

# Functional Behavioral Assessment in Schools

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**Federal law (Individuals with Disabilities Education Act, 1997) mandates the use of functional behavioral assessments (FBAs) and positive behavioral supports to address challenging behaviors demonstrated by students in school settings. FBA is a proactive approach to program planning and is a crucial step in providing the link to intervention based on the purpose of the student's behavior within the current environment. This article overviews the underlying principles of FBA and the methods and procedures associated with conducting FBA in the schools.**

**M**any behavior analysts viewed functional behavioral assessment (FBA) and positive behavioral support (PBS) as necessary procedures for effective practice in schools prior to the time these were first mandated by federal law in 1997, under the amendments to the Individuals with Disabilities Education Act (IDEA). Functional assessment is not a new concept. It has a scientifically based history with more than 30 years of research rooted in applied behavior analysis. Skinner discussed functional analysis in 1953 in his seminal work *Science and Human Behavior*. Because IDEA did not provide instructions on conducting FBAs, educators have incorporated concepts from the field of applied behavior analysis to guide their practice. This article presents the purpose of FBA, discusses its underlying principles, and describes the three methods and procedures (indirect, direct or descriptive, and experimental) used to conduct FBAs.

FBA is a collection of methods or procedures used to obtain information about antecedents, behaviors, and consequences to determine the reason or function of the behavior. It is considered a multimethod strategy, not a single test or approach. The goal of FBA is to determine the purpose of the behavior so that appropriate interventions can be applied to decrease the problem behavior. FBA is a proactive approach to program planning and is a crucial step in providing the link to intervention based on the purpose of the student's behavior within the current environment. Interventions that are selected without the use of FBA could strengthen a problem behavior and not provide alternative reinforcement for more desirable behavior.

A basic understanding of contingencies is needed to use FBA principles for students' problem behaviors. Contingencies describe relationships among a behavior (B) and its antecedents (A) and consequences (C). Antecedents are events or stimuli that occur before the target behavior (either immediately before or at some earlier time) and may be associated with a behavior, but they do not describe the function of the behavior. An example of the  $A \rightarrow B \rightarrow C$  relationship follows. A request from the teacher (antecedent) is followed by student compliance (behavior), which is followed by teacher praise (consequence). According to the operant learning perspective, behaviors are a function of (maintained by) consequences that occur contingent upon those behaviors (Skinner, 1953).

## Consequent Events

### Positive and Negative Reinforcement

A central principle of FBA is that positive reinforcement involves the presentation of an event or a stimulus that increases the probability of the behavior in the future,

and negative reinforcement involves the removal, delay, avoidance, or reduction of an event that increases the probability of the behavior in the future. Positive and negative reinforcement both increase or strengthen behavior. If a teacher gives a student a sticker each time he completes his homework and the student's rate of homework completion increases, the stickers would be an example of a positive reinforcer for this student in this situation. If the teacher tells the student that she will not have to take the final exam if she completes all of her homework assignments during the marking period and her rate of homework completion increases, the avoidance or escape from the final exam served as a negative reinforcer that increased the rate of homework completion.

Let's look at another example. A student raises his hand to answer a question instead of blurting out an answer, and the teacher says, "I like the way you raised your hand." Is this an example of positive reinforcement? In this case, we do not know because of lack of information. It would be an example of positive reinforcement if as a result of the praise the student was more likely to raise his hand in the future. Remember that the consequence of the behavior increases the probability that the behavior will occur again in the future during reinforcement procedures. For many children, social praise is a positive reinforcer that strengthens their behavior, but for some children this is not the case: The behavior of some children diagnosed with autism is not reinforced by social praise. The key point to remember is that reinforcers are specific to the situation, and the only way to determine if an event or a condition is a reinforcer is to measure its effect on behavior.

The following example describes negative and positive reinforcement occurring in the same scenario. A student has a tantrum at school when she demands to be given access to the computer and the instructional assistant says no. The instructional assistant eventually allows the student access to the computer, and the student stops her tantrum. As a result, the instructional assistant is more likely to allow the student access to the computer when she has tantrums. This is an example of negative reinforcement for the instructional assistant. She has avoided or escaped the aversive tantrum by giving the student access to the computer. The student is also more likely to tantrum at school because it results in access to the computer from the instructional assistant. This is an example of positive reinforcement for the student. A stimulus is added (access to the computer), and her tantrums increase.

The terms *positive* and *negative* when applied to reinforcement are not synonymous with the concepts of good and bad or favorable and unfavorable. Many individuals like chocolate and assume that it must be a positive reinforcer because chocolate candy is generally viewed as a good or desired item. However, this is not true for every-

one. It would not necessarily be true for the person who is allergic to chocolate. Pickles served as positive reinforcement for one student I worked with. Her work completion behavior increased after she was given pickles for completed assignments, although work completion did not increase after she was given candy. Reinforcement is idiosyncratic to the individual and the situation. If giving a student candy does not result in an increase in the targeted behavior, then candy is not a reinforcer for that child in that situation. In regard to reinforcement, the term *positive* refers to adding a stimulus or condition and the term *negative* refers to taking something away or allowing the individual to avoid or escape a condition. Positive reinforcement can be referred to as a *reward*, and negative reinforcement can be referred to as *relief* (Lefrancois, 2000). Both types of reinforcement increase the probability of the targeted behavior occurring in the future. When conducting an FBA, educators need to look for the positive and/or negative reinforcement contingencies.

