Functional Assessments and their Importance

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Abstract

Functional assessments, their value, how they are conducted, and their relevance to selecting effective interventions are discussed. Functional assessments can help the professionals determine the purpose or function of a person's behavior. Once the purpose is determined, more relevant and effective interventions can be selected than when interventions are arbitrarily chosen. When functional assessments are used, the emphasis changes from what can be done to the person to stop the problem behavior to what changes can be made in the client's environments to enable them to achieve their potential.

Keywords: Functional Assessments; Interventions; Behavior

Why Must Behavior Intervention Plans Be Based on Functional Assessments?

As early as 1989, a National Institute of Health panel recognized the importance of functional assessments and recommended that treatment of severe behavior disorders be based on the results of pretreatment functional assessments [1]. Now, according to the Behavior Analysis Certification Board's (BACB's) Professional and Ethical Compliance Code [2], a functional assessment must be conducted before a behavior-reduction program is developed. And, as you will see, functional assessments are not only helpful when designing an intervention to reduce behavior, but they also are useful when teaching specific behaviors. Let's look why functional assessments are so important to behavior change programs.

The Value of Functional Assessments

First, let's review what a functional assessment (FA) does: It helps us to determine why a person repeats a particular behavior, or why is the behavior occurring at this time in this situation. What does the behavior result in for the person? What is the communicative intent of the behavior--what is the person requesting or protesting through the display of the behavior? Or, an FA helps us determine what is the behavior's purpose, function or reinforcing consequence.

The emphasis on functional assessments appears to be due to two major reasons. First, functional assessments (FAs) can improve the effectiveness and efficiency of treatment [3]. Because the results of an FA can help identify the purpose or function of a behavior, caregivers can be assisted through the information provided by an FA. For example, if the behavior's function is identified by the FA as escape from doing a requested activity, you would not want to use timeout on the misbehavior. If timeout were used in this situation, it would be providing the person with the escape, or the negative reinforcement that he or she seeks. Similarly, if the function of the misbehavior was attention, you should not use scolding because scolding might provide the sought after attention. These examples show that "interventions relevant to behavioral function are more likely to be effective than those that are arbitrarily chosen" ([4], p. 237). Information from a functional assessment, then, can be used by caregivers to avoid the misuse of behavior management procedures to enhance the intervention's effectiveness.

Secondly, until the more recent emphasis on functional assessments, punishment approaches were considered to be the most effective means of reducing severe behavior problems [5,6]. A major problem with using punishment approaches, however, is that they foster aggression (e.g., violence, assaults, vandalism), escape (e.g., tardiness, truancies, and dropouts), low self-concepts, and negative attitudes toward self, home and/or school [7-9]. They also tend to be dehumanizing. Thankfully, research (e.g., Iwata., *et al.* [4]) has shown that reinforcement approaches to behavior reduction that match behavioral function are usually just as effective as punishment approaches. Thus, functional assessments have become particularly relevant in responding effectively to the national trend of replacing punishment with reinforcement approaches in changing behavior. In fact, according to current ethical standards, the least restrictive procedures likely to be effective are to be used, and reinforcement procedures are to be used rather than punishment whenever possible. Let's look next at conducting FAs.

Collection of Functional Assessment Information

Functional assessment data are gathered from three sources: (1) interviews with significant others (e.g., parents, current and previous teachers, and others who know the individual well) and the individual (if at an adequate developmental level), (2) review of records and other assessment reports, and (3) direct observation. The following information must be obtained from these three sources: (a) information on the immediate antecedent events associated with the targeted inappropriate behavior, (b) information on the consequences to the targeted behavior to determine its function or purpose, (c) previously used interventions, (d) ecological factors or what we now call motivational operations (other antecedent events that influence the value, or magnitude, of immediate antecedents and consequences, such as how long has it been since the person has eaten - if food is to be used as a reinforcer, previous experience with requested activity, reinforcing and/or punitive nature of environment, etc.), and (e) any possible health and medical factors which may influence the student's behavior.

Functional assessments include three basic components. These three components form what is often referred to as a contingency, or ABC analysis, where the "A" stands for the antecedents, the "B" for the behavior(s), and the "C" for the consequences [10,11].

Behaviors (B): First, the problem and positive replacement behaviors must be operationally defined to facilitate communication among all involved parties, and so that the behaviors' severity can be measured. For example, if Mike engages in self-injurious behavior (SIB) during math, it might be operationalized as hitting his face with his fists. The positive replacement behavior might be completing his math without hitting. If the problem behavior was frequently leaving his table, the positive replacement behavior might be working on his assignment while at his table.

