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# Preference Assessment Procedures for Individuals With Developmental Disabilities

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Significant advancements have been made in the development of procedures to systematically identify preferred stimuli that may function as reinforcers for persons with developmental disabilities. Indirect assessment procedures include care provider and client interviews, whereas direct assessment procedures involve systematically exposing participants to stimuli while recording their responses. These types of direct assessment procedures can be categorized as either approach-based or engagement-based. Approach-based procedures involve recording the individuals' approach responses to stimuli presented singly or concurrently with other stimuli, whereas engagement-based procedures involve recording duration of engagement with stimuli. Although the predictive validity of indirect preference assessment procedures has yet to be established, using them in combination with direct measures of preference may be most efficacious for identifying potential reinforcers. Recent research on preference assessment procedures used with persons with developmental disabilities is reviewed and the variables that one might consider prior to selecting which procedure to use in a given situation are discussed.

**Keywords:** *competing items; preference assessment; stimulus engagement*

**Significant advancements have been made** in the development of procedures to systematically identify preferred stimuli that may function as reinforcers for persons with developmental disabilities (e.g., DeLeon & Iwata, 1996; Fisher et al., 1992). For those working with this population, conducting some type of preference assessment is a routine part of the assessment and treatment development process. The purpose of this article is to summarize relevant literature on pref-

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erence assessment procedures potentially useful with adults with developmental disabilities.

Prior to any discussion about preference assessment procedures, it is important to note the distinction between preference and reinforcer assessments. During a reinforcer assessment, the reinforcing effects of stimuli are directly evaluated by determining the extent to which those stimuli increase the occurrence of the targeted behaviors when provided contingently. Preference assessments generally attempt to determine client preferences for certain stimuli on the basis of care provider opinions (Green et al., 1988), or client responses during brief presentations of those stimuli (e.g., Pace, Ivancic, Edwards, Iwata, & Page, 1985). Although preference assessments do not directly measure a stimulus' reinforcing properties, they permit one to evaluate a large number of stimuli in a relatively brief period of time. Although the predictive validity of some preference assessment procedures has been empirically demonstrated (e.g., Piazza, Fisher, Hagopian, Bowman, & Toole, 1996), one cannot assume that highly preferred stimuli will function as effective reinforcers. Furthermore, reinforcement effects are not absolute, but are a function of a number of contextual variables, including the targeted response, the availability of other reinforcement, and recent history of access to (or deprivation from) reinforcement. Therefore, one should regard high-preference stimuli as being "potential" reinforcers.

### INDIRECT MEASURES

Preference assessments can be categorized as being either indirect or direct, on the basis of whether client responses to stimuli are directly observed. Indirect preference assessments rely on the opinions of care providers or others who know the participants and involve the use of structured and unstructured interviews or checklists (Fisher, Piazza, Bowman, & Amari, 1996; Matson et al., 1999). Stimuli are then ranked on the basis of care provider endorsements of how much the client appears to prefer or engage with each stimulus.

A standardized checklist of potential reinforcers for individuals with severe or profound mental retardation was developed by Matson

et al. (1999). The checklist, consisting of 49 edible and nonedible preferred stimuli identified by direct care staff familiar with 185 participants, was developed via interviews. Test-retest reliability was assessed approximately 3 weeks after the initial interview with the same direct care staff, and a significant correlation was found between the test and retest total scores ( $r = .54, p .001$ ). However, the validity of this checklist in predicting whether stimulus rankings predict reinforcing effectiveness was not examined in that study.

Fisher et al. (1996) developed the Reinforcer Assessment for Individuals With Severe Disabilities (RAISD), a structured interview designed to generate a list of potential preferred stimuli. In that study, Fisher et al. examined the correspondence between the RAISD and a direct preference assessment procedure (the paired stimulus procedure, described below). Correlations between care provider rankings of stimuli identified on the RAISD and rankings derived from the paired stimulus preference assessment were low but statistically significant ( $r_s = .32, p < .005$ ). However, the utility of the RAISD was demonstrated as potent reinforcers were found among the stimuli identified by care providers.

Other studies have examined indirect procedures for assessing preference, and have directly compared the results with preference rankings derived from direct methods. For example, Green, Reid, Canipe, and Gardner (1991) used a Likert-type survey, with scale values ranging from 1 (*least preferred*) to 5 (*most preferred*), to assess direct-care staff's opinions regarding the participant's apparent preference for certain stimuli. The results were compared with a direct measure of preference. Similarly, Parsons and Reid (1990) compared a caregiver survey of participant's food preferences to a direct measure of preference. Surveys, consisting of a 5-point rating scale for target food/drink pairs, asked staff what they thought a particular participant's response would be when provided with a choice between two respective food or drink items. In both of these studies, researchers found a lack of concordance between care provider report of preference for stimuli and direct observations of preferences (e.g., Green et al., 1991; Parsons & Reid, 1990). For example, Green et al. found significant Spearman correlations between caregiver rankings and direct preference assessment rankings for only 2 of 6 participants. Parsons

and Reid reported that staff opinions did consistently correspond with the direct preference rankings; however, correlation coefficients were not reported.

