array and moving it to the right end of the array; and then the other stimuli are shifted so that all the stimuli are again equally spaced on the table.

In a study by DeLeon and Iwata (1996) three methods of identifying reinforcers, MSW, MSWO, and PS (paired stimulus or forced-choice) were compared. Seven individuals with profound developmental disabilities and/or mental retardation (Down Syndrome, Cornelia deLange Syndrome, no expressive language, etc.) participated in this study. All participants lived at a state residential facility and were selected for participation in the study because they had a number of behavioral deficits and could benefit from the identification of additional reinforcers. Each participant was exposed to five sessions of each assessment procedure, for a total of 15 sessions with no more than two sessions a day. Seven items per participant were chosen for presentation during each assessment and were arbitrarily selected by the experimenter without prior knowledge of the participants' preferences. Before each session, the therapist placed a linear array of the seven stimuli on a table in front of the participant. During the MSW assessment procedure the participants were verbally instructed to select one stimulus. If the participant failed to respond, the instruction was repeated. Instructions never had to be

repeated more than twice. After a stimulus was selected, the participant was given 10s access before it was replaced to the array. The trial did not end until all items were selected or until a participant made no selection within 30s from the beginning of the start of the trial. All remaining unchosen items were recorded as "not selected". Attempts to select more than one stimulus at a time were blocked, and the verbal instruction was repeated. The procedure for the MSWO assessment was the same, except that each trial's chosen stimulus was not placed back into the array of stimuli. During the paired-stimulus procedure (Fisher et al., 1992) only two items were presented in each trial, and the session continued until each item had been paired with every other item (21 total trials per session). Stimulus pairing followed a predetermined order, such that a given stimulus was never presented on two consecutive trials. In contrast to both the multiple-stimulus presentation methods, failure to select an item from the pair of stimuli each trial did not terminate the session, but simply produced the next trial.

The present study compared a preference procedure involving multiple stimulus presentation without replacement to the multiple stimulus method with replacement, using the paired stimulus procedure as the standard for comparison. Comparisons between the two MS procedures included rank-order correlations with the PS procedure, consistency of rank orders across sessions, time of administration, and number of potential reinforcers identified. Results from this study demonstrate that for four out of seven participants, all three assessment methods identified the same reinforcer as the most highly preferred. For the five of the seven participants the rank order correlations with the PS procedure were higher for MSWO procedure then the MSW procedure. Subsequently, both assessment methods also produced significantly similar hierarchies in

regards to the low preferred (less than 50% approach responses), moderately preferred (60%-79% approach responses), and highly preferred stimuli (80%-100% approach responses). With some variations in the exact order of rankings of the seven stimuli, the MSWO procedure and the PS procedure produced similar, moderate to high correlations for the individual participants, with respective means of .81 and .83. The coefficients were highly significant for all seven participants. This indicates that the exact ranking of preference for each stimulus was relatively consistent across sessions. In contrast, the MSW procedure resulted in somewhat lower correlations across sessions (M = .56). Although the correlations were at least moderately high for most participants during the MSW procedure, the selection patterns by 3 participants produced correlations lower than .50. It was observed that some participants only selected the highly preferred items on all sessions, which created a highly preferred ranking category and the remaining stimuli more consistently fell within low preferred ranking category, thus failing to produce a consistent rank order across sessions and meaningless hierarchies of stimulus preference. Consistent rank orders and hierarchies should include highly, moderately, and low preferred stimuli in order to more accurately identify potential reinforcers. For all participants, the MSW method produced more unselected items than did the MSWO or the Paired Stimulus procedures. For example, two out of the seven participants only selected two items from the array of stimuli throughout the entire MS procedure. In comparison, 90% of the items from the array of stimuli were selected at least once across participants during the MSWO and the Paired Stimulus procedures. For the MSW procedure, only 24 items (out of a total of 49items) were ever selected across all of the participants. Also, measurements of time required to conduct each procedure was

recorded and revealed that the entire five-session assessment required a mean of 16.5 min, 21.8 min, and 53.3 min for the MSW, MSWO, and the PS procedures, respectively. These group means are highly representative of the data for individual participants. That is, for 6 of the 7 participants, the MSW assessment required less time to complete than the MSWO assessment, which in turn required less time than did the Paired Stimulus assessment.

The results for Deleon and Iwata (1996) demonstrate that the MSW and the MSWO procedures were approximately as effective in identifying preferences as the Paired Stimulus procedure and in half the administration time. This is an extremely useful finding because many practitioners are limited in the amount of time that they can spend determining preferences. Furthermore, the results produced by the MSWO and the Paired Stimulus procedure can also suggest that the highly preferred stimuli identified by these procedures will also be effective reinforcers, because the more an item is selected, the more accurate a practitioner can be in predicting the items reinforcing properties. According to this prediction, the items recorded as "not selected" by the MS procedure (25 items), would not be predicted to function as reinforcers. However, some of the items "not selected" in the MS procedure were identified as highly preferred items by the MSWO procedure, the paired stimulus procedure, or both. This suggests that the "not selected" items may in fact function as reinforcers, but that sort of prediction might have been obscured by the continuous availability of a small number of highly preferred items.

