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A COMPARISON OF OUTCOMES FROM DESCRIPTIVE AND FUNCTIONAL ANALYSES OF PROBLEM BEHAVIOR

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We compared results of descriptive and functional analyses of problem behavior for 12 participants whose descriptive data have been reported previously (Thompson & Iwata, 2001). Results indicated that in only 3 of the 12 cases was problem behavior maintained by the consequence observed most frequently during the descriptive analysis. Attention was the most common consequence for problem behavior during descriptive analyses for 8 of the 12 participants; however, maintenance of problem behavior by attention was evident for only 2 of these 8 participants.

DESCRIPTORS: aggression, assessment, descriptive analysis, functional analysis, self-injurious behavior

Although results from several studies have shown poor correspondence between the outcomes of descriptive and functional analyses (Hall, 2005; Lerman & Iwata, 1993; Mace & Lalli, 1991; Piazza et al., 2003; St. Peter et al., 2005), descriptive analyses are commonly used as the basis for developing interventions for problem behavior (Desrochers, Hile, & Williams-Moseley, 1997; Ellingson, Miltenberger, & Long, 1999; Kern, Hilt, & Gresham, 2004). In other words, it is assumed that the naturally occurring consequences for problem behavior reveal functional relations in spite of evidence to the contrary.

The descriptive analysis is a structural approach to examining environment–behavior relations. It identifies events that are correlated with the occurrence of behavior, and perhaps the most common of these are the reactions of caregivers. Although it is possible that caregivers' reactions to clients' problem behavior serve as reinforcement, other factors may account for observed correlations between the two, such as program policies requiring the interruption of all problem behavior, general concerns related to safety, or even peer contingencies. Typical caregiver responses to problem behavior were examined in two recent studies. McKerchar and Thompson (2004) observed teachers' responses to problem behavior displayed by preschool children, and Thompson and Iwata (2001) recorded staff members' responses to problem behavior displayed by adults with developmental disabilities. Results from both studies showed that attention was the most frequently observed consequence. Whether attention was functionally related to the problem behavior of these participants was unknown because data from functional analyses were not reported. However, the ubiquitous nature of attention suggests that descriptive analyses are likely to identify attention as a common consequence even though it may not serve as a reinforcer for

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problem behavior (St. Peter et al., 2005). To explore this possibility further, we compared the results of descriptive analyses reported by Thompson and Iwata with results of functional analyses for a subset of the participants. Although this type of comparison has been conducted in several previous studies, the number of participants has been small (range, 1 to 6); therefore, additional replications would be helpful in determining correspondence between outcomes of these two assessment techniques.

METHOD

Participants and Setting

Participants were 12 of the 27 participants from the Thompson and Iwata (2001) study. All participants had been diagnosed with severe to profound mental retardation, and their ages ranged from 30 to 52 years. They were selected for the current study because a functional analysis had been conducted as part of their treatment plan within 1 year of their participation in the previous study. Topographies of problem behavior assessed in the experimental analysis were those for which participants had been referred for treatment. The order of conducting the descriptive and functional analyses varied unsystematically. Functional analysis sessions were conducted in therapy rooms at the site of a day-treatment program.

Descriptive Analysis

Each participant was observed during a minimum of four 15-min observations; however, observations continued until (a) 10 intervals of problem behavior were recorded and (b) 20 intervals of antecedent demands were recorded. Data were collected during regularly scheduled activities, and staff were instructed to behave as they would ordinarily. From these data, we calculated conditional probabilities of various staff responses to problem behavior (see Thompson & Iwata, 2001, for a more complete description of procedures).

Response Measurement and Interobserver Agreement

Response definitions during functional analyses were the same as those used during the descriptive analyses (Thompson & Iwata, 2001) but included only self-injury or aggression (none of the participants had been referred for treatment of disruptive behavior). Trained observers used handheld computers to collect data on the frequency of problem behavior. Interobserver agreement was assessed by having a second observer independently record data during 36% of all sessions (range, 21% to 50% for individual participants). Agreement percentages were calculated by dividing session time into 10-s intervals and comparing observers' records on an interval-by interval basis. The smaller number of responses in each interval was divided by the larger; these fractions were then summed across all intervals, divided by the total number of intervals in the session, and multiplied by 100%. Mean interobserver agreement across participants was 95% (range, 89% to 99%).

