CHAPTER 27

Functional Behavior Assessment

Stephanie M. Peterson and Nancy A. Neef

LEARNING OBJECTIVES

- Name the functions that problem behavior can serve.
- Describe the role functional behavior assessment plays in preventing problem behavior and developing interventions for problem behavior.
- State the different methods of conducting a functional behavior assessment.
- State the primary characteristics of and rationale for conducting a descriptive assessment.
- Describe various methods for gathering descriptive assessment data and under what circumstances each is appropriate.
- Given a set of descriptive data, interpret the data to form a hypothesis regarding the possible function of problem behavior.
- State the primary characteristics of and rationale for conducting a functional analysis as a form of functional behavior assessment.
- Describe how to conduct a functional analysis.
- Given a set of data from a functional analysis, interpret the data to determine the function of problem behavior.

When it is time to wash hands before lunch, Stella turns the handles of the faucet and places her hands under the running water, but Flo screams and tantrums. The teacher is confused about why Stella performs so well in this context and Flo performs so poorly. Consequently, she is at a loss as to how to respond when Flo screams and tantrums. The crying and tantrums could occur for a variety of reasons. To understand why they are occurring, the teacher could perform a functional behavior assessment of Flo's problem behaviors. This assessment may provide information valuable for creating an effective behavior intervention. Consistent with the scientific precept of determinism described in Chapter 1, behaviors—including problem behaviors—are lawfully related to other events in the environment. **Functional behavior assessment (FBA)** enables hypotheses about the relations among specific types of environmental events and behaviors. Specifically, FBA is designed to obtain information about the purposes (functions) a behavior serves for a person. This chapter describes the basis for FBA, its role in the intervention and prevention of behavior difficulties, and alternative approaches to functional assessment. We will revisit Flo's problem behavior throughout this chapter to illustrate.

FUNCTIONS OF BEHAVIOR

Evidence from decades of research indicates that both desirable and undesirable behaviors, whether washing hands or screaming and tantrumming, are learned and maintained through interaction with the social and physical environment (see Schlinger & Normand, 2013, for a review). As explained in Chapters 11 and 12, these behavior–environment interactions are described as positive or negative reinforcement contingencies. Behaviors can be strengthened by either "getting something" or "getting out of something."

FBA is used to identify the type and source of reinforcement for challenging behaviors as the basis for intervention efforts designed to decrease the occurrence of those behaviors. FBA can be thought of as a reinforcer assessment of sorts. It identifies the reinforcers currently maintaining problem behavior. Those reinforcers might be positive or negative social reinforcers provided by someone who interacts with the person, or automatic reinforcers produced directly by the behavior itself. The idea behind FBA is that if these reinforcement contingencies can be identified, then interventions can be designed to decrease problem behavior and increase adaptive behavior by altering these contingencies. FBA fosters proactive, positive interventions for problem behavior. Although reinforcement contingencies are discussed in other chapters, a brief review of their role in FBA is warranted.

Positive Reinforcement

Social Positive Reinforcement (Attention)

Problem behavior often results in immediate attention from others, such as head turns; surprised facial expressions; reprimands; attempts to soothe, counsel, or distract; and so on. These reactions can positively reinforce problem behavior (even if

inadvertently), and the problem behavior is then more likely to occur in similar circumstances. Problem behavior maintained by positive reinforcement in the form of reactions from others can often occur in situations in which attention is otherwise infrequent, whether because the person does not have a repertoire to gain attention in desirable ways or because others in the environment are typically otherwise occupied.

Tangible Reinforcement

Many behaviors result in access to reinforcing materials or other stimuli. Just as pressing a button on the television remote changes the channel to a desired television show, problem behaviors can produce reinforcing outcomes. A child may cry and tantrum until a favorite television show is turned on; stealing another child's candy produces access to the item taken. Problem behaviors may develop when they consistently produce a desired item or event. This often occurs because providing the item temporarily stops the problem behavior (e.g., tantrum), although it can have the inadvertent effect of making the problem behavior more probable in the future under similar circumstances.

Automatic Positive Reinforcement

Some behaviors do not depend on the action of others to provide an outcome; some behaviors directly produce their own reinforcement. For example, thumb sucking might be reinforced by physical stimulation of either the hand or the mouth. Hand flapping while looking at a light might be reinforced by the visual stimulation of the light being blocked and revealed, as the hand flapping might simulate a flashing light. Swinging a tennis racket correctly as a tennis ball approaches and hits the head of the racket might be reinforced by the "pop" sound the ball makes when it hits the "sweet spot" of the racket. Placing hands under the faucet might be reinforced by the warm sensation of water on the skin. A behavior is assumed to be maintained by automatic reinforcement only after social reinforcers have been ruled out (e.g., when the behavior occurs even when the individual is alone).

Negative Reinforcement

Social Negative Reinforcement (Escape)

Many behaviors are learned as a result of their effectiveness in terminating or postponing aversive events. Hanging up the phone terminates interactions with a telemarketer; completing a task or chore terminates requests from others to complete it or the demands associated with the task itself. Problem behaviors can be maintained in the same way. Behaviors such as aggression, self-injurious behavior (SIB), and bizarre speech may terminate or avoid unwanted interactions with others. For example, noncompliance postpones engagement in a nonpreferred activity, and disruptive classroom behavior often results in the student being sent out of the classroom, thereby allowing escape from instructional tasks or teacher demands. All of these behaviors can be strengthened by negative reinforcement to the extent that they enable the individual to escape or avoid difficult or unpleasant tasks, activities, or interactions.

Automatic Negative Reinforcement

Aversive stimulation, such as a physically painful or uncomfortable condition, is a motivating operation that makes its termination reinforcing. Behaviors that directly terminate aversive stimulation are therefore maintained by negative reinforcement that is an automatic outcome of the response. Automatic negative reinforcement can account for behaviors that are either appropriate or harmful. For example, putting calamine lotion on a poison ivy rash can be negatively reinforced by alleviation of itching, but intense or prolonged scratching that breaks the skin can be negatively reinforced in the same manner. Some forms of SIB may distract from other sources of pain, which may account for their correlation with specific medical conditions (e.g., DeLissovoy, 1963).

Function Versus Topography

Several points can be made from the previous discussion of the sources of reinforcement for behavior. It is important to recognize that environmental influences do not make distinctions between desirable and undesirable topographies of behavior; the same reinforcement contingencies that account for desirable behavior can also account for undesirable behavior. For example, Stella, the child who washes and dries her hands before lunch, has probably received praise for doing so. Flo, the child who frequently engages in tantrums in the same situation, may have received attention (in the form of reprimands). Both forms of attention have the potential to reinforce the respective behaviors.

Likewise, the same topography of behavior can serve different functions for different individuals. For example, tantrums may be maintained by positive reinforcement in the form of attention for one child and by negative reinforcement in the form of escape for another child (e.g., Kennedy, Meyer, Knowles, & Shukla, 2000).

Because different behaviors that look quite different can serve the same function, and behavior of the same form can serve different functions under different conditions, the *topography*, or form, of a behavior often reveals little useful information about the conditions that account for it. Identifying the *conditions* that account for a behavior (its function), in contrast, suggests what conditions need to be altered to change the behavior. Assessing the function of a behavior can therefore yield useful information with respect to intervention strategies that are likely to be effective.

ROLE OF FUNCTIONAL BEHAVIOR ASSESSMENT IN INTERVENTION AND PREVENTION

FBA and Intervention

If a causal relation between environmental events and a problem behavior can be determined, and that relation can be altered, the problem behavior will occur less often. Interventions informed by FBA primarily consist of three strategic approaches: alter antecedent variables, alter consequent variables, and teach alternative behaviors.

Alter Antecedent Variables

FBA can identify antecedents that might be altered so the problem behavior is less likely to occur. Altering the antecedents

for problem behavior can change and/or eliminate either (a) the motivating operation for problem behavior or (b) the discriminative stimuli that trigger problem behavior. For example, the motivating operation for tantrums when Flo is asked to wash her hands before lunch could be modified by changing the characteristics associated with lunch so that the avoidance of particular events is no longer reinforcing. Depending on the function of the tantrums, this might involve initially reducing table-setting demands, altering seating arrangements to minimize taunts from a sibling or peer, or reducing snacks before lunch and offering more preferred foods during lunch. Alternatively, if the FBA shows that running water is the discriminative stimulus that triggers problem behavior when Flo is asked to wash her hands, she might be given a waterless antibacterial hand gel instead. In this case, the discriminative stimulus for problem behavior has been removed, thereby decreasing problem behavior.

Alter Consequent Variables

FBA can also identify a source of reinforcement to be eliminated for the problem behavior. For example, an FBA that indicates Flo's tantrums are maintained by social negative reinforcement (avoidance or escape) suggests a variety of treatment options, which, by altering that relation, are likely to be effective. Flo's tantrums can be placed on extinction by ensuring that the reinforcer (e.g., avoidance of the activities associated with setting the table for snack or lunch) no longer follows problem behavior (tantrums). Another approach could be to provide the reinforcer for alternative behaviors instead of for the problem behavior. Finally, the schedule might be modified so that hand washing follows—and thereby provides escape from—an event that is even less preferred.

Teach Alternative Behaviors

FBA can also identify the source of reinforcement to be provided for appropriate replacement behaviors. Alternative appropriate behaviors that have the same function (i.e., produce the same reinforcer) as tantrums could be taught. For example, if Flo's tantrums are maintained by escaping lunchtime activities, she might be taught to touch a card communicating "later" after washing her hands, to produce a delay in being seated at the lunch table.

FBA and Default Technologies

Interventions based on an FBA may be more effective than those selected without consideration of behavioral function (e.g., Ervin et al., 2001; Iwata et al., 1994b). Understanding *why* a behavior occurs often suggests *how* it can be changed for the better. In contrast, premature efforts to treat problem behavior before seeking an understanding of the purposes it has for a person can be inefficient, ineffective, and, in some cases, harmful. For example, suppose that a time-out procedure is implemented in an attempt to attenuate Flo's tantrums when she is asked to wash her hands before lunch. Flo is removed from the hand-washing activity to a chair in the corner of the room. It may be, however, that the events typically following hand washing (those associated with lunch time, such as the demands of arranging chairs or setting the table or interactions with others) are aversive for Flo, and tantrumming has allowed her to avoid those events. In this case, the intervention would be ineffective because it has done nothing to alter the relation between tantrums and the consequence of avoiding the aversive events associated with lunch. In fact, the intervention may exacerbate the problem if it produces a desired outcome for Flo. If stopping the hand-washing activity and having Flo sit on a chair as "time-out" for tantrumming enables her to avoid the aversive lunchtime events—or to escape them altogether—tantrums may be more likely under similar circumstances in the future. When the time-out intervention proves unsuccessful, other interventions might be attempted. Without understanding the function that the problem behavior serves, however, the effectiveness of those interventions cannot be predicted.

At best, a trial-and-error process of selecting and implementing interventions without consideration of behavioral function can be lengthy and inefficient. At worst, such an approach may cause the problem behavior to become more frequent or severe. As a result, caregivers might resort to increasingly intrusive, coercive, or punishment-based interventions, which are often referred to as *default technologies*.

FBA can decrease reliance on default technologies and contribute to more effective interventions in several ways. When FBAs are conducted, reinforcement-based interventions are more likely to be implemented than are those that include punishment (Pelios, Morren, Tesch, & Axelrod, 1999). In addition, the effects of interventions based on FBAs are likely to be more durable than those that do not take the function of problem behavior into account. If contrived contingencies are superimposed on unknown contingencies that are maintaining the behavior, their continuation is often necessary to maintain improvements in the behavior. If those superimposed contingencies are discontinued, the behavior will continue to be influenced by the unchanged operative contingencies.

FBA and Prevention

By furthering understanding of the conditions under which certain behaviors occur, FBA can also contribute to the prevention of difficulties. Although problem behavior may be suppressed without regard to its function by using punishment procedures, additional behaviors not subject to the punishment contingencies may emerge because the motivating operations for problem behavior remain. For example, contingent loss of privileges might eliminate tantrums that occur whenever Flo is asked to wash her hands, but it will not eliminate avoidance as a reinforcer or the conditions that establish avoidance as a reinforcer. Thus, other behaviors that result in avoidance, such as aggression, property destruction, or running away may develop. These unintended effects are less likely to occur with interventions that address (rather than override or compete with) the reinforcing functions of problem behavior.

On a broader scale, the accumulation of FBA data may further assist in prevention efforts by identifying the conditions that pose risks for the future development of problem behaviors. Preventive efforts can then focus on those conditions. For example, based on data from 152 analyses of the reinforcing functions of self-injurious behavior (SIB), Iwata and colleagues (1994b) found that escape from task demands or other aversive stimuli accounted for the behavior in the largest proportion of cases. The authors speculated that this outcome might have

been an unintended result of a move toward providing more aggressive treatment. For example, if Flo tantrums when she is required to wash her hands, the teacher might assume that she does not know how to wash her hands. The teacher might decide to replace playtime with a period of intensive instruction on hygiene. Rather than decreasing problem behavior, such interventions may exacerbate it. The data reported by Iwata and colleagues suggest that preventive efforts should be directed toward modifying instructional environments (such as providing more frequent reinforcement for desirable behavior, opportunities for breaks, or means to request and obtain help with difficult tasks) so that they are less likely to function as sources of aversive stimulation (motivating operations) for escape.

OVERVIEW OF FBA METHODS

FBA methods can be classified into three types: (a) functional (experimental) analysis, (b) descriptive assessment, and (c) indirect assessment. The methods can be arranged on a continuum with respect to considerations such as ease of use and the type and precision of information they yield (see Figure 27.1). Selecting the method or combination of methods that will best suit a particular situation requires consideration of each method's advantages and limitations. We discuss functional analysis and its variations first because descriptive and indirect methods of functional assessment developed as an outgrowth of functional analysis. As noted later, functional analysis is the only FBA method that allows practitioners to confirm hypotheses regarding functional relations between problem behavior and environmental events.

Functional (Experimental) Analysis

Basic Procedure

Functional analysis procedures were first pioneered by Iwata, Dorsey, Slifer, Bauman, and Richman (1994a). In a **functional analysis**, antecedents and consequences representing those in the person's natural environment are arranged so that their separate effects on problem behavior can be observed and measured. This type of assessment is often referred to as an *analog* because antecedents and consequences similar to those occurring in the natural routines are presented in a systematic manner, but the analysis is not conducted in the context of naturally occurring routines. Analog conditions are often used because they allow the behavior analyst to better control the environmental variables that may be related to the problem behavior than can be accomplished in naturally occurring situations. Analogs refer to the arrangement of variables rather than the setting in which assessment occurs. Research has found that functional analyses conducted in natural environments (e.g., classroom settings) often yield the same (and, in some cases, clearer) results compared to those conducted in simulated settings (Noell, VanDerHeyden, Gatti, & Whitmarsh, 2001).