For this reason, DeLeon and Iwata (1996) also conducted a second experiment to verify predictions about stimuli that were never selected in the MS procedure. The experiment tested the reinforcing effects of four items that had never been selected during

the MS procedure, but had been selected some proportion of the time in the other two assessments (PS and MSWO). The reinforcement effects were examined by arranging a schedule of contingent delivery for the four items to determine if they could support levels of responding above baseline. If these items failed to increase rates of responding on arbitrary tasks over baseline levels, then there would be support to conclude that the MSWO and the PS procedures are more prone to the production of false positives than is the MS procedure (i.e., items would be identified as potential reinforcers when, in fact, they do not function as such). Alternatively, increases in responding would support the conclusion that the items can function as reinforcers and that the MS procedure is more prone to false negatives. For this second experiment only four of the original seven participants participated because each of these individuals had selected items from the MSWO and PS procedures that were never selected in the MS procedure.

The result of this experiment demonstrated that for three out of the four participants, items that had never been selected during the MS procedure but had been selected on some proportion of the trials during the MSWO and PS procedures produced increases in responding when delivered on a contingent basis. Thus, these results suggest that, in at least some cases, items that remain unidentified as reinforcers in the MS procedure do function effectively as reinforcers, and that the MSWO and PS procedures more readily identify those items as reinforcers.

In general the result from this study demonstrate that the MSW and the MSWO procedures provide similar information compared to the PS procedure in less time, which can afford therapist and practitioners the opportunity to conduct less assessments and perhaps tailor treatment and training programs to

idiosyncratic shifts in preference. However, overall it appears that the MSWO procedure may be more superior then the MSW procedure given (1) the MSWO procedure produces higher correlations of stimulus rank orders across sessions producing consistent preference hierarchies, and (2) the MSWO procedure identifies potential reinforcers more consistently and accurately (i.e., produces fewer false negatives).

Categorization of Preference Assessment Procedures

There have been major advancements in the development of procedures to systematically identify preferred stimuli that may function as reinforcers for persons with developmental disabilities (single-stimulus, multiple stimulus with replacement, multiple stimulus without replacement, and paired-stimulus or forced-choice). Over that same relatively brief period, conducting a preference assessment has become an almost routine part of the assessment and treatment development process in the field of applied behavior analysis. In general, procedures for assessing preference can be categorized as either approached-based or engagement based (Hagopian, Rush, Lewin, and Long, 2001). Approached bases procedures involve recording the individuals approach responses to stimuli (e.g., Fisher et al.), whereas engagement based procedures involve recording the duration of engagement with stimuli (e.g., DeLeon, Iwata, Conners, and Wallace, 1999). Approach based preference assessments include the single stimulus or successive choice (SS; Pace, Ivancic, Edwards, Iwata, & Page, 1985), paired stimulus or forced choice (PS; Fisher et al., 1992), and multiple stimulus presentation method (DeLeon & Iwata, 1996) procedures. Although, as highlighted by DeLeon and Iwata (1996), the MSWO procedure is reliable, valid, and efficient; however researchers still need to take into account that at times the MSWO has proven to produce ambiguous results. These ambiguous results

may have occurred because one limitation of the MSWO procedure is that the participant must fully scan an array of several stimuli prior to making a selection, which may decrease its utility when assessing preferences for individuals with severe mental or physical disabilities or problems with impulsivity. For example, an individual that is impulsive with decision making may pick the first stimuli in the array instead of scanning all of the stimuli in the array, thus identifying the stimuli picked as preferred when another stimuli that was not observed is actually more reinforcing. Also, in a small proportion of cases, as with other assessments based on a concurrent choice, the MSWO assessment produces undifferentiated approach percentages for many of the stimuli. One explanation for undifferentiated approach percentages is that if none or very few of the items are preferred, the individual may make more random selections, and responding is limited to only two responses per trial (i.e., selecting an item or selecting nothing). Thus, the MSWO assessment may not produce accurate approach percentages, which could produce false positives.