### Factors Influencing Reinforcement

Many factors determine the effectiveness of reinforcement, such as immediacy, contingency, satiation or deprivation, and characteristics of the consequence (Miltnerberger, 2001). For a consequence to be most effective as a reinforcer, it should occur immediately after the behavior occurs. A consequence is also more likely to reinforce a behavior when a contingency exists. In other words, the behavior is strengthened when the reinforcer occurs only if the behavior occurs. Satiation and deprivation also can decrease or increase the effectiveness of reinforcers. Food and attention are more powerful reinforcers if the person has gone without them for a period of time. On the other hand, food and attention can be less potent if the person has had substantial exposure to them. Characteristics of the consequence also need to be considered. What is reinforcing for most individuals may not be reinforcing for a particular individual. I would not have thought to suggest using pickles at school for the aforementioned student if I had not found out during an interview with the student's mother that pickles were highly preferred at home. Generally, the stronger the amount or intensity of a reinforcer, the more powerful it is. For example, a person might work longer for a large amount of money than for a small amount.

### Positive and Negative Punishment

Sometimes we may think that we are providing a student with reinforcement when, in fact, the behavior we wanted to increase has decreased in frequency. Consequences that result in the decrease or weakening of future behavior are referred to as *punishers* in applied behavior analysis. Punishment techniques need to be used carefully, if used at all in schools, and typically only after functional nonaversive techniques have been tried and have not worked. If a teacher yells at a student each time he uses profanity in class and the occurrences of profanity decrease in the future, the teacher's yelling is a punisher for that student. This can also be referred to as *castigation* (Lefrancois, 2000). However, if the teacher yells after each occurrence of profanity and the number of profanity episodes increases, the teacher's yelling is not a punisher for this student. Instead it is functioning as a positive reinforcer for this student because it has increased or strengthened the profanity behavior.

The terms *positive punishment* and *negative punishment* are used when a target behavior has weakened or decreased following the addition or removal of a stimulus or event, respectively. Again, the terms *positive* and *negative* do not refer to good and bad or favorable and unfavorable; they refer to whether a stimulus or event was added (positive) or taken away (negative) after a behavior. The example just mentioned—where the teacher yelled after the student cursed and the cursing behavior decreased—is an example of positive punishment because a stimulus (yelling) was added that resulted in a future decrease of cursing. On the other hand, if a stimulus is removed and the target behavior decreases, this is referred to as *negative punishment* or a *penalty* (Lefrancois, 2000). An example of negative punishment would be when a person's misbehavior decreases following the removal of money or privileges (see Table 1). Time-out (temporary loss of access to a variety of reinforcers) and response cost (permanent loss of a specific reinforcer) are considered forms of negative punishment when they result in weakening the target behavior. An important point to note is that the stimulus that is removed in negative punishment is usually not the same stimulus that was maintaining the behavior.

Quiz yourself to see if you understand the concepts of positive and negative reinforcement and positive and negative punishment by filling in the blanks on the 10 items

**Table 1.** Contrasting Reinforcement and Punishment

Behavioral outcome	Consequences of behavior	
	Stimulus is presented	Stimulus is removed
Strengthened in future	Positive reinforcement (reward)	Negative reinforcement (relief)
Weakened in future	Positive punishment (castigation)	Negative punishment (penalty)

1. Contingent praise from peers encourages a student to run a mile in less time. With respect to fast running, praise exemplifies \_\_\_\_\_.
2. Hitting decreases when removal of a toy is made contingent upon it. This exemplifies \_\_\_\_\_.
3. An increase in behavior contingent upon the removal of a stimulus is called \_\_\_\_\_.
4. An individual with mental retardation who doesn't like to be touched pushes people away who are close to him. Pushing is maintained by \_\_\_\_\_.
5. A parent begins to praise a child for hanging up his coat. The child, although reluctant, hangs up his coat more frequently. This exemplifies \_\_\_\_\_.
6. A student is given time-out from attention after misbehavior and the misbehavior decreases. This is an example of \_\_\_\_\_.
7. Rubbing one's infected ear reduces the pain. Rubbing is maintained by \_\_\_\_\_.
8. A teacher's reward system increases the amount of time a student remains on task. The reward system is \_\_\_\_\_.
9. \_\_\_\_\_ occurs when a stimulus presented contingent upon behavior decreases the future probability of the behavior.
10. A parent starts giving a child money every time he takes out the garbage. Taking out the garbage decreases. Giving money represents \_\_\_\_\_.

Figure 1. Self-assessment quiz.

in Figure 1. The answers can be found at the end of this article (see Note).