Antecedents (A): Next, antecedent events, including motivational operations, health and medical factors, are identified that predict the occurrence and nonoccurrence of the problem behavior. This also is done for the positive replacement behavior if it has occurred. For example, an antecedent event for SIB might be several instructions followed by several errors [12]. Antecedent events for working on the assignment without SIB might be academic materials that are adjusted to the student's level and that yield frequent success.

To obtain information that might help to predict the occurrence and nonoccurrence of the identified behaviors, answers to questions such as those in table 1 can be helpful.

Questions	Information Collected
What are the differing circumstances under which problem and replacement behaviors occur?	
What are the circumstances under which the problem behavior does NOT occur?	
Does the behavior (problem and/or replacement) occur at certain times of the day (e.g., individual resists stopping or starting an activity, transitions poorly, or has difficulty in non-structured activities)?	
Does the behavior occur only in the presence of certain people?	
Does the behavior occur prior to or collateral with any other behavior (e.g., doing an assignment)?	
Could the problem behavior be related to a social or an academic skill deficit?	
Does the problem behavior occur during certain seasons of the year?	
Does the problem behavior occur after eating certain food?	
Does the behavior occur after certain events in prior situations (e.g., in home, on the way to school, during recess)?	

Table 1: Gathering Information to Predict the Occurrence and Nonoccurrence of the Identified Behaviors.

Consequences (C): As the antecedents are being identified, it is helpful to determine what interventions have been used previously, and what possible functions, or purposes, do the problem and positive replacement behaviors serve. Four major functions have been

identified. These include escape (Does the individual attempt to escape or avoid an activity or person?); attention seeking (Does the person engage in the behavior to obtain attention?); access to materials, activities, or food (Does the behavior result in getting the person what he wants?); and sensory stimulation or automatic reinforcement (Is the behavior self-reinforcing?). One task of the functional assessment is to help determine which function, or combination of functions, are maintaining the problem behavior. Another task of the functional assessment is to determine what specific activities, food items, forms of attention and other reinforcers within the functional area are maintaining the behavior. Once identified, these reinforcers can often be rearranged to support acceptable replacement behaviors.

Sometimes the problem behavior serves multiple functions. For example, three individuals with varying handicapping conditions and ages were found to engage in self-injury or aggression that resulted in escape from difficult tasks in one condition, and to engage in the same problem behavior to obtain access to preferred items in another condition [13].

To further complicate matters, the function or reinforcer for a behavior can change over time. In other words, the problem behavior may occur initially to achieve escape from a difficult task. An intervention is set up that successfully reduces the behavior, but later the behavior starts increasing in occurrence again, even though the "effective" program is still in consistent operation. Upon conducting an additional functional assessment it is found that the problem behavior is now being used to obtain access to preferred items. Thus, as Lerman, Iwata, Smith Zarcone, and Vollmer [14] point out: "When relapse occurs following successful treatment to reduce problem behavior, it is often attributed to inconsistent implementation of maintenance programs. Although less likely, another potential cause for relapse is a change in the behavior's maintaining contingency over time" (p. 357). Thus, when relapse is noted, and the agreed to intervention is being implemented consistently, a current FA should be conducted to determine if new treatment components are needed.

Functional assessments, then, should not be viewed as one-time events. In fact, it's helpful to continue the assessment throughout the intervention in order to better understand changes in the behavior and to fine-tune the intervention. For additional information on conducting functional assessments, a manual is available [15]. Also, Mayer., *et al*. [11] have written a chapter addressing the topic.

Matching Behavior's Function With Intervention

It is clear that interventions that match the function(s) of aberrant behaviors are much more likely to be effective than those chosen arbitrarily. Thus, we will now address the four major functions that behavior serve and the interventions relevant to each function.

Escape/Avoidance

Currently, two types of escape have been identified. The most common involves task avoidance. For example, SIB and aggression often function to avoid or to remove demands, requests, or other aversive situations or activities [4]. Various activities acquire aversive properties by being paired with failure or punishment. Even the "failure to provide frequent reinforcement for appropriate performance during training may create a situation in which instruction per se amounts to aversive stimulation" ([4], p. 236). Thus, a person might respond to an instruction to do a difficult or non-reinforcing assignment by engaging in an aberrant behavior in order to escape having to do the assignment.

The second type of escape involves social avoidance. Some individuals with disabilities engage in aberrant behavior when they receive attention from others. Apparently, attention from others has been paired with, or is associated with, punishment for them. They will engage in aberrant behavior in order to get the person to leave them alone.

When escape/avoidance from tasks is determined to be the behavior's function, some appropriate strategies can include [4] (1) increasing reinforcement for compliance (a differential reinforcement procedure of alternative behaviors--DRA), (2) initially removing or reducing the task demands followed by gradually increasing demands during training, (3) teaching individuals how to seek help when faced with difficult tasks, (4) providing differential reinforcement for the absence of the inappropriate behavior (DRO), and (5) teaching alternative, acceptable ways of escaping, such as short work breaks.