More recently, engagement with stimuli rather than approach has been used as an index of preference during single stimulus and multiple stimulus procedures (e.g., DeLeon et al., 1999; Roane et al., 1998). If an individual chooses to engage with a stimulus during any type of preference assessment (PS, MSW, MSWO, SS) for a duration or percentage of time, that may be a more accurate indication of preference than relying on an approach response. DeLeon et al. (1999) evaluated the use of a single stimulus engagement (SSE) preference assessment to clarify ambiguous results sometimes obtained with the MSWO procedure. Specifically, this study compared the results of a SSE and a MSWO preference procedure and then determined which procedure produced

more reliable reinforcers during a reinforcement assessment. For the SSE, seven nonfood items were presented singly for 2min, during which engagement was recorded. These nonfood items included leisure items that primarily affected the visual, auditory, tactile, and olfactory senses. The procedure was repeated five times, results were averaged across sessions, and the outcomes were compared with the results of the MSWO procedure. The engagement-based preference assessment revealed a more differentiated preference hierarchy (highly preferred 80-100%, moderately preferred 60-79%, and low preferred 0-59%) then the MSWO procedure. Furthermore, stimuli that were highly preferred during the single stimulus engagement procedure were shown to function as reinforcers in a subsequent reinforcer assessment compared to the majority of the highly preferred stimuli identified in the MSWO assessment.

In a more recent study by Hagopian et al. (2001) researchers evaluated the stimuli in the SSE preference hierarchy, and determined its ability to predict relative reinforcing effectiveness. Results of the SSE were compared with the results of the PS procedure. The PS procedure, which had been used as the standard of comparison in previous studies (DeLeon & Iwata, 1996; Roane et al., 1998), has reliably yielded a preference hierarchy that predicts relative reinforcement effects. Four individuals who had been admitted to an inpatient unit for the assessment and treatment of severe behavioral problems participated in the study were diagnosed with autism and moderate to severe mental retardation. During the PS assessment, approach was defined as the participant moving toward the stimulus, with any part of the body, within 5s of stimulus presentation. During the SSE assessment, stimulus engagement was defined as interaction with the stimulus, consuming the stimulus (for edible items), or engaging in the activity (when the

stimulus was an activity, such as playing catch with the therapist). The duration of stimulus engagement was recorded. Based on The Reinforcer Assessment for Individuals with Severe Disabilities (RAISD; Fisher, Piazza, Bowman, & Amari, 1996) eight stimuli were chosen to be presented in both assessment procedures. In Phase 1 of the study, the PS procedure was conducted with each participant using the procedures described by Fisher et al. (1992). During the SSE procedure, each stimulus was presented singly for two minutes while stimulus engagement was recorded. Stimuli were presented in a randomized order. The SSE and the PS procedures were repeated once per day for three days over the course of a week.

Result from Phase 1 of the study demonstrated that the PS procedure produced hierarchies with greater variability in response to the stimuli compared to the variability in percentage of engagement during the SSE calculated using Separate Spearman rank-order correlation coefficients. For example, there was a significant and distinct difference in percentage of approach between highly preferred (80-100%), and moderately preferred (60-79%) and moderately and lowly preferred (0-59%) stimuli respectively with the PS procedure. In contrast, all participants demonstrated high levels of engagement (between 80% and 100%) for 50% or more of the stimuli under the SSE procedure. Thus, little variability in engagement was observed during the SSE administrations across most stimuli for some of the participants (i.e., some participants engaged with most stimuli more than 90% of the time). As a result, relatively small changes in the percentage of engagement that occurred across administrations sometimes produced large changes in the relative ranking of stimuli. Not surprisingly, correlations in rank order of preferences across sessions were higher for PS than SSE. Therefore,

analyses of intersession correlations with the SSE were conducted on the percentage of stimulus engagement, a more absolute measure of preference. The reliability of percentage of engagement with each stimulus across administrations of the SSE for each participant was calculated. Correspondence between the relative rankings from the two procedures was high for two of the four participants. Finally, the SSE procedure required an average of 23% less time to administer than the PS procedure across participants. To further investigate these findings the researchers conducted a reinforcer assessment (Piazza et al., 1996) to determine if the relative rankings of stimuli using the SSE procedure predicted relative reinforcing effectiveness in a concurrent schedule reinforcer assessment.

In Phase 2, the predictive validity of the SSE procedure was examined by conducting a concurrent-schedule reinforcer assessment to compare the relative reinforcing value of stimuli ranked as high, medium, and low preference. First, the SSE preference hierarchy was used to assign groups of stimuli to one of three categories for the reinforcer assessment (high 80-100%, middle 60-79%, and low preference 0-59%). Each category was comprised of two stimuli. Training sessions were first conducted to guarantee that the participants could independently emit the target responses (walking to a designated chair and staying there for a period of time). Each training session consisted of 10 trials. Training sessions were conducted until the participant responded independently on at least 80% of trials for two consecutive sessions. The reinforcer assessment consisted of three different sessions, each of which involved a comparison of the relative reinforcing effects of three consequences. Prior to each session two brief paired stimulus procedures were conducted to determine which of the stimuli from the

two stimuli in each category (high, middle, or low preference) would be used in the forthcoming session. During the paired stimulus procedures there were three response options that were concurrently available during each session. One of the response options produced no programmed consequence (control). The other two response options each produced access to a corresponding stimulus that was selected in the brief PS procedures. Prior to the start of each session, participants were physically shown the stimulus each response would produce. During the first session of the reinforcer assessment, high- versus middle- preferences was compared and the target response produced access to either a high- preference stimulus, middle- preference stimulus, or no reinforcement. The other two sessions involved comparisons of high- versus low-preference stimuli and middle- versus low- preference stimuli. The sequence of comparisons was randomly determined for every participant.