## Antecedent Events

Although FBA attempts to identify reinforcement and punishment contingencies (consequent events), antecedent events can have a significant influence on behavior. However, Iwata (1994) cautioned the observer not to assume correlations between antecedents and behavior and abandon a more careful analysis. Antecedents can occur immediately before a behavior or at some earlier time. Antecedent events have been referred to as potential ecological or setting events (O'Neill et al., 1997) or contextual variables (Iwata, 1994). An antecedent event that is associated with or signals that a response will be reinforced is referred to as a discriminative stimulus. A bell that rings at the end of the school day becomes a discriminative stimulus for leaving the classroom to go home because the only time leaving the classroom is reinforced to go home is after the bell rings. There are also other variables that temporarily alter the effectiveness of

a reinforcer, such as satiation and deprivation. For example, the effectiveness of water increases after a student has been running around the track for 30 minutes during recess on a hot day and has not had anything to drink for several hours. However, offering water to a student who just drank several glasses of water and has not performed any exercise may not be as effective as it was to the other student. In behavioral terms, antecedent events that alter the value of reinforcers are referred to as *establishing operations* (Michael, 1982).

Some behaviorists refer to distant events that precede behavior as *setting events*. Examples of setting events are medications, medical or physical problems, sleep cycles, eating routines and diet, daily schedule, numbers of people, and staffing patterns and interactions (O'Neill et al., 1997). Also, it may be helpful to know what happened in the morning before the student came to school. Perhaps he or she had a fight with a parent at home or a fight on the school bus with a peer. These events and the seven listed previously could have an influence on his or her compliance behavior later at school. Setting events function similarly to establishing operations in that they alter the value of certain consequences.

## The Functions of Behavior

The purpose or pay-off that the behavior serves is referred to as the *function of the behavior*. These functions generally fall into the following four categories:

1. to receive attention from others,
2. to gain a preferred item or activity,
3. to escape from an unpleasant academic or social demand, and
4. to meet sensory needs.

The first three functions are considered social because they involve others in the individual's environment mediating the important consequences. The sensory function can also be referred to as automatic because it does not involve others and often involves internal stimulation. For example, rocking and hand flapping may provide sensory stimulation for some individuals. Treatments for problem behavior are based on the function of the behavior and not on the form or topography of the behavior. For example, not all self-injurious behavior in the form of head banging by individuals with autism is caused by sensory stimulation. It may also have a socially mediated cause. For instance, if a student inadvertently bangs his head and the teacher immediately goes over to him to find out what was wrong, the student may then continue to bang his head in the future to get the teacher's attention. He may also have discovered that after he banged his head, the staff had him stop his work activity. He may bang his head in the future to escape work tasks. The purpose of

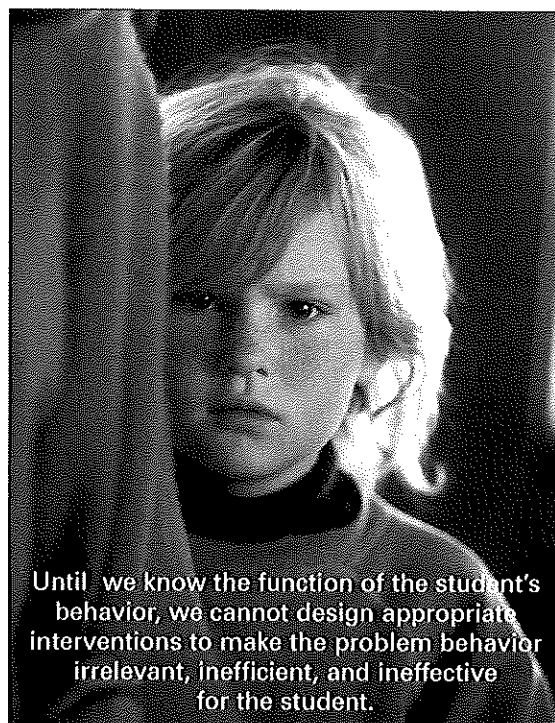
the behavior in one situation may not be the purpose in another situation. Therefore, functional behavioral assessment is not a one-time effort but rather a process.

## Extinction Procedures

When the same reinforcer that was maintaining behavior is removed and the behavior stops in the future, the process of extinction occurs. When we want to eliminate an inappropriate behavior, we may put it on extinction. If giving a student undue attention for yelling out in class results in an increase in the student's yelling-out behavior, we may decide to ignore the yelling-out behavior. By not giving the student attention or positive reinforcement for the inappropriate behavior (yelling), we are putting the yelling behavior on extinction.

Several important considerations need to be understood before you decide to implement an extinction procedure. First, has the reinforcer that is maintaining the behavior been identified? Is extinction safe to use? If it could cause harm to the student exhibiting the problem behavior, then we cannot use it. Is the entire school team in agreement, and do they have the skills to carry out the procedures consistently in the exact way they were designed? If one person gives in and positively reinforces the student's inappropriate behavior, this will lead to intermittent reinforcement of the inappropriate behavior. Skinner (1953) demonstrated that behavior that is on an intermittent reinforcement schedule (not reinforced every time it occurs) is more difficult to extinguish than behavior that is on a continuous reinforcement schedule (reinforced every time the target behavior occurs). The student will continue to seek the reinforcement that was withheld by the rest of the team but was given by the one member who did not follow the procedures.

