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# Progressing from initially ambiguous functional analyses: Three case examples

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ABSTRACT

Most often functional analyses are initiated using a standard set of test conditions, similar to those described by Iwata, Dorsey, Slifer, Bauman, and Richman [Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis*, *27*, 197–209 (Reprinted from *Analysis and Intervention in Developmental Disabilities*, *2*, 3–20, 1982)]. These test conditions involve the careful manipulation of motivating operations, discriminative stimuli, and reinforcement contingencies to determine the events related to the occurrence and maintenance of problem behavior. Some individuals display problem behavior that is occasioned and reinforced by idiosyncratic or otherwise unique combinations of environmental antecedents and consequences of behavior, which are unlikely to be detected using these standard assessment conditions. For these individuals, modifications to the standard test conditions or the inclusion of novel test conditions may result in clearer assessment outcomes. The current study provides three case examples of individuals whose functional analyses were initially undifferentiated; however, modifications to the standard conditions resulted in the identification of behavioral functions and the implementation of effective function-based treatments.

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Functional analysis is a robustly researched and experimentally rigorous behavioral assessment technique for identifying environmental variables that occasion and maintain problem behavior

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(Hanley, Iwata, & McCord, 2003). This assessment technique, first described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994), involves exposing consumers' problem behavior to potentially evocative environmental situations in which putative reinforcing events are withheld and delivered dependent upon problem behavior. Through direct observation and measurement of problem behavior during repeated exposure to these test conditions, individuals' levels of problem behavior during each test condition are compared to a control condition in which the same reinforcing events are provided independent of problem behavior (i.e., on fixed-time schedules). When elevated levels of problem behavior are observed in a given test condition (relative to the control condition), it indicates that the behavior is sensitive to the reinforcer delivered in that test condition.

Functional analyses are typically arranged to assess behavioral sensitivity to a number of sources of positive and negative reinforcement. The most common test conditions included in a functional analysis are (a) a test for behavioral sensitivity to social positive reinforcement in the form of attention in which a therapist withholds attention, except to deliver a mild reprimand each time the client engages in a targeted problem behavior, (b) a test for behavioral sensitivity to social negative reinforcement in the form of escape from demands in which a therapist provides continuous instruction to engage in tasks (typically academic or self-care) and provides a brief break from these demands following each instance of problem behavior, and (c) a test for behavioral sensitivity to automatic sources of reinforcement (either positive or negative) in which an individual is placed in an austere environment and no consequences are provided for problem behavior other than the direct sensory products of the behavior (e.g., the stimulation generated by contact of the hand to the head).

Reviews of functional analysis methodology have suggested that functional analyses result in a determination of behavioral function in about 94% of the cases in which they are applied (Hanley et al., 2003; Iwata, Pace, & Dorsey, 1994). The remaining 6% of reported cases are commonly referred to as undifferentiated or ambiguous functional analysis results (i.e., analyses which did not result in a determination of behavioral function). There are at least three potential reasons why functional analyses may be undifferentiated. First it is possible that problem behavior for that individual is maintained by a source of reinforcement that was not included in the original functional analysis. Second, it is possible that the appropriate test condition was arranged, but that there was not a sufficient establishing operation in place to potentiate that source of reinforcement. Third, it is possible that although the correct reinforcement contingency was arranged, the behavior was under the stimulus control of some event not specifically programmed into the assessment setting.

There have been a number of studies in which reinforcers other than those typically included in a functional analysis have been shown to maintain problem behavior, such as access to toys (Iwata et al., 1994), food (Vollmer, Borrero, Lalli, & Daniel, 1999), wheel chair movement (DeLeon, Kahng, Rodriguez-Catter, Sveinsdottir, & Saddler, 2003), and compliance with requests (Bowman, Fisher, Thompson, & Piazza, 1997) or termination of non-preferred events such as noise (McCord, Iwata, Galensky, Ellingson, & Thompson, 2001) or social interaction (Hagopian, Wilson, & Wilder, 2001; Vollmer et al., 1998). For example, Hagopian et al. conducted a functional analysis with a 6-year-old boy diagnosed with autism and mental retardation who was referred for the assessment and treatment of aggression, self-injurious behavior (SIB), and disruptive behavior. The initial results of a functional analysis of this problem behavior were undifferentiated, however the results became clear when the authors included additional test conditions including one to test for problem behavior's sensitivity to escape from attention as a reinforcer. That is, this test condition involved providing continuous social interaction and terminating this interaction for 30-s contingent upon each instance of problem behavior. An effective intervention was then implemented based upon the outcomes of this revised assessment.

Several studies have demonstrated the importance of arranging appropriate establishing conditions to occasion problem behavior as well. For instance, escape-maintained behavior may occur only in the presence of "Don't" requests as opposed to "Do" requests (Fisher, Adelinis, Thompson, Worsdell, & Zarcone, 1998), in the presence of general instructions but not in the presence of more specific instructions (Harding, Wacker, Cooper, Millard & Jensen-Kovalan, 1994), when provided instructions are novel but not when they are familiar, when instructions are provided rapidly, but not when they are provided at a slower pace, or when instructional sessions are lengthy, but not when they are short in duration (Smith, Iwata, Goh, & Shore, 1995).