Functional analyses (FA) typically comprise four conditions: three test conditions—contingent attention, contingent escape, and alone—and a control condition, in which problem behavior is expected to be low because reinforcement is freely available and no demands are placed on the individual (see Table 27.1). However, it should be understood that there is no "standard" FA. FAs should be flexible and individualized. The practitioner can implement myriad conditions to address

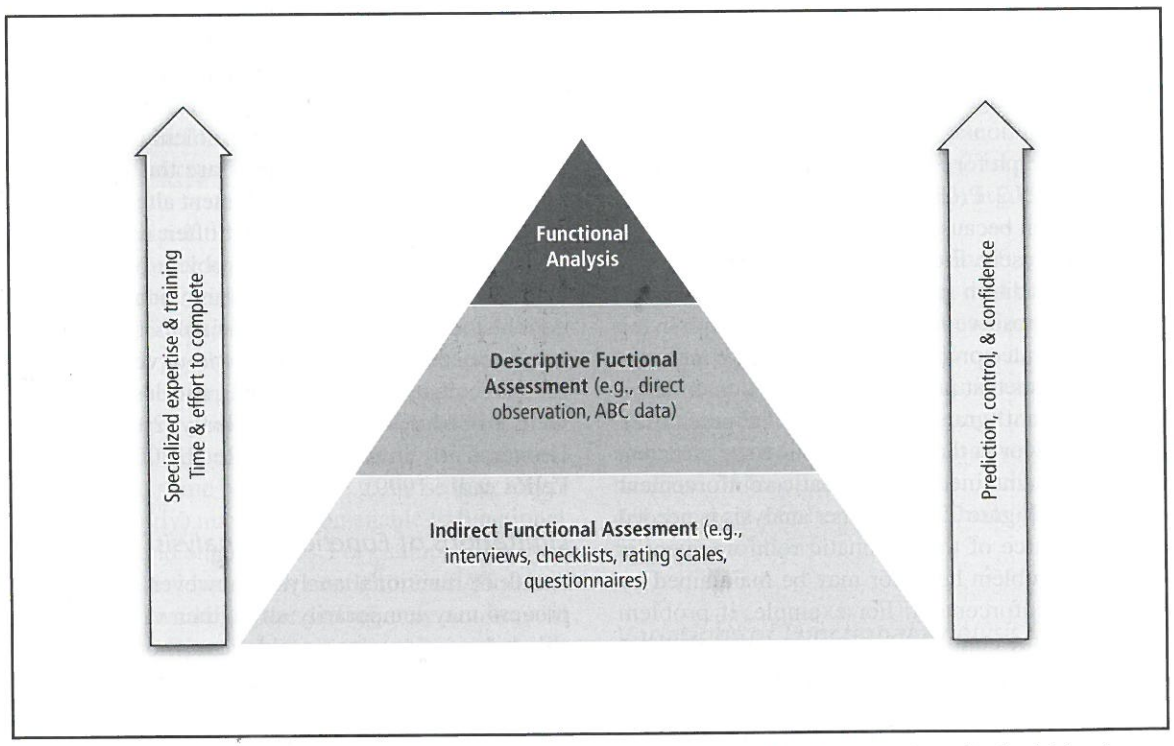


Figure 27.1 FBA methods. The amount or value of each dimension or outcome identified within the arrows increases from the bottom to the top of the pyramid.

Diagram contributed by Rebecca Eldridge.

TABLE 27.1 Motivating Operations and Reinforcement Contingencies for Typical Control and Test Conditions of a Functional Analysis

Condition	Antecedent conditions (motivating operation)	Consequences for problem behavior
Play (control)	Preferred activities are continuously available, social attention is provided, and no demands are placed on the person.	Problem behavior is ignored or neutrally redirected.
Contingent attention	Attention is diverted or withheld from the person.	Attention is provided in the form of mild reprimands or soothing statements (e.g., "Don't do that. You'll hurt someone.").
Contingent escape	Task demands are delivered continuously using a three-step prompting procedure (e.g., [1] "You need to fold the towel." [2] Model folding the towel. [3] Provide hand-over-hand assistance to fold the towel).	Break from the task is provided by removing task materials and stopping prompts to complete the task.
Contingent tangible	After having access to a preferred activity/toy, the preferred activity/toy is removed (e.g., "My turn to play with that."). Moderately preferred or neutral toys are still continuously available, as is adult attention.	The preferred activity/toy is returned to the individual.
Alone	Low level of environmental stimulation is present (i.e., therapist, task materials, and play materials are absent).	Problem behavior is ignored or neutrally redirected.

specific hypotheses. For example, some FAs also include a tangible test condition (Day, Rea, Schussler, Larsen, & Johnson, 1988). Each test condition contains a motivating operation (MO) and a potential source of reinforcement for problem behavior. The conditions are presented systematically one at a time and in an alternating sequence, and occurrences of problem behavior are recorded during each session. Sessions are repeated to determine the extent to which problem behavior consistently occurs more often under one or more conditions relative to another.

Interpreting Functional Analyses

The function problem behavior serves for a person can be determined by visually inspecting a graph of the results of an analysis to identify the condition(s) under which high rates of the behavior occurred. A graph for each potential behavioral function is shown in Figure 27.2. Problem behavior is expected to be low in the play condition because no motivating operations for problem behavior are present. Elevated problem behavior in the contingent attention condition suggests that problem behavior is maintained by social positive reinforcement (see graph in top left of Figure 27.2). Elevated problem behavior in the contingent escape condition suggests that problem behavior is maintained by negative reinforcement (graph in top right of Figure 27.2). Elevated problem behavior in the alone condition suggests that problem behavior is maintained by automatic reinforcement (graph in bottom left of Figure 27.2). Further analysis is needed to determine if the source of the automatic reinforcement is positive or negative. Problem behavior may be maintained by multiple sources of reinforcement. For example, if problem behavior is elevated in the contingent attention and contingent escape conditions, it is most likely maintained by both positive and negative reinforcement.

If problem behavior oecurs frequently in all conditions (including the play condition), or is variable across conditions, responding is considered *undifferentiated* (see graph in bottom right of Figure 27.2). Such results are inconclusive, but can also occur with behavior that is maintained by automatic reinforcement.

Functional analysis has been replicated and extended in hundreds of studies, thereby demonstrating its generality as an approach to the assessment and treatment of a wide range of behavior difficulties. (See the 1994 and 2013 special issues of the *Journal of Applied Behavior Analysis* for a sample of such applications and Hanley, Iwata, & McCord, 2003, and Beavers, Iwata, & Lerman, 2013, for reviews.)

Advantages of Functional Analysis

The primary advantage of functional analysis is its ability to yield a clear demonstration of the variable or variables that influence the occurrence of a problem behavior. In fact, functional (experimental) analyses are the standard of scientific evidence by which other assessment alternatives are evaluated, and represent the method most often used in research on the assessment and treatment of problem behavior (Arndorfer & Miltenberger, 1993). Because functional analyses allow valid conclusions concerning the variables that maintain problem behavior, they have enabled the development of effective reinforcement-based treatments and less reliance on punishment procedures (Brosnan & Healy, 2011; Ervin et al., 2001; Horner, Carr, Strain, Todd, & Reed, 2002; Iwata et al., 1994b; Pelios et al., 1999).

Limitations of Functional Analysis

A risk of functional analysis, however, is that the assessment process may temporarily strengthen or increase the undesirable behavior to unacceptable levels, or possibly result in the behavior acquiring new functions. Second, relatively little is known about the acceptability of functional analysis procedures to practitioners (Ervin et al., 2001; Reid & Nelson, 2002). The deliberate arrangement of conditions that set the occasion for, or potentially reinforce, problem behavior can

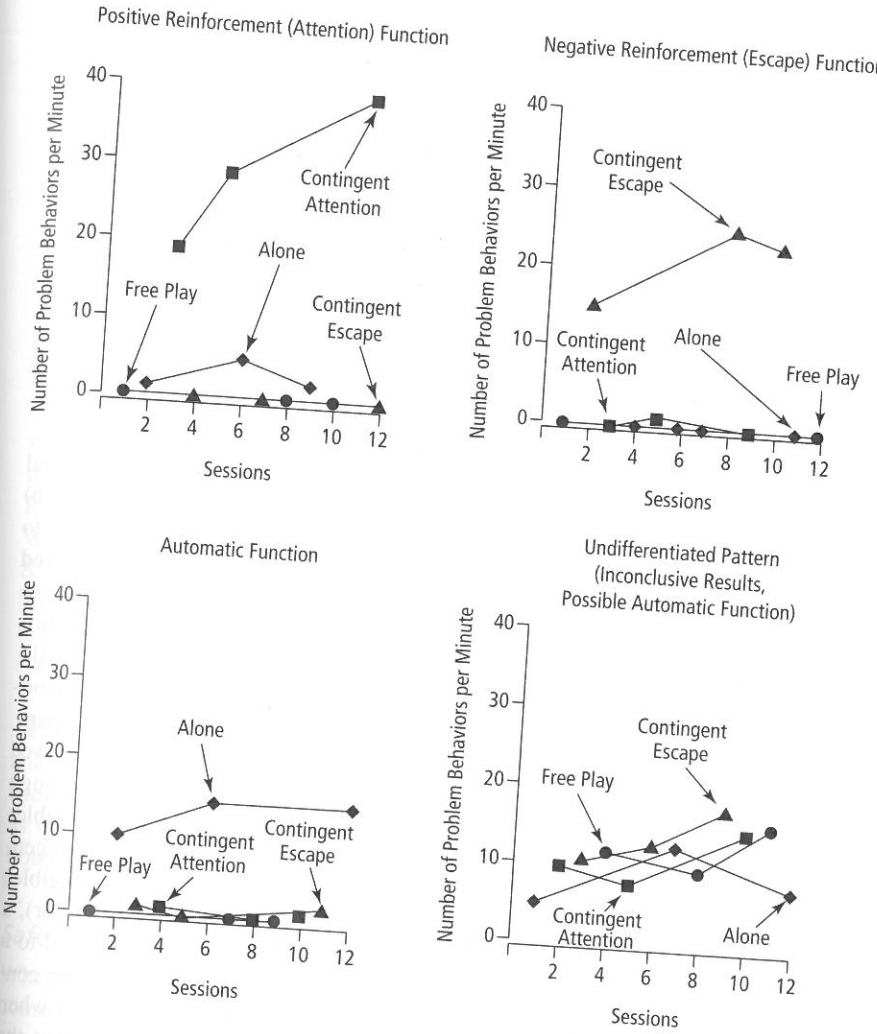


Figure 27.2 Data patterns typical of each behavioral function during a functional analysis.

be counterintuitive to persons who do not understand its purpose (or that such conditions are analogs for what occurs in the natural routine). O'Neill, Bundock, Kladis, and Hawken (2015) found that teachers reported positive perceptions of, and willingness to engage in, systematic direct observations and functional analysis manipulations. Interestingly, their positive perceptions were reportedly higher than those of school psychologists. School psychologists also expressed more concern about the time and effort required to conduct FBAs. Across both teachers and school psychologists, the most concerns were expressed about FA procedures. O'Neill and colleagues suggest that some of the concerns about these issues emanated from a lack of training and a lack of time to conduct the analyses. A third limitation is that some behaviors (e.g., those that, albeit serious, occur infrequently) may not be amenable to functional analyses due to setting and other factors. For example, if proper safety equipment or individuals with enough training to keep the client safe are not available, the setting may not be safe for conducting the FA. Fourth, functional analyses that are conducted in contrived settings might not detect the variables that account for the occurrence of the problem behavior in the natural environment, particularly if the behavior is controlled by idiosyncratic variables that are not represented in the functional analysis conditions (e.g., Noell et al., 2001). Finally, the time, effort, and professional expertise required to conduct and interpret functional analyses have been frequently cited as obstacles to its widespread use in practice (e.g., Spreat & Connelly, 1996; 2001, Volume 2 issue of *School Psychology Review*), although Hanley (2012) argues that these perceptions are not warranted.

Of course, untreated or ineffectively treated problem behaviors also consume a great deal of time and effort (without a constructive long-term outcome), and implementation of effective treatments (based on an understanding of the variables that maintain them) is likely to require skills similar to those involved in conducting functional analyses. These concerns have led to research on ways to enhance the practical use of functional analyses, including variations and the development of alternative methods of FBA described in the following sections.

Variations of Functional Analysis Procedures

Rather than dictating particular settings or conditions, functional analysis procedures achieve relevance through flexible arrangements tailored to individual circumstances. Some procedural variations are described here; for a review, see Lydon, Healy, O'Reilly, and Lang (2012).

Brief Functional Analysis. Functional analyses are typically conducted across multiple sessions. Sometimes time constraints or the severity of the problem behavior may restrict the number of sessions that can be conducted. In such circumstances, a **brief functional analysis** (Derby et al., 1992; Northup et al., 1991) may be appropriate. In a brief functional analysis, only one or two 5- to 10-min sessions are conducted for each condition. A convincing demonstration of function can be achieved by either alternating a condition that produces problem behavior with one that does not or conducting a contingency reversal. A contingency reversal is when the practitioner first makes the putative reinforcer contingent on one target behavior, such as tantrums, and then on an appropriate replacement behavior, such as making requests. (See the case example with Marie later in this chapter for an illustration.)

A brief functional analysis can be a robust procedure (Tincani, Castrogiavanni, & Axelrod, 1999) that preserves many advantages of an FA; however, it reveals a function clearly in fewer cases than a full functional analysis (Kahng & Iwata, 1999; Wallace & Knights, 2003). Some researchers (e.g., Vollmer, Marcus, Ringdahl, & Roane, 1995) have suggested that practitioners may want to consider beginning with a brief functional analysis and proceeding to a full functional analysis only if clear and replicable patterns do not emerge.

Conducting Functional Analyses in Natural Settings. Although not a requirement of functional analyses, they are often conducted in clinical settings. However, it can be advantageous to conduct functional analyses in the setting where the problem behaviors typically occur because the relevant stimulus cues are present in those settings. Sasso and colleagues (1992) provided one of the first demonstrations of functional analysis in classroom settings. Since then, many others have demonstrated the utility of functional analysis in the classroom (e.g., Wright-Gallo, Higbee, Reagon, & Davey, 2006), vocational (e.g., Wallace & Knights, 2003), and home settings (e.g., Wacker et al., 2013). One challenge when implementing functional analyses in natural settings is that the procedures can be disruptive to ongoing routines and may require additional supervision so that the other students, children, or clients are appropriately supervised while the teacher or caregiver devotes his or her attention to the analysis. An adaptation that can be made in natural settings is to use a trial-based approach, which may be more easily embedded into the ongoing activities of the classroom (Sigafoos & Saggers, 1995).

Trial-based Functional Analysis. A **trial-based functional analysis** (Bloom, Iwata, Fritz, Roscoe, & Carreau, 2011; Lambert, Bloom, & Irvin, 2012; Sigafoos & Sagers, 1995) consists of a series of trials interspersed among classroom activities. (See the case example with Carson later in this chapter for an illustration.) Each trial consists of two components, each lasting 1 minute. The first component consists of presenting the establishing operation and contingency for problem behavior (test condition), and the second component consists of continuous access to the reinforcer (control condition). For example, during the first component, a demand may be placed on the child and as soon as a tantrum occurs, the demand is terminated. During the second component, a task break is continuously provided. These conditions are implemented at times when they naturally occur (e.g., during free play periods for tangible conditions and during classroom instruction for escape conditions). Teachers may be able to perform the procedure with fidelity in their classrooms (Rispoli et al., 2015) and find it more manageable than session-based functional analyses. However, Bloom et al. describe a number of considerations that may result in discrepant results using trial-based functional analyses. For example, exposure to the relevant establishing operations and consequences may be too brief to evoke or maintain problem behavior.

Synthesized Functional Analyses. Hanley, Jin, Vanselow, and Hanratty (2014) and Jessel, Hanley, and Ghaemmaghami (2016) describe a variation of functional analysis that is designed to increase efficiency by using an **interview-informed synthesized contingency analysis** (IISCA). In the test condition, multiple contingencies are implemented simultaneously (e.g., attention and escape) when the problem behavior is demonstrated. In the control condition, those same reinforcers are presented noncontingently and continuously. For example, for one participant, Gail, in Hanley et al. (2014), problem behavior was not observed in the typical attention and tangible conditions, even though the behavior analysts hypothesized these were the variables maintaining her problem behavior. When these two contingencies were presented together (i.e., both attention *and* tangibles presented simultaneously contingent on problem behavior), a clear pattern of problem behavior emerged, as compared to a condition in which attention and tangibles were available continuously. Furthermore, these effects were observed only when Gail's mother presented the contingencies and not when the behavior analyst presented them.

This technology may have particular utility when problem behavior is not observed in typical FA conditions and when the behavior analyst suspects multiple contingencies may be maintaining problem behavior. At this time, the limited research that has compared IISCA with functional analysis is conflicting (Fisher, Greer, Romani, Zangrillo, & Owen, 2016; Hanley et al., 2014). Thus, the utility of IISCA is as yet unclear. We suggest that behavior analysts closely monitor additional research on this topic as it emerges.