Results of the second phase of the study by Hagopian et al. (2001) demonstrated that across all four participants, high- preference stimuli produced higher responding relative to both middle- and low- preference stimuli. Furthermore, middle- preference stimuli produced higher levels of responding to low- preference stimuli. Therefore, the results obtained during the reinforcer assessment supported the validity of the SSE preference assessment in predicting relative reinforcing effectiveness.

The findings obtained in this study extend previous research by suggesting that the relative ranking of stimuli as high, middle, or low preference via the SSE procedure accurately predicted relative reinforcer effectiveness even when the absolute differences between categories are small. The results have important clinical implications because the SSE procedure has several potential advantages over other types of assessments. For

example, the SSE may be more appropriate for individuals with severe or profound developmental disabilities who have difficulty scanning large number of items or making choices among items. In addition, the SSE procedure (and other engagement-based preference assessments in general) appears to take less time to administer than the PS procedure, particularly when assessing large numbers of stimuli (DeLeaon & Iwata, 1996; Hagopian et al., 2001). The lengthier stimulus access may also be more appropriate for assessing activity reinforcers (e.g., playing a video game) and stimuli that are difficult to present in a choice format (e.g., singing songs, dancing, going for a walk). Finally, occurrences of problem behavior can be recorded concurrently with stimulus-engagement during the access period (Roane et al., 1998). Thus, engagement-based preference assessments can provide information about the preference for a stimulus as well as its ability to compete with reinforcement maintaining problem behavior (Ringdahl, Vollmer, Marcus, & Roane, 1997).

Three Stimulus Representation Methods for Assessing Preferences

Preference assessments serve to increase an individual's opportunity to make choices which is important for improving the quality of life and increasing the sense of control that these individuals experience on a daily basis. Parsons and Reid (1990) reported that although the opportunity to make choices is essential to one's well being, persons with developmental disabilities do not receive opportunities to make choices as frequently as the rest of the population. Moreover, individuals with developmental disabilities require structured choice-making opportunities. For example, whereas some persons may possess the skills needed to choose an object after hearing a spoken description of the options, others may need to view pictures of objects in order to make a

meaningful choice. Still further, others may make reliable choices only when the actual objects are presented.

In presenting choices, there are clear practical advantages for using pictures over objects and for using spoken words over pictures. For example, compared to objects, pictures permit the representation of less manipulative objects (e.g., a car, a bike) and events and activities that involve many stimuli and behaviors (e.g., going for a walk, going shopping). For persons with functional receptive language, spoken representation of choices offers further convenience and increased choice options, in addition to more normalized interactions (Conyers et al., 2002). Given that basic discrimination skills are essential to successful choice making, it is important to determine effective choice-representation procedures based on the person's discrimination skills. Presenting a choice in a preference assessment can be viewed as a prompt or discriminative stimulus designed to occasion a specific response. If the choice-presentation method is too complex for the individual's discriminative repertoire the relevant response will not occur consistently and the accuracy of preference assessment is likely to be compromised.

Conyers et al. (2002) examined the capability to accurately predict which choice representation method, including verbal descriptions, object manipulation, and pictorial representation would be most appropriate for individual participants based on a systematic assessment of their discrimination skills. Included in this study were nine participants with developmental disabilities whom had been diagnosed with either severe or profound mental retardation. Each individual's discrimination skills were assessed by using the Assessment of Basic Learning Skills (see Kerr, Meyerson, & Flora, 1977). For this study only the discrimination levels 3, 4, and 6 were used out of the total six levels

on the ABLS. The level 3 discrimination test of the assessment of basic learning skills assesses the ease or difficulty with which a participant is able to learn a two-choice visual discrimination. First the participant will view the tester place a neutral color piece of foam in either a red or yellow box. Then the participant will be requested to place the neutral color piece of foam into the same container when presented with both the red and yellow boxes. The level 4 discrimination test or the two-choice visual quasi-identity match-to-sample discrimination requires the participant to put a manipulandum, either a yellow cylinder or red cube, into the matching container, i.e., a yellow can or a red box. The level 6 discrimination test or the two-choice auditory visual combined discrimination requires the participant to place a piece of foam into the container that was verbally requested by the tester (e.g. "yellow can" or "red box"). Following the assessment of basic discrimination skills, each participant received a preference assessment utilizing the forced choice procedure. The high and low preference items identified during the preference assessment were then used to evaluate the three presentation methods in a reversal design. This was done twice, first using only food items and second with nonfood items. At least two sessions were conducted during each phase, and each session consisted of ten trials. The right-left positions of the two-choice options were counterbalanced across trials within each session.

