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Abstract

Several preference assessments have been developed to identify potential reinforcers for individuals with developmental disabilities, but some of the most widely used methods have been associated with false negatives. DeLeon, Iwata, and Roscoe (1997) showed that the presence of very highly preferred items may obscure participants' preferences for items ranked as less preferred. The current study sought to replicate and extend the findings of DeLeon et al. (1997) by conducting two forced-choice preference assessments (Fisher et al., 1992), the second of which evaluated preferences for five low-ranked items from the initial assessment. Some of these low-ranked items did emerge as highly preferred when assessed among themselves, and these were shown to increase the occurrence of target responses relative to baseline levels of responding.

Evaluation of Low-Ranked Items in a Preference Assessment

Teaching new skills to individuals with developmental disabilities (e.g., mental retardation) is a considerable challenge for both special educators and behavior analysts (Fisher et al., 1992; Green et al., 1988). Knowledge of stimuli that will function effectively as positive reinforcers for persons with these disabilities is essential to the process of operantly conditioning new behavior (Pace, Ivancic, Edwards, Iwata, & Page, 1985; Wacker, Berg, Wiggins, Muldoon, & Cavanaugh, 1985). Several methods have been developed to assess preferences of individuals diagnosed with developmental disabilities, and, thus, to identify potential reinforcers. These assessments have included caregiver interviews (Fisher, Piazza, Bowman, & Amari, 1996; Green et al.; Windsor, Piché, & Locke, 1994) and behavioral measurement of preferences (DeLeon & Iwata, 1996; Fisher et al., 1992; Pace et al., 1985; Roane, Vollmer, Ringdahl, & Marcus, 1998). Behavioral measurement of preferences generally has involved systematically presenting stimuli one, two, or several at a time, while recording the individual's response to the items (e.g., approach).

In 1985, Wacker and colleagues called for the inclusion of systematic methods for identifying potential reinforcers as a standard part of behavior modification programs used with individuals who have developmental disabilities. Pace et al. (1985) generated the first such systematic method in which sixteen items (e.g., mirror, light, juice, graham cracker) were presented to participants one at a time, with 10 trials for each item, and operationally defined approach responses (e.g., participant moving toward the stimulus) were recorded. Results suggested that the procedure identified preferred stimuli (defined as those items approached by

subjects on at least 80% of trials) for 6 individuals with profound mental retardation. Furthermore, these stimuli were shown to increase adaptive behavior when compared to nonpreferred stimuli. Green et al. (1988) demonstrated that the procedure developed by Pace et al. more effectively identified preferred, reinforcing stimuli than did caregiver opinion, but they noted that behavioral measures of preference (e.g., approach responses) were not always consistent with reinforcement effects. In particular, Green et al. showed that the preference assessment was sometimes associated with false positives; that is, some items identified as preferred were found to be ineffective as reinforcers. Fisher et al. (1992) designed a forced-choice preference assessment to more clearly distinguish between preferred and nonpreferred stimuli. Each of 16 items was paired with every other item, and participants were allowed to choose (i.e., approach) only one of the two items on each trial. Relative preferences for the various items were determined by dividing the number of times a particular item was selected by the total number of times it was presented. Results showed that the forced-choice method generated a distinct ranking of preferences for each individual and more accurately predicted which items would be effective reinforcers than the single-presentation method described by Pace et al. Fisher et al. found, as did Green et al., that the single-presentation method was associated with false positives.

In a subsequent study, Windsor, Piché, and Locke (1994) compared the forced-choice assessment to a group presentation method in which individuals could select one item from among six stimuli that were available at the same time. The entire array of items was presented ten times, and relative preferences were determined by calculating the percentage of times each

item was selected. Results showed that the group assessment took less time to administer than the forced-choice method. Nevertheless, the forced-choice method produced more consistent results across repeated administrations of the preference assessment and provided a clearer ranking of preferences. DeLeon and Iwata (1996) combined the benefits of the forced-choice and group presentation formats by creating a multiple-stimulus-without-replacement (MSWO) method in which each stimulus chosen by the individual from a group of items was removed from the array on subsequent presentation trials. This required participants to choose from among less preferred items. The MSWO method was compared to a multiple-stimulus-with-replacement (MSW) procedure (similar to the group presentation method described by Windsor et al.) and to the forced-choice procedure. Results showed that the MSWO method required less administration time than the forced-choice assessment. Furthermore, the MSWO procedure identified a wider variety of preferences than the MSW. Roane et al. (1998) further evaluated the group presentation format by demonstrating that a very brief preference assessment, in which participants were given free access to several stimuli during 5-minute sessions, could identify highly preferred items that were effective reinforcers. However, like the MSW method, it identified only one or two of the most highly preferred stimuli.

Results of prior research clearly show that preference assessments accurately identify items that are highly preferred by individuals with developmental disabilities and that these items can be used effectively as reinforcers to strengthen adaptive behavior. Furthermore, modifications to the method described by Pace et al. (1985) successfully reduced the incidence of false positives. However, the accuracy of these assessments (i.e., forced-choice, MSW, MSWO)

may be limited in some cases by false negatives. That is, items identified as less preferred, and therefore assumed to be ineffective as reinforcers, may have actually been useful sources of reinforcement. For example, many items were never chosen by participants during the group presentation assessments because individuals consistently selected only their most preferred items, not necessarily because they disliked the other items (Roane et al., 1998; Windsor et al., 1994). DeLeon and Iwata (1996) demonstrated that stimuli never chosen during the MSW procedure nonetheless increased adaptive responses for 3 out of 4 participants and that some items ranked as less preferred during the forced-choice procedure also functioned as reinforcers.

Results of a recent study by DeLeon, Iwata, and Roscoe (1997) indicated that items ranked as less preferred by the MSWO procedure were not necessarily ineffective as reinforcers but were overpowered by a few very highly preferred stimuli. Specifically, the researchers showed that participants' preferences for food items were so great that any preferences for leisure items in a preference assessment array were obscured by the availability of edible stimuli. First, the researchers assessed preferences for food and leisure items separately using the MSWO procedure. They then combined the top-ranked food and leisure items from each assessment and conducted a third MSWO assessment. Leisure items ranked as highly preferred in their own assessment were displaced by food in the final assessment. That is, leisure items were selected on as few as 22.7% of the trials even though these items were shown to be effective reinforcers in a subsequent phase of the study.