Latency-based Functional Analysis. Sometimes, problem behavior is so severe that it is not possible to conduct an assessment that requires repeated occurrences of the problem behavior. In these cases, a **latency-based functional analysis** may be helpful (Thomasen-Sassi, Iwata, Neidert, & Roscoe, 2011). (See the case example with Elija later in this chapter for an illustration.) In a latency-based functional analysis, like a trial-based assessment, each session is terminated as soon as a problem behavior occurs. However, in this case, the session may last longer than 1 minute, because the establishing operation is present as long as necessary to evoke the problem behavior (or until a pre-established time limit has expired). The index of problem behavior is the latency from onset of the

establishing operation to the first occurrence of the problem behavior. Using a latency-based measure can reduce the number of occurrences of problem behavior necessary for analysis and shorten the time required to conduct the analysis. As with trial-based assessments, a limitation to latency-based assessment is that there is only one exposure to the contingency per session. Analyses that rely on response-repetition measures are generally preferable.

Functional Analysis of Precursors. Sometimes, even one occurrence of problem behavior can be so severe that evoking it poses unacceptable risk to the client and/or others. In these cases, it can be helpful to conduct the functional analysis on precursor behavior—a behavior that reliably precedes the target behavior (Borrero & Borrero, 2008; Herscovitch, Roscoe, Libby, Bourret, & Ahearn, 2009; Najdowski, Wallace, Ellsworth, MacAleese, & Cleveland, 2008; Smith & Churchill, 2002). (See the case example with Will later in this chapter for an illustration.) For example, growling may reliably signal aggression, in which case the analysis can be conducted using growling.

In addition to these variations of functional analysis, other methods of FBA can be used to inform the functional analysis process. Although these methods have sometimes been used as alternatives to functional analyses, we view them as valuable steps in the process, not as substitutes for a functional analysis.

Safety Considerations for FAs

When conducting FAs, the behavior analytic practitioner must consider ethical issues surrounding the client's safety. Kahng et al. (2015) noted that, in a retrospective study of 99 clients' functional analyses, the injury rate was relatively low and any injuries that did occur were mild. However, because target behaviors are expected to be evoked during FAs, it is important to implement precautionary measures to ensure the safety of all individuals involved. In particular, steps should be taken when analyzing potentially harmful behaviors, such as aggression, self-injurious behavior, and pica. Some procedures that have been used to mitigate risk of injury when assessing potentially dangerous behaviors are as follows: medical examinations to rule out health and physical concerns, presence of medical staff for especially severe behavior (Iwata 1982, 1994a), ensuring that trained practitioners plan and run analyses, having additional staff present to block behavior, using protective equipment, establishing a behavioral and/or medical criterion for terminating sessions (Kahng et al., 2015), using soft toys to conduct the analysis (Hanley, 2012), and using brief FA or assessing precursor behaviors (Najdowski et al., 2008; Smith & Churchill, 2002). Protective equipment can be utilized during the analysis as well; however, researchers have found the use of protective equipment can invalidate FA results (Borrero, Vollmer, Wright, Lerman, & Kelley, 2002; Le & Smith, 2002). (For a list of some other protections that can be taken, see Hanley, 2012, and Weeden, Mahoney, & Poling, 2010). Thus, although these precautions are often cited as recommendations, additional research is warranted to develop widely accepted evidence-based safety standards and best-practice guidelines.

Descriptive Functional Behavior Assessment

As with functional analyses, **descriptive functional behavior assessment** encompasses direct observation of behavior; unlike functional analyses, however, observations are made under naturally occurring conditions. Thus, descriptive assessments involve observation of the problem behavior in relation to events that are not arranged in a systematic manner. Descriptive assessments have roots in the early stages of applied behavior analysis; Bijou, Peterson, and Ault (1968) initially described a method for objectively defining, observing, and coding behavior and contiguous environmental events. This method has been used subsequently to identify events that may be correlated with the target behavior. Events that are shown to have a high degree of correlation with the target behavior may suggest hypotheses about behavioral function. We describe three variations of descriptive analysis: ABC (antecedent-behavior-consequence) continuous recording, ABC narrative recording, and scatterplots.

Before we describe the forms of descriptive assessment, we think it is important for the reader to consider some caveats. All of the forms of descriptive assessments explained below are generally considered invalid for detecting behavioral function. This is because they tend to yield false positives for an attention function. When an individual displays severe problem behavior, attention is often ubiquitous in the environment—attention is often delivered both independent of and contingent on problem behavior. In addition, false negatives can occur for escape-maintained problem behavior, because others in the environment may deliberately avoid making demands on an individual or placing the individual in any situations that trigger the problem behavior. Instead, the reader is cautioned to restrict conclusions based on descriptive assessments to only the prevalence of environmental factors that precede and follow the target behavior (Hanley, 2012).

ABC Continuous Recording

With ABC continuous recording, an observer records occurrences of the targeted problem behaviors and selected environmental events in the natural routine during a period of time. Codes for recording specific antecedents, problem behaviors, and consequences can be developed based on information obtained from a Functional Assessment Interview or ABC narrative recording (described later). For example, following an interview and observations using narrative recording, Lalli, Browder, Mace, and Brown (1993) developed stimulus and response codes to record the occurrence or nonoccurrence of antecedent (e.g., one-to-one instruction, group instruction) and subsequent events (attention, tangible reinforcement, escape) for problem behavior during classroom activities.

With ABC continuous recording, the occurrence of a specified event is marked on the data sheet (using partial interval, momentary time sampling, or frequency recording)

(see Figure 27.3). The targeted environmental events (antecedents and consequences) are recorded whenever they occur, regardless of whether problem behavior occurred with it. Recording data in this manner may reveal events that occur in close temporal proximity to the target behavior. For example, descriptive data may show that tantrums (behavior) often occur when a student is given an instruction to wash her hands (antecedent); the data may also show that tantrums are typically followed by the removal of task demands. A possible hypothesis in this situation is that tantrums are motivated by academic demands and are maintained by escape from those demands (negative reinforcement). (See the case example with Chris later in this chapter for an illustration.)

Advantages of ABC Continuous Recording. Descriptive assessments based on continuous recording use precise measures (similar to functional analyses), and in some cases the correlations may reflect causal relations (e.g., Alter, Conroy, Mancil, & Haydon, 2008; Sasso et al., 1992). Because the assessments are conducted in the context in which the problem

Figure 27.3 Sample data collection form for ABC continuous recording.

ABC Recording Form
observer: R. Van Norman
Time begin: 9.30 A.M Time end: 10:15 A.M.
Date: January 25, 2006

Antecedent	Behavior	Consequence
❑ Task prompt/instruction		❑ Social attention
☒ Attention diverted		☒ Reprimand
❑ Social interaction	☒ Tantrum	❑ Task demand
❑ Engaged in preferred activity	❑ Aggression	❑ Access to preferred item
❑ Preferred activity removed		❑ Task removed
❑ Alone (no attention/no activities)		❑ Attention diverted
☒ Task prompt/instruction		❑ Social attention
❑ Attention diverted		❑ Reprimand
❑ Social interaction	☒ Tantrum	❑ Task demand
❑ Engaged in preferred activity	❑ Aggression	❑ Access to preferred item
❑ Preferred activity removed		☒ Task removed
❑ Alone (no attention/no activities)		❑ Attention diverted
☒ Task prompt/instruction		❑ Social attention
❑ Attention diverted		❑ Reprimand
❑ Social interaction	☒ Tantrum	❑ Task demand
❑ Engaged in preferred activity	❑ Aggression	❑ Access to preferred item
❑ Preferred activity removed		☒ Task removed
❑ Alone (no attention/no activities)		❑ Attention diverted
❑ Task prompt/instruction		❑ Social attention
☒ Attention diverted		❑ Reprimand
❑ Social interaction	☒ Tantrum	❑ Task demand
❑ Engaged in preferred activity	❑ Aggression	❑ Access to preferred item
❑ Preferred activity removed		❑ Task removed
❑ Alone (no attention/no activities)		☒ Attention diverted
☒ Task prompt/instruction		❑ Social attention
❑ Attention diverted		❑ Reprimand
❑ Social interaction	❑ Tantrum	❑ Task demand
❑ Engaged in preferred activity	❑ Aggression	❑ Access to preferred item
❑ Preferred activity removed		❑ Task removed
❑ Alone (no attention/no activities)		❑ Attention diverted
☒ Task prompt/instruction		❑ Social attention
❑ Attention diverted		❑ Reprimand
❑ Social interaction	☒ Tantrum	❑ Task demand
❑ Engaged in preferred activity	❑ Aggression	❑ Access to preferred item
❑ Preferred activity removed		☒ Task removed
❑ Alone (no attention/no activities)		❑ Attention diverted

(continued)

Figure 27.3 (*continued*)

❑ Task prompt/instruction ☒ Attention diverted ❑ Social interaction ❑ Engaged in preferred activity ❑ Preferred activity removed ❑ Alone (no attention/no activities)	❑ Tantrum ❑ Aggression	❑ Social attention ❑ Reprimand ❑ Task demand ❑ Access to preferred item ❑ Task removed ❑ Attention diverted
☒ Task prompt/instruction ❑ Attention diverted ❑ Social interaction ❑ Engaged in preferred activity ❑ Preferred activity removed ❑ Alone (no attention/no activities)	☒ Tantrum ❑ Aggression	❑ Social attention ❑ Reprimand ❑ Task demand ❑ Access to preferred item ☒ Task removed ❑ Attention diverted
❑ Task prompt/instruction ❑ Attention diverted ☒ Social interaction ❑ Engaged in preferred activity ❑ Preferred activity removed ❑ Alone (no attention/no activities)	☒ Tantrum ❑ Aggression	❑ Social attention ☒ Reprimand ❑ Task demand ❑ Access to preferred item ❑ Task removed ❑ Attention diverted
☒ Task prompt/instruction ❑ Attention diverted ❑ Social interaction ❑ Engaged in preferred activity ❑ Preferred activity removed ❑ Alone (no attention/no activities)	☒ Tantrum ❑ Aggression	❑ Social attention ❑ Reprimand ❑ Task demand ❑ Access to preferred item ☒ Task removed ❑ Attention diverted
❑ Task prompt/instruction ❑ Attention diverted ☒ Social interaction ❑ Engaged in preferred activity ❑ Preferred activity removed ❑ Alone (no attention/no activities)	☒ Tantrum ❑ Aggression	❑ Social attention ❑ Reprimand ❑ Task demand ❑ Access to preferred item ❑ Task removed ☒ Attention diverted

Source: Recording form developed by Renée Van Norman. Used by permission.

behaviors occur, they are likely to provide useful information for designing a subsequent functional analysis if that proves necessary. In addition, they do not require disruption to the person's routine.

Considerations for ABC Continuous Recording. Although descriptive analyses of this type may show a correlation between particular events and the problem behavior, such correlations can be difficult to detect in many situations. This is especially likely if the influential antecedents and consequences do not reliably precede and follow the behavior. In such cases, it may be necessary to analyze descriptive data by calculating **conditional probability** (the likelihood that a target problem behavior will occur in a given circumstance) or conducting a **contingency space analysis** (CSA, see Box 27.1).

However, conditional probabilities can be misleading. If a behavior is maintained by intermittent reinforcement, the behavior might occur often even though it is not followed consistently by a particular consequence. For example, the teacher might send the student to time-out only when tantrums are so frequent or severe that they are intolerable. In this case, only a small proportion of tantrums would be followed by that consequence, and the conditional probability would be low. One possibility, therefore, is that a functional relation that exists (e.g., tantrums negatively reinforced by escape) will not be detected. Furthermore, the child's current behavior intervention plan might require three repetitions of the instruction and an attempt to provide physical assistance before time-out is implemented. In that situation, the conditional probability of tantrums being followed by attention would be high. A descriptive analysis might, therefore, suggest a functional relation (e.g., tantrums positively reinforced by attention) that does *not* exist. Perhaps for these reasons, studies that have used conditional probability calculations to examine the extent to which descriptive methods lead to the same hypotheses as functional analyses have generally found low agreement (e.g., Lerman & Iwata, 1993; Noell et al., 2001).

ABC Narrative Recording

ABC narrative recording is a form of descriptive assessment that differs from continuous recording in that (a) data are collected only when behaviors of interest are observed, and (b) the

BOX 27.1

What Is Contingency Space Analysis?

by Nathan VanderWeele and Corinne Gist

Contingency spaces display the relationship between events in terms of the probability of one event (e.g., a particular consequence) given or not given another event (e.g., the presence or absence of a particular behavior) (Martens, DiGennaro, Reed, Szczech, & Rosenthal, 2008; Matthews, Shimoff, & Catania, 1987; Schwartz, 1989). For example, if Johnny yells out 13 times during 20 observation intervals and, as a result, the teacher removes him from the classroom following 2 of those occurrences, we would say that the probability of the teacher removing Johnny from the classroom was 2/13, or approximately 15% of occurrences (see raw data below in row, Escape/Present; columns B, B+C, and B+C/B).

Attention	B	B+C	B+C/B
Present	13	9	0.69
Absent	7	3	0.43
Escape	**B**	**B+C**	**B+C/B**
Present	13	2	0.15
Absent	7	3	0.43
Other	**B**	**B+C**	**B+C/B**
Present	13	2	0.14
Absent	7	1	0.17

However, identifying the probability of a behavior–consequence relation in isolation represents an incomplete analysis of the event. In addition to determining the probability of the occurrence of the consequence following the behavior, the probability of the consequence following the absence of the behavior should also be determined, (e.g., 43% per the raw data shown above in row, Escape/Absent; columns B, B+C, and B+C/B) with the resulting values compared in what is called a *contingency space analysis (CSA)*.

Graphing conditional probabilities in the general operant contingency space reveals the degree of contingency between events and behavior (see Figure A below), which may address some of the limitations associated with ABC recordings. A CSA is conducted in the natural environment and does not require experimental manipulation of the consequences. Direct observation is used to identify the presence of a positive, negative, or neutral contingency between behavior and its consequences. The contingency is said to be "positive" if a specific consequence is more likely to occur after the behavior. The contingency is said to be "negative" if the consequence is less likely to occur following the behavior. For example, if Johnny yells out 13 times during an observation period and receives teacher attention following 9 of those instances, we would say that the consequence of teacher attention (c) was *more* likely to occur following yelling out (b), indicating a positive contingency for yelling out and teacher attention. Alternatively, if the teacher more frequently withholds attention (c) following yelling out (b), we would say that teacher attention is *less* likely to occur following the behavior. Thus, a negative contingency may exist, since the consequence is not likely to follow the behavior.