At the beginning of the object presentation method the participant was prompted to sample each food item, and when nonfood items were presented the participant was prompted to touch each item. Next, during each trial, the researcher placed the two items in front of the participant and asked him or her to "pick one" without saying the items name. If an edible item was chosen then the participant got to consume the item and if the

item was not an edible item the participant was allowed access to the item for approximately one minute. The nonchosen items were immediately removed.

In the pictorial representation method the trials were conducted in the same manner as the object manipulation phase, except that realistic color pictures of the items were presented instead of the actual items. At the beginning of each session, the participant was shown each picture and was then presented with the corresponding item. In subsequent trials the tester placed the two pictures in front of the participant and asked him or her to "pick one" without saying the items names. Once again the participant was given the food items to consume or was allowed one minute access to nonfood items.

During the verbal description method the researcher presented the participant with two identical solid containers, each of which concealed an item inside. At the beginning of each session, the researcher stated the name of the item while pointing to the corresponding container concealing that item, and then opened the container and gave the item to the participant. This was then repeated with the second item and container. Thereafter, the tester stated the name of each item while pointing to the corresponding container, before asking the participant to "pick one". For both food and nonfood items, the participant was given the item from the selected container on each trial.

Results from the Conyers et al. (2002) study demonstrated that when the participants were given a choice between high and low preference edible items in object, picture, and verbal phases, their ability to consistently choose their high preference edible item was predicted by their discrimination skills as measured on the ABLA test. For example, participants one and two significantly functioned superior at ABLA level 3 and they selected their preferred edible items consistently (greater than 70%) when the actual

objects were used as choice options but not when pictures or spoken cues were used. However, an incongruity was found in the performance of participant three (ABLA Level 3), who was able to select her preferred item consistently in the object phase (as predicted) and the picture phase (not predicted), but not when spoken cures were used (as predicted). Also, participants four through six, who functioned at ABLA Level4, selected their preferred edible items consistently when choices were given as objects and pictures, but not when spoken cues were used. Finally, participants seven through nine, who functioned at ABLA Level 6, selected their preferred edible items with all three presentation methods including verbally.

Somewhat similar results were observed when participants were given a choice between high and low preference nonfood items in the object, picture, and verbal phases. Participants one and two, who functioned at ABLA Level 3, demonstrated a consistent preference in the object phase, but not in the picture or spoken phases. However, an incongruity was observed in the performance of participant 3, who was able to make choices consistent with her preference in both the object and picture phases. As predicted, participant five demonstrated a consistent preference in the object and picture phases, but not in the spoken phases. However, inconsistencies were found for participant four and six, who made choices consistent with their preferences only in the object phases. Moreover, participant four did not demonstrate a preference in the last two sessions of the object phase. Given that both participants four and six had demonstrated a consistent preference with food items, these results suggest that the food might be a more powerful reinforcer than the nonfood items. Thus, it is possible that motivation might have accounted for the difference in the picture phase between food and nonfood items.

For participant four, the loss of consistent choice responding in the last two nonfood sessions of the object phase also suggests a possible change in preference. Finally, as predicted, participants seven through nine, who passed all three ABLA levels, chose items consistent with their preference assessments in all three conditions.

The results suggest that a systematic assessment of basic discrimination skills, such as the ABLA test, could be a useful tool to help select an effective method of choice presentation for persons with severe and moderate mental retardations. It should be noted that the results could not have been predicted simply by the participant's level of mental retardation. This study does emphasize the importance of taking into account an individual's discrimination skills when providing choice opportunities. Matching the appropriate presentation method to the person's discrimination skill is important for several reasons. First, there is an increasing emphasis on providing choice opportunities to people with developmental disabilities and measuring stability of preference over time. However, the results of this study showed that choice opportunities, if they are to be meaningful, must be provided in a way that is matched to the client's discrimination skills. Presenting choices in a format that is beyond the client's discrimination skills would be the same as presenting them in an unfamiliar language. Second, choice presentation methods that are beyond the client's discrimination skills may lead to erroneous conclusions: that the person is unable to choose or that the person does not have a preference among the options presented. The first conclusion would underestimate the client's ability to choose and therefore may limit future choice opportunities. The second conclusion may result in using a less preferred or entirely ineffective reinforcer if one of the choice options is arbitrarily selected by the trainer. For

these reasons, researchers, practitioners, and direct care persons need to pay particular attention to a client's discrimination skills when providing choice opportunities.

