A DEMONSTRATION OF INDIVIDUAL PREFERENCE FOR NOVEL MANDS DURING FUNCTIONAL COMMUNICATION TRAINING

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Preference for mand topography was evaluated for 2 individuals with developmental disabilities who exhibited problem behavior. The results of a functional analysis showed that each participant's problem behavior was maintained by social reinforcement. Participants were taught two novel mand topographies for the same functional reinforcer, and each proved to be effective in reducing problem behavior. Finally, preference for mand topography was assessed within a concurrent-schedules design. Results indicated that functional communication training was an effective treatment, regardless of the mand used, and that each participant demonstrated a preference for one mand topography relative to the other.

DESCRIPTORS: functional analysis, functional communication training, problem behavior, mands

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Since the publication of the study by Carr and Durand (1985), different mand topographies, including vocal speech (Carr & Durand), communication cards (Horner & Day, 1991), microswitches (Wacker et al., 1998), and voice output devices (Durand, 1999), have been used successfully with functional communication training (FCT). In most cases, the selection of mand topography has been based on arbitrary guidelines such as the individual's developmental level, motor skills, and the recommendations of a speech-language pathologist. Client preference for mand topography or the occurrence of problem behavior correlated with specific mand topographies has not typically been reported in the FCT literature when describing the mand selection process.

Two studies have demonstrated that individuals with developmental disabilities may prefer certain behavioral interventions to others (Hanley, Piazza, Fisher, Contrucci, & Maglieri, 1997; Hanley, Piazza, Fisher, & Maglieri, 2005). Participants in these studies consistently demonstrated a preference for FCT over noncontingent reinforcement in a concurrent-schedules design, even when the rate and amount of reinforcement were held constant. The same design was used to illustrate that 2 children with problem behavior maintained by social positive reinforcers (i.e., attention, tangible items) actually preferred an FCT intervention that included a punishment component to one that included an extinction component for problem behavior. In spite of evidence that participants may prefer FCT as an intervention, few studies have examined client preference for mand topography in designing FCT interventions.

FCT treatment outcomes may vary as a function of response effort (Horner & Day, 1991), reinforcement history (Derby, Fisher, Piazza, Wilke, & Johnson, 1998; Winborn, Wacker, Richman, Asmus, & Geier, 2002), and client preference for the type of mand used (Peck et al., 1996; Richman, Wacker, & Winborn, 2001; Winborn et al.). The studies that have assessed mand preference have potentially confounded results because important variables related to the reinforcement contingency (e.g., amount and quality, response

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effort, history of reinforcement) were altered simultaneously or were not experimentally controlled. In the current study, we further evaluated preference for mand topography within a concurrent-schedules design while controlling for (a) amount and quality of reinforcement (i.e., same functional reinforcer on equal fixed-ratio [FR] schedules for equal durations), (b) history of reinforcement (i.e., two novel mands), and (c) response effort (i.e., similar motor response effort for each topography).

METHOD

Participants and Setting

Participants had been referred to an inpatient service for treatment of problem behavior. Jack was a 7-year-old boy who had been diagnosed with pervasive developmental delays and a seizure disorder. Sally was a 20-year-old woman who had been diagnosed with mental retardation. Each communicated using gestures. All sessions were conducted in a therapy room equipped with a one-way mirror and video camera.

Response Definitions and Interobserver Agreement

Jack's problem behavior was aggression, defined as hair pulling and hand biting. Sally's problem behavior included aggression (i.e., hitting, biting) and self-injury (i.e., hand biting, head banging, thigh slapping). For each participant, one mand topography was touching a picture (a 20 cm by 25 cm picture of the therapist for Jack, a 12 cm by 20 cm picture of an item for Sally), and the second topography was pressing an Abelnet BIGmack (10 cm by 10 cm) with a prerecorded message that said, "Play, please" (Jack) or "Can I have my —, please?" (Sally).

Data were collected on laptop computers by trained clinical staff. Mands and problem behavior were recorded using a frequency measure and were reported as responses per minute. Interobserver agreement was calculated by separating each session into consecutive 10-s intervals, dividing the number of intervals with an exact agreement on the occurrence of behavior by the sum of agreements plus disagreements, and converting this ratio to a percentage. Interobserver agreement for Jack ranged from 81% to 100% (M = 98%) and for Sally ranged from 97% to 100% (M = 99%). Procedural integrity data was collected across 20% of mand-choice analysis sessions and ranged from 90% to 100% (M = 93%) accuracy.