As previously mentioned, to determine the operant strength of a behavior–consequence relation, the probability of the consequence following the behavior *and* the

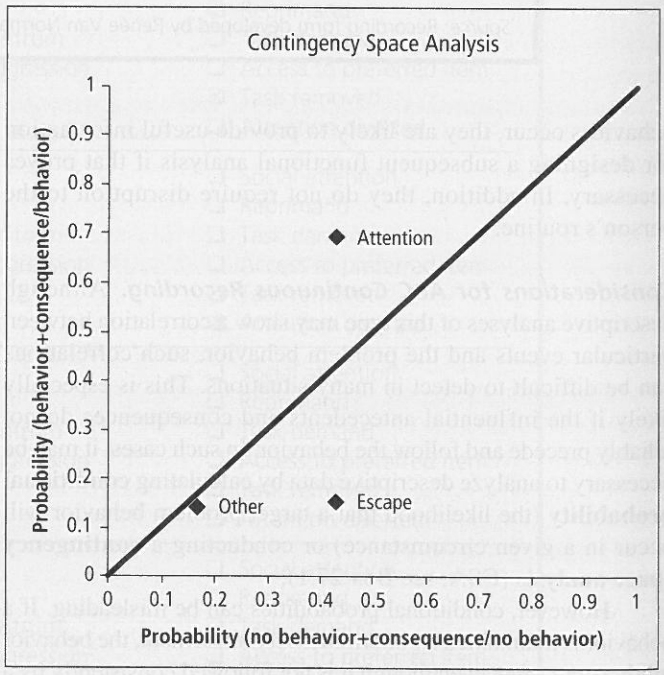


Figure A Hypothetical CSA data with graph illustrating potential positive (attention), negative (escape), and neutral (other) contingencies provides an example of a contingency space graph. The *y*-axis value equals the probability of a consequence given the occurrence of a behavior, and the *x*-axis value equals the probability of a consequence given the absence of a behavior.

probability of the consequence following the absence of behavior are calculated. To calculate the probability, the number of times the consequence followed the behavior is divided by the total number of behaviors emitted during an observation period, and the number of times the consequence occurred following the absence of the behavior is divided by the total number of intervals in which the behavior did not occur. These values are then plotted along the *x*-axis of the graph (see Figure A). The location of the resulting data point on the graph indicates the type and strength of the behavior–consequence relation. If the data point falls above and to the left of the line, a positive contingency may exist, suggesting that the consequence could be maintaining the behavior. If the data point falls below and to the right of the line, a negative contingency may exist, suggesting that the consequence is likely not maintaining the behavior. If data points fall on or near the neutrality line, no contingency is likely to exist, indicating that the consequence is equally likely to occur independent of the occurrence of behavior. Additionally, the greater the distance between the data point and the neutrality line, the stronger (positive) or weaker (negative) the hypothesized behavior–consequence relationship. It is important to note, however, that the efficacy of CSA results will rely heavily on the fidelity of the descriptive data collected.

recording is open-ended (any events that immediately precede and follow the target behavior are noted) (see Figure 3.3 in this text). Because data are recorded only when the target behavior occurs, narrative recording may be less time-consuming than continuous recording. However, narrative recording has several disadvantages in addition to those described earlier.

Considerations for Narrative Recording. Because narrative recording data are seldom reported in published research, their utility in identifying behavioral function has not been established. However, ABC narrative recording might identify functional relations that do not exist because antecedent and consequent events are recorded only in relation to the target behavior; it would not be evident from ABC data if particular events occurred just as often in the absence of the target behavior. For example, ABC data might erroneously indicate a correlation between peer attention and disruption even though peer attention also occurred frequently when the student was not disruptive.

Another potential limitation of ABC narrative recording concerns its accuracy. Unless observers receive adequate training, they may report inferred states or subjective impressions (e.g., "felt embarrassed," "was frustrated") instead of describing observable events in objective terms. In addition, given the likelihood that a number of environmental events occur in close temporal proximity to one another, discriminating the events that occasion a behavior can be difficult. Lerman, Hovanetz, Strobel, and Tetreault (2009) found that teachers collected ABC data more accurately when using a more structured format than with narrative recording. Thus, ABC narrative recording may be best suited as a means of gathering preliminary information to inform continuous recording or functional analyses.

Scatterplot Recording

Scatterplot recording is a procedure for recording the extent to which a target behavior occurs more often at particular times than others (Symons, McDonald, & Wehby, 1998; Touchette, MacDonald, & Langer, 1985). Specifically, scatterplots involve dividing the day into blocks of time (e.g., a series of 30-min segments). For every time segment, an observer uses different symbols on an observation form to indicate whether the target problem behavior occurred a lot, some, or not at all (see Figure 27.4). After data have been collected over a series of days, they are analyzed for patterns (specific time periods that are typically associated with problem behavior). If a recurring response pattern is identified, the temporal distributions in the behavior can be examined for a relation to particular environmental events. For example, a time period in which the behavior occurs often might be correlated with increased demands, low attention, certain activities, or the presence of a particular person. If so, changes can be made on that basis.

Considerations for Scatterplots. The primary advantage of scatterplots is that they identify time periods during which the problem behavior occurs. Such information can be useful in pinpointing periods of the day when more focused ABC assessments might be conducted to obtain additional information regarding the function of the problem behavior. Although scatterplots are often used in practice, little is known about their utility. It is unclear whether temporal patterns are routinely evident (Kahng et al., 1998). Another problem is that obtaining accurate data with scatterplots may be difficult (Kahng et al., 1998). In addition, the subjective nature of the ratings of how often the behavior occurs (e.g., "a lot" versus "some") can contribute to difficulties with interpretation (standards for these values might differ across teachers or raters).

Indirect Functional Behavior Assessment

Indirect functional assessment methods use structured interviews, checklists, rating scales, or questionnaires to obtain information from those who are familiar with the person exhibiting the problem behavior (e.g., teachers, parents, caregivers, and/or the individual himself or herself) to identify possible conditions or events in the natural environment that correlate with the

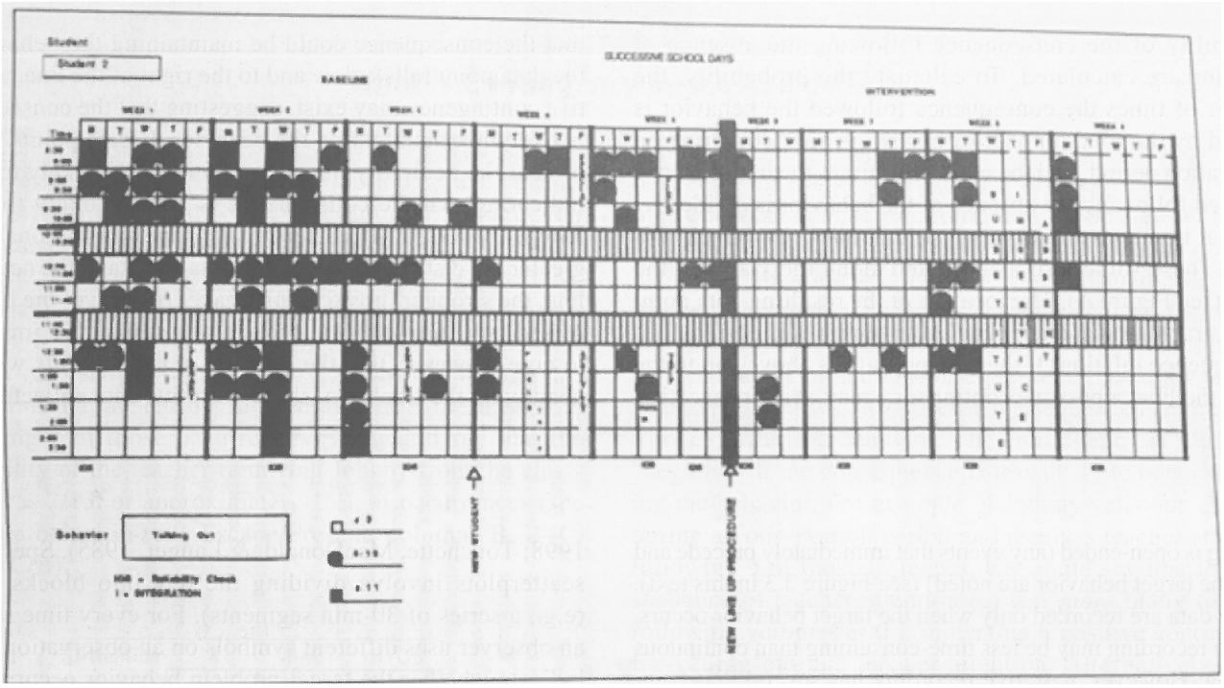


Figure 27.4 Example of scatterplot recording form. Different shapes represent different observed rates of talk-outs per daily observation intervals. Open squares, 2 or fewer talk-outs; shaded circles, 4–10 talk-outs; filled squares, 11 or more occurrences.

From "Functional Assessment and Teacher Collected Data," by F. J. Symons, L. M. McDonald, and J. H. Wehby, 1998, *Education and Treatment of Children, 21*, p. 145. Copyright 1998 Used by permission.

problem behavior. Such procedures are referred to as "indirect" because they do not involve direct observation of the behavior, but rather solicit information based on others' recollections of the behavior.

Behavioral Interviews

Interviews are used routinely in assessment. The goal of a behavioral interview is to obtain clear and objective information about the problem behaviors, antecedents, and consequences. This might include clarifying descriptions of the behavior (consequences); when (times), where (settings, activities, events), with whom, and how often it occurs; what typically precedes the behavior (antecedents); what the child and others typically do immediately following the behavior (consequences); and what steps have previously been taken to address the problem, and with what result. Similar information might be solicited about desirable behavior (or the conditions under which undesirable behavior does not occur) to identify patterns or conditions that predict appropriate versus problem behavior. Information can also be obtained about the child's apparent preferences (e.g., favorite items or activities), skills, and means of communicating. A skillful interviewer poses questions in a way that evokes specific, complete, and factual responses about events, with minimal interpretation or inferences.

Lists of interview questions have been published, and they provide a consistent, structured format for obtaining information through either an interview or a questionnaire format. For example, the Functional Assessment Interview (O'Neill et al., 1997) has 11 sections, which include description of the form (topography) of the behavior, general factors that might affect the behavior (medications, staffing patterns, daily schedule), antecedents and outcomes of the behavior, functional behavior repertoires, communication skills, potential reinforcers, and treatment history.

A form of the Functional Assessment Interview for students who can act as their own informants is also available (Kern, Dunlap, Clarke, & Childs, 1995; O'Neill et al., 1997). Questions include the behavior or behaviors that cause trouble for the students at school, a description of their class schedule and its relation to problem behavior, rating of intensity of behaviors on a scale of 1 to 6 across class periods and times of day, aspects of the situation related to the behavior (e.g., difficult, boring, or unclear material; peer teasing; teacher reprimands), other events that might affect the behavior (e.g., lack of sleep, conflicts), consequences (what occurs when the individuals engage in the behavior), possible behavior alternatives, and potential strategies for a support plan.

Two other questionnaires are the Behavioral Diagnosis and Treatment Information Form (Bailey & Pyles, 1989) and the Stimulus Control Checklist (Rolider & Van Houten, 1993), which also address questions about the conditions under which the behavior occurs or does not occur and how often. In addition, they include questions about physiological factors that might affect the behavior.

Behavior Rating Scales

Behavior rating scales designed for functional assessment ask informants to estimate the extent to which behavior occurs under specified conditions, using a Likert scale (e.g., *never, seldom, usually, always*). Hypotheses about the function of a behavior are based on the scores associated with each condition. Those conditions assigned the highest cumulative or average rating are hypothesized to be related to the problem behavior. For example, if an informant states that problem behavior always occurs when demands are placed on a child, a negative reinforcement hypothesis might be made. Table 27.2 summarizes features of several behavior rating scales.

Considerations for Indirect FBA

Some indirect assessment methods can provide a useful source of information in guiding subsequent, more objective assessments, and contribute to the development of hypotheses about variables that might occasion or maintain the behaviors of concern. Because indirect forms of FBA do not require direct observation of problem behavior, most behavior analytic practitioners view them as convenient and consider them useful in conducting an FBA. However, we caution readers that closed-ended indirect assessment instruments such as the MAS and QABF have been repeatedly demonstrated to be unreliable and therefore of questionable validity in identifying function (see Hanley, 2012).

CONDUCTING A FUNCTIONAL BEHAVIOR ASSESSMENT

FBA can best be viewed as a four-step process:

1. Gather information with indirect and descriptive assessment.
2. Interpret information from indirect and descriptive assessment and formulate hypotheses about the purpose of problem behavior.
3. Test hypotheses using functional analysis.
4. Develop intervention options based on the function of problem behavior.

Gathering Information

It is often helpful to begin the FBA process by conducting Functional Assessment Interviews with the person's teacher, parent, caregiver, and/or others who work closely with the person. The interview can be helpful in preparing the evaluator to conduct direct observations by identifying and defining the target problem behaviors, identifying and defining potential

TABLE 27.2 Behavior Rating Scales Used to Assess Possible Functions of Problem Behavior

Behavior rating scale	Functions assessed	Format and number of items	Example item and possible function
Motivation Assessment Scale (MAS) (Durand & Crimmins, 1992)	Sensory reinforcement, escape, attention, and tangible reinforcement	16 questions (4 for each of 4 functions), 7-point scale from *always* to *never*	Does the behavior seem to occur in response to your talking to other persons in the room? (attention)
Motivation Analysis Rating Scale (MARS) (Wieseler, Hanson, Chamberlain, & Thompson, 1985)	Sensory reinforcement, escape, and attention	6 statements (2 for each of 3 functions), 4-point scale from *always* to *never*	The behavior stops occurring shortly after you stop working or making demands on this person. (escape)
Problem Behavior Questionnaire (PBQ) (Lewis, Scott, & Sugai, 1994)	Peer attention, teacher attention, escape/avoid peer attention, escape/avoid teacher attention, and assessment of setting events	Questions, 7-point range	When the problem behavior occurs, do peers verbally respond to or laugh at the student? (peer attention)
Functional Analysis Screening Tool (FAST) (Iwata & DeLeon, 1996)	Social reinforcement (attention, preferred items), social reinforcement (escape), automatic reinforcement by sensory stimulation, automatic reinforcement by pain attenuation	Yes or no as to whether statements are descriptive	When the behavior occurs, do you usually try to calm the person down or distract the person with preferred activities (leisure items, snacks, etc.)? (social reinforcement, attention, preferred items)
Questions About Behavioral Function (QABF) (Paclawskyj, Matson, Rush, Smalls, & Vollmer, 2000)	Attention, escape, nonsocial, physical, tangible	Statements, 4-point range	Participant engages in the behavior to try to get a reaction from you. (attention)

antecedents and consequences that may be observed, and gaining an overall picture of the problem behavior as well as the strengths of the person. The interview can also help determine if other assessments are warranted before a more extensive FBA is conducted. For example, if the interview reveals that the person has chronic ear infections that are currently untreated, a medical evaluation should be conducted before further behavioral assessment takes place.

In many cases, conducting an interview with the person who has problem behavior can be helpful if he has the language skills to understand and respond to interview questions. Sometimes the person has useful insights regarding why he displays problem behavior in specific contexts.

At this point, conducting direct observations of the problem behavior within the natural routine is useful. Such observations help confirm or disconfirm the information obtained through the interviews. If it is not clear when the problem behavior occurs most often, a scatterplot analysis may be useful to determine when further behavioral observations should be conducted. When the problematic time periods have been determined, the behavior analyst can conduct ABC assessments. Information obtained from the interviews is helpful in guiding the ABC assessment because the evaluator should already have clear definitions of the target behavior(s), antecedents, and consequences. However, the behavior analyst must also watch for additional, unexpected antecedents and consequences that might present themselves in the natural environment. Teachers or caregivers sometimes overlook or are unaware of specific stimuli triggering or following problem behavior.

Interpreting Information and Formulating Hypotheses

Results from indirect assessments should be analyzed for patterns of behavior and environmental events so that hypotheses regarding the function of the problem behavior can be made. If problem behavior occurs most frequently when low levels of attention are available and problem behavior frequently produces attention, a hypothesis that attention maintains the problem behavior is appropriate. If the problem behavior occurs most frequently in high-demand situations and often produces a reprieve from the task (e.g., through time-out, suspension, or another form of task delay), then a hypothesis that escape maintains the problem behavior is appropriate. If problem behavior occurs in an unpredictable pattern or at high rates across the school day, a hypothesis that the behavior is maintained by automatic reinforcement may be appropriate. In reviewing assessment results and considering possible hypotheses, behavior analysts should remember that behaviors may serve multiple functions and different topographies of problem behavior may serve different functions.

Hypothesis statements should be written in ABC format. Specifically, the hypothesis statement should state the antecedent(s) hypothesized to trigger the problem behavior, the topography of problem behavior, and the maintaining consequence. An example is presented below:

Hypothesized Function	Antecedent	Behavior	Consequence
Escape from hand washing and/or lunch.	When Flo is prompted to wash her hands in preparation for lunch, . . .	she screams and falls to the ground, which is followed by . . .	termination of hand washing and lunch by being sent to time-out.

Writing hypothesis statements in this manner is useful because it requires the behavior analyst to focus on potential avenues for intervention: modifying the antecedent and/or modifying the reinforcement contingencies (which may involve teaching a new behavior and altering what behaviors are reinforced or placed on extinction).