Limitations of Preference Assessments

Although all the procedures for conducting preference assessments have demonstrated effectiveness in identifying individual preferences for specific stimuli, they also each have certain limitations. For example, during the successive choice procedure, stimuli are presented singly and observers record whether or not the individual approaches each stimulus. One limitation of the successive choice procedure is that some individuals approach most or all of the stimuli presented, some of which may be false positives (Hagopian et al., (2001). The reason these false positive arise is because when items are presented singly to an individual there is no other competing stimuli to compare the level of preference for one particular item and an individual may be approaching an item for no significant reason other than it being in front of them. Therefore, when these items are further examined it is commonly found that the items do not possess any reinforcing properties. The successive choice procedure also does not differentiate between high, middle, and low preferences as efficiently as the other preference procedures, thus not producing a preference hierarchy that can be easily utilized to choose reinforcers that may compete with each other if one stimulus looses its reinforcing effectiveness overtime.

The forced choice procedure involves presenting stimuli in pairs and recording which stimulus the client approaches. Unlike the successive choice procedure, the forced choice has been shown to yield a preference hierarchy that predicts relative reinforcer effectiveness (Piazza, Fisher, Hagopian, Bowman, and Toole, 1996). The main limitation

of the forced choice procedure is that it takes longer to administer than other preference assessments (see DeLeon & Iwata,, 1996; Roane, Vollmer, Ringdahl, & Marcus, 1998).

During the multiple stimulus preference assessment without replacement procedure, the client is instructed to select one item from among several stimuli presented simultaneously in an array. Once an item has been selected, it is removed from the array on subsequent trials. The MSWO procedure has been shown to have the predictive validity of the forced choice procedure but requires less than half the time to administer. However, one limitation of the MSWO procedure is that the participant must fully scan an array of several stimuli prior to making a selection. This requirement may decrease its utility for individuals with severe mental or physical disabilities or problems with impulsivity because they may lack the capability of accurately scanning the whole array of stimuli.

The multiple stimulus preference assessment has also proven to be more time efficient then the forced choice procedure. However, the MS procedure does not produce a discrete ranking of stimulus preferences (Roane et al., 1998). That is, in the MS procedure, an individual could select the same item in all trials. Therefore, the MS procedure should only identify high preferred and low preferred items.

In regards to the limitations of preference assessment procedures in general, it has become crucial for researchers to acknowledge and be more aware of participants' deficits, so these procedures can be modified accordingly. For example, one must decide how to present the chosen stimuli to be used in the preference assessment whether it is by verbal instruction, pictorial displays of stimuli, or through tangible manipulation of the stimuli. Researchers have also shown the benefits of assessing an individual's

discrimination skills and how this may help identify which assessment procedure is within that person's repertoire. All of these factors should be taken into consideration when developing a preference assessment for individuals with severe mental retardation and other developmental disabilities.

The Effects of Establishing Operations on Preference Assessment Outcomes

Previous research on preference assessments has shown that individuals with severe mental retardation and other disabilities do in fact show preferences to certain stimuli, but what happens over time to individual preferences is still under investigation. Researchers have found that these individual preferences may change over time either within a session or a day (Kennedy & Haring, 1993) or over a period of weeks (Ivancic & Bailey, 1996; Smith, Iwata, & Shore, 1995).

Kelman and Whitely (1986) discovered that establishing operations may vary over time. Establishing operations are events or conditions (e.g., satiation and deprivation) that temporarily alter the effectiveness of a reinforcer and alter the frequency of behavior previously reinforced by that reinforcer. For example, when an individual has consumed a great deal of one stimulus, that particular stimulus looses its reinforcing effectiveness. Likewise, when an individual has not consumed a specific stimulus over an extended period of time, that stimulus' reinforcing effectiveness is enhanced.

Three adults with profound multiple disabilities participated in a study by Kelman and Whitley (1986). Individuals with profound multiple disabilities were described as having mental ages ranging from 1-8 months, spastic quadriplegia, sensory impairments, other health related disabilities, no use of any symbolic communication, limited motor abilities, and total dependence on others for positioning and activities of daily living. All

of the participants had already participated in a preference assessment prior to this study and showed a tendency to habituate to preferred stimuli over time, which means that the preferred stimuli generated from the previous preference assessment, were no longer reinforcing for those participants. Approximately two weeks later, the researchers decided to introduce some neutral or non-preferred stimuli identified from the previous preference assessment and found that these neutral or non-preferred stimuli were likely to reinstate higher levels of responding when habituation to the preferred stimuli had occurred. For example, when the preferred stimuli from the initial preference assessment no longer evoked responding from the participants (habituation) their level of responding rapidly declined. However, once the neutral or non-preferred items were introduced, the participants' level of responding matched or exceeded the initial levels of responding that were recorded with the initially preferred stimuli. Thus, the stimuli that were previously identified as neutral or non-preferred had over time become highly preferred to the participant, which indicates that the preferences for these participants did in fact change over time. These findings suggest that preferred stimuli identified during the preference assessment were later in time no longer preferred by the participants due to the effects of satiation. The neutral or non-preferred stimuli were also likely to reinstate higher levels of responding due to the effects of deprivation.

