JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1999, **32,** 111–114 NUMBER 1 (SPRING 1999)

EXAMINATION OF AMBIGUOUS STIMULUS PREFERENCES WITH DURATION-BASED MEASURES

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Items that produced ambiguous results in an approach-based preference assessment were reassessed using a duration-based assessment. The reinforcing effects of three items on free-operant responding were subsequently tested. The results suggested that the duration-based assessment produced slightly more differentiated results and that predictions about reinforcer value, based on this assessment, were accurate.

DESCRIPTORS: stimulus preference, reinforcer assessment, developmental disabilities

We previously reported that a preference assessment in which selections are made without replacement from a multiple stimulus array (MSWO assessment) offered several advantages over other currently used methods (DeLeon & Iwata, 1996). However, in a small proportion of cases, as with other assessments based on concurrent choice, the MSWO assessment produces undifferentiated approach percentages for many of the stimuli. There are at least two explanations for undifferentiated outcomes. First, if none or very few of the items are preferred, the individual may make more or less random selections. Alternatively, if several items are highly preferred and compete with each other in a concurrent arrangement, switches in preference across trials may also yield a somewhat random distribution. Thus, undifferentiated percentages may reflect the presence of either very few or very many highly preferred items.

The effects of item competition on approach percentages can be avoided by presenting items singly rather than in pairs or groups (e.g., Pace, Ivancic, Edwards, Iwata, & Page, 1985). However, single-stimulus approach methods may sometimes overestimate the value of reinforcers (Fisher et al., 1992), perhaps through the indiscriminate approach of any item that is available. Interpretative difficulties stemming from both item competition and indiscriminate approach, however, may be potentially avoided by measuring duration of item contact (e.g., Piazza, Fisher, Hanley, Hilker, & Derby, 1996), rather than approach percentage, during single-stimulus presentation. In this study, we evaluated the duration of contact with stimuli used in four relatively undifferentiated MSWO assessments. If an individual manipulates an item for more than half of the observation period, it is reasonable to conclude that the item may be a reinforcer even though the MSWO assessment did not clearly predict such an effect. Finally, in two cases, reinforcement effects were evaluated for stimuli with high duration measures but ambiguous MSWO outcomes and, in one

This research was supported in part by a grant from the Florida Department of Children and Families. We appreciate the valuable assistance of Jana Lindberg in conducting various aspects of the research, and we thank Marc Branch, Mary Dykes, Timothy Hackenberg, and Mark Lewis for their comments on earlier versions of the paper.

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case, for a stimulus with a low duration measure and an ambiguous MSWO outcome.

METHOD

Participants and Settings

Four individuals, Robbie (46 years old), Rod (45 years old), Charlene (52 years old), and Max (32 years old), participated in the study. All had been diagnosed with mental retardation, could follow simple instructions, and had very limited expressive language skills. Sessions were conducted in one room of a day treatment center for behavior disorders (Robbie, Rod, and Max) or in the participant's bedroom (Charlene).

Preference Assessments

Two preference assessments involving seven nonfood stimuli were conducted with each participant. Both assessments were administered five times each, and outcome measures were summarized across administrations. One assessment used the MSWO format described by DeLeon and Iwata (1996). In the other assessment, the experimenter placed a single item on the table in front of the participant for 2 min during each trial. An observer used one timer to monitor trial duration (2 min from initial placement of an item on the table) and a second timer to record the amount of time the participant maintained physical contact with the item. At the end of the trial, the experimenter removed the item and, after a few seconds, presented the next item. Sessions continued until each item had been presented for 2 min. The dependent measure was the percentage of time (of the 10-min total) during which the participant manipulated each item.

Reinforcer Assessments

Charlene and Robbie were subsequently exposed to reinforcer assessments, in which rates of hair brushing (Charlene) and matching coins to groups of pennies having the same value (Robbie) were measured during baseline and during a condition in which an item from the preference assessments was delivered on a fixed-ratio (FR) 1 schedule. Two of the items (kaleidoscope, Stimulus 5, for Charlene and massager, Stimulus 2, for Robbie) were chosen because they had been approached at levels comparable to several other stimuli during the MSWO assessment, but had been manipulated more than 50% of the time during the duration assessment. In addition, Robbie's analysis also included an item (talking toy, Stimulus 3) that resulted in both low approach percentages and low item contact in the preference assessments. All sessions lasted 5 min, not including reinforcer access time. Verbal prompts were delivered at the beginning of the session and at the beginning of each minute thereafter (i.e., five prompts per session). During baseline, none of the items was in view, and correct responses resulted in verbal praise. During item delivery phases, the item being tested was placed behind the task materials and was delivered for 30 s contingent on each correct response.

Data Collection and Interobserver Agreement

During the MSWO procedure, observers recorded the item selected on each trial, and a second observer independently recorded data during 40% of sessions. The observers agreed on item approach in 100% of the trials. A second observer measured duration of item engagement during 45% of the duration assessment sessions. An agreement for duration engagement was scored if the reliability observer's total duration for a given item was within ± 1 s of the primary observer's duration. Across all observations, the percentage agreement was 88.7%. During reinforcer assessments, observers collected data using handheld computers and recorded the occurrence of prompts, participant responses, and reinforcer deliveries. A second observer recorded data during 24% of ses-