Experimental Design and Procedure

Functional analyses were conducted within multielement designs using the attention, escape, and play (control) conditions as described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994) and Iwata, Duncan, Zarcone, Lerman, and Shore (1994). For both participants, a modified tangible condition was tested based on contingencies evident in the natural environment. Initially, participants had 30-s access to a preferred item (i.e., chosen more than 80% of selections in a stimulus-choice preference assessment; Fisher et al., 1992). Following the 30-s period, the item was removed, and the participant was allowed to play with a neutral item (i.e., chosen less than 20% of selections). Access to the neutral item continued for the remainder of the 5-min session contingent on appropriate behavior. Thirty seconds of access to the preferred item was provided contingent on problem behavior.

Jack's FCT was evaluated within an ABAB design (A = picture card, B = microswitch). Sally's FCT was conducted within a multielement design, and training conditions were randomly drawn (i.e., microswitch or picture card), followed by the alternate condition and another random draw. Both participants were taught to activate a microswitch and to touch a picture card to gain access to attention (Jack) and tangible items (Sally). Sixty seconds of attention (Jack) and tangible items (Sally) was provided following the use of mands. The occurrence of problem behavior resulted in no differential consequences during the establishing operation interval (i.e., when no attention for Jack or no tangible items for Sally were available) or resulted in immediate removal of the functional reinforcer (i.e., response cost) for 15 s or until problem behavior ceased during the reinforcement interval. A three-prompt sequence (verbal, verbal with model, physical assistance) was used to teach mands, and all training occurred during the depicted sessions. Only mands requiring a verbal prompt (e.g., "If you want me to play, you need to press the switch" or "touch the card") or no prompt (e.g., spontaneous request) were graphed.

Three 45-min training sessions (subdivided into 10 to 12 10-min session blocks) were conducted daily. Mand materials were placed in the same location of the room. The criteria for progressing to the mand-choice analysis were a minimum of three sessions with no problem behavior and an established stable trend of manding.

Jack and Sally were able to obtain reinforcement using either mand on an FR 1 FR 1 schedule within a concurrent-schedules design. The same consequences for problem behavior and mands as described in FCT were employed. A two-prompt sequence was used: (a) general verbal (e.g., "If you want to play, you just need to ask") and (b) specific verbal ("If you want me to play, you need to press the microswitch or touch the picture card"). Both mands were placed approximately 15 cm apart in the same location of the room. The side on which the mands were positioned and the order that mands were verbally prompted were alternated across sessions. Three times, Jack used both mands (e.g., touched the card and then pressed the microswitch before the therapist could physically block the second mand). In these instances, the first mand was reinforced, but both mands were scored and graphed. Dual mands never occurred for Sally.

RESULTS AND DISCUSSION

Problem behavior occurred most often during the attention condition (M = 1.0 response per minute) of the functional analysis. For Jack (Figure 1, top), FCT with the picture card resulted in a mean of 0.5 mands per minute, whereas problem behavior occurred at near-zero levels (0.1 response per minute or less). FCT with the microswitch resulted in a mean of 1.1 responses per minute, and problem behavior remained low and somewhat variable (M = 0.1 response per minute). The replication of the FCT conditions resulted in a mean of 0.9 and 0.6 responses per minute for the picture card and microswitch, respectively, and rates of problem behavior were low. During the mand-choice analysis, Jack allocated responding toward the picture card (M = 0.6) more often than the microswitch (M = 0.2 response per minute) during all but one session, with no problem behavior during any of these sessions.

Figure 1 (bottom) illustrates that Sally's problem behavior occurred only during the tangible condition (M = 0.2 response per minute) of the functional analysis. Problem behavior was eliminated after the first session of FCT, and mands occurred with an increasing trend in both FCT conditions (M = 0.6 with the picture, M = 0.8 with the microswitch). During the analysis of mand choice, Sally allocated responding toward the microswitch (M = 0.6) relative to the picture card (M = 0.2), and problem behavior remained at zero across all sessions.

This study replicates and extends previous findings that individuals with disabilities can exhibit clear preferences for one topography of mand over another (Peck et al., 1996; Richman et al., 2001; Winborn et al., 2002) using a concurrent-schedules arrangement (Fisher & Mazur, 1997). First, preference for one mand over the other occurred in spite of equal quality and quantity of the functional reinforcer and equal response effort. In addition, longer reinforcement histories did not appear to account for preference, in that Jack demonstrated a preference for the picture card (85 response–reinforcer pairings) compared to the