The purpose of the present study was to replicate and extend the results of DeLeon et al. (1997) by evaluating participants' preference for and the reinforcing effectiveness of items

ranked as less preferred in preference assessments. The forced-choice format described by Fisher et al. (1992) was used because it is considered to be the most reliable method for assessing preferences. Based on the results of DeLeon et al., it was predicted that at least some low-ranked items from an initial forced-choice assessment would represent false negatives due to their displacement by very highly preferred items. To examine this possibility, a second forced-choice assessment using only the low-ranked items was conducted. It was expected that, when the highly preferred items were removed, another discrete ranking of preferences would emerge among the original low-ranked items. Furthermore, it was predicted that some of these low-ranked items would be highly preferred and effective at increasing a desirable behavior with respect to its baseline level. A reversal design was used to evaluate the reinforcing effectiveness of the most highly preferred of the originally low-ranked items.

Study 1: Preference Assessments

Method

Participants and Setting

Three individuals recruited from local area schools participated in Study 1. Brad was 8 years old and was diagnosed with moderate mental retardation. Mark was 14 years old and diagnosed with multiple disabilities and a speech impairment, and he appeared to be functioning within the severe range of mental retardation. Alice was 13 years old and diagnosed with severe mental retardation. None of the participants had expressive language skills, and all but Mark were ambulatory.

The study was conducted in designated therapy rooms at the participants' schools. These

rooms contained tables, chairs, desks, and a variety of materials that were needed to conduct the experimental sessions (see below). Trained therapists and observers were also present to conduct the sessions and collect data.

Response Measurement and Reliability

Trained observers recorded approach responses using paper and pencil during each preference assessment. Approach was scored when the participant reached for one of two items presented concurrently and grasped the item for at least 5 s. The total percentage of trials in which each item was selected was determined by dividing the number of times the item was approached by the total number of times it was presented. A second observer independently recorded approach responses during 67% of the assessments. Interobserver agreement was calculated by dividing the total number of agreements by the sum of agreements plus disagreements and then multiplying this number by 100. If both observers recorded that a given item was approached or that neither item in the pair was approached, it was considered an agreement. If the observers recorded that different stimuli were approached, or if one observer recorded that neither item was approached while the other indicated that one item was approached, it was considered a disagreement. Mean interobserver reliability was 95% for Brad, 98.5% for Mark, and 100% for Alice.

Procedure

All participants were exposed to a pre-assessment and two stimulus preference assessments. Each assessment was completed in one or two sessions, and sessions were conducted on separate days. Sessions lasted between 10 min and 20 min.

Pre-assessment . A pre-assessment was conducted to identify an array of at least 8 items for each individual, which were then further evaluated in the preference assessments. Items were identified via a structured caregiver interview (The Reinforcer Assessment for Individuals with Severe Disabilities, or RAISD; Fisher et al., 1996). Additional items relevant to various sensory modalities (e.g., auditory, visual) also were included. This group of stimuli was then refined using a single-presentation procedure similar to that described by Pace et al. (1985). Each item in a participant's array was presented singly to him/her for 30 s. This procedure was repeated, such that each item was presented for a total of 60 s. The amount of time during the interval that he/she spent interacting with an item was recorded by an observer using a laptop computer. Interaction was defined as consuming an edible item or manipulating a non-edible item with the hand(s). The final array of stimuli for each individual consisted of the 8 to 10 items with which he/she interacted for the longest amount of time during the 60-s presentation interval.

Complete-array assessment. A forced-choice preference assessment similar to that described by Fisher et al. (1992) was first conducted using the stimuli identified in the pre-assessment (information from caregivers prompted the inclusion of an additional stimulus, keys, in Mark's final array). The items were presented to participants one pair at a time, and each item was paired with every other item twice. The therapist instructed the individual to choose one item. The participant was permitted to interact with the selected item for 30 s, while the unselected item of the pair was removed. Simultaneous approach to both of the items was blocked by quickly removing the items and then re-presenting them. If the individual did not approach either item within 5 s, the therapist verbally prompted him/her to interact with each

item for 5 s. After this sampling, the pair of stimuli was again presented, approach within 5 s was recorded, and 30 s of access to the selected item was granted. If the individual again failed to approach either item, the stimuli were removed, and the next trial was conducted.

Partial-array assessment. The second stimulus preference assessment included only the five stimuli ranked as least preferred by the complete-array assessment. Presentation and data collection methods were identical to those used in the first assessment.

Results

Results of the single-presentation procedure used in the pre-assessment for each participant can be found in Table 1. Table 1 shows the percentage of the presentation interval during which the individuals interacted with given stimuli. The items listed are those that were associated with the greatest amount of interaction and, thus, were subsequently evaluated in his/her complete-array assessment.

Figure 1 shows the results of the complete and partial-array assessments for each participant. In the left column, stimuli included in each individual's complete-array assessment are rank-ordered from left to right according to the percentage of trials in which they were approached. The right column depicts the same information for items in the partial-array assessments. As illustrated in the top left panel, the five items ranked as least preferred in Brad's complete-array assessment were approached by him in fewer than 50% of the trials. However, in his partial-array assessment (top right panel), Brad selected one of these items, the vibrating octopus, in nearly 88% of the trials. The octopus was subsequently used in his reinforcer assessment. As shown in the middle left panel, Mark approached the five lowest ranked items in

his complete-array assessment in fewer than 60% of the paired presentations. Although the stuffed alligator and orange koosh ball were both approached by Mark in 56% of the trials, inspection of the raw data revealed that he chose the alligator over the koosh ball when the two were paired together. Thus, the koosh ball was deemed to be less preferred, and it was included with the other four low-ranked stimuli in his partial-array assessment. During this second assessment (middle right panel), Mark approached the orange koosh ball in nearly 88% of the trials, and its reinforcing effectiveness was then tested in Study 2. In Alice's complete-array assessment (bottom left panel), she approached the five lowest-ranked items during fewer than 35% of the trials. During the partial-array assessment (bottom right panel), Alice approached the previously low-ranked Mardi Gras beads in over 60% of the trials.

Insert Figure 1 about here.

Study 2: Reinforcer Assessment

Method

Participants and Setting

The three individuals from Study 1 participated in this study. Settings were identical to those used in Study 1.

Response Measurement and Reliability

Target responses, consistent with adaptive behaviors in the participants' educational plans, were selected for the individuals. Placing blocks in a bucket (Brad and Mark) involved

picking up small wooden or plastic blocks from a table and putting them into a plastic bucket that was also on the table. Switch pressing (Mark) involved depressing a microswitch with the hand or fingers. Only responses that resulted in full depression of the switch were recorded. Card touching (Alice) was defined as contact between the hand or fingers and a 13.97 cm x 21.59 cm card that was taped to the wall of the therapy room. The card displayed the picture of the tested preferred stimulus. A trained observer recorded the frequency of these responses on a laptop computer, and the data were expressed as either responses per minute (blocks in bucket and switch presses) or as the percentage of 10-s intervals in each session during which the response occurred (card touches). An additional response selected for Mark was locomotion, which required that he crawl (he was unable to walk) to one of two 71.12 cm x 91.44 cm poster boards, or squares, that were taped onto the carpet of the therapy room. The trained observer recorded the duration of in-square behavior, defined as having any part of the body inside the square, on a laptop computer, and the data were expressed as duration of session time spent in the squares. A second observer independently recorded occurrences of the behaviors during 69% of Brad's sessions, 43% of Mark's sessions, and 38% of Alice's sessions. Interobserver agreement was calculated by dividing the sessions into consecutive 10-s intervals. The number of agreements was divided by the number of agreements plus disagreements and multiplied by 100. An agreement was defined as both observers scoring the same number of responses in a given interval. Mean exact agreement percentages across sessions were 97% for Brad, 95% for Mark, and 96% for Alice.