One school team decided to put a middle school student's escape behavior on extinction. But to help decrease his need to escape, his academic work was modified, he was provided choices regarding academic tasks, and he was rewarded for on-task behavior and compliance with teacher directives, with the rewards that he had previously selected. In addition, all of his teachers, the administrative staff, related services personnel, and his mother were in agreement that he would not be allowed to leave school to go home except if he was sick, which was going to be determined only by a fever or vomiting. Headaches were no longer a reason to go home. Of course, he could have medication at school to decrease headache pain. In the past, the student pleaded with the nurse to go home because he had a headache, and he was allowed to go home. The nurse was made aware of the new plan and did not allow him to go home when he complained of a headache. He then found a school staff member or a substitute staff member who was not aware that he had already been told during the previous class that he could



not go home and he asked that person to allow him to call home. Another team meeting was held, and the mother reported that he had been to the doctor to evaluate his headaches and there was no medical reason for them. She also agreed to support the school's decision to have him stay at school and not allow him to go home after the concept of intermittent reinforcement was explained. This resulted in the student staying at school more often, and he stopped going to the nurse with complaints of headaches. However, the escape behavior reemerged and the school team met again with the student's mother to discuss a plan to put the escape behavior on extinction. Unfortunately, the school nurse had not been asked to attend to this meeting. The student then managed to go home one day after he called his mother from the nurse's office and also on another day that week when he called his mother from the office phone without the assistant principal's knowledge. The escape behavior was back on intermittent reinforcement and was difficult to extinguish. This example highlights the need to have all persons who will come in contact with the student in agreement with the behavior plan and also to make sure that every person can carry out the plan exactly as it was designed.

Additionally, you need to be prepared for an extinction burst when putting a behavior on extinction. The behavior that is no longer reinforced will briefly get worse in frequency, duration, or intensity before it decreases and eventually stops. Can the staff tolerate an extinction burst? If not, extinction should not be used. Furthermore, we should never put a behavior on extinction without teaching the student a replacement or alternative behavior. In the case of the student who yelled out to get the

teacher's attention, we may teach the student a more appropriate way of getting the teacher's attention, such as raising his hand. To determine an effective replacement behavior, we need to know the function of the behavior or we may make the behavior worse. For example, using time-out for every inappropriate behavior is not effective. If the student is trying to escape a task and we put him in time-out away from the task, we may be allowing him to escape an unpleasant task rather than putting his misbehavior on extinction. Furthermore, delivering the functional reinforcer either contingently or noncontingently helps avoid the undesirable side effects of extinction.

Decreasing problem behaviors often involves three general procedures:

- eliminating the behavior's establishing operation (Smith & Iwata, 1997),
- terminating the behavior's reinforcement contingency by extinction (Iwata, Pace, Cowdery, & Miltenberger, 1994), and
- replacing the behavior with another response (Carr & Durand, 1985).

The establishing operation could be deprivation or aversive stimuli. Eliminating the establishing operation can be accomplished by giving the student noncontingent reinforcement (Vollmer, Iwata, Zarcone, Smith, & Mazaleski, 1993). For behavior maintained by attention, the treatment would be noncontingent attention to eliminate the need for attention. The teacher could provide attention in the form of positive comments and proximity to the student every 5 minutes. For escape-related behavior, the treatment could involve noncontingent removal of the task or modifying the task. In other words, the teacher removes the work demand, but the removal is not contingent on the misbehavior. Ways of modifying the task include shortening the assignment by requiring the student to only complete the odd problems or changing the difficulty level of the assignment. For behavior maintained by sensory stimulation, noncontingent stimulation is provided.

If the function of the behavior has been determined to be positive social reinforcement in the form of attention, then it is appropriate to ignore the problem behavior if it is not dangerous and also teach an appropriate replacement behavior. In other words, we put attention on extinction by ignoring the problem behavior. Time-out can be an appropriate strategy to use when the problem behavior is maintained by positive reinforcement involving social reinforcement by others or tangible reinforcers. It is only effective if the current environment has positively reinforcing activities or interactions so that the student wants to be there. Time-out negatively reinforces problem behavior when the time-out environment is less aversive than the ongoing activities in the current envi-

ronment. For example, time-out in the hallway may be less aversive for the student than spending time in the math class.

Ignoring or time-out is not an appropriate strategy to use when the purpose of the behavior is maintained by negative reinforcement (escape) or automatic reinforcement (sensory stimulation). Escape behavior is put on extinction by not allowing the student to escape (e.g., continue with instruction). It is difficult to implement because it sometimes requires physically guiding a response that may not be possible with all students. Changes in the antecedents can also be made to reduce misbehavior (Smith & Iwata, 1997); for instance, the task can be modified so that it is not as difficult, choices can be provided, the student could be warned that a new task is about to occur, the tasks can be varied and easy tasks can be interspersed with harder tasks, the way the student is asked to work can be changed, and the pace of the instruction can be adjusted. The teacher can guide the student to comply with the request to work by modeling the required task and by providing as much assistance as is needed to get the student to comply until behavioral momentum is achieved. Students can also be taught appropriate ways to ask for breaks so that they do not need to continue misbehaving to escape work.