Testing Hypotheses

After hypotheses have been developed, a functional analysis can be conducted to test them. The functional analysis should always contain a control condition that promotes the lowest frequency of problem behavior. Often this is the play condition, which consists of (a) continuous availability of preferred toys and/or activities, (b) no demands, and (c) continuously available attention. Then, conditions are selected to test specific hypotheses. For example, if the primary hypothesis is that the problem behavior is maintained by escape, then a contingent escape condition should be implemented. Other test conditions may not need to be implemented.

Being selective about the test conditions implemented will help keep the functional analysis as brief as possible; however, no conclusions can be made regarding additional functions of problem behavior if additional test conditions are not implemented. For example, if play and contingent escape are the only conditions tested, and problem behavior occurs most frequently in the contingent escape condition and seldom or never occurs in the play condition, the conclusion that escape maintains the problem behavior is supported. However, because a contingent attention condition was not implemented, one could not rule out the possibility that attention also maintains the problem behavior.

Developing Interventions

When an FBA has been completed, an intervention that matches the function of problem behavior can be developed. Interventions can take many forms. Although FBA does not identify which interventions will be effective in treating problem behavior, it does identify antecedents that may trigger problem behavior, potential behavioral deficits that should be remedied, and reinforcement contingencies that can be altered, as described earlier in this chapter. In addition, FBA *does* identify powerful reinforcers that can be used as part of the intervention package. The intervention should be **functionally equivalent** to problem behavior. That is, if problem behavior serves an escape function, then the intervention should provide escape (e.g., in the form of breaks from task demands) for a more appropriate response or involve altering task demands in a fashion that makes escape less reinforcing.

One effective way to design interventions is to review confirmed hypotheses to determine how the ABC contingency can be altered to promote more positive behavior. For example, consider the hypothesis developed for Flo, and assume the functional analysis revealed a pattern similar to that seen in the upper right-hand corner of Figure 27.2:

Hypothesized Function	Antecedent	Behavior	Consequence
Escape from hand washing and/or lunch.	When Flo is prompted to wash her hands in preparation for lunch, . . .	she screams and falls to the floor, which is followed by . . .	termination of hand washing and lunch by being sent to time-out.

The antecedent could be altered by changing the time of day when Flo is asked to wash her hands (so that it does not precede lunch, thereby decreasing the motivation for escape-motivated tantrums).

Hypothesized Function	Antecedent	Behavior	Consequence
Escape from hand washing and/or lunch.	Flo is prompted to wash her hands before recess.	N/A (Problem behavior is avoided.)	N/A (The consequence is irrelevant because problem behavior did not occur.)

The behavior could be altered by teaching Flo a new behavior (e.g., signing "break") that results in the same outcome (escape from lunch).

Hypothesized Function	Antecedent	Behavior	Consequence
Escape from hand washing and/or lunch.	When Flo is prompted to wash her hands in preparation for lunch, . . .	Flo is prompted to sign "break," which is followed by . . .	termination of hand washing and lunch.

Or, the consequences could be altered. For example, the reinforcer for problem behavior could be withheld so that problem behavior is extinguished.

Hypothesized Function	Antecedent	Behavior	Consequence
Escape from hand washing and/or lunch.	When Flo is prompted to wash her hands in preparation for lunch, . . .	she screams and tantrums, which is followed by . . .	continued presentation of hand washing and lunch activities.

An intervention can also consist of several different components. For example, Flo could be taught a replacement behavior (signing "break"), which results in breaks from lunch, while tantrums are simultaneously placed on escape extinction.

FBA can also help identify interventions that are likely to be ineffective or that may worsen the problem behavior. Interventions involving time-out, in-school or out-of-school suspension, or planned ignoring are contraindicated for problem behaviors maintained by escape. Interventions involving reprimands, discussion, or counseling are contraindicated for problem behaviors maintained by attention.

We offer a final word about intervention: When an intervention has been developed, FBA is not "done." Assessment is ongoing once intervention is implemented, as it is important for the continued monitoring of intervention effectiveness. The functions of behavior are not static. Rather, they are dynamic and change over time. Intervention may lose its effectiveness because the function of problem behavior may change (Lerman, Iwata, Smith, Zarcone, & Vollmer, 1994). In such cases, additional functional analyses may be needed to revise the intervention.

CASE EXAMPLES ILLUSTRATING THE FBA PROCESS

FBA is a highly idiosyncratic process. It is unusual for any two FBAs to be exactly the same because each person presents with a unique set of skills and behaviors, as well as a unique history of reinforcement. FBA requires a thorough understanding of behavioral principles to parcel out the relevant information from interviews and ABC assessments, to form relevant hypotheses, and to test those hypotheses. Beyond these skills, a solid understanding of behavioral interventions (e.g., differential reinforcement procedures, schedules of reinforcement, and tactics for promoting maintenance and generalization) is needed to match effective treatments to the function of challenging behavior. Furthermore, it is important for the practitioner to keep abreast of the current literature in functional analysis and treatment of problem behavior, because the evidence base is constantly evolving. This can seem like a daunting process. In an attempt to demonstrate the application of FBA across the idiosyncratic differences in people, we present an array of case examples that illustrate its utility in developing interventions that render the problem behavior ineffective, irrelevant, or inefficient.

Marie—Brief Functional Analysis

Gathering Information, Interpreting Information, and Forming Hypotheses

Marie was an 8-year-old girl with autism who had been referred to a behavior analyst for an evaluation of severe problem behavior, specifically aggression toward her family members. Her insurance covered 3 hours of "ABA therapy" per week, which she was receiving from a community mental health agency social worker. Her mother and sister attended every session.

The only behavior analyst with the skills necessary to consult on this case was 150 miles away at a local university, so the behavior analyst helped the agency staff conduct the functional analysis via teleconsultation.

The behavior analyst began by conducting a Functional Assessment Interview with Marie's mother, who reported that aggression occurred in a variety of settings, toward children and adults, and typically occurred when Marie did not get what she wanted, usually a preferred toy. Aggression also took place during her therapy sessions when the therapist was talking to Marie's mother, updating her on the session. However, aggression toward her on-site therapist had recently decreased. The behavior analyst then collected some ABC data during a play session with Marie's mother and younger sister, as well as during her ABA therapy session at the clinic. The ABC data showed a pattern of aggression when Marie's preferred items were removed. In addition, the ABC data indicated that the consequence that most often followed aggression was Marie's mother or sister relinquishing the item back to Marie. Based on the descriptive data, it was hypothesized that Marie's aggression could be maintained by access to tangibles.

Testing Hypotheses

Due to the limited number of hours per week Marie received services, a brief functional analysis was conducted to determine the function of Marie's aggression. The consulting behavior analyst trained Marie's therapist to conduct the assessment via teleconsultation, and was available during the assessment to provide coaching and feedback. Four 5-min functional analysis conditions (free play, attention, demand, and tangible) were conducted, and aggression occurred only in the tangible condition. During each session, the behavior analyst scored the occurrence of problem behavior using a 10-sec partial interval recording procedure. During the contingency reversal, the number of requests was also recorded. The functional analysis results are shown in Figure 27.5. After the first four conditions, the behavior analyst coached the on-site therapist on how to implement functional communication training (FCT) to teach Marie to ask for the tangible item. This was selected as a replacement behavior because it matched the function of the problem behavior and could efficiently compete for the reinforcer. During three 5-min training sessions, requests increased and aggression dropped to zero. The behavior analyst instructed the on-site therapist to conduct a contingency reversal by implementing a second tangible functional analysis condition. During this reversal, aggression increased to 50% of intervals, and requesting decreased from 11 to 2 occurrences. Upon reinstatement of FCT, aggression returned to zero and requesting returned to the previous treatment level. All functional analysis and treatment conditions were completed in a 60-min appointment with Marie's therapist, mother, and sister present.

Developing an Intervention

During the brief FA, functional communication training (FCT; teaching appropriate requesting) was shown to be an effective treatment for decreasing aggression. It matched the function and was more efficient than the problem behavior in obtaining access

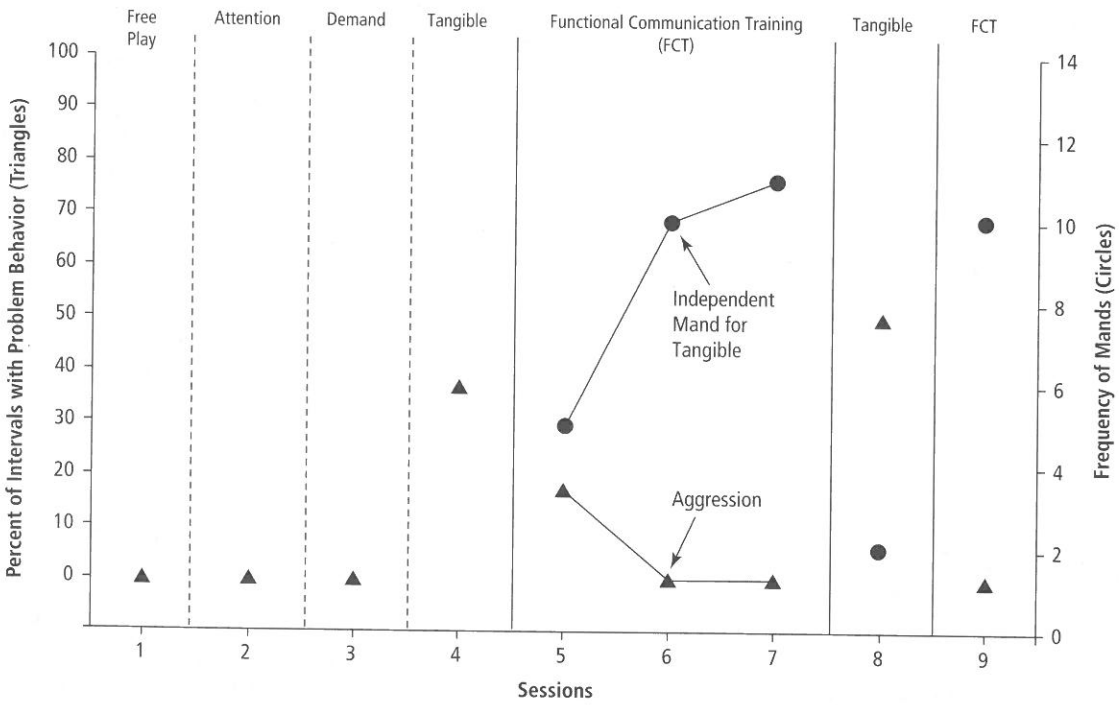


Figure 27.5 Results from the brief functional analysis for Marie. The graph depicts the percentage of 10-sec intervals in which problem behavior occurred (left *y*-axis) and the number of independent mands (right *y*-axis) in each condition.

Marie's case example contributed by Rebecca Eldrige and Nathan VanderWeele.

to the tangible item. During a follow-up meeting, the behavior analyst, the on-site therapist, and Marie's mother met to develop the treatment plan. Marie's mother was concerned about the times that she would need to say "no" to Marie when Marie was asking for preferred items and was worried that aggression would result. The behavior analyst worked with the team to develop a treatment plan that included initially delivering the item each time Marie requested it until aggression had decreased to zero for three consecutive 30-min sessions. When Marie was regularly making requests without aggression, a program to teach waiting for the preferred item was introduced. To gain access to the preferred item, Marie had to wait (without aggression) for 1 to 60 seconds after requesting it. Once waiting was mastered, Marie was taught to complete a task while while waiting. She could then earn the preferred item only after the task was complete. The behavior analyst and on-site therapist then taught Marie's mother to implement the procedure, which she did successfully.

Carson—Trial-based Functional Analysis

Gathering Information, Interpreting Information, and Forming Hypotheses

Carson, a 10-year-old boy with a chromosomal deletion disorder, was receiving special education services in the general education classroom. He displayed several problem behaviors—most notably, talking to peers during group instruction, yelling out answers, and running around the room. These behaviors occurred only in the general education classroom. They had increased in intensity, resulting in more time spent in the resource room, away from the general education setting. Consequently, Carson was missing valuable instruction time and falling behind in the curriculum.

The behavior analyst assigned to Carson's case was asked to complete an FBA in order to design an intervention plan that would increase the time he spent in the general education classroom and decrease his disruptive behavior. After obtaining consent from Carson's parents to conduct an FBA, the behavior analyst conducted a Functional Assessment Interview with Carson's teachers and paraprofessionals. From the interview, it appeared that Carson's problem behaviors occurred most often during group lessons on the carpet and individual work at his desk. Carson's teachers and paraprofessionals could not identify a clear pattern of consequences for his behavior because they had tried so many different strategies without success. Following the interview, the behavior analyst used a structured data form to begin collecting ABC data during those times reported as most problematic by the teachers. The ABC assessment showed that escape from demands or access to one-on-one attention could be maintaining Carson's disruptive behavior.

Testing Hypotheses

At this point, the behavior analyst needed to test her hypotheses, but she had several reservations about conducting a traditional FA in the classroom setting. She was concerned about the time that a traditional FA would take as well the teacher's ability to implement it with a high degree of fidelity while also teaching. For these reasons, the behavior analyst decided to conduct a trial-based functional analysis (TBFA) on disruptive behavior, with the teacher implementing the conditions. Four conditions were conducted: attention test, attention control, escape test, and escape control. During the attention test condition, teacher attention was diverted unless Carson engaged in disruption. If he engaged in disruption, the teacher provided attention for 10 seconds and ended the trial. During the attention control condition, attention was delivered every 5 seconds for 60 seconds, with no programmed consequences for disruptive behavior. During the escape test condition, the teacher worked one-on-one with Carson, repeatedly prompting him to complete his work. If he engaged in disruption, the teacher walked away and removed task demands for 10 seconds. During the escape control condition, the teacher provided a 1-min break with no attention or task demands and no programmed consequences for disruption. Each condition was implemented 8 times (trials) for 1 min during regular instruction throughout the school day. The percentage of trials with disruption in each condition was then calculated and graphed. The results (see Figure 27.6) showed that disruption occurred most often in the attention

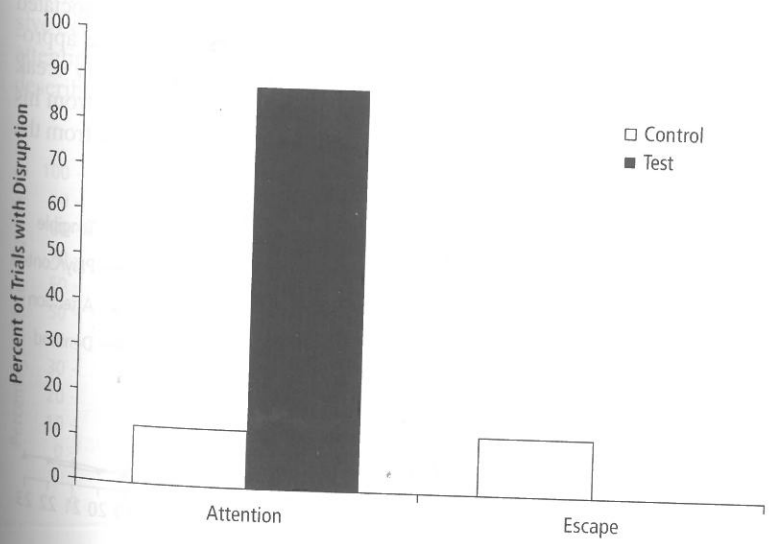


Figure 27.6 Results from the trial-based functional analysis for Carson. The graph shows the percentage of trials, for both the control and the test conditions, in which disruptive behavior occurred.

Carson's case example contributed by Rebecca Eldrige and Nathan VanderWeele.

test condition, and thus supported the hypothesis that attention was maintaining disruptive behavior. In addition, the escape test condition evoked no problem behavior, which suggested that escape from demands was not a reinforcing variable for disruptive behavior.

Developing an Intervention

Based on the results of the trial-based functional analysis, a multicomponent treatment plan was developed that included discontinuing attention when Carson engaged in disruptive behavior, teaching him to raise his hand to gain attention, and providing contingent breaks with teacher attention for sitting quietly at his desk for increasing amounts of time. Thus, problem behavior was placed on extinction, and more appropriate behaviors (hand raising and sitting quietly engaged in his work) produced teacher attention.