When social avoidance is determined to be the behavior's function, the person would not be taught the alternative behavior of requesting assistance, as in task avoidance, for obvious reasons. One intervention strategy might be to pair social attention with other strong reinforcers, such as food, to help recondition social attention. Increased reinforcement for compliance (DRA) and for the absence of the aberrant behavior (DRO) also could be provided.

Avoid using procedures such as extinction and timeout with problem behaviors that are maintained by escape. The nonreinforcement conditions of timeout and extinction cannot be achieved; thus these procedures would be ineffective. Attempting to use them also would probably make the problem behavior worse, because the individuals would learn that if they engaged in the problem behavior they would be able to achieve escape--the behavior's function or reinforcer. This would result in reinforcing, or teaching, the very behavior targeted for reduction. For example, if Jim threw objects, engaged in SIB, or became aggressive when given attention or requested to do a difficult or aversive task, placing him in isolation would provide him with (negative) reinforcement in that he would get out of doing, or escape from, the aversive task or the attention. Similarly, if he were no longer responded to as a result of his problem behavior, he also would escape the aversive demands or the attention. Thus, all reinforcement from the problem behavior would not be withheld, as is required to make extinction effective.

Attention-Seeking

Sometimes when a person engages in an aberrant behavior in response to an instructional demand, the function of the behavior might be to obtain additional attention rather than to avoid the task. Thus, it is important not to assume that certain behaviors (e.g., noncompliance) serve a certain function (e.g., escape). Careful, thorough functional assessments need to be conducted to determine the behavior's function.

When the function of the behavior has been determined to be obtaining attention from others, a variety of possible interventions might be used effectively. Commonly used strategies have included: (1) Provide more frequent attention to decrease the need to misbehave in order to obtain the attention. (2) Place the inappropriate behavior on extinction. (3) Teach alternative acceptable behaviors, by using strategies such as DRA, DRO and modeling, that will provide the sought after attention (e.g., functional communication training). Timeout also has been used effectively on inappropriate attention seeking behaviors. However, its use should be a last resort because it is a punitive procedure.

Avoid using verbal reprimands and interrupting or redirecting the student's behavior because these strategies sometimes make the problem behavior even worse. These strategies provide attention for the problem behavior and thus need to be avoided.

Access to Materials, Activities, or Food

When the function of problem behavior has been determined to be obtaining access to materials, activities, or food, several strategies have been used successfully to reduce the problem behavior. One has been to deny access to the material, activity, or food for the problem behavior (i.e., implement extinction), while teaching and reinforcing alternative acceptable behaviors to achieve access. Another strategy has been to provide more frequent access to the material, activity, or food, but not contingent on the problem behavior. Response cost and timeout also have been used effectively [11], but their use should be a minimized because they are punitive procedures.

Sensory Stimulation or Automatic Reinforcement

Sensory stimulation can take various forms (e.g., waving hands in front of eyes when sitting in front of a light, rhythmic rocking, mouthing or biting hand, rubbing nose or ears lightly, masturbating, poking eyes, and scratching). Problem behaviors that produce automatic reinforcement usually occur when the individual is alone, perhaps to remove boredom. Thus, some strategies that have worked to reduce problem behaviors that are maintained by such sensory stimulation have involved (1) frequent or continuous access to alternative sources of stimulation, (2) response interruption and redirection, and, (3) the use of differential reinforcement strategies, such as DRO and DRA.

Avoid using withholding attention from the behavior, or placing the individual in timeout. Withholding attention from the behavior is not an application of extinction because it is impossible to withhold the self-reinforcement: The individual is likely to continue the self-reinforcement activity. Similarly, if placed in timeout, the individual is most likely to continue the self-stimulatory behavior during timeout. Thus, the non-reinforcing environment necessary for timeout to be effective is not achievable.

Examples of Matching Function with Interventions

Let's look at a couple of examples:

1. The problem behavior (B) is that Mike waves his hands and makes grunting sounds loud enough for everyone in the classroom to hear. As we do our FA of the antecedents (A), we find that this behavior occurs mainly when he is sitting in the back of the room, the teacher is in the front of the room or helping other students in the class. The consequences (C) for his behavior is that the teacher goes to him, talks to him about his bothering other students and tries to calm him down. The other students look at him and complain about his annoying them. We would like Mike to complete his assignments without waving hands and making grunting sounds (the goal B). This goal has occurred when he was sitting near the teacher, or the teacher was working with him. So, based on this analysis of Mike's behavior, what is the function of his inappropriate behavior? It's attention. When he is getting his teacher's attention, he engages in his goal or replacement behavior. However, when he has been left for a period of time without the attention, he misbehaves. And, his misbehavior works. It gets him the attention he seeks. Thus, instead of giving Mike attention following his disruptive classroom behavior, the attention could be used to reinforce his assignment completion without his disrupting the class. In other words, the teacher could talk to him and compliment him every so often while he is working on his assignments. Gradually, the frequency of the teacher's attention could be reduced as Mike begins to learn to work quietly.