Sensory stimulation behavior may be put on extinction by blocking the student's response. For example, a student who is banging his head may need to wear a helmet for protection to block the blows to his head. In addition, an alternative method of receiving sensory stimulation needs to be provided. Students who fidget excessively may be provided with legitimate opportunities for appropriate movement in the classroom by erasing the blackboard or taking messages to the office.

## FBA Methods and Procedures

Functional behavioral assessment is a problem-solving process conducted to determine the purpose of behavior so that appropriate interventions can be selected to address problem behavior. Generally, indirect and direct methods of assessment are referred to as *functional behavioral assessment* and experimental methods are referred to as *functional behavioral analysis*. The terms *assessment* and *analysis* can be confusing because they are sometimes used interchangeably. However, functional analysis differs from functional assessment in that functional analysis is the only method that actually manipulates variables and results in the determination of functional relations. Functional assessment and functional analysis both involve similar problem-solving steps with the last steps in the process, including the development of an appropriate behavior intervention plan (BIP) and then an evaluation of

that BIP to determine if it is successful or if more information or a revision is needed.

The first step in FBA is identifying and clearly describing the problem behavior. This is frequently done through an interview. Once the specific behavior or behaviors are clearly defined, the teacher may be asked to provide baseline data and academic information about the student. Because behavior does not occur in a vacuum, the environmental and setting demands need to be identified and described. Direct observation may be the next step. If a functional analysis (experimental manipulation) is not going to be completed, the direct observation forms and a functional analysis form similar to the one in Figure 2 will be completed. A hypothesis is then developed. If a functional assessment is going to be conducted, the hypothesis is then tested experimentally. This is followed by writing a behavioral plan based on the hypothesis or hypothesis testing and implementing the behavior plan. Data is then collected as the intervention is being implemented. This is followed by a team meeting to determine if more assessment is needed and/or if the BIP needs to be revised. Figure 3 outlines the basic steps of the functional assessment process.

### Indirect Methods

This type of assessment involves collecting information reported by an informant. The informant could be the individual with the problem behavior or his or her care providers, including parents and teachers. Sources of indirect information can include historical records, questionnaires, behavioral rating scales and checklists, and interviews. The advantages of the indirect method are that it is easy to conduct and does not take much time. Minimal professional time is required, and a great deal of information can be quickly obtained. It is recommended that several informants are included in the assessment and more than one assessment tool is used to collect data. Several disadvantages of the indirect method are that the informant must rely on his or her memory of events, and there is the possibility that the informant interpreted the checklist item or question differently than was intended by the author of the rating scale or checklist.

One of the initial steps in conducting FBA is a systematic review of the student's school records: demographics, special education status, attendance, grades, achievement test scores, retentions, disciplinary contacts, suspensions, health information, and previous accommodations or interventions. Many questionnaires and checklists are available for the behavior assessment process, such as the Achenbach Scales, which include the *Child Behavior Checklist*, *Teacher's Report Form*, and the *Youth Self-Report* (Achenbach & Rescorla, 2001), and the *Behavior Assessment System for Children* (Reynolds & Kamphaus, 1992), which includes a parent, teacher, and self-rating scale. The in-

formants respond to items describing behavior with a rating. The results obtained from these behavior rating scales may provide information and descriptions of the student's behavior that can be used to gain an understanding of his or her responses in various environments (i.e., home, school) and may also be used to determine special education eligibility. However, this information may not include the specific problem or target behavior of concern. Other rating scales such as the *Motivation Assessment Scale* (MAS; Durand & Crimmins, 1992) and the *Functional Analysis Screening Tool* (FAST; Iwata & DeLeon, 2002) contain items that are correlated to four likely maintaining variables. Information obtained from indirect assessment is based on behavior that has already occurred.

A structured interview can provide information about the problem behavior, antecedents, and consequences that can be used to generate hypotheses about the function of the behavior. The information collected should be clear and objective and should describe environmental events without inferences and interpretations. An effective interview can also teach the informant about functional assessments through the questions asked and the structure of the interview (Miltenberger, 2001). An operational definition of the problem or target behavior must be determined. This is an objective description of a behavior that uses terms that are specific, observable, and measurable and does not require guessing as to what the behavior looks like. For example, "aggressive and out of control" is not an operational definition. Does this refer to verbal or physical aggression? We do not know. However, describing the student's specific aggression, such as stating, "grasping or pulling another student's hair with her fingers" provides more information as to the form of the behavior. Including information on the frequency, duration, and intensity of the behavior, as well as including when the behavior occurs (e.g., leaving her chair when peers are seated), are also important components of an operational definition. The following is a summary of questions that Miltenberger (2001) suggested the interviewer might ask to gain information about the antecedents and consequences of a student's behavior:

### Questions Regarding the Antecedents

- When does the target behavior usually occur?
- Where does the target behavior usually occur?
- Who is present when the target behavior occurs?
- What activities or events precede the target behavior?
- What do people say or do immediately prior to the target behavior?
- Does the child demonstrate any other behaviors prior to the target behavior?
- When, where, with whom, and in what conditions is the target behavior least likely to occur?