Functional Analysis

Participants were exposed to a minimum of four assessment conditions (demand, attention, play, and ignore) that were alternated in a multielement design (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994). During all conditions, the designated consequence was delivered contingent on problem behavior according to a fixed-ratio 1 schedule. During the attention condition, the therapist did not interact with the participant except to deliver brief verbal (e.g., "You're hurting me") and physical attention following occurrences of problem behavior. During the demand condition, the therapist presented instructional trials and implemented a brief time-out (usually 30 s) following occurrences of problem behavior. During the ignore condition, the participant did not have access to materials, and no interactions occurred. During the play condition, the participant had free access to leisure

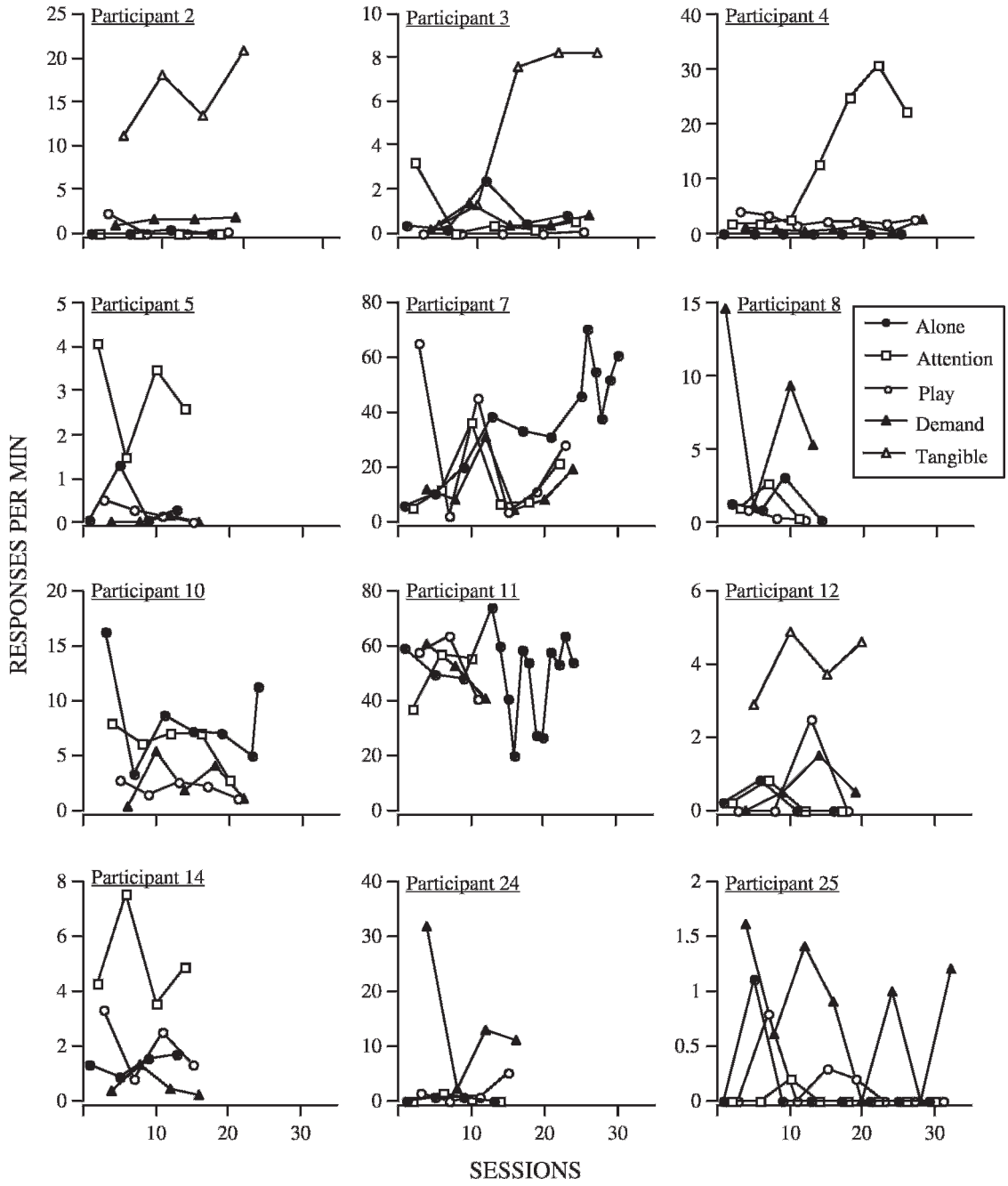

Figure 1. Responses per minute of problem behavior during functional analyses.

materials throughout the session, and the therapist delivered attention on a fixed-time 30-s schedule. Three participants (Participants 2, 3, and 12) also were exposed to a tangible condition in which a food item (e.g., a piece of popcorn or candy) was presented contingent on problem behavior. The tangible condition was included for these participants based on (a) staff reports that problem behavior often occurred when access to food was denied (e.g., when

Table 1
Comparison of Descriptive and Functional Analyses

Participant	Topographies	Number of DA sessions	Number of intervals of problem behavior	Conditional probability of consequent event given problem behavior			FA results
				Attention	Escape	Tangible	
2	SIB	14	11	.36	.33	0	Tangible
3	SIB	4	12	.33	0	.08	Tangible
4	SIB, AGG	4	23	.78	0	0	Attention
5	SIB	7	15	.47	0	0	Attention
7	SIB	4	65	.25	.14	.03	Automatic
8	SIB, AGG	4	69	.55	1.0	0	Escape
10	SIB	4	31	.19	0	.1	Automatic
11	SIB	5	325	.05	0	0	Automatic
12	SIB	6	20	.35	0	0	Tangible
14	SIB, AGG	6	31	.26	.8	.1	Attention
24	SIB	8	21	0		0	Escape
25	SIB	4	20	0		0	Escape

Note. DA = descriptive analysis; FA = functional analysis; SIB = self-injurious behavior; AGG = aggression.

participants requested food between meals) or (b) informal observations indicating that staff provided these participants with food following episodes of problem behavior at least occasionally.