Procedure

Two to four sessions were conducted one to five days per week as schedules permitted. All sessions lasted 10 min. Subjects were seated in chairs during all sessions except Mark's in-square sessions.

Brad. At the start of each session, the therapist delivered one instructional trial using a three-prompt sequence (Horner & Keilitz, 1975). First, Brad was verbally prompted to engage in the response (e.g., "Brad, put the block in the bucket"). If he did not respond within 5 s, the therapist modeled dropping a block into the bucket. If Brad again failed to respond within 5 s, he was physically guided by the therapist to engage in the response. Thereafter, the therapist delivered verbal prompts to engage in the response every time Brad failed to respond for 30 s. During baseline sessions (A), Brad did not receive reinforcement for putting blocks in the bucket. Baseline sessions were conducted until responding remained stable for several consecutive sessions. In the reinforcement condition (B), each correct response produced 20 s of access to the highest ranked item from Brad's partial-array assessment (that is, the highest ranked item from the group of originally low-ranked items), which was the vibrating octopus. Session time was stopped while the reinforcer was delivered, such that reinforcement time was omitted from total session time. The reinforcement condition continued until responding was stable for several consecutive sessions.

Mark. A block-in-bucket procedure, identical to that used with Brad, was initially implemented with Mark using his highest ranked item from the group of originally low-ranked items (the orange koosh ball). Various complications (see Appendix) necessitated the selection of a new target behavior, pressing a microswitch. At the beginning of each session, an

instructional trial was delivered using the three-prompt sequence described above. Thereafter, the therapist delivered a verbal prompt to press the switch every time Mark failed to respond for 30 s. During baseline sessions (A), switch pressing was not reinforced. In the reinforcement condition (B), Mark received 20 s of access to the orange koosh ball contingent on each correct response. Reinforcement time was omitted from total session time. Once again, there were difficulties with Mark's sessions, and a change was necessitated (see Appendix for a full explanation and the results of these trials).

A new response, locomotion, was then targeted. At the start of each session, Mark was placed on the floor behind a starting "line" (a designated pattern in the carpet), which was 81.28 cm from two squares that were taped on the floor to his right and left in front of him. The squares were 119.38 cm apart from each other. He was permitted to crawl forward into either square. After Mark had spent 30 s in one square or in the neutral zone between the squares, he was again placed behind the starting point. During baseline sessions (A), both squares were empty, and Mark received no reinforcement for locomotion and in-square behavior. Baseline sessions were conducted until the percentage of session time spent in-square was stable for three consecutive sessions. In the reinforcement condition, the orange koosh ball was placed in one square (the reinforcement square), and the other square remained empty (the control square). To control for any preference for the left or right square, the square into which the koosh ball was placed first alternated across sessions, and the koosh ball was moved into the other square 5 min after the start of each session. Mark could access the reinforcer for 30 s by crawling into the reinforcement square. If Mark tried to leave the square with the item, it was immediately

returned to the square. Reinforcement sessions were conducted until the percentage of session time Mark spent in-square was stable or on a clear upward trend.

Alice. Prior to each session, the therapist delivered ten instructional trials using the three-prompt sequence described above. During the reinforcement phase, Alice received 15 s of access to the highest ranked stimulus from her partial-array assessment (several strands of plastic Mardi Gras beads) for touching the card during the training trials. During all sessions, the therapist delivered one verbal prompt with modeling every time Alice failed to respond for 30 s. In the baseline condition (A), Alice did not receive reinforcement for touching the card, and baseline was continued until responding had remained stable for several sessions. During the reinforcement condition (B), Alice gained 20 s of access to the Mardi Gras beads each time she touched the card. Reinforcement time was omitted from total session time, and a minimum of ten sessions were conducted until responding was stable for several consecutive sessions.

Experimental Design

A reversal design (A-B-A-B) was used to assess the reinforcing effectiveness of the most preferred item from each participant's partial-array assessment.

Results

Figure 2 shows the results of the reinforcer assessment for Brad. During the initial baseline sessions, Brad exhibited very low rates of placing blocks in the bucket ($M = 0.3$ responses per minute [rpm]; range, 0 rpm to 0.7 rpm). In the first reinforcement condition, Brad's rates of responding increased substantially compared to baseline rates ($M = 7.7$ rpm; range, 0.1 rpm to 11.8 rpm). His rates became more variable and decreased considerably during

the reversal to baseline (M = 1.0 rpm; range, 0 rpm to 3.1 rpm). Brad's responding again increased substantially when the final reinforcement condition was implemented (M = 21.5 rpm; range, 16.6 rpm to 26.2 rpm).

Insert Figure 2 about here.

Results of Mark's initial reinforcer assessments can be found in the Appendix. Figure 3 presents the results of Mark's reinforcer assessment for locomotion and in-square behavior. During the initial baseline sessions, the percentage of session time that Mark spent in the control squares was low (M = 5.9%; range, 0% to 10%). In the first reinforcement condition, Mark spent more session time in the reinforcement square (M = 37.7%; range, 15.2% to 59.6%) than in the control square (M = 4.6%; range, 0% to 9.3%). The percentage of session time spent in the control squares was low (M = 6.2%; range, 0% to 13.3%) during the return to baseline. In the final reinforcement condition, in-square behavior remained very low in the control square (M = 0.3%; range, 0% to 0.8%) while time spent in the reinforcement square was very high (M = 40.6%; range, 36.5% to 46.1%).

Insert Figure 3 about here.

Figure 4 shows the results of Alice's reinforcer assessment. In the first baseline sessions, Alice displayed very low levels of card touching (M = 2.6%; range, 0% to 16.4%). Card

touching increased slightly during the first reinforcement condition (M = 5.7%; range, 0% to 26.8%). During the return to baseline, rates of responding were variable and somewhat higher than those in the previous condition despite a lack of reinforcement for responding (M = 10.6%; range, 0% to 27.9%). Implementation of the final reinforcement condition resulted in continued low rates of card touching (M = 4.6%; range, 0% to 8.5%). Thus, probe sessions were then conducted using Alice's highest ranked stimulus from her complete-array assessment. In these sessions, Alice gained access to the orange koosh ball each time she touched the card. Her most preferred item also failed to increase responding relative to baseline levels (M = 3.7%; range, 0% to 10.5%).