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Target Behavior: Operationally define the behavior that most interferes with the student's functioning in the classroom. Include intensity (high, medium, or low), frequency, and duration.

When, where, with whom, and in what condition is the target behavior *least* likely to occur?

Setting Events or Context Variables (i.e., hunger, lack of sleep, medications, problems on bus):

Immediate Antecedents & Consequences

<i>Antecedents</i>	<i>Problematic Settings</i>	<i>Consequences</i>
<input type="checkbox"/> Demand/Request	<input type="checkbox"/> Unstructured setting	<input type="checkbox"/> Behavior ignored
<input type="checkbox"/> Difficult task	<input type="checkbox"/> Unstructured activity	<input type="checkbox"/> Reprimanded
<input type="checkbox"/> Time of day	<input type="checkbox"/> Individual seat work	<input type="checkbox"/> Verbal redirection
<input type="checkbox"/> Interruption in routine	<input type="checkbox"/> Group work	<input type="checkbox"/> Time-out (duration: _____)
<input type="checkbox"/> Peer teased/provoked	<input type="checkbox"/> Specials	<input type="checkbox"/> Loss of incentives
<input type="checkbox"/> No materials/activities	<input type="checkbox"/> Specific subject/task	<input type="checkbox"/> Physical redirection
<input type="checkbox"/> Could not get desired item	<input type="checkbox"/> Crowded setting	<input type="checkbox"/> Physical restraint
<input type="checkbox"/> People _____	<input type="checkbox"/> Noisy setting	<input type="checkbox"/> Sent to office
<input type="checkbox"/> Alone	<input type="checkbox"/> Other _____	<input type="checkbox"/> Suspension
<input type="checkbox"/> Other _____	<input type="checkbox"/> Other _____	<input type="checkbox"/> Other _____

What function(s) does the target behavior seem to serve for the student?

Escape from:  demand/request  person  activity/task  school  other \_\_\_\_\_

Attention from:  adult  peer  other \_\_\_\_\_

Gain desired:  item  activity  area  other \_\_\_\_\_

Automatic sensory stimulation: \_\_\_\_\_

Hypothesis:

When \_\_\_\_\_ (antecedent) occurs in the context of \_\_\_\_\_ (problematic setting)

the student exhibits \_\_\_\_\_ (target behavior) in order to \_\_\_\_\_ (perceived function)

This behavior is more likely to occur when \_\_\_\_\_ (setting event/context variables)

Replacement or competing behavior that could still serve the same function for the student:

Is the replacement behavior in the student's repertoire, or will it need to be taught directly? \_\_\_\_\_

If so, how will it be taught? \_\_\_\_\_

List some potential motivators for student: \_\_\_\_\_

Figure 2. Functional behavioral assessment worksheet. This figure may be copied for noncommercial use only. © 2004 by PRO-ED, Inc.

1. Identify the problem behavior.
2. Describe the problem behavior.
3. Collect baseline data and academic information.
4. Describe the environment and setting demands.
5. Complete a functional assessment form and/or behavior rating scales.
6. Conduct a direct observation.
7. Develop a hypothesis.
8. Hypothesis testing (experimental manipulation).
9. Write a behavioral intervention plan (BIP).
10. Implement BIP.
11. Collect intervention behavioral data.
12. Conduct a follow-up meeting and revise plan as needed.

Figure 3. Functional assessment steps.

### Questions Regarding the Consequences

- What happens after the target behavior occurs?
- What do you do when the target behavior occurs?
- What do other people do when the target behavior occurs?
- What changes after the target behavior?
- What does the child get after the target behavior?
- What does the child get out of or avoid after the target behavior?

A more detailed structured informant interview such as the *Functional Assessment Interview* (FAI; O'Neill et al., 1997) can be used to gather information about the problem behavior and the environmental conditions and events surrounding it. The FAI contains the 11 following sections:

- Description of behavior, including topography, frequency, duration, and intensity
- Potential setting events
- Specific immediate antecedent events
- Consequences or outcomes of behavior
- Description of efficiency of target behavior
- The functional alternative behaviors the person already knows
- Primary ways the person communicates with others
- Things you should do and things you should avoid when working with this person
- Potential reinforcers
- Previous attempts at behavior reduction
- Summary statements for each major predictor or consequence