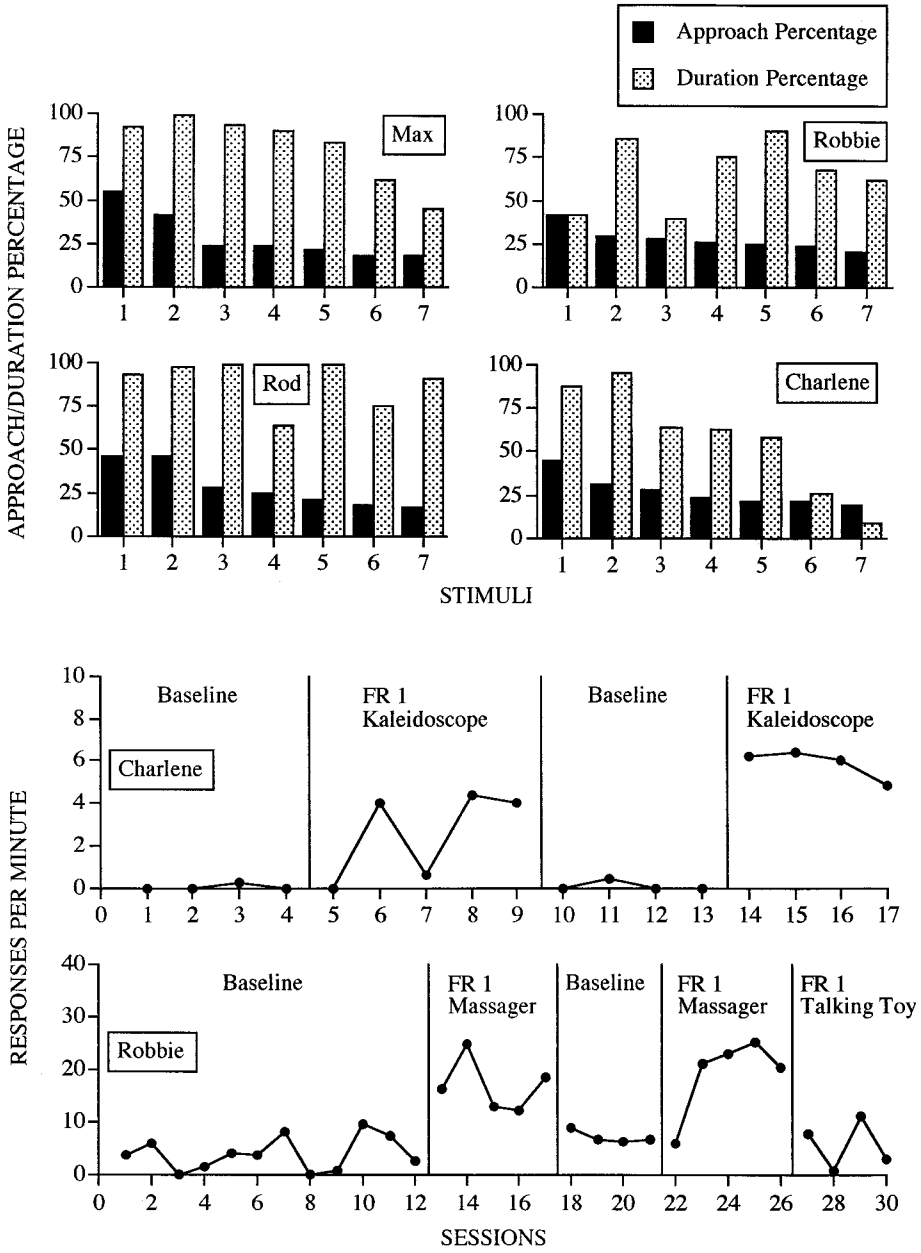

Figure 1. Approach and engagement duration percentages for each stimulus by each participant during the preference assessments (top four panels) and response rates under baseline and FR 1 conditions during the reinforcer assessments for Charlene and Robbie (bottom two panels).

sions. Interobserver agreement was calculated on an interval-by-interval basis by dividing the smaller number of recorded events during 10-s intervals by the larger number, summing the quotients across intervals, dividing by the total number of intervals in the session, and multiplying by 100%. Mean interobserver agreement was 100% for prompts, 98% for participant responses, and 97.1% for reinforcer delivery.

RESULTS AND DISCUSSION

Figure 1 displays the approach and duration engagement percentages for each item for each participant. For all participants, only one of the items resulted in an approach percentage greater than 50%, with percentages for most of the items clustering around 25%. By contrast, 23 of the 28 items were manipulated for over half of the total time they were available during the duration assessments. Insofar as the range of values was wider, the duration-based assessment also produced somewhat more differentiated results.

Figure 1 also shows the results of the reinforcer assessments for Charlene and Robbie. Both items that resulted in high duration of contact effectively increased response rates above baseline levels. By contrast, the item that resulted in both low approach and duration measures failed to increase rates above baseline levels for Robbie.

Overall, several of the items that clustered around the median approach percentage in the MSWO assessment produced duration percentages above 50% for all 4 participants. Given that the results of the reinforcer assessments in this study and in others (e.g., Piazza et al., 1996) suggest that duration of item contact is a valid index of reinforcer value, the undifferentiated results in the approach-based assessment appear to have been a function of the presence of multiple highly valued stimuli. However, because all participants maintained contact with most of the items for high duration percentages, our suggestion that ambiguous assessments may also result from the absence of highly valued stimuli remains speculative at this time. Furthermore, although the duration-based assessment produced more differentiated results, there was still a tendency for the duration percentages to cluster towards the top. It is possible that outcomes of duration-based assessments may closely resemble those obtained from the single-stimulus approach method (Pace et al., 1985), which was not evaluated in the present study.

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Received February 17, 1998
Initial editorial decision April 24, 1998
Final acceptance July 29, 1998
Action Editor, Timothy R. Vollmer