Insert Figure 4 about here.

Discussion

In Study 1, stimuli originally ranked low in forced-choice preference assessments were assessed among themselves to determine if preferences for these items had been obscured by strong preferences for more highly ranked items. In the partial-array assessments, discrete rankings of preferences for the originally low-ranked items were obtained, and participants did, in fact, prefer some of these stimuli. These results are consistent with observations that many items are not selected in group or forced-choice presentation preference assessments because participants consistently select only a few very highly preferred items (Roane et al., 1998; Windsor et al., 1994). The current results also support the work of DeLeon et al. (1997) who

found that preferences for leisure items, as determined in preference assessments of these items alone, were later obscured by the presence of highly preferred food items in combined assessments.

In Study 2, it was predicted that some of the stimuli ranked as less preferred by the complete-array assessments would, nonetheless, be effective sources of reinforcement. For Brad and Mark respectively, the previously low-ranked octopus and koosh ball were successful at increasing the rates of target responses relative to baseline levels. These results are consistent with those of DeLeon et al. (1997), who found that low-ranked leisure items were effective reinforcers despite their displacement by food items in preference assessments. Results for these two participants suggest that some items ranked low in preference assessments are, in fact, potential sources of reinforcement and should not be automatically disregarded as such. Thus, the possibility that group or forced-choice presentation preference assessments are associated with false negatives is supported by these results.

For Alice, the highest preferred of her low-ranked items was not successful in increasing and stabilizing rates of the target response above baseline levels. However, results of the final probe sessions showed that her most highly preferred item in the complete-array assessment also was not effective. As such, results for Alice are inconclusive. It is possible that no potent sources of reinforcement were identified through the pre-assessment.

DeLeon et al. (1997) noted that knowledge of the reinforcing effectiveness of items ranked low in preference assessments is limited. Although the current results are interesting, further evaluation of the topic is needed before the full implications for both preference

assessments and behavior programs can be determined.

Nonetheless, effective reinforcers are an essential part of educational programs for individuals with developmental disabilities. Since preferences have been shown to change over time (Fisher et al., 1992; Roane et al., 1998), identification of reinforcers outside of the group of highly preferred stimuli is important. In addition, studies have shown that reinforcer variation helps to prevent satiation effects (Bowman, Piazza, Fisher, Hagopian, & Kogan, 1997; Egel, 1981). The partial-array assessment identified differential preferences for less preferred items, some of which were found to be effective sources of reinforcement. This assessment may be useful to clinicians in providing enriched environments and in identifying alternative sources of reinforcement for use in behavioral programs for individuals with developmental disabilities.

References

Bowman, L. G., Piazza, C. C., Fisher, W. W., Hagopian, L. P., & Kogan, J. S. (1997). Assessment of preference for varied versus constant reinforcers. Journal of Applied Behavior Analysis, 30, 451-458.

DeLeon, I. G. & Iwata, B. A. (1996). Evaluation of a multiple-stimulus presentation format for assessing reinforcer preferences. Journal of Applied Behavior Analysis, 29, 519-533.

DeLeon, I. G., Iwata, B. A., & Roscoe, E. M. (1997). Displacement of leisure reinforcers by food during preference assessments. Journal of Applied Behavior Analysis, 30, 475-484.

Egel, A. L. (1981). Reinforcer variation: Implications for motivating developmentally disabled children. Journal of Applied Behavior Analysis, 14, 345-350.

Fisher, W. W., Piazza, C. C., Bowman, L. G., & Amari, A. (1996). Integrating caregiver report with a systematic choice assessment to enhance reinforcer identification. American Journal on Mental Retardation, 101, 15-25.

Fisher, W., Piazza, C. C., Bowman, L. G., Hagopian, L. P., Owens, J. C., & Slevin, I. (1992). A comparison of two approaches for identifying reinforcers for persons with severe and profound disabilities. Journal of Applied Behavior Analysis, 25, 491-498.

Green, C. W., Reid, D. H., White, L. K., Halford, R. C., Brittain, D. P., & Gardner, S. M. (1988). Identifying reinforcers for persons with profound handicaps: Staff opinion versus systematic assessment of preferences. Journal of Applied Behavior Analysis, 21, 31-43.

Horner, R. D. & Keilitz, I. (1975). Training mentally retarded adolescents to brush their teeth. Journal of Applied Behavior Analysis, 8, 301-309.

Pace, G. M., Ivancic, M. T., Edwards, G. L., Iwata, B. A., & Page, T. J. (1985). Assessment of stimulus preference and reinforcer value with profoundly retarded individuals. Journal of Applied Behavior Analysis, 18, 249-255.

Piazza, C. C., Fisher, W. W., Hagopian, L. P., Bowman, L. G., & Toole, L. (1996). Using a choice assessment to predict reinforcer effectiveness. Journal of Applied Behavior Analysis, 29, 1-9.

Roane, H. S., Vollmer, T. R., Ringdahl, J. E., & Marcus, B. A. (1998). Evaluation of a brief stimulus preference assessment. Journal of Applied Behavior Analysis, 31, 605-620.

Wacker, D. P., Berg, W. K., Wiggins, B., Muldoon, M., & Cavanaugh, J. (1985). Evaluation of reinforcer preferences for profoundly handicapped students. Journal of Applied Behavior Analysis, 18, 173-178.

Windsor, J., Piché, L. M., & Locke, P. A. (1994). Preference testing: A comparison of two presentation methods. Research in Developmental Disabilities, 15, 439-455.

Table 1

Results of Single Presentation Procedures in Pre-assessments

Participant	Item	% of interval
Brad		
	Megamouth	100
	Space game	97
	Bumble ball	97
	Vibrating bug	97
	See-n-Say	97
	Purple octopus	97
	Zoo toy	94
	Bumble train	82
	Social attention	82
	Bear clock	79
Mark		
	Cluster ball	100
	Mardi Gras beads	100
	Megamouth	100
	Mirror	100
	Orange koosh ball	100
	Alligator	92
	Whistle	70
	Toy car	50
Alice		
	Orange koosh ball	100
	Bumble ball	100
	Turtle	98
	Keys	98
	Mardi Gras beads	95
	Radio	85
	Car game	85
	Shaker of birdseed	85
	Alligator	57
	Vibrating bug	48

Note. Item = stimuli identified via caregiver interview as preferred by the participant or representing various sensory modalities; % of interval = percentage of the presentation interval during which the participant interacted with the item.