2. Maria behavior (B) is she whines in an irritating voice, saying she has a stomachache, she has to go to the bathroom, or she's tired when it's reading time. This occurs in situations (A) when she has a new reading assignment; she is asked to read out loud, and when the level of reading is too difficult for her skill level. As a result (C) she is sent to the nurse, bathroom or to lie down. In other words it appears she is able to escape from a difficult reading activity by engaging in these behaviors. To provide further evidence, we find that when the reading material is at her level and the topics are of interest to her, she stays in her seat while actively working on her reading assignment. One possible solution, then, would be to match the reading material to her reading level and interests.

Functional communication training (FCT) is based on using FAs to identify the function (or purpose) of the behavior and then using that function, or access to that reinforcer, for engaging in a socially acceptable alternative behavior. Carr and Durand documented and evaluated FCT in several studies [16-18]. When working with children who had various developmental disabilities, their FAs determined that some engaged in a problem behavior to gain attention, others to escape task demands that were difficult for them. For those who sought to escape the task demands, they taught them to solicit assistance. For those who sought attention, they taught them more appropriate means to attain the attention they sought. By so doing, they were able successfully to reduce problem behavior and increase the children's use of verbal requests.

Table 2 presents the four functions and summarizes some potentially useful and harmful interventions for each function.

Function of Behavior	Potential Interventions
Escape/Avoidance	**For Task Avoidance:**
	Reinforce for Compliance
	Teach How to Seek Help
	Teach Acceptable Alternatives to Escape
	Reinforce for Absence of Problem
	Initially Remove/Reduce Task Demands and Then Gradually
	Introduce/Increase Demands
	For Social Avoidance:
	Pair Social Attention with Strong Reinforcers
	Reinforce for Compliance
	Reinforce for Absence of Problem
	Avoid
	Extinction (Ignoring)
	Timeout
Attention Seeking	Increase Attention for Appropriate Behaviors
	Use Extinction on Problem Behavior
	Teach Acceptable Alternatives for Attention
	(Functional Communication Training)
	Use Timeout as Last Resort
	Avoid
	Verbal Reprimands
	Response Interruption/Redirection
Access (To Material, Activity, or Food)	Deny Access (Extinction)
	Teach Acceptable Alternatives to Obtain Access
	Provide Frequent Non-Contingent Access
	Use Response Cost or Timeout as Last Resort
	Avoid
	Access to Material, Activity, or Food Following Problem Behavior
Sensory Stimulation	Increase Access to Alternative Sources of Stimulation
	Interrupt/Redirect Behavior
	Use Differential Reinforcement Strategies
	Avoid
	Withholding Attention
	Timeout

***Table 2:** Matching intervention to behavioral function.*

Concluding Comments

Treatment approaches based on behavioral function are becoming widely recognized, accepted, and in some cases mandated. The reason for this greater emphasis is that functional assessments can result in major reductions in the misuse of behavioral procedures, and in significant reductions in the use of punishment by parents, educators and other care givers. Functional assessments, then, focus on what changes can be made in the school and/or home that can create an environment more conducive for learning, rather than on what can be done to individuals to stop their "problem" behavior.

When conducting a functional assessment, always remember that antecedent conditions must be carefully considered along with the consequences. Within each major functional category there can be many variants that need to be identified for effective treatment planning. For example, under social avoidance, it might be discovered that self-injury occurs following the attention of specific adults, and not others. Or, within task avoidance, aggression might be more likely when a youngster is given a long task rather than a short one [17]. Sometimes a change in such antecedent conditions alone can substantially reduce the occurrence of the problem behavior. Thus, both antecedent and consequential factors must be analyzed in the functional assessment to obtain a clear picture of what might be the most effective intervention to employ.

A variety of effective interventions are possible, and depending on the situation, some are better than others. Also, the suggested interventions are only examples and are not meant to be comprehensive. Other interventions might be more appropriate in various contexts. Nor should it be assumed that the "best" intervention should always be recommended. The recommended intervention must be contextually appropriate. For as Horner [3] has so eloquently stated:

The goal is not to find the one true intervention, but to find an intervention that is effective and will be implemented by the people in the setting. An intervention is contextually appropriate if it fits with the skills, schedules, resources, and values of the people who must implement the plan (p. 403).

Therefore, it is usually best for the professional to involve care givers in the intervention selection process. By doing so, the selected interventions are much more likely to be based on the skills of the care givers, and they will feel greater ownership and commitment to the program: important factors if the intervention is to be implemented.

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