### **DIRECT MEASURES**

Direct measures of preference generally involve systematically exposing the client to stimuli for a brief period and then recording his or her approach responses or levels of engagement with each stimulus across multiple trials. The approach or engagement data are then summarized across trials, and a preference hierarchy is derived.

#### **APPROACH-BASED MEASURES**

The single-stimulus (SS) procedure described by Pace et al. (1985) involves presenting each stimulus individually, and the client is given the opportunity to approach or briefly consume that stimulus. Preference ratings are based on the percentage of trials in which each stimulus was approached or consumed. Pace et al. provided some support for the predictive validity of the SS procedure by demonstrating that high-preference stimuli were more effective reinforcers than non-preferred stimuli in a subsequent reinforcer assessment for 6 individuals with profound mental retardation between the ages of 3 and 18 years. In addition, Roscoe, Iwata, and Kahng (1999) further demonstrated the predictive validity of the SS procedure by evaluating stimuli identified as highly preferred by the SS procedure in a single-operant reinforcer assessment. For 6 of 7 adult participants (ages ranging from 25 to 65 years), stimuli found to be highly preferred via the SS procedure were effective as reinforcers.

In the paired-stimulus (PS) procedure described by Fisher et al. (1992), stimuli are presented in pairs, and the client is given an opportunity to select one of the stimuli. Preference is determined by calculating the percentage of trials in which each particular stimulus was chosen across the trials in which it was presented. Participants in the Fisher et al. study were all children. However, the PS procedure has been applied in a number of studies with adults (e.g., DeLeon & Iwata,

1996). This procedure has been shown to have good test-retest reliability across multiple administrations ranging from a 1-week period (DeLeon & Iwata, 1996) to over the course of a 2-month period (Windsor, Piche, & Locke, 1994), with mean Kendall rank coefficients of concordance administrations,  $w$ , ranging from .63 to .81. In addition, it has been shown to have good predictive validity in several studies as it can yield a preference hierarchy that predicts relative reinforcer effectiveness (Fisher et al., 1992; Piazza et al., 1996). The main limitation of the PS procedure is that it requires a relatively longer period of time to administer than other types of direct preference assessments (see DeLeon & Iwata, 1996; Roane, Vollmer, Ringdahl, & Marcus, 1998).

With the multiple-stimulus (MS) presentation procedure (Windsor et al., 1994), the client is instructed to select one among several stimuli presented simultaneously in an array. Preference using the MS procedure is determined by calculating the percentage of trials in which each stimulus was selected. Eight adults with severe to profound disabilities participated in the study, which compared the MS procedure to the PS procedure. Stimuli were selected on the basis of staff report of client preference and consisted of various foods and beverages. Results suggested that the MS presentation method required less time to administer; however, it resulted in less stable stimulus preference rankings over a 2-month period when compared with the PS procedure (Windsor et al., 1994). The mean reliability Kendall rank coefficients of concordance across multiple administrations,  $w$ , were .49 for the MS presentation.

DeLeon and Iwata (1996) developed a variation of the MS procedure on the basis of observation that a high rate of false negatives can result when the client consistently selects only one stimulus on each trial. In the multiple-stimulus without replacement (MSWO) procedure, once a stimulus is selected, it is removed from the array on subsequent trials. Preference is determined by calculating the percentage of trials each stimulus was selected relative to the number of trials it was presented. Seven adults with various levels of developmental disabilities participated in the study comparing MSWO, PS, and MS procedures. Relative to the MS procedure, the MSWO procedure had better predictive validity in a subsequent reinforcer assessment. In

addition, the MSWO was shown to have good concurrent validity with the PS procedure for 5 of the 7 participants, with Kendall rank-order coefficients between the MSWO and the PS ranging from .71 to .86. The MSWO procedure was shown to have the predictive validity of the PS procedure but required less than half the time to administer. Test-retest reliability of the MSWO appears adequate: Mean Kendall rank-order coefficients of concordance across administrations,  $w$ , over a 1-week period were .81.

#### ENGAGEMENT-BASED MEASURES

Duration of engagement with stimuli rather than approach has also been used to obtain indices of preference (e.g., DeLeon, Iwata, Conners, & Wallace, 1999; Hagopian, Rush, Lewin, & Long, 2001; Ringdahl, Vollmer, Marcus, & Roane, 1997; Roane et al., 1998). For example, Roane et al. described a procedure that involved presenting an array of stimuli already identified as preferred via a PS assessment. A free-operant (FO) preference assessment was conducted with 10 participants, ranging in age from 3 to 37, with diagnoses ranging from moderate to profound mental retardation. The procedure involved presenting an array of 10 to 11 stimuli to the participant and allowing him or her free access to all the items during 5-minute sessions. Item engagement with each stimulus was recorded, and a preference hierarchy was developed on the basis of the percentage of 10-second intervals in which engagement occurred with each stimulus. In a subsequent concurrent-schedule reinforcer assessment, the highest ranked stimulus was shown to function as a more effective reinforcer than the lowest ranked stimulus for 8 of 10 cases. These findings provided support for the predictive validity of the FO preference assessment; however, reliability data were not reported.