Elija—Latency-based Functional Analysis

Gathering Information, Interpreting Information, and Forming Hypotheses

Elija was a 9-year-old boy diagnosed with autism spectrum disorder. He engaged in elopement and noncompliance and was referred to a behavior analyst for a functional analysis.

The behavior analyst began with a Functional Assessment Interview (O'Neill et al., 1997) with Elija's mother. Elija's mother reported that he typically engaged in elopement in the community as well as in the home; he would run out of the home or store and into the street when he wanted something he couldn't have (while in the community) or when he was denied access to his toys (at home). Consequently, his mother did not take him out much, which limited the number of activities Elija could engage in throughout the day. His mother kept all the doors locked in the house.

Next, the behavior analyst conducted some direct observation of Elija's behavior at home using remote technology. Elija's mother was observed working with him under a variety of naturally occurring conditions. The behavior analyst took data on elopement attempts as well as the immediate antecedents and consequences. Attempts to elope were blocked to keep Elija safe. During the ABC assessment, the behavior analyst observed elopement attempts when Elija was asked to complete academic tasks. Additionally, when he eloped, Elija's mother provided extensive attention in an attempt to get him to sit back down at the table and do his work. Based on the ABC observations, the behavior analyst hypothesized that Elija's elopement was maintained by escape from task demands as well as access to tangible items, and attention.

Testing Hypotheses

The functional analysis was conducted at the center where Elija received services. The behavior analyst decided to conduct a latency-based functional analysis. She chose this assessment given the dangerous nature of the problem behavior. That is, she wanted to minimize the number of occurrences of elopement, and staff had to intervene when elopement did occur. The behavior analyst immediately reinforced elopement, which prevented Elija from eloping too far from the setting. Elopement was defined as any instance of Elija moving more than 3 feet away from the instructional setting and/or from an adult without permission. In addition to conducting the latency FA, the behavior analyst also ensured that additional therapists were assigned to all exits in the building to prevent Elija from going out of the building. The FA consisted of the following conditions: tangible, play (control), attention, and demand. The behavior analyst started a stopwatch when the condition began and let it run until elopement occurred. When elopement occurred, the behavior analyst stopped the stopwatch and recorded the time that had elapsed. This was the latency to elopement. The results of the FA are shown in Figure 27.7. The graph depicts that elopement was maintained by escape from demands and access to attention, because Elija's latency to elopement was shortest during the escape and attention conditions.

Developing an Intervention

It can be challenging when elopement or any other dangerous problem behavior serves an attention function, because the problem behavior cannot be placed on extinction (i.e., ignored) safely. The problem behavior will likely always result in at least some attention. Such was the case for Elija. As a result, the behavior analyst designed an intervention based on concurrently available reinforcement contingencies. When Elija was presented with a task demand, he was asked to make a choice from among three concurrently available options, which were signaled by three different colors (green, yellow, and red). Green was associated with Elija completing the assigned task demand. If he appropriately completed the task, he was given a high-quality break for 60 seconds. During his break, he received attention from his mother, as well as preferred toys. If he asked for a break from the

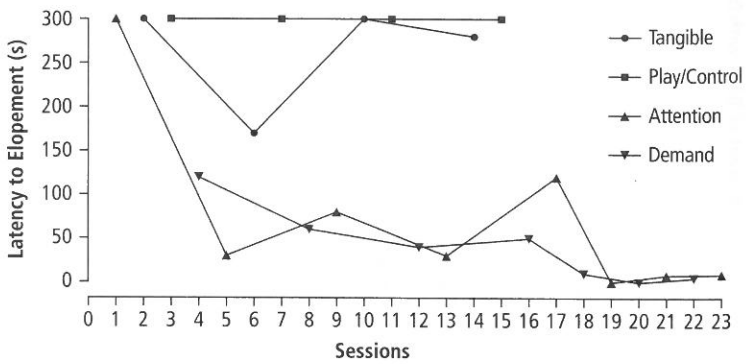


Figure 27.7 The latency to elopement for each condition in the FA for Elija. Note that elopement never occurred in the Play/Control condition; thus, the data points are plotted at 300 s, which represents the entire session duration (5 min). The latency was shortest during the attention and demand conditions, indicating escape and attention functions.

Elija's case example contributed by Denice Rios and Nicole Hollins.

task (the yellow option), he was given a task break. However, the break lasted only 30 seconds, he had access to less preferred toys, and his mother stayed with him for only a few seconds. If he engaged in elopement (the red option), he escaped the task for 10 seconds, no toys were available, and his mother neutrally blocked his egress from the room. Over time, the duration of the task demand to earn the high-quality break increased until Elija reliably engaged in the task demand rather than eloping.

Will—Evaluating Precursor Behavior

Gathering Information, Interpreting Information, and Forming Hypotheses

Will was 14 years old with a primary diagnosis of autism. He was quite large for his age and displayed high levels of physical aggression, verbal outbursts, and urinating on people. As a result of the severity and frequency of his problem behaviors, his size, a lack of informed treatment, and limited resources, Will was sent to a high-security juvenile detention center, where he was exposed to individuals without diagnosed disabilities who had committed violent, serious, and/or gang-related crimes. The county serving Will recognized that the juvenile detention center was not an appropriate placement for him but had no other placement options. As a last resort, the service coordinator on the case sought a behavior analytic consultation.

Upon getting involved with the case, the behavior analyst realized that everyone working with Will was skeptical that anything would help. The behavior analyst conducted an FBA interview with individuals who had worked with Will in the detention center. Because the center was a lock-down facility, the staff could not give much information about how Will performed in a variety of conditions. The interview yielded little useful information. Also, observations of natural routines were limited due to the nature of the placement. As a result, no formal descriptive assessments were completed. The behavior analyst proposed a functional analysis, but one of Will's caseworkers was concerned that once Will got upset, he would engage in aggression for hours. She was also concerned that Will's behaviors were so severe that allowing them to occur even once could be dangerous.

Based on a review of Will's records and the limited information available, it was hypothesized that Will's aggressive behaviors were maintained by escape from demands or by attention. In addition, it was determined that verbal outbursts describing the aggressive behavior he was about to engage in (e.g., "I'm going to piss on you!") reliably preceded Will's aggression. As a result of all these factors, it was decided that the functional analysis would be conducted on Will's verbal outbursts rather than on his aggression.

Testing Hypotheses

The functional analysis consisted of four conditions: tangible, free play, escape, and attention. In each of these conditions, occurrences of verbal outbursts were recorded using a 10-sec partial interval measurement system and plotted as the percentage of intervals with problem behavior (see Figure 27.8). Will displayed high levels of verbal outbursts during the tangible condition. The behavior analyst noted that Will's verbal outbursts could be interrupted if the therapist provided attention or task demands (i.e., the attention and demand conditions that followed the tangible condition) that redirected Will's behavior to some form of independent work.

Developing an Intervention

Based on the results of the functional analysis, the behavior analyst recommended that Will receive training in effectively and appropriately asking for tangible items. In addition, it was recommended that the training focus on teaching Will to tolerate delays in getting access to those tangible items. In his typical environment (e.g., school and home setting), gaining immediate access to tangible items was not always going to be feasible, so tolerating delays would be imperative for Will's success. Thus, a structured treatment that involved providing access to tangible items following appropriate requests, but not verbal outbursts, was recommended. After Will reliably requested items in an appropriate way, the behavior analyst slowly built in delays to the preferred item and asked Will to work on an independent task while waiting. Following appropriate waiting, Will received access to the preferred item. After observing the process, Will's caseworker—albeit initially resistant—considered that Will could live in a less restrictive environment.

Chris—Evaluating ABC Data

Gathering Information, Interpreting Information, and Forming Hypotheses

Chris was a 37-year-old man diagnosed with intellectual disabilities who lived in a group home. He had a limited vocal verbal repertoire and he used a wheelchair for mobility. Chris displayed

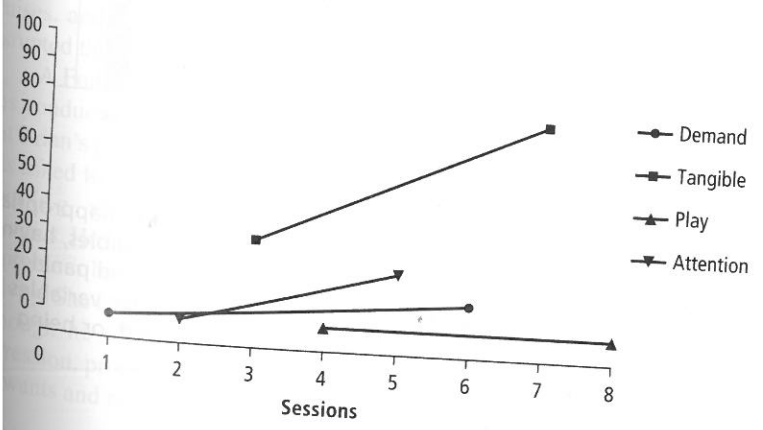


Figure 27.8 Results of Will's functional analysis of precursor behavior (verbal outbursts).

Will's case example contributed by Cody Morris, Denice Rios, and Lloyd Peterson.

frequent screaming toward caregivers and peers across many locations, including his home, various day programs, and outings. Interviews with staff members indicated that the screaming occurred throughout the day, but most frequently at his day programs. The staff hypothesized that the screaming occurred when Chris observed other roommates getting attention from staff. The behavior analyst also noticed that when staff members moved Chris's wheelchair, they often did so by walking up behind him and moving his wheelchair without saying anything to Chris about what was going to happen. This seemed to startle Chris, and the behavior analyst wondered if his screaming might also be maintained by avoidance of being removed from a specific area in the day program.

Structured ABC observations (similar to that in Figure 27.3) and narrative recordings (providing descriptors of each event) were conducted across various times in Chris's home and day programs. Both inappropriate vocalizations (screaming) and appropriate vocalizations were tracked. After data were collected, each antecedent and consequence entry was coded into categories, such as attention, presentation or removal of a demand, being relocated, and alone. Each occurrence of appropriate and inappropriate vocalization was then analyzed to determine what category of antecedent immediately preceded it and what category of consequence followed it. The percentage of both appropriate and inappropriate vocalizations preceded or followed by each category of variables was then graphed and analyzed using methods described in Chapter 6. The results are shown in Figure 27.9.

Based on the ABC observations and graphed ABC data, it was hypothesized that Chris's screaming served an attention function. The graphed data clearly showed that the most common antecedent variable that preceded both appropriate and inappropriate vocalizations was Chris being alone. However, Chris rarely received attention following appropriate attempts to interact with staff. In contrast, he reliably received staff attention following screaming. In fact, Chris was about twice as likely to receive attention for inappropriate vocalizations as for appropriate ones. Moreover, the narrative aspect of the ABC recording (see Table 27.3) indicated that staff members reliably ignored Chris while he scrolled through a wide variety of appropriate vocalizations (e.g., "hi," "how are you") that escalated to grunting and eventually screaming. Typically, it wasn't until Chris began screaming that he received high-quality attention from staff.

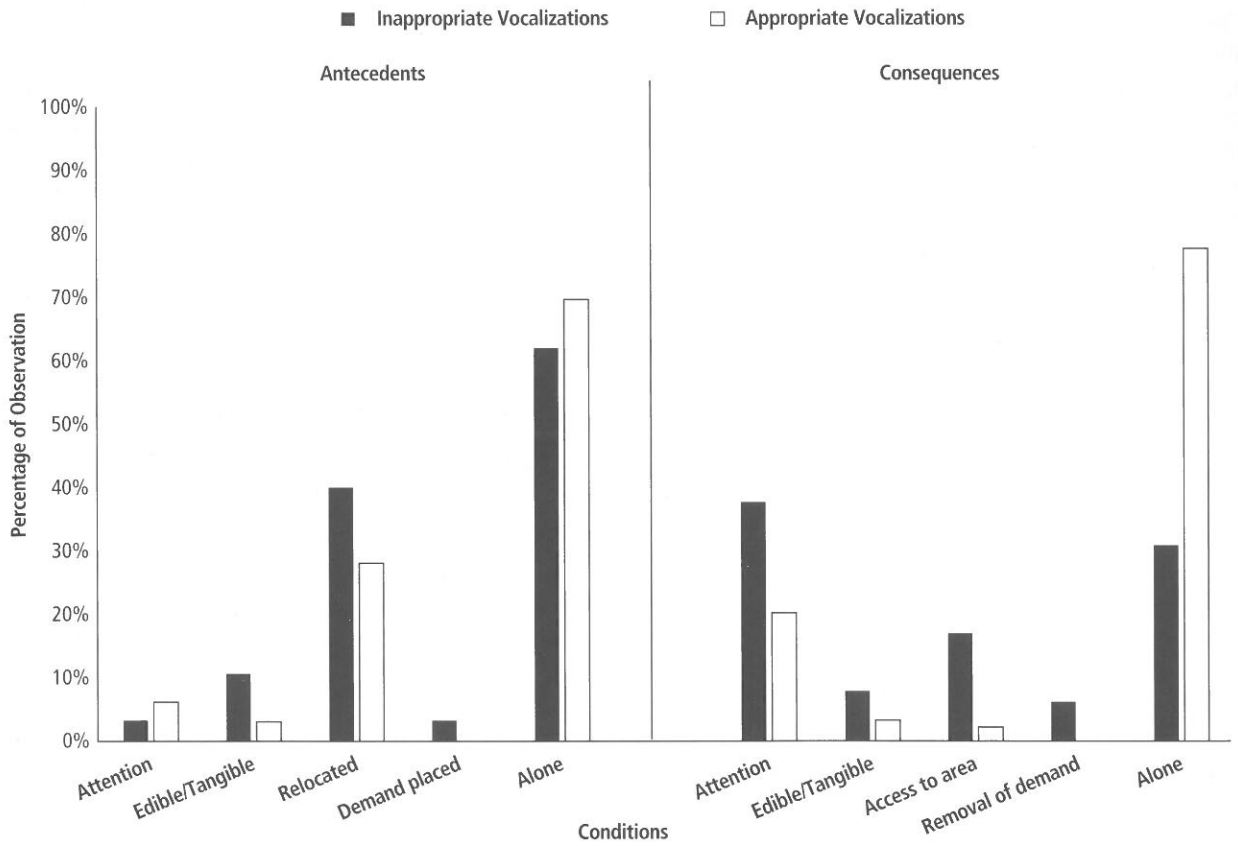


Figure 27.9 Results of Chris's ABC assessment. The left-hand panel shows the percentage of appropriate and inappropriate vocalizations that were preceded by the antecedent variables of one-on-one attention, access to edibles/tangibles, having someone move his wheelchair (relocated), having a demand placed on him, or being left alone. The right-hand panel shows the percentage of appropriate and inappropriate vocalizations that were followed by the consequence variables of one-on-one attention, access to edibles/tangibles, having access to a new area, having a demand removed, or being left alone.

Case example contributed by Cody Morris and Becky Kolb.

TABLE 27.3 Results of ABC Narrative Assessment for Chris's Appropriate and Inappropriate Behavior

Antecedent	Behavior	Consequence
Chris alone	Said "hi you"	Ignored by staff
Chris alone	Said "a ba" while pointing to a book	Ignored by staff
Chris alone	Screamed	Approached and told "Please stop screaming" and asked "What's wrong, Chris?"
Chris transitioned to a new activity (sorting)	Screamed	Staff asked Chris why he was upset—"Chris, what do you need?"
Chris transitioned to a different room (because of an event occurring)	Said "are you my boy" to staff while walking	Ignored by staff

Developing an Intervention

Because the ABC analysis identified a very apparent issue with staff interaction with Chris, it was not clear that a functional analysis was necessary. The behavior analyst wanted to first try having staff attend to appropriate behavior that Chris was already displaying. The intervention consisted of reversing staff's differential reinforcement of the inappropriate vocalizations. This was done by having staff reinforce the appropriate vocalizations (i.e., responding to the appropriate bids for attention) while placing screaming on extinction. In addition, because Chris engaged in high levels of appropriate vocalizations already, he was taught to tolerate a delay to reinforcement. Staff members were asked to acknowledge his requests and to provide reinforcement (attention) immediately, whenever possible. However, staff members were also taught to work directly with Chris to teach him to "wait" when necessary by slowly increasing delays to attention following their acknowledgement of his request. Finally, because Chris's vocalizations were somewhat difficult to understand and limited in variety, interventions to expand and improve the quality of Chris's mand repertoire were introduced.