RESULTS AND DISCUSSION

Functional Analysis

Figure 1 shows results of the functional analyses.[1] Results for Participants 2, 3, and 12 showed that problem behavior was maintained by access to tangible items. Data for Participants 4, 5, and 14 indicated maintenance by attention, whereas data for Participants 8, 24, and 25 indicated maintenance by escape from task demands. Finally, Participants 7, 10, and 11 displayed variable rates of problem behavior across all conditions and consistently high rates during the alone condition, suggesting maintenance by automatic reinforcement.

Comparison of Descriptive and Functional Analyses

Table 1 summarizes results of descriptive and functional analyses for the 12 participants. As noted previously, the descriptive data were collected for the Thompson and Iwata (2001) study; however, these data were recalculated for the current study to include only those topographies of problem behavior evaluated in the functional analysis. The data in Table 1 indicate that maintenance of problem behavior in the functional analyses by consequences having the highest conditional probability in the descriptive analyses occurred in only 3 of the 12 cases (Participants 4, 5, and 8). In 3 cases (Participants 7, 10, and 11), problem behavior in the functional analyses was found to be insensitive to all social consequences delivered by staff during the descriptive analyses (i.e., problem behavior was maintained by automatic reinforcement). In 4 cases (Participants 2, 3, 12, and 14), problem behavior was found to be insensitive to the consequences presented with the highest conditional probability during the descriptive analysis, but was sensitive to consequences that were presented with a lower conditional probability or never presented. Finally, functional analyses for 2 individuals (Participants 24 and 25) showed that problem behavior was sensitive to escape as a reinforcer; however, these 2 participants never exhibited problem behavior when demands were presented in the descriptive analysis.

[1] Data for Participants 2, 4, 5, 12, and 14 also appear in Conners et al. (2000); data for Participant 4 also appear in Worsdell, Iwata, Hanley, Thompson, and Kahng (2000); and data for Participants 3, 4, and 5 also appear in Kahng, Iwata, Thompson, and Hanley (2000).

Although attention was the most common consequence for problem behavior for 8 of the 12 participants, maintenance by attention was evident for only 2 of these 8 participants. This finding is consistent with the results of two recent studies. Descriptive analyses conducted by St. Peter et al. (2005) showed evidence of a matching relation between problem behavior and caregiver attention for 4 participants, although maintenance by attention was ruled out via functional analysis. Similarly, Hall (2005) found that problem behavior displayed by 4 participants was most likely to be followed by attention during descriptive analyses; however, problem behavior of only 1 participant was sensitive to attention during the functional analysis. Together, these results suggest that attention is frequently delivered as a consequence, regardless of whether it is a reinforcer for problem behavior.

Compared with attention, the delivery of tangible items and escape from demands was observed much less frequently during the descriptive analysis, although these events were as likely to maintain problem behavior. Results of functional analyses for 3 participants revealed maintenance by access to tangible items, but these items were rarely (Participant 3) or never (Participants 2 and 12) presented following problem behavior during the descriptive analysis. Similarly, results of the functional analysis for 3 participants (Participants 8, 24, and 25) indicated that problem behavior was maintained by escape; however, 2 of these participants did not exhibit problem behavior when presented with demands during the descriptive analysis. It is possible that functional analyses produced false-positive results for these participants by revealing so-called sensitivity to events that did not maintain or evoke behavior under naturally occurring conditions. An alternative possibility is that functional analyses identified a relation that existed under naturalistic conditions but that the descriptive analyses did not capture the relevant behavioral sequences. For example, staff may have delivered tangible items on extremely thin schedules of reinforcement or only under particular conditions (e.g., by certain staff members; Shirley, Iwata, & Kahng, 1999), or staff may have avoided presenting demands that were likely to evoke problem behavior (Carr, Taylor, & Robinson, 1991).

Several limitations of the descriptive analysis should be noted. Observations for some participants were very brief relative to the length of the functional analysis, and, in some cases, relatively few instances of problem behavior were observed during the descriptive analysis. In addition, data analysis focused exclusively on consequent events. Nevertheless, our results are generally consistent with those from previous studies in which participants were observed over much longer durations and in which antecedents and consequences associated with many instances of problem behavior were examined (e.g., Hall et al., 2005; Lerman & Iwata, 1993). Discrepancies between outcomes of functional and descriptive analyses in this study, as well as across studies, suggest that descriptive analysis results should be interpreted with caution and highlight the importance of determining whether a functional relation exists between events that may be correlated.

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