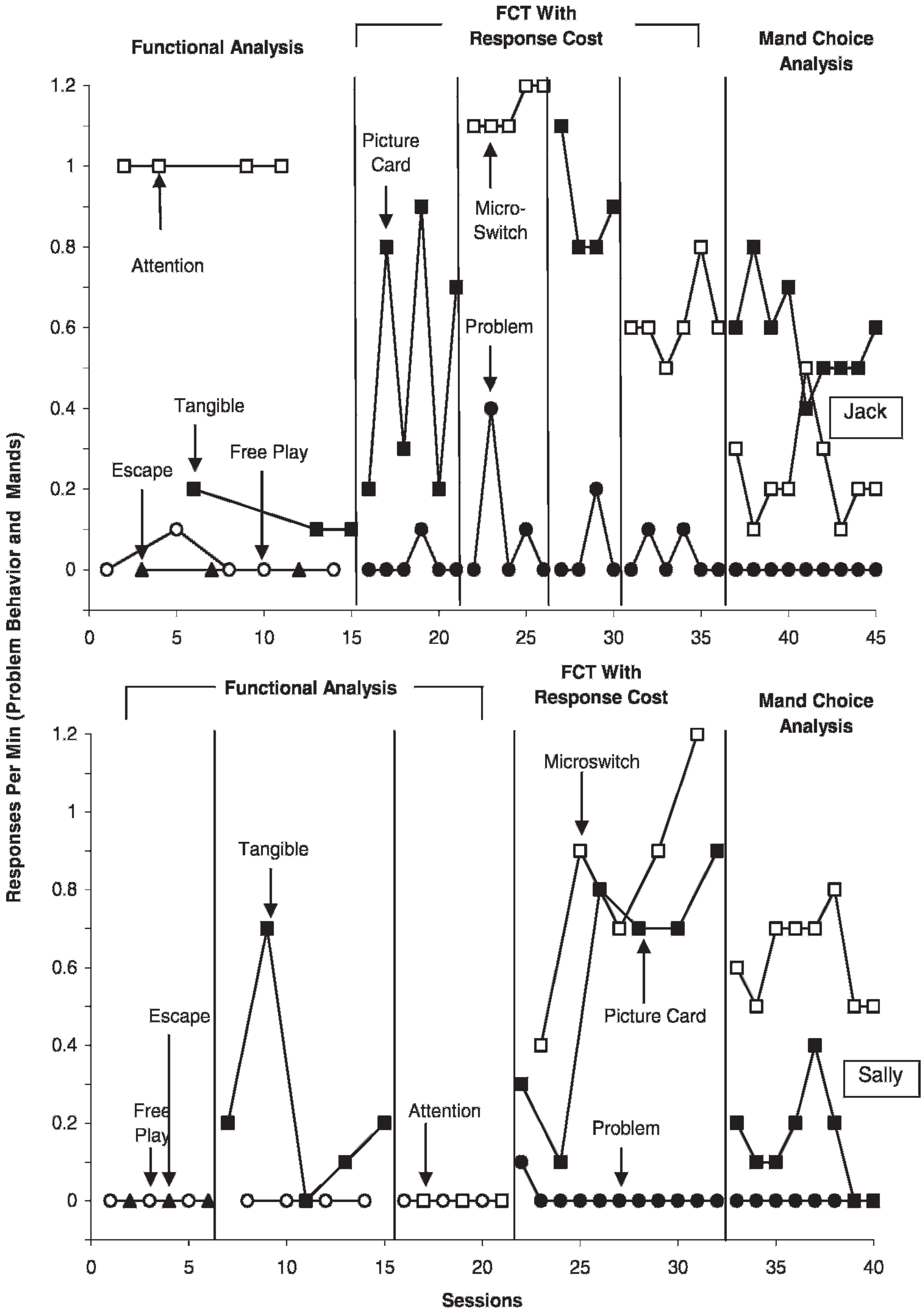

Figure 1. Problem behavior and mand rates during the functional analysis, functional communication training (picture card and microswitch) with response cost, and mand-choice analysis for Jack (top) and Sally (bottom).

microswitch (93 pairings), and Sally preferred the microswitch (41 pairings) to the picture card (52 pairings). Second, individual participants had unique preferences that were not predictable prior to the concurrent-schedules choice evaluation. These results, similar to those of Winborn et al., suggest the need for the systematic assessment to identify mand preference at the individual level.

One variable that may have influenced mand preference is a possible differential history of response cost for problem behavior during the reinforcement interval for the two mand topographies. During Sally's FCT, problem behavior did not occur during reinforcer access in either FCT condition, so there was no history with response cost. For Jack, however, these data were not available, and it is unclear if there was a differential history associated with mand preference. Future research should directly examine this issue or conduct FCT without a response-cost contingency.

In summary, these results suggest that preference for a mand topography emerged even when the topographies were novel and required similar effort. In addition, the number of response–reinforcer pairings did not drive preference. Limitations of this study are an incomplete demonstration of experimental control for each type of FCT and the inability to rule out order effects in the FCT phases. Future research is needed to determine the effects of mand preference on the maintenance of FCT programs.

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