Brian—Multiple Functions of Problem Behavior

Gathering Information

Brian was 13 years old and diagnosed with pervasive developmental delay, oppositional defiant disorder, and attention-deficit hyperactivity disorder. He had moderate delays in cognitive and adaptive skills. Brian displayed several problem behaviors, including aggression, property destruction, and tantrums. Brian's aggression had resulted in several of his teachers having bruises, and his property destruction and tantrums frequently disrupted the daily activities of the classroom.

A Functional Assessment Interview (O'Neill et al., 1997) was conducted with Brian's teacher, Ms. Baker, who reported that Brian's problem behavior occurred most frequently when he was asked to perform a task that required any kind of physical labor (e.g., shredding papers) and occurred least during leisure activities. However, Ms. Baker reported that Brian often engaged in problem behavior when he was asked to leave a preferred activity. She noted that Brian used complex speech (sentences), although he often used verbal threats, curse words, and/or aggression, property destruction, and tantrums to communicate his wants and needs.

Because Brian had a spoken repertoire, a Student-Assisted Functional Assessment Interview (Kern et al., 1995) was also conducted. In this interview, Brian reported that he found his math work too difficult but that writing and using a calculator were too easy. He reported that he sometimes received help from his teachers when he asked for it, that sometimes teachers and staff noticed when he was doing a good job, and that he sometimes received rewards for doing good work. Brian indicated that his work periods were always too long, especially those that consisted of shredding papers. Brian reported that he had the fewest problems in school when he was allowed to answer the phone (his classroom job), when he was completing math problems, and when he was playing with his Gameboy. He stated that he had the most problems at school when he was outside playing with the other students because they often teased him, called him names, and cursed at him.

An ABC assessment was conducted on two separate occasions. The results of the ABC assessment are shown in Table 27.4.

Interpreting Information and Formulating Hypotheses

Based on the interviews and ABC assessments, the function of Brian's problem behavior was unclear. It was hypothesized that some of Brian's problem behaviors were maintained by access to adult attention and preferred items. This hypothesis was a result of the ABC assessment, which indicated that many of Brian's problem behaviors occurred when adult attention was low or when access to preferred items was restricted. Brian's problem behavior often resulted in access to adult attention or preferred activities. It was also hypothesized that Brian's problem behavior was maintained by escape because his teacher reported that Brian frequently engaged in problem behavior in the presence of task demands and because Brian reported that some of his work was too hard and work periods lasted too long. Thus, a functional analysis was conducted to test these hypotheses.

Testing Hypotheses

The functional analysis consisted of the same conditions as described previously, with two exceptions. First, an alone condition was not conducted because there was no reason to believe that Brian's problem behavior served an automatic function. Second, a contingent tangible condition was added because there was reason to believe Brian engaged in problem behavior to gain access to preferred tangibles and activities.

TABLE 27.4 Results of ABC Assessments for Brian's Aggression, Property Destruction, and Tantrums

Antecedent	Behavior	Consequence
Adult attention diverted to another student; denied access to Nintendo by teacher (i.e., told no when he asked if he could play it)	Yelled at teacher, "That's not fair! Why do you hate me?!"	Told to "calm down"
Teacher attending to another student	Hit sofa, attempted to leave classroom	Given choice of activity and verbal warning to stay in classroom
Teacher attention diverted to another student	Yelled "Stop!" at another student	Reprimand from teacher: "Don't worry, Brian. I will take care of it."
Story time, teacher attending to other students	Laughed loudly	Reprimand from teacher: "Stop it!"
Story time, teacher listening to other students	Interrupted other students while they were talking: "Hey, it's my turn. I know what happens next!"	Reprimand from teacher: "You need to listen."

This condition was just like the play condition (i.e., Brian had access to adult attention and preferred toys at the beginning of the session), except that intermittently throughout the session, he was told it was time to give his toy to the teacher and to play with something else (which was less desirable). If Brian complied with the request to give the toy to the teacher, he was given a less preferred toy. If he engaged in problem behavior, he was allowed to continue playing with his preferred toys for a brief period.

The results of the functional analysis are shown in Figure 27.10. Notice that problem behavior never occurred in the play condition when continuous attention and preferred items were available and no demands were placed on Brian. However, it occurred at high rates in all three of the test conditions (contingent attention, escape, and tangible). These results indicated that Brian's problem behavior was maintained by escape, attention, and access to preferred items.

Developing an Intervention

Based on the results of the functional analysis, a multicomponent intervention was implemented. The intervention components changed at different points in time, depending on the context. For example, when Brian was engaged in a work task, it was recommended that he be given frequent opportunities to request breaks. In addition, the time-out intervention that the teacher had been using was discontinued in the work context. During leisure times, when Brian had previously been expected to play alone, the classroom schedule was rearranged so that Brian could play and interact with peers. Brian was also taught to request toys appropriately while playing with peers. In addition, several interventions aimed at increasing teacher attention for appropriate behavior were implemented. Brian was taught how to request teacher attention appropriately, and teachers began to respond to these requests rather than ignoring them, as they had been doing. In addition, a self-monitoring plan was established, in which Brian was taught to monitor his own behavior and to match his self-recordings to the recordings of his teachers. Accurate self-recording resulted in teacher praise and access to preferred activities with the teacher. Brian's teachers also implemented their own plan to increase attention and praise every 5 minutes as long as Brian was not engaged in problem behavior during independent work.

Lorraine—Multiple Topographies That Serve Multiple Functions

Lorraine was 32 years old and functioned in the moderate range of intellectual disability. She had a diagnosis of Down syndrome and bipolar disorder with psychotic symptoms, for which Zoloft

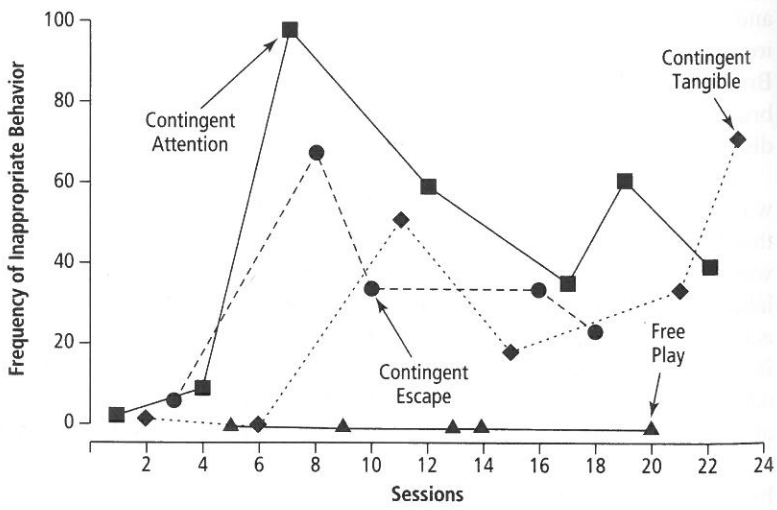


Figure 27.10 Results of Brian's functional analysis. Inappropriate behavior consists of aggression, property destruction, and tantrums.

Based on Brian's functional analysis conducted by Renee Van Norman and Amanda Flaute.

(sertraline) and Risperdal (risperidone) were prescribed. She also took Tegretol (carbamazepine) for seizure control. Her verbal skills were low and her articulation was poor. She communicated through some signs, a simple communication device, gestures, and some words.

Lorraine had resided in a group home for 9 years and attended a sheltered workshop during the day. Lorraine displayed noncompliance, aggression, and self-injurious behavior (SIB) in both settings, but the FBA focused on her problem behavior in the group home, where it was more severe and frequent. Noncompliance consisted of Lorraine putting her head down on the table, pulling away from people, or leaving the room when requests were made of her; aggression consisted of kicking others, throwing objects at others, biting others, and squeezing others' arms very hard; SIB consisted of biting her arm, pulling her hair, or pinching her skin.

Gathering Information

Interviews were conducted with Lorraine, her parents, and workshop and group home staff. Lorraine's parents noted that some of her behavior problems had increased when changes in her medication had been made. Workshop staff noted that Lorraine was more likely to have problem behavior at work if many people were around her. Workshop staff had also noted that noncompliance had increased shortly after a dosage change in medication 2 months previously. The group home staff members noted that they were most concerned about Lorraine's leaving the group home when she was asked to perform daily chores. Lorraine would often leave the group home and not return until the police had picked her up. Many neighbors had complained because Lorraine would sit on their porches for hours until the police came and removed her.

An ABC assessment was conducted at the workshop and group home to determine whether environmental variables differed across the two settings (e.g., the manner in which tasks were presented, the overall level of attention). At the workshop, Lorraine was engaged in a jewelry assembly task (one she reportedly enjoyed), and she worked well for $2\frac{1}{2}$ hours. She appeared to work better when others paid attention to her and often became off task when she was ignored; however, no problem behavior was observed at work. At the group home, aggression was observed when staff ignored Lorraine. No other problem behavior occurred. No demands were placed on Lorraine in the group home during the ABC observation. Group home staff rarely placed any demands on Lorraine in an attempt to avoid her problem behavior.

Interpreting Information and Formulating Hypotheses

Some of Lorraine's problem behaviors seemed to be related to a dosage change in her medication. Because Lorraine's physician judged her medication to be at therapeutic levels, a decision was made to analyze the environmental events related to her problem behavior. Observations of problem behavior during the ABC assessment were limited because workshop staff placed minimal demands on Lorraine to avoid problem behaviors. However, Lorraine's noncompliance reportedly occurred when demands were placed on her. Therefore, it was hypothesized that these problem behaviors were maintained by escape from task demands. Aggression occurred during the ABC assessment when Lorraine was ignored. Although SIB was not observed during the ABC assessment, group home staff reported that Lorraine often engaged in SIB during the same situations that evoked aggression. Therefore, it was hypothesized that both aggression and SIB were maintained by attention.

Testing Hypotheses

The functional analysis consisted of free play, contingent attention, and contingent escape conditions (see Figure 27.11). Because the problem behaviors may have served different functions, each problem behavior was coded and graphed separately. Noncompliance occurred most frequently during the contingent escape condition and rarely occurred during the free play or contingent attention condition. SIB occurred most frequently during the contingent attention condition and rarely occurred during the free play or contingent escape condition. These data suggested that noncompliance served an escape function and SIB served an attention function. As is often the case for low-frequency, high-intensity behaviors, it was difficult to form hypotheses about the function of aggression because the behavior occurred rarely in any of the FBA conditions.

Developing an Intervention

Different interventions were developed for the problem behaviors because results of the FBA suggested that the behaviors served different functions. To address noncompliance, Lorraine was taught to request breaks from difficult tasks. Tasks were broken down into very small steps. Lorraine was presented with only one step of a task at a time. Each time a task request was made, Lorraine was reminded that she could request a break (either by saying "Break, please" or by touching a break card). If she requested a break, the task materials were removed for a brief period. Then they were presented again. Also, if Lorraine engaged in noncompliance, she was *not* allowed to escape the task. Instead, she was prompted through one step of the task, and then another step of the task was presented. Initially, Lorraine was allowed to completely escape the task if she appropriately requested a break each time the task was presented. Over time, however, she was required to complete increasing amounts of work before a break was allowed.

Intervention for aggression consisted of teaching Lorraine appropriate ways to gain attention (e.g., tapping someone on the arm and saying, "Excuse me") and teaching group home staff to regularly attend to Lorraine when she made such requests. In addition, because her articulation was so poor, a picture communication book was created to assist Lorraine in having conversations with others. This communication book could be used to clarify words that staff could not understand. Finally, staff members were encouraged to ignore Lorraine's SIB when it did occur. In the past, staff had approached Lorraine and stopped her from engaging in SIB when it occurred. The functional analysis demonstrated that this intervention may have increased the occurrence of SIB, so this practice was discontinued.

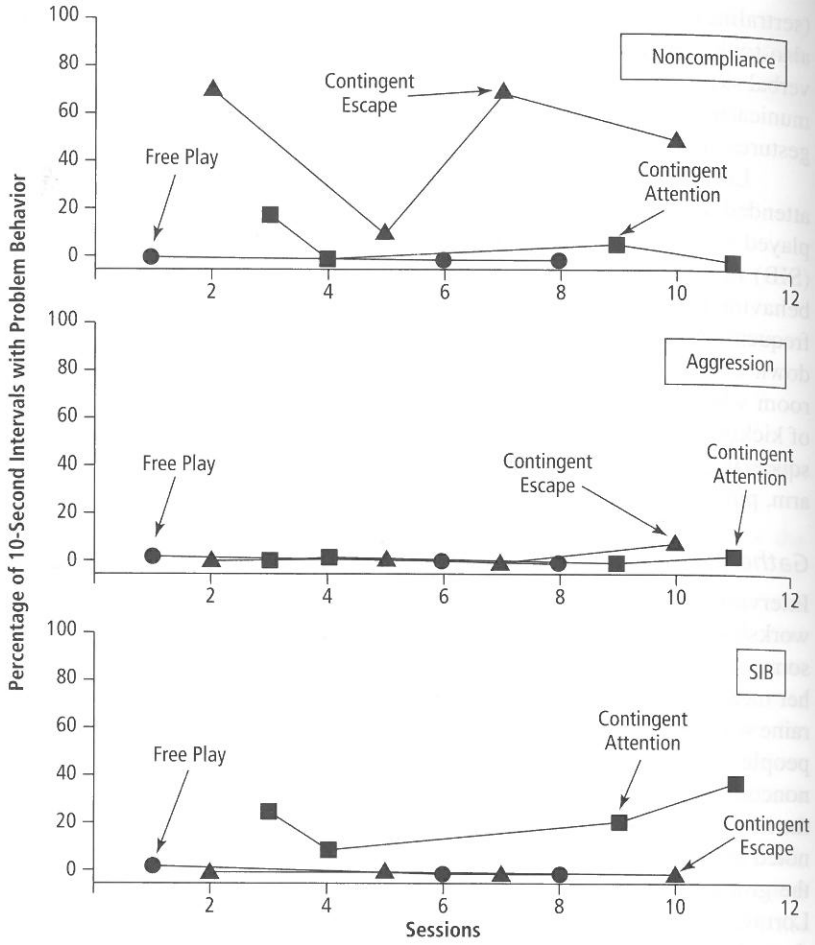


Figure 27.11 Results of Lorraine's functional analysis.

Based on Lorraine's functional analysis conducted by Corrine M. Murphy and Tabitha Kirby.

SUMMARY

Functions of Behavior

1. Many problem behaviors are learned and maintained by positive, negative, and/or automatic reinforcement. In this respect, problem behavior can be said to have a "function" (e.g., to "get" something or to "get out of" something).

2. The *topography*, or form, of a behavior often reveals little useful information about the conditions that account for it. Identifying the *conditions* that account for a behavior (its function) suggests what conditions need to be altered to change the behavior. Assessment of the function of a behavior can therefore yield useful information with respect to intervention strategies that are likely to be effective.

Role of Functional Behavior Assessment in Intervention and Prevention

3. FBA can lead to effective interventions in at least three ways: (a) It can identify antecedent variables that can be altered to prevent problem behavior, (b) it can identify reinforcement contingencies that can be altered so that problem behavior no longer receives reinforcement, and (c) it can help identify reinforcers for alternative replacement behaviors.

4. FBA can decrease reliance on default technologies (increasingly intrusive, coercive, and punishment-based interventions) and contribute to more effective interventions. When FBAs are conducted, reinforcement-based interventions are more likely to be implemented than are interventions that include a punishment component.