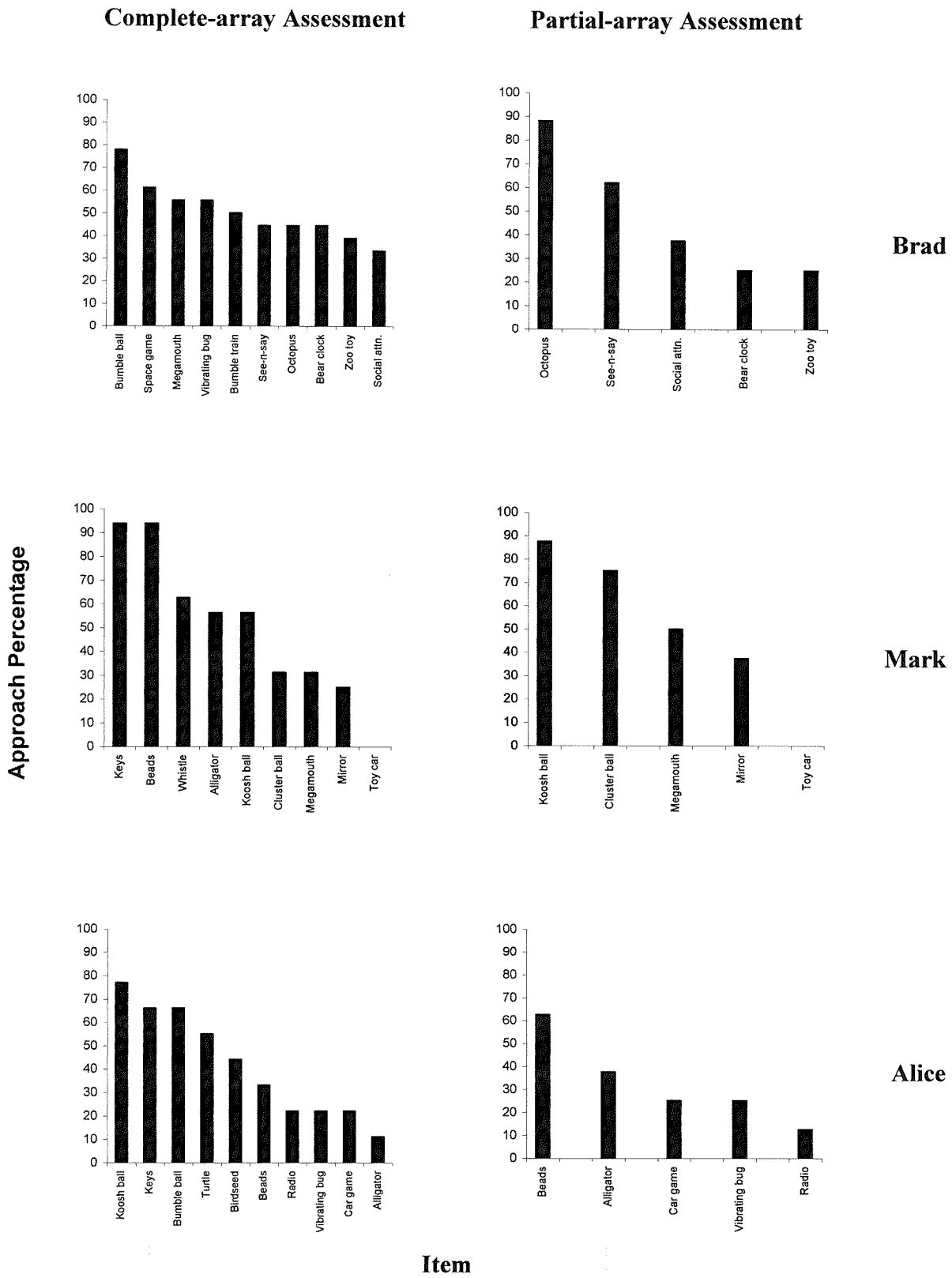
Figure Captions

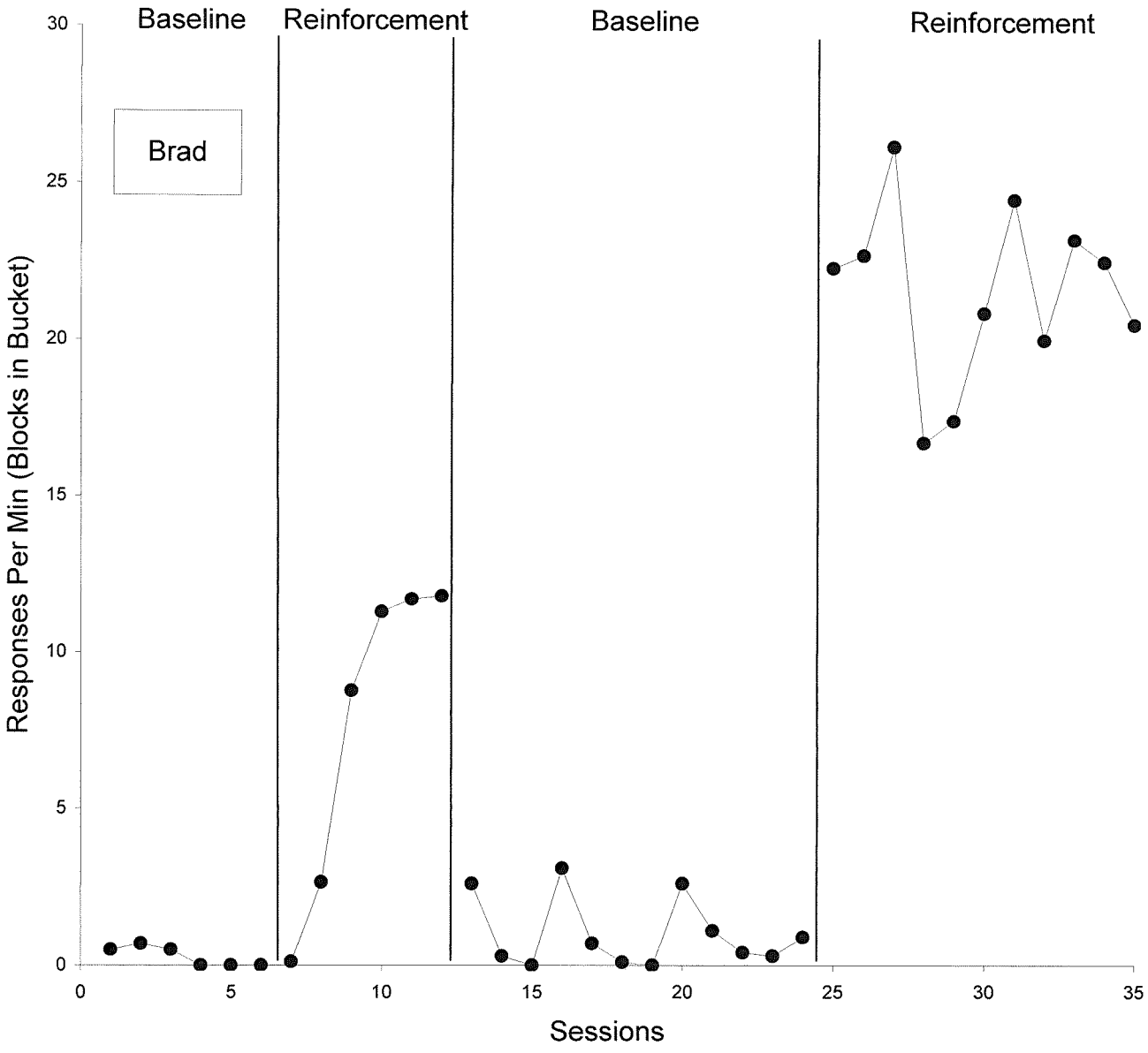
Figure 1. Approach percentages for stimuli in the complete-array assessment and the partial-array assessment for each participant in Study 1.