Other research has also suggested that deprivation and satiation may affect preference assessment outcomes. For instance, when individuals with profound multiple disabilities were deprived of access to certain stimuli, known as deprivation, these individuals experienced an increase in preference for those stimulus items (Gottschalk, Libby, & Graff, 2000). Likewise, when these same individuals were allowed access to

certain stimuli, known as satiation, the individuals then experienced a decrease in preference for those stimuli.

Most of the research on the degree to which establishing operations influence outcomes of preference assessments has been focused on preference assessments for food. More recently, McAdam et al., (2005) conducted a study in which they evaluated the effects of deprivation and satiation, potential establishing operations, on the results of preference assessments for leisure items or toys. In this study, forced choice preference assessments for tangible items were conducted under three conditions: control, deprivation, and satiation. A total of four tangible items were randomly selected for each participant (e.g., stuffed animal, playing cards, coloring, and foam puzzle).

Six individuals participated in the study. Three individuals had either moderate or severe mental retardation and had been admitted to a neurobehavioral unit for the treatment of aberrant behaviors. The other three participants were normally developing children who attended a university-based preschool.

Before the actual experiment began, three to four forced choice preference assessments were conducted to identify high and moderate preference stimuli prior to introducing the manipulations. Based on these initial preference assessments, two high and two medium preference items were selected for inclusion in the control, deprivation, and satiation conditions.

After the initial preference assessments were conducted; two control, four deprivation, and four satiation assessments were conducted with each participant and no more than one preference assessment was conducted per day. During the control condition the participants received regulated and equal access to each of the four items.

The participants with developmental disabilities were allotted 10 min access to each item and the normally developing children were allotted 20 min access to each item immediately prior to conducting the preference assessment. In the deprivation condition the participants received either 10 min or 20 min of regulated and equal access to three of the four items immediately prior to the start of the preference assessment. Participants with developmental disabilities were deprived of the fourth item for 24 to 48 hours and the normally developing children were deprived of the fourth item for 24 to 144 hours. Throughout the four deprivation assessments, all four items were deprived from the participants at least once. Finally, in the satiation condition the participants were provided either a 10min or 20 min period of free access to one of the four items immediately prior to conducting the preference assessment. The participants had free access to all of the items, singly, throughout the four satiation assessments. The participants were deprived of the other three items for 24 to 144 hours.

Results of the McAdam et al. (2005) demonstrated that the deprivation condition resulted in increased selection of that item for at least one item for all of the participants and at least three items for four of the participants. Furthermore, in the satiation condition at least two items were chosen less frequently after the satiation manipulation for each participant and at least one item was never selected by each participant following the satiation manipulation. Overall, these results suggest that researchers should further examine the use of both deprivation and satiation with environmental enrichment interventions designed to increase engagement and to reduce problem behaviors. Also, the impact of establishing operations on an individual's preference at any given moment suggests the possible utility, if not need, to conduct pre-session preference assessments.

A pre-session preference assessment is conducted immediately before an instructional activity or task and assesses the individual's preference for a particular stimulus at that moment in time. Before pre-session preference assessments can be utilized a stimulus preference assessment must be conducted a few weeks ahead of time to generate a pool of preferred and non-preferred stimuli. From this pool of stimuli, two preferred and two non-preferred stimuli are chosen to be utilized in the pre-session preference assessment. The duration of a pre-session preference assessment is usually no longer than two minutes and during this time individuals are presented either two or more preferred stimuli, or preferred and non-preferred stimuli, immediately before an instructional session. The stimulus the individual selects during this pre-session preference assessment would be considered preferred at that moment in time and instructors, teachers, or parents could utilize that stimulus to increase or maintain a specified or desired behavior.

For example, DeLeon et al. (2001) conducted a study in which a lengthy paired-choice preference assessment was initially conducted to identify a hierarchy of preferred items. Subsequently, pre-session multiple-stimulus-without-replacement assessments using the same items were completed each day prior to an instructional activity or task. On days when results of the daily pre-session MSWO assessment differed from the lengthy assessment, the relative reinforcing effects of the top items from each assessment were compared in a concurrent-schedule arrangement. The results revealed that when the two assessments differed, participants generally allocated more responses to the activity or task associated with the daily top-ranked items, i.e. the MSWO pre-session assessment. In another study by Gast et al. ((2000) a forced-choice preference assessment

was preformed to produce a hierarchy of preferred items. Then two weeks later a pre-session assessment was conducted immediately before an instructional activity using the successive choice procedure. The results from this study produced similar findings in that the participants engaged in higher durations of responding when the stimulus identified during the pre-session assessment was associated with the activity or task compared to the top ranked stimuli from the general preference assessment, when the two assessments differed. It is highly suggestible that individual shifts in preference can be a direct effect of establishing operations and if this is so, than pre-session preference assessments are capable of identifying these effects, especially when an individual can not readily communicate these changes themselves. For this reason the MSWO pre-session assessments should be used to access preferences among different stimuli to be utilized as reinforcers during instructional activities or tasks.