### Direct Descriptive Methods

Direct observation of antecedents, behaviors, and consequences is critical to FBA. It should be used to confirm the information received from the indirect assessment tools described earlier (Gresham, Watson, & Skinner, 2001). Observations are typically conducted in the natural environment where the behavior is most likely to occur, such as the playground and classroom. The observer records the immediate antecedents and consequences as they happen. One advantage of the direct method is that the observer is recording the antecedents, behaviors, and consequences as they occur rather than reporting them from someone's memory. This information is likely to be more objective and accurate when it is derived from direct observation. However, direct observation is more time consuming than indirect methods. Direct and indirect methods also do not demonstrate a functional relationship. They demonstrate correlation of the antecedent and consequences with the target behavior. In other words, they identify variables that appear to influence behavior. This information can be used to develop a hypothesis about the reinforcer that maintains the behavior and the antecedents that evoke the behavior. A strong hypothesis can be used to develop an effective treatment plan. The hypothesis is strengthened when the information from indirect assessment is consistent with the observation assessment (Miltenberger, 2001). However, a word of caution is necessary: You may observe that a student bangs his head and the consequence observed is that the teacher reprimands him each time he demonstrates head banging. The head-banging behavior is correlated with teacher reprimands; however, the actual function of the behavior may be sensory stimulation and not teacher attention. Further hypothesis testing through functional analysis or experimental methods might be used to confirm the functional relationship.

ABC (antecedent-behavior-consequence) observations can be organized in several ways. In the descriptive method, the observer briefly describes the behavior as it occurs on a three-column form, such as the one shown in Figure 4. He or she then needs to write down immediately a description of each antecedent event that occurred and each consequence that followed the behavior. It can be time consuming to record this information. This method is considered open-ended and contains descriptions of all events that occur close to the time of the behavior. Because it is an open-ended procedure, this ABC method is sometimes conducted before indirect methods are used and before any hypotheses are generated about the function of the behavior (Miltenberger, 2001).

The ABC observation checklist also contains three columns for the possible antecedents, behaviors, and consequences. However, the target behaviors have already been identified prior to the observation, and a list of possible antecedents and consequences have been generated and placed on the form above the appropriate columns.

Student Name: \_\_\_\_\_ Date: \_\_\_\_\_

Describe Behavior(s): \_\_\_\_\_

Date, Time	What happened just before the behavior?	Behavior: What happened? What was said?	What happened just after behavior?

Figure 4. ABC observation sheet.

The observer only needs to put checks next to the behavior observed and the time it occurred. He or she then places check marks in the columns that identify the immediate antecedent and consequence following the behavior. This information is then used to generate hypotheses regarding the function of the behavior.

Another way to conduct direct observations is to use interval-based methods to record the occurrence and nonoccurrence of behavior. In interval-based recording methods, an observation period is divided into brief time

intervals (i.e., 10-second or 15-second intervals) and the observer puts a mark in each interval that the behavior occurs. The observer can also identify the specific antecedents and consequences to record in each interval through indirect assessment or direct observation. Remember that there are several forms of interval-based recording. In partial interval recording, the target behavior is recorded if it occurs at any time during the interval; whereas, in whole interval recording, the target behavior is recorded only if it happens during the entire interval.

Student Name: \_\_\_\_\_

Target Behavior(s): \_\_\_\_\_

Put an "X" in the space that corresponds to the time and date of each observed behavior. If plotting more than 1 behavior, use another letter.

Dates:

	Monday	Tuesday	Wednesday	Thursday	Friday	Comments
8:30						
8:45						
9:00						
9:15						
9:30						
9:45						
10:00						
10:15						
10:30						
10:45						
11:00						
11:15						
11:30						
11:45						
12:00						
12:15						
12:30						
12:45						
1:00						
1:15						
1:30						
1:45						
2:00						
2:15						
2:30						
2:45						
3:00						
3:15						
3:30						

Figure 5. Scatterplot.

Partial interval recording is the preferred method for high-frequency and rapidly occurring behaviors. Whole interval recording is most often used for behaviors that occur continuously (e.g., sustained attention to an academic task). In momentary time sampling, the observer looks at the student only at predetermined points of time (i.e., at the beginning of the interval or at the end of the interval). This method is used when continuous observation of a student is not practical or when an observer is

measuring behaviors on several students in one setting. The results of the observations collected through interval-based methods are reported in terms of the number of percentage intervals in which the target behavior occurs. These results are estimates of the rate and duration of the behavior (Watson & Steege, 2003).

The scatterplot (see Figure 5) is considered to be an interval recording method (Miltenberger, 2001). This method involves recording the time of day that the be-

havior occurs over several days. The observer then visually inspects the data sheets to identify possible associations between the problem behavior, time of day, and related tasks or activities. By correlating the problem behavior with the time of day, tasks, activities, staff, and other variables, the observer can identify those variables associated with the problem behavior and generate hypotheses regarding possible cause-effect relationships (Watson & Steege, 2003). Remember that these hypotheses are only suggestive of functional relations.

### Experimental Functional Analysis

Experimental methods of conducting functional assessment are differentiated from indirect and direct descriptive methods in that they actually manipulate antecedent or consequent variables to demonstrate their effect on problem behavior. Experimental functional analysis is the only procedure that allows you to establish a functional relationship between antecedents and consequences and the problem behavior. The other methods discussed earlier provide correlational information and allow you to develop hypotheses about the antecedent and consequent variables controlling the target behavior, but they do not allow you to definitively determine functional relationships. To conduct a functional analysis, it is essential that someone with direct supervised experience in conducting functional analysis manipulations guide the procedure. The amount of risk needs to be determined, and appropriate permission needs to be obtained. Several trained staff members may be needed to maintain safety if the student exhibits aggressive, self-injurious, or running away behavior. Functional analysis procedures have been used more in research activities than in typical school settings (O'Neill et al., 1997).