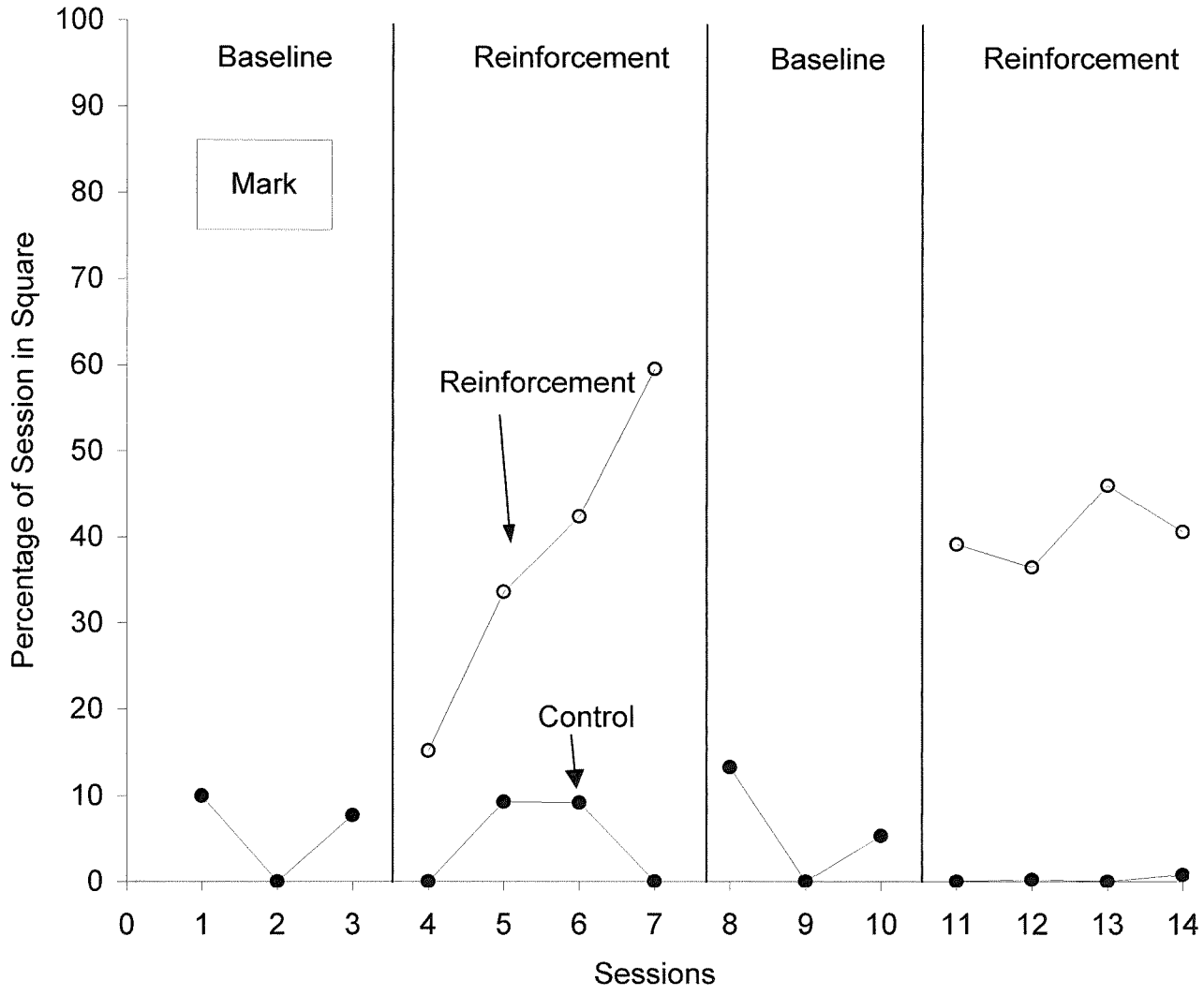
Figure 2. Responses per min (blocks in bucket) for Brad's reinforcer assessment in Study 2.

