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Biographical Sketch: **Susan G. Friedman, Ph.D.**, is a psychology professor at Utah State University, specializing in applied behavior analysis (ABA), the technology of behavior change. Over the last decade, she has pioneered the dissemination of ABA principles, procedures and ethical standards to improve the quality of life for all learners.

FUNCTIONAL ASSESSMENT: HYPOTHESIZING PREDICTORS AND PURPOSES OF PROBLEM BEHAVIOR TO IMPROVE BEHAVIOR-CHANGE PLANS

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INTRODUCTION

“Any intelligent fool can make things bigger and more complex... It takes a touch of genius - and a lot of courage to move in the opposite direction.” Albert Einstein

Hidden in the complex world of behavior science is a simple, often underutilized, fact that there is never just behavior. Behavior never occurs in a vacuum or sprays out of an animal haphazardly like water from a leaky showerhead, independent of conditions. Behavior always depends on the environment in some way. Functional assessment is the process of developing hypotheses about the functional relations between behaviors and the environment. The hypotheses generated from a sound functional assessment improves our understanding of behavior and our ability to predict it. Functional assessment also improves the interventions we design to decrease problem behavior, increase appropriate alternative behaviors, and teach new skills.

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Respondent and operant responses are two basic types of behavior that depend on environmental events in different ways. Respondent behaviors are defined by their dependence on the presentation of certain antecedent stimuli, the events that occur before the behavior. Respondent behaviors are innate, built into the nervous system, in the sense that they are triggered by the eliciting stimulus automatically, without prior experience. For example, a puff of air directed at an animal's eye automatically elicits a blink (A causes B). In contrast, operant behaviors are defined by their dependence on consequences. Antecedent stimuli do not automatically elicit operant behaviors. Rather, operant behaviors occur at some frequency and are strengthened (increased) or weakened (decreased) depending on the consequences the behaviors produced in the past (B is a function of C). For example, a dog may increase the frequency of scratching at the door as a function of the caregiver opening it. The main focus of functional assessment is operant behavior, as so many problem behaviors are the result of poorly arranged antecedent signals and inadvertent reinforcement.

ANTECEDENTS, BEHAVIOR AND CONSEQUENCES

With operant behavior, the smallest unit of analysis is the three-term contingency antecedent-behavior-consequence, or ABC. From the perspective of the behavioral model, behavior is defined as what an animal does in certain conditions, which can be measured. Hypothetical, psychological constructs (e.g., intelligence, dominance, motivation) and vague, diagnostic labels (aggression, anxiety, and obsessive-compulsive disorder) are not behaviors -- they are concepts and concepts cannot cause behavior. As a result, these descriptions are often barriers to understanding and changing behavior. With functional assessment, the focus is on what we most need to know -- observable behavior and conditions. This focus on observable behavior does not discount the existence of animals' private

cognitions and emotions. It simply represents adherence to the most fundamental standard of scientific practice: measurability. As measurement technology improves, it may be that internal correlates of behavior such as changes in heart rate, can improve our work with certain species and behavior problems.

Consequences are the engine that drives the future strength of operant behavior -- the very purpose of behaving. Antecedents are the signposts that signal the behavior-consequence (B-C) contingency immediately ahead. For example, an offered hand (A) may set the occasion for an animal to approach (B), which results in human attention (C). Over time, approach behavior may increase as a function of attention, in the presence of an offered hand. The offered hand is a predictor of the approach-attention contingency, and attention is the purpose the approach behavior serves. An animal doesn't approach *because* it's sweet; it's called sweet because it approaches. For a different individual, an offered hand (A) may signal a different B-C contingency – approaching (B) results in confinement in a crate (C). For this second animal, approaching may decrease as a function of confinement in the crate and the offered hand may predict biting will be reinforced by escape from the crate. This animal doesn't bite because it's dominant; rather, it's called dominant because it bites.

It is the nature of animal behavior to change what they do, based on the outcomes of doing it. In this way, behavior is selected by consequences¹: Behaviors that produce desired outcomes are repeated; behaviors that produce aversive consequences are modified or suppressed. Behavior is a purposive tool, part of every animal's biological endowment, used to affect the environment. Even bacteria change what they do based on the consequences of doing it.²

FUNCTIONAL ASSESSMENT

Functional assessment requires observation skills that client's can quickly develop. The following key questions will help focus their observations on the ABCs:

- What does the problem look like in terms of actual behavior, i.e., what do you see?
- Under what conditions does your animal do this behavior, i.e., what events predict it?
- What does your animal get, or get away from, by emitting this behavior?
- Under what conditions does your animal not do this behavior, i.e., when is it successful?
- What do you want the animal to do instead?