DeLeon et al. (1999) described a procedure that involved presenting stimuli singly for a period of 2 minutes, during which time engagement was recorded. Four individuals ranging in age from 32 to 52 years diagnosed with severe behavior disorders participated in the study. The results of the single stimulus engagement (SSE) procedure were compared with the results of an MSWO assessment. The SSE produced a more differentiated hierarchy than the MSWO procedure.

The predictive validity of the SSE was demonstrated, as stimuli that were highly preferred were shown to function as reinforcers in a subsequent single-schedule reinforcer assessment.

Hagopian et al. (2001) described an SSE preference assessment similar to that described by DeLeon et al. (1999). Four individuals ranging in age from 7 to 20 years exhibiting severe problem behaviors participated. Each stimulus was presented individually to each participant for 2 minutes on three different occasions over the course of 1 week. A preference hierarchy was derived on the basis of the percentage of time the participant engaged with each stimulus. Spearman correlations between preference rankings based on the first administration were moderately correlated with the average of all administrations (range:  $r_s = .42$  to  $.81$ ). The predictive validity of the SSE procedure was demonstrated in a concurrent reinforcer assessment. Across all participants, high-preference stimuli were more potent reinforcers relative to both medium- and low-preference stimuli; and medium-preference stimuli were more potent reinforcers relative to low-preference stimuli.

### CONCLUSIONS AND RECOMMENDATIONS

A variety of indirect and direct measures of preference have been described in the literature in recent years. In determining the type of preference assessment to employ, one should take several things into consideration: the resources available in the setting, the type of stimuli being examined, the client's level of functioning, and the client's visual or physical impairments.

Indirect measures of preference are often the method of choice because they are easy to implement and can be employed with limited resources. Given that the predictive validity of indirect preference assessments has yet to be established, however, routine use of these procedures as the sole method to identify potential reinforcers cannot be recommended at this time. Additional research on the psychometric properties of indirect preference assessments is needed given ease of administration and apparent popularity. The extant data suggest that utilizing both indirect and direct measures of preference

may be most efficacious for identifying potential reinforcers for both children and adults with developmental disabilities. Specifically, it may be beneficial to first use an indirect method to narrow down a list of potential preferred stimuli, followed by a direct preference assessment to obtain more precise relative rankings of stimuli. This approach was exemplified by Piazza et al. (1996), who utilized a structured interview to first develop a list of potential preferred stimuli and subsequently used a direct measure to assess preference.

When determining which direct measure of preference to employ, a number of variables should be considered, including the type of stimuli to be assessed. For example, approach-based procedures may be more appropriate than engagement-based procedures when assessing preference of food items because providing free access to preferred edible items for several minutes may be both unnecessary and undesirable. On the other hand, engagement-based procedures may be more appropriate when assessing preference of stimuli that require a longer access period for the individual to contact the reinforcing properties of those stimuli (e.g., playing a video game) or of stimuli/activities that may not lend themselves to the choice presentation format used with approach-based procedures (e.g., going for a walk, singing songs).

Finally, specific characteristics of the individual should be considered when choosing a preference assessment method. In general, lower functioning or physically impaired individuals may have greater difficulty choosing among stimuli presented simultaneously. Thus, approach-based procedures that require the individual to make a choice from a wide array of stimuli (e.g., MSWO) or even two stimuli (PS) may not be as appropriate as engagement-based procedures (e.g., SSE). For some clients, it may be necessary to modify some procedures. For example, Paclawskyj and Vollmer (1995) describe a modification of the PS procedure (Fisher et al., 1992) for visually impaired individuals. The procedure involved physically guiding the participants to touch and explore the two stimuli prior to each trial. Conversely, for relatively higher functioning individuals, procedures involving the simultaneous presentation of multiple stimuli (e.g., MSWO) may be desirable given that these procedures require less time to administer. In addition, for individuals who demonstrate prob-

lem behavior or become agitated when preferred stimuli are removed or when access is limited to a brief period, engagement-based procedures may be more desirable than approach-based procedures (which allow only brief access periods) (Roane et al., 1998).

Although major advancements have been made in the development of preference assessment procedures in recent years, a number of questions about these procedures remain. In particular, additional research is needed to further develop and validate indirect preference assessment procedures. Many of the suggestions provided above regarding the selection of preference assessment procedures are speculative and require formal empirical investigation.

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