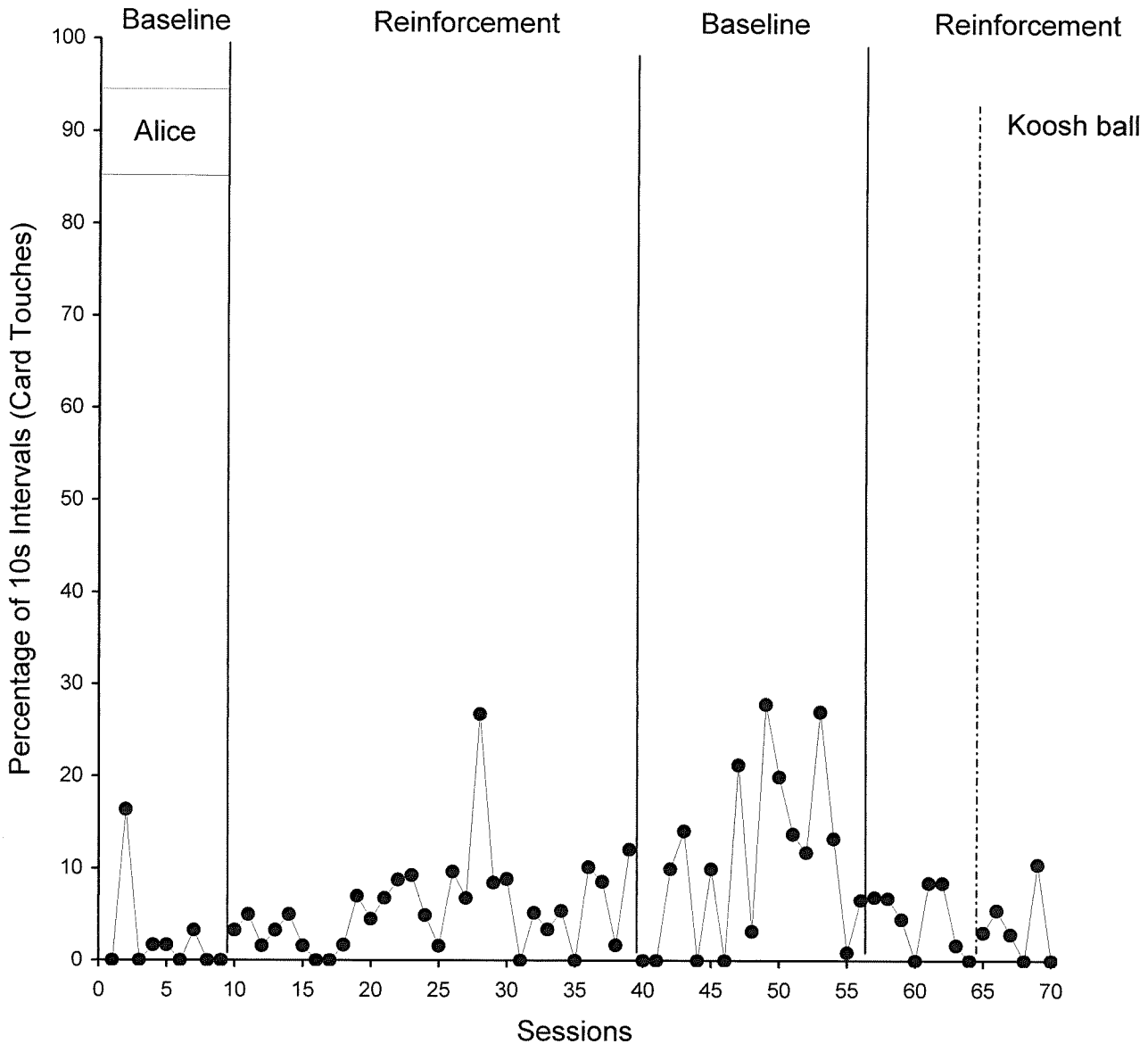
Figure 3. Percentage of session time (in-square behavior) for Mark's reinforcer assessment in Study 2.

Figure 4. Percentage of 10-s intervals (card touching) for Alice's reinforcer assessment in Study 2.


Complete-array Assessment
Partial-array Assessment
Brad
Mark
Alice
Approach Percentage
Item
Bumble ball
Space game
Megamouth
Vibrating bug
Bumble train
See-n-say
Octopus
Bear clock
Zoo toy
Social attn.
Keys
Beads
Whistle
Alligator
Koosh ball
Cluster ball
Megamouth
Mirror
Toy car
Turtle
Birdseed
Radio
Car game


Baseline
Reinforcement
Baseline
Reinforcement
Brad
Responses Per Min (Blocks in Bucket)
Sessions
0
5
10
15
20
25
30
35


Baseline
Reinforcement
Baseline
Reinforcement
Mark
Reinforcement
Control
Percentage of Session in Square
Sessions
100
90
80
70
60
50
40
30
20
10
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14


Baseline
Reinforcement
Baseline
Reinforcement
Alice
Koosh ball
Percentage of 10s Intervals (Card Touches)
Sessions
100
90
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70

Appendix

Results of Initial Reinforcer Assessments for Mark

Figure A1 shows the results of Mark's reinforcer assessment in which the target response was placing blocks in a bucket. Mark's rate of responding was very low during baseline sessions (M = 0.03 rpm; range, 0 rpm to 0.1 rpm). However, responding remained at 0 rpm during the first 6 sessions of the reinforcement condition. Across both baseline and reinforcement sessions, Mark engaged in both aggression and disruption (e.g., threw the blocks). We hypothesized that these behaviors, which appeared to be escape-motivated, may have competed with Mark's acquisition of the target behavior, and the decision was made to select a simpler response, switch pressing.

Insert Figure A1 about here.

The results of Mark's reinforcer assessment using switch pressing as the target behavior can be found in Figure A2. Mark exhibited variable, low rates of switch pressing during the initial baseline sessions (M = 0.6 rpm; range, 0 rpm to 1.4 rpm). In the reinforcement condition, responding increased and remained variable (M = 1.7 rpm; range, 0 rpm to 4.2 rpm). However, rates were similar during the return to baseline (M = 1.4 rpm; range, 0 rpm to 4.9 rpm). Two reinforcement sessions and two probe sessions using one of Mark's highest preferred items (beads) as potential reinforcement were conducted in the final condition. Rates were similar to those in the previous baseline condition. We hypothesized that the response was too simple or

was maintained by the consequences associated with pressing the switch alone (e.g., auditory or tactile stimulation). These consequences may have maintained switch pressing after toy reinforcement increased responding during the first reinforcement condition.