Iwata and colleagues introduced functional analysis in their study of self-injurious behavior demonstrated by nine developmentally disabled individuals (Iwata, Dorsey, Slifer, Bauman, & Richman, 1994). Functional analysis entails exposing the individual to each of the possible maintaining conditions (social attention, access to tangible reinforcers, escape from aversive stimuli, and automatic reinforcement or sensory stimulation) and a control condition (free play) in a tightly controlled experimental design such as a multielement or reversal design. The behavior analyst controls the delivery and rate of reinforcement. Rates of the problem behavior in each condition are graphed, and the reinforcer in the conditions that produce high rates of problem behavior relative to a control condition are considered to be maintaining the behavior.

In the positive reinforcement (attention) condition, the student is ignored unless a target behavior occurs. Contingent on the occurrences of the target behavior, the behavior analyst makes statements of approval or disapproval or physically attends to the student to test for be-

havioral sensitivity to positive reinforcement by attention. In the positive reinforcement (tangible) condition, the student is given access to tangibles just prior to the start of this condition. When the condition session begins, the tangibles are removed from reach but are still within the student's view. Contingent on occurrences of the problem behavior, the student is given access to the tangibles for a brief period of time. During the negative reinforcement (escape) condition, the student is given tasks to do that are typically followed by the target behavior. If the target behavior occurs during the tasks, the task demands are removed until the next designated time the request or demand will occur. In the automatic reinforcement or sensory stimulation condition, the student is observed in a room with no access to preferred stimuli or attention. No consequences are provided. The purpose of this condition is to test whether the problem behavior occurs at higher rates in an austere environment and in the absence of social contingencies. This condition tests for automatic reinforcement (sensory stimulation) as the function of the behavior. In the play (control) condition, the student is provided with continuous access to preferred stimuli and attention and no academic demands are made. The play condition serves as a control because all reinforcers are freely available and it eliminates the motivation to exhibit the problem behavior. Behavior maintained by attention, escape, or automatic reinforcement should be less likely to occur during the control condition than in the other conditions. The occurrences of the problem behavior in each condition are graphed, and the reinforcer in the condition with the highest frequency of problem behavior is considered to be maintaining the behavior. Some behaviors can have multiple controlling reinforcers. This is demonstrated by high frequencies of problem behavior in several conditions (Vollmer, Marcus, Ringdahl, & Roane, 1995).

In some cases, only a few experimental conditions are used in functional analysis. This can occur if the behavior analyst has a specific hypothesis that he or she wants to confirm or disconfirm. For example, Miltenberger (2001) suggested that if after conducting indirect assessment and direct observation, you hypothesize that a student's behavior was being reinforced by attention, you might use two experimental conditions in your functional analysis. In one condition, attention would only be given after the problem behavior was exhibited. In the other condition, high levels of attention would be given noncontingently and no attention would be given after the problem behavior was exhibited. If the problem behavior occurred at a higher rate in the first condition and at a lower rate in the second condition, these results would confirm the hypothesis that attention was reinforcing the problem behavior.

Antecedents are sometimes manipulated to determine their influence on a problem behavior. For example, if it is hypothesized that a student misbehaves when she is

given hard math tasks to complete and her behavior is maintained by escaping these hard math tasks, you may manipulate the difficulty of the math tasks and observe her behavior. Examples of antecedents that may be manipulated in the classroom are providing novel tasks versus repetitive tasks; teacher-assigned tasks versus student choice of tasks; oral versus written tasks; difficult versus easy tasks (Watson & Steege, 2003). Other antecedents in the classroom that can be manipulated are location of the student's desk, location of the teacher, use of a predictable versus an unpredictable schedule, and the noise level in the classroom.

## Final Thoughts

FBA is a valuable tool for educators to use to determine the purpose of a student's problem behavior in a specific setting. The results from FBA need to be used to develop an effective BIP. Until we know the function of the student's behavior, we cannot design appropriate interventions to make the problem behavior irrelevant, inefficient, and ineffective for the student. In fact, we may make the behavior worse if we apply interventions that are not based on FBA. We also need to use the results of FBA to design teaching strategies, such as teaching an alternative or replacement behavior and teaching the student prosocial skills to get his or her needs met. Thinking functionally about student behavior can also help educators avoid blaming students for behavioral and academic difficulties and instead focus on what they can do to change variables in the educational environment to promote success for students exhibiting problem behaviors.

## ABOUT THE AUTHOR

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### Note.

#### Answers to Self-Assessment Quiz

- (1) positive reinforcement, (2) negative punishment, (3) negative reinforcement, (4) negative reinforcement, (5) positive reinforcement, (6) negative punishment, (7) negative reinforcement, (8) positive reinforcement, (9) positive punishment, (10) positive punishment.