Future Directions

There are always limitations to studies, which creates directions for future research. One limitation of previous preference assessment studies is the problem occurrence of aberrant behavior, which is sometimes a characteristic of individuals with profound multiple disabilities (Roane et al, 1998). During preference assessments an individual may display unusual behaviors that may be mistaken as an approach response (target behavior) or indication of preference. For example, if a participant's aberrant behavior is hand flapping, a researcher could unintentionally identify this atypical behavior as an approach response. This could result in stimuli being identified as reinforcers when they actually have no reinforcing effect at all. The Roane et al, study included participants that were referred for treatment of aberrant behavior. Roane et al.

(1998) found that the paired-stimulus preference assessment produced higher rates of aberrant behavior, which could be caused from the lack of the attention provided for the aberrant behavior and that the levels of noncontingent attention provided do not successfully attenuate the behavior. Impending studies should incorporate functional analysis results, which could be examined in relation to the occurrences of aberrant behavior in various preference assessments. During a functional analysis researches would study and examine the behaviors displayed by an individual in many different environments and social interactions, with the expectation of distinguishing aberrant behaviors that appear to be approach responses from actual approach responses. By obtaining this data researchers could gain valuable information regarding the mechanisms that are responsible for differences in aberrant responding across different preference assessments (Roane et al., 1998).

In the Conyers et al. study (2002) there is some limitations that should also be addressed in future research. The purpose of this study was to evaluate how choice responding was influenced by different methods of choice presentation, specifically through object, picture, and verbal descriptions. However, one limitation of this study was that choice stimuli used in the study were limited to items often used as reinforcers. Generality of the results to other stimuli that the participants have not been exposed to previously in other preference assessments, or in their immediate environment needs to be examined. Second, although pictures or spoken presentations have the potential to depict less manipulable objects or activities, the choice stimuli used in this study were confined to manipulable objects. Pictures of activities, such as watching a television set, going for a walk, or eating at a restaurant, should be explored. Third, in addition to

replicating the present results with more participants, future research could also study the predictive relation between discrimination skills and presentation methods functionally. For example, research might investigate whether individuals at Level 3 (e.g., participants 1 through 3 in this study) could respond to picture and spoken presentations consistently after being trained to pass the ABLA Levels 4 and 6 discriminations in a multiple baseline design. Fourth, motivation was suggested as a possible variable that may have influenced choice consistency between food and non-food items for participants 4 and 6. Additional research is needed to isolate motivational effects. For example, future research might examine whether a person will exhibit more consistent choices between items with a large difference in preference than between items with a smaller difference in preference while stimulus type is controlled.

Another uncertain component when conducting preference assessments is the duration of sessions in which an individual has contact with a single stimulus. For example, one study allots an individual five minutes to assess each stimulus and another study, using the exact same procedures, only allots the individual three minutes to assess each stimulus. Future research should examine within-session patterns of stimulus interaction to evaluate the optimal session duration required to identify clear stimulus preferences (Roane et al., 1998).

It has been shown that the use of either brief preference assessments or pre-session preference assessments can be beneficial for identifying stimuli that are reinforcing for an individual at that moment in time, since preferences are known to change frequently. However, there is no clear indication of how frequent these assessments should be conducted and how frequent the pool of preferred and non-

preferred stimuli used in these assessments should be changed to prevent habituation and provide an adequate number of different stimuli to account for the changes in preference over time. Furthermore, it is still unknown how frequent a general preference assessment should be conducted as the basis on which these preferred and non-preferred stimuli for the brief preference and pre-session preference assessments. For this reason, a longitudinal study needs to be conducted on a group of individuals to determine how often one needs to conduct either brief or pre-session preference assessments, so that habituation does not occur. Also, this study should assess how regularly the initial general preference assessment should be performed in order to incorporate additional stimuli into the pool of preferred and non-preferred stimuli to be utilized in the brief and pre-session preference assessments.

Finally, future research should be conduct to examine the efficiency of training staff and educational professionals on how to conduct preference assessment since they work with individuals who have disabilities on a daily basis. There are many types of preference assessments (MS, MSWO, PS, etc.) and it may be easier to teach these professionals one procedure compared to another, or maybe all procedures can be efficiently taught to staff with comparable ease. Furthermore, another study should be conducted to examine the capability of staff and teachers to interpret and use the data to translate the results of the assessment procedures into effective interventions.

These future directions in the area of stimulus preference assessments can only benefit individuals with profound multiple disabilities. Also, the findings from these future directions will help enhance programs and intervention, which will allow individuals with developmental disabilities to have the freedom of choice in their

immediate environment and to effectively learn skills that will increase their ability to integrate into the community. Furthermore, these individuals will be able to gain a sense of independence and autonomy, which is an essential component of development and life itself.

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