Overview of FBA Methods

5. FBA methods can be classified into three types: (a) functional (experimental) analysis, (b) descriptive assessment, and (c) indirect assessment. The methods can be arranged on a continuum with respect to considerations such as ease of use and the type and precision of information they yield.

6. Functional analysis involves systematically manipulating environmental events thought to maintain problem behavior within an experimental design. The primary advantage of functional analysis is its ability to yield a clear demonstration of the variable or variables that relate to the occurrence of a problem behavior. However, this assessment method requires a certain amount of expertise to implement and interpret. Several variations of functional analysis procedures have been developed to adapt to a variety of situations and contexts, including brief functional analysis, conducting functional analyses in natural settings, trial-based functional analysis, synthesized functional analysis, latency-based functional analysis, and analyzing precursor behaviors.

7. Descriptive assessment involves observation of the problem behavior in relation to events that are not arranged in a systematic manner and includes ABC recording (both continuous and narrative) and scatterplot recording. The primary advantages to these assessment methodologies are that they are easier to do than functional analyses and they represent contingencies that occur within the individual's natural routine. Caution must be exercised when interpreting information from descriptive assessments, however, because it can be very difficult to parse the contingencies via them.

8. Indirect functional assessment methods use structured interviews, checklists, rating scales, or questionnaires to obtain information from persons who are familiar with the individual exhibiting the problem behavior (e.g., teachers, parents, caregivers, and/or the individual himself or herself) to identify possible conditions or events in the natural environment that correlate with the problem behavior. Again, these forms of FBA are easy to conduct, but they are limited in their accuracy. As such, they are probably best reserved for hypothesis formulation. Further assessment of these hypotheses is almost always necessary.

Conducting a Functional Behavior Assessment

9. Given the strengths and limitations of the different FBA procedures, FBA can best be viewed as a four-step process:
   - First, gather information via indirect and descriptive assessment.
   - Second, interpret information from indirect and descriptive assessment and formulate hypotheses about the purpose of problem behavior.
   - Third, test hypotheses using functional analysis.
   - Fourth, develop intervention options based on the function of problem behavior.

10. When teaching an alternative behavior as a replacement for problem behavior, the replacement behavior should be functionally equivalent to the problem behavior (i.e., the replacement behavior should produce the same reinforcers that previously maintained the problem behavior).

KEY TERMS

conditional probability
contingency reversal
descriptive functional behavior assessment
functional analysis
functional behavior assessment (FBA)
functionally equivalent
indirect functional assessment

MULTIPLE-CHOICE QUESTIONS

1. Devonia hits her head with a closed fist when her one-on-one teaching assistant leaves her side to interact with another student. Usually, when Devonia does this, her teaching assistant returns to her side, asks her to stop hitting herself, and soothes her. She rarely engages in head hitting when her assistant works directly with her. What is the most likely function of Devonia's problem behavior?
   a. Escape
   b. Attention
   c. Automatic reinforcement
   d. Tangible
   e. Escape and/or tangible
   Hint: (See "Functions of Behavior")

2. Charles spits on his teacher when he prompts him to complete a toothbrushing task. For obvious reasons, this behavior really grosses out the teacher, who refuses to work with him when he behaves like this. When Charles spits on him, the teacher walks away and allows Charles to leave the toothbrushing task and go to the computer to calm down. As long as he is playing on the computer, he rarely spits on his teacher. What is the most likely function of Charles' behavior?
   a. Escape
   b. Automatic reinforcement
   c. Tangible
   d. Escape and/or tangible
   e. Escape and/or attention
   Hint: (See "Functions of Behavior.")

3. On a practical level, FBA is important for prevention of and intervention for problem behavior because:
   a. When the cause-and-effect relation between environmental effects and behavior can be determined, that relation can be altered to improve behavior.
   b. It meets the federal guidelines for best practices in treating problem behavior.
   c. It will tell a teacher exactly what to do for intervention.
   d. None of these
   Hint: (See "Role of Functional Behavior Assessment in Intervention and Prevention")

4. Devonia's one-on-one assistant (see Question 1) decides that he will no longer leave Devonia's side to interact with other children as an intervention for her problem behavior. This is an example of what form of intervention?
   a. Altering antecedent variables
   b. Altering consequent variables
   c. Teaching alternative behaviors
   d. All of these
   Hint: (See "Role of Functional Behavior Assessment in Intervention and Prevention")

5. There are at least three forms of FBA. They are:
   a. Functional analysis, standardized assessment, and descriptive assessment
   b. Indirect assessment, descriptive assessment, and behavioral observation
   c. Functional analysis, descriptive assessment, and indirect assessment
   d. Behavioral observation, standardized assessment, and curriculum-based assessment
   Hint: (See "Overview of FBA Methods")

6. Which methods of FBA allow you to confirm hypotheses regarding the function of problem behavior?
   a. Functional analysis
   b. Descriptive assessment
   c. Indirect assessment
   d. All of these
   Hint: (See "Overview of FBA Methods")

7. Which of the following describes a descriptive functional behavior assessment?
   a. An analog analysis in which consequences representing those in the natural routine are systematically arranged.
   b. Direct observation of behavior made under naturally occurring conditions
   c. Structured checklists that caregivers fill out to identify events that correlate with problem behavior
   d. Behavior rating scales that caregivers fill out to identify events that correlate with problem behavior
   Hint: (See "Descriptive Functional Behavior Assessment")

8. A limitation of descriptive assessment is:
   a. It may be misleading in that it can identify environmental variables that occur in close proximity to the problem behavior but that are not causally related to the problem behavior.
   b. It may not be a very reliable measure of problem behavior and environmental events.
   c. It is extremely difficult and time-consuming to perform.
   d. The first two answer choices are correct.
   Hint: (See "Descriptive Functional Behavior Assessment")

9. Ms. Frieder, who teaches fifth grade at Franklin Elementary School, decides to conduct a descriptive FBA for Amelia. Amelia has been refusing to do her schoolwork lately and has been ripping up her worksheets on a daily basis. Ms. Frieder creates a form on which she will mark specific antecedents and consequences that precede and follow Amelia's work refusals. For antecedents, she will mark one of the following: Math work given, reading work given, spelling work given, error correction given, work that requires writing given. For consequences, she will mark one of the following: verbal reprimand, another worksheet (same worksheet) provided, another worksheet (different worksheet) provided, time out, ignore. She will record these environmental events, whether or not a problem behavior occurs. What kind of descriptive assessment is Ms. Frieder conducting?
   a. Scatterplot recording
   b. ABC continuous recording
   c. ABC narrative recording
   d. Conditional probability recording
   Hint: (See "Descriptive Functional Behavior Assessment")

10. Mr. Peterson has been struggling with Arnold, a boy with severe disabilities who hums and rocks back and forth intermittently throughout the day. Mr. Peterson wants to see if these behaviors are associated with any specific activities during the school day so that he can then more closely analyze what occurs during those time periods. Which descriptive assessment method would be the best choice for what he wants to accomplish?
    a. Scatterplot recording
    b. ABC continuous recording
    c. ABC narrative recording
    d. Functional analysis
    Hint: (See "Descriptive Functional Behavior Assessment")

11. Ms. Carmichael is conducting an FBA for Jamal, a boy in her class who runs away from activities and teachers. Ms. Carmichael began by interviewing her teaching assistants and by participating in the conversation with them to define the target behavior and to determine what antecedents and consequences she would watch for during her ABC assessment. Ms. Carmichael completes her ABC assessment and finds that running away from tasks and materials occurs most frequently when difficult tasks are presented and that the most common consequence for this behavior is a teacher chasing after him and returning him to the classroom. Sometimes he is required to return to the task and sometimes he is allowed to do a different activity when he comes back to the classroom. What can be concluded from this descriptive assessment?
    a. The problem behavior most likely occurs to get attention from teachers
    b. The problem behavior most likely occurs to escape from nonpreferred tasks.
    c. The problem behavior most likely occurs to get access to more preferred activities.
    d. The function of the problem behavior remains unclear.
    Hint: (See "Conducting a Functional Behavior Assessment")

12. After you complete a descriptive assessment, you should write hypothesis statements that reflect your interpretation of the data. Which of the following is a hypothesis statement that contains all of the important elements?
    a. Gain peer attention: When Valerie is playing alone on the playground, she bear hugs her peers.
    b. Gain peer attention: Valerie bear hugs her peers, which is followed by attention in the form of teasing from her peers.
    c. When Valerie is playing alone on the playground, she bear hugs her peers, which is followed by attention in the form of teasing from her peers.
    d. Gain peer attention: When Valerie is playing alone on the playground, she bear hugs her peers, which is followed by attention in the form of teasing from her peers.

    Hint: (See "Conducting a Functional Behavior Assessment")

13. The primary reason for conducting a functional analysis is:
    a. To test hypotheses generated via indirect and descriptive assessments.
    b. To generate hypotheses that can be further evaluated via indirect and descriptive assessments.
    c. To observe problem behavior within the naturally occurring routine.
    d. To identify any temporal patterns in problem behavior.

    Hint: (See "Overview of FBA Methods")

14. Characteristics of functional analysis include:
    a. They are conducted within naturally occurring routines.
    b. They are conducted within analog conditions that represent naturally occurring routines.
    c. They utilize interviews and rating scales rather than direct observation of problem behavior.
    d. They are conducted in clinical settings only.

    Hint: (See "Functional (Experimental) Analysis")

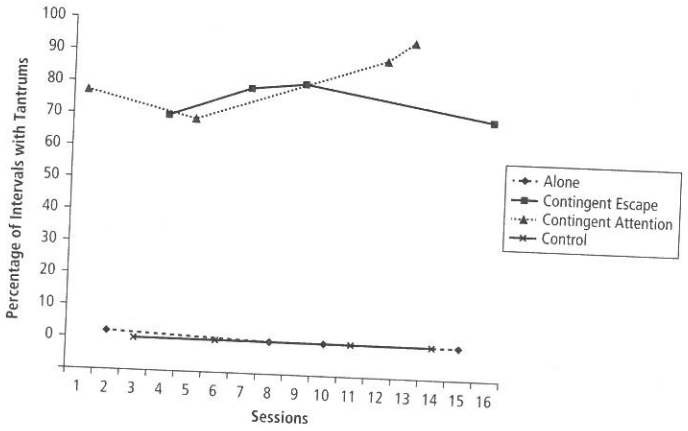
15. In addition to a control condition, a functional analysis typically consists of what test conditions?
    a. Contingent attention
    b. Contingent escape
    c. Alone
    d. All of these

    Hint: (See "Functional (Experimental) Analysis")

16. Mr. Moon is conducting a functional analysis with Ira, who kicks his teachers frequently. Mr. Moon is implementing a contingent escape condition. He prompts Ira to engage in a difficult task. Ira kicks Mr. Moon in the shin. How should Mr. Moon respond if he is to implement the contingent escape condition correctly?
    a. He should continue prompting Ira to do the task, but he should provide a mild reprimand, such as, "Ira, don't kick me. That hurts. Come on, it's time to work."
    b. He should remove the task materials and turn away from Ira for a short period of time.
    c. He should ignore Ira's kicking and continue with the task.
    d. He should provide Ira with a more preferred activity for a short period of time.

    Hint: (See "Table 27.1, page 682")

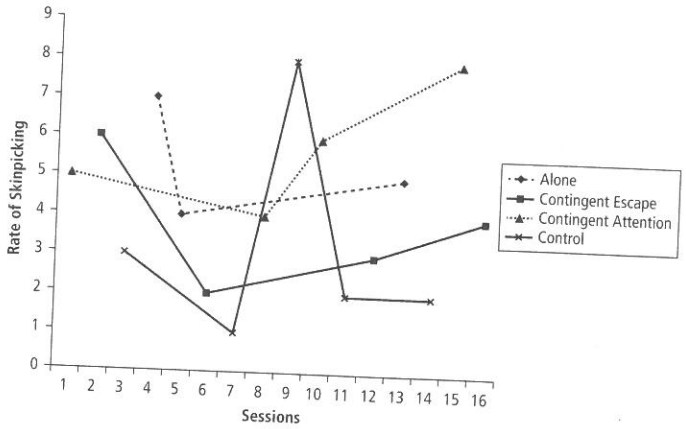
17. Look at the following graph from a functional analysis of Elsa's tantrums. What would you conclude is the function of Elsa's tantrums?



    a. Escape
    b. Attention
    c. Both escape and attention
    d. The pattern of behavior is undifferentiated; therefore the analysis is inconclusive.

    Hint: (See "Overview of FBA Methods")

18. Look at the following graph from a functional analysis of Walter's skin picking. What would you conclude is the function of Walter's skin picking?



    a. Escape
    b. Attention
    c. Automatic
    d. The pattern of behavior is undifferentiated; therefore the analysis is inconclusive.

    Hint: (See "Overview of FBA Methods")

ESSAY-TYPE QUESTIONS

1. Provide an example of a problem behavior that is maintained by social positive reinforcement, social negative reinforcement, and automatic reinforcement. In your answer, state what happens prior to the problem behavior, what the problem behavior is, and what follows the problem behavior.

   Hint: (See "Functions of Behavior")

2. Discuss three different ways in which the results of a functional behavior assessment can be used to formulate interventions that prevent future occurrences of problem behavior.

   Hint: (See "Role of Functional Behavior Assessment in Intervention and Prevention")

3. Explain the three types of functional behavior assessment. Discuss them in the order in which they might best be implemented and explain this sequence. Your explanation of the sequence should include the strengths and limitations of each type.

   Hint: (See "Overview of FBA Methods and Case Examples")

4. Compare and contrast descriptive and indirect assessments. What is the primary variable that sets these two forms of gathering descriptive information apart?

   Hint: (See "Overview of FBA Methods: Descriptive Functional Behavior Assessment and Indirect Functional Behavior Assessment")

5. Give an example of a descriptive assessment and state what specific information this assessment would yield.

   Hint: (See "Overview of FBA Methods: Descriptive Functional Behavior Assessment")

6. Assume you are a behavioral consultant for a local developmental disabilities agency. You have been asked to consult on young adult, Melissa, who is 22 years old and frequently disrobes while at work. You conduct indirect and descriptive assessments with her staff and learn the following: Melissa rarely disrobes when she is in the break room having a snack and interacting with her co-workers and staff. She disrobes most frequently when she is working on her assigned job task. It doesn't seem to matter what task she is working on. You conduct an ABC assessment and note that she works well when a staff member comes by to check her work, and this seems to continue for a few minutes after the staff member leaves. About 4 minutes after the staff member leaves, however, the clothes start coming off. Melissa is happy to put her clothes back on when directed to by a staff member. Because of these behaviors, Melissa's work station has been moved to behind a curtain in the work room. Much to the staff's chagrin, Melissa's disrobing has actually been worsening since they did this. What is your working hypothesis for Melissa's problem behavior? Write your hypothesis in the form recommended by the text, and provide a rationale for your hypothesis.

   Hint: (See "Conducting a Functional Behavior Assessment: Gathering Information and Interpreting Information and Forming Hypotheses")

7. Explain the difference between a functional analysis and other forms of functional behavior assessment (e.g., descriptive and indirect assessments). Specifically, why is it that a functional analysis allows you to test hypotheses, while other forms of functional behavior assessment are used for hypothesis formulation?

   Hint: (See "Overview of FBA Methods: Basic Procedure")

8. Describe the conditions that might be implemented in a functional analysis, as well as how and why each condition is implemented.

   Hint: (See "Overview of FBA Methods: Basic Procedure" and "Conducting a Functional Behavior Assessment: Testing Hypotheses")

9. Assume that in your role as a consultant, you decide to conduct a functional analysis of Melissa's disrobing (see Question 6). Assume that your functional analysis indicates her disrobing is maintained by both attention from others and escape from task demands. Assume that the functional analysis also confirmed your hypothesis that she rarely engages in problem behavior when she has attention and no task demands. Draw a graph that would illustrate this function appropriately.

   Hint: (See "Case Examples Illustrating the FBA Process")