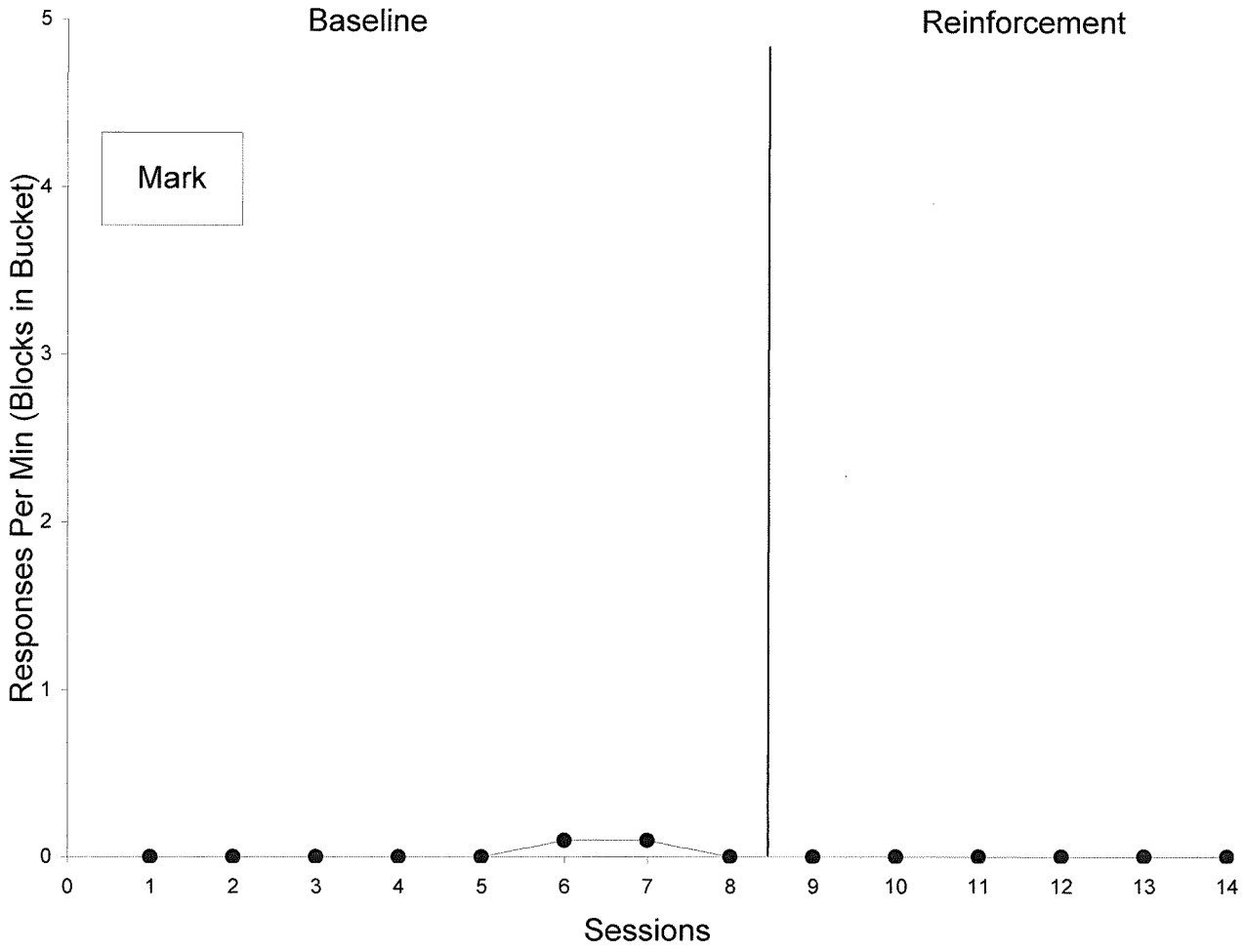
Insert Figure A2 about here.

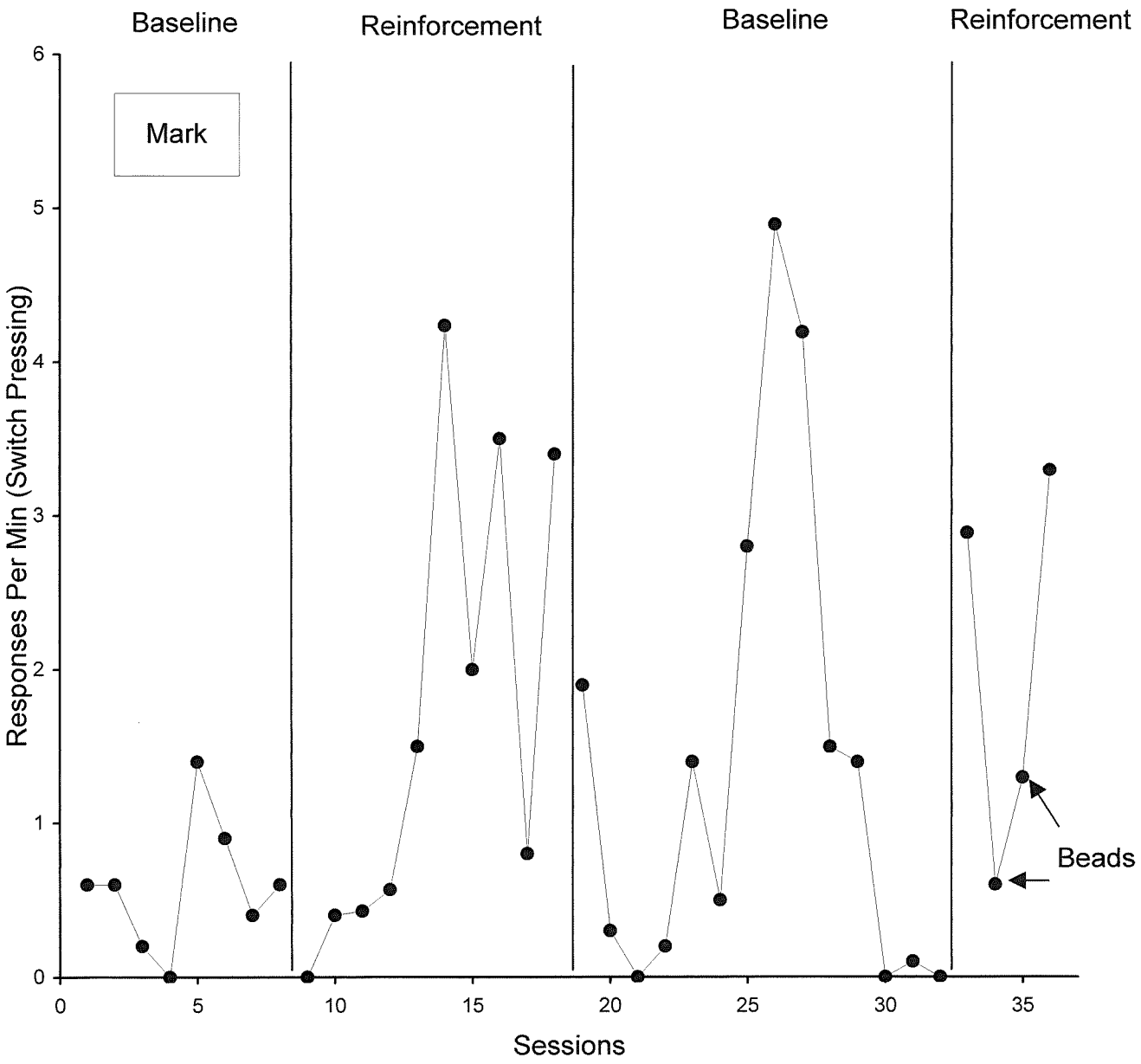
Anecdotally, Mark was known to occasionally crawl to obtain items. The decision to define locomotion as a new target response was a compromise between the two initial target behaviors: it was seen as requiring more effort than switch pressing, but not as aversive as placing blocks in a bucket.

Figure Captions

Figure A1. Responses per min (blocks in bucket) for Mark's reinforcer assessment.

Figure A2. Responses per min (switch pressing) for Mark's reinforcer assessment.


Baseline
Reinforcement
Mark
Responses Per Min (Blocks in Bucket)
Sessions
0
1
2
3
4
5
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14


Baseline
Reinforcement
Baseline
Reinforcement
Mark
Responses Per Min (Switch Pressing)
Sessions
Beads
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35