The answers to these questions will improve clients understanding of the problem behavior and their ability to predict and change it. Examining the ABCs reveals that there really are no problem behaviors; there are problem situations. The problem behavior is only one element of problem situations. The other two elements, occasion setting antecedents and functionally related consequences, are environmental elements that can be changed. Through the process of functional assessment, caregivers are better prepared to take responsibility for their animals' problem behavior and then change conditions that maintain it. Without this information, they may inadvertently make the problem behavior worse with a faulty solution.

CONSIDERATIONS FOR DESIGNING A BEHAVIOR-CHANGE PLAN

Reducing problem behaviors is not the only goal when planning an intervention. A good plan is one in which the physical and social context of the environment are redesigned to provide the animal with an opportunity to replace the function served by the problem behavior with an acceptable alternate behavior, and to allow the animal to learn new skills that make the problem less likely to occur. The focus on replacing the function of a problem behavior with an appropriate alternative is fundamental to understanding behavior and respecting behaving organisms: If the behavior didn't matter to the animal, it wouldn't keep doing it. For example, the function typically served by biting is to remove someone's hand, i.e., to say no. Since all animals have a right to say no, our first goal should be to replace biting with an acceptable way to say no, e.g., leaning away or vocalizing. Our second goal is teaching the animal that saying yes, by approaching, yields even better outcomes.

O'Neill et al.,³ describe four considerations to increase the effectiveness and efficiency of behavior change plans: First, behavior support plans should describe how the client plans to change the environment to promote and maintain appropriate behavior. This is accomplished by changing a wide

range of conditions such as medications, diet, physical settings, schedules, exercise, training procedures, and the use of rewards and punishers. It is also important to describe in detail exactly who in the family will do what and when. To change animal behavior, we change what we do, including the environment we provide.

Second, there should be a clear link between the functional assessment and the intervention plan. For example, a functional assessment may reveal that a dog repeatedly chews the floorboards to gain sensory reinforcement. Therefore, the intervention plan to reduce this behavior should identify what alternative behavior the animal can use to accomplish this goal in a more acceptable way (e.g. the dog can chew a variety of approved items). The intervention should also identify new behaviors to teach the dog (e.g., use stimulating puzzle toys). See Figure 2 for a diagram of the problem behavior, replacement behavior and desired behavior paths. The main focus of an intervention plan should be on what an animal should do instead of the problem behavior, not on what it should not do. Thus the importance of asking, what do you want the animal to do instead?

Third, behavior change plans should be technically sound. A technically sound plan is one that adheres to the scientific principles of learning and behavior in order to make the problem behavior irrelevant, inefficient, and ineffective. A problem behavior becomes irrelevant when an alternate behavior provides the same, or more, reinforcement. A problem behavior becomes inefficient when, compared to the wrong behavior, the right behavior can be performed with less effort, fewer responses, and results in quicker reinforcement. And, a problem behavior becomes ineffective when the maintaining reinforcer is reduced or withheld each time the behavior is exhibited.

Fourth, the behavior-change program should fit the client's setting and skills. The best strategy is the one that can be implemented effectively by the people responsible for the plan. Interventions should fit the client's routines, values, resources, and skills. A good plan is effective in helping the animal and also results in reinforcing outcomes for client, in both the short and long run.

The following worksheet will help structure client's understanding and prediction of the problem behaviors, and design of a behavior-change plan using the most positive, least intrusive, effective methods.

FUNCTIONAL ASSESSMENT AND INTERVENTION DESIGN (FAID) FORM

1. Observe and operationally define the target behavior.
 - a. What does the animal do that can be observed and measured?
2. Identify the distant and immediate physical and environmental antecedents that predict the behavior.
 - a. What general conditions or events affect whether the problem behavior occurs?
 - i. Medical or physical problems?
 - ii. Sleep cycles?
 - iii. Eating routines and diet?
 - iv. Daily schedule?
 - v. Enclosure and activity space?
 - b. What are the immediate antecedents (predictors) for the problem behavior?
 - i. When, where and with whom is the behavior problem most likely to occur?
 - ii. Does the behavior immediately follow a caregiver's demand or request, or a person entering or leaving the environment?

- c. When is the animal most successful, that is, when doesn't the problem occur?
3. Identify the consequences that maintain the problem behavior, i.e., the immediate purpose the behavior serves.
 - a. What does the animal gain by behaving in this way, such as attention, an item or activity, or sensory feedback?
 - b. What does the animal avoid by behaving in this way, such as particular people, a demand or requests, items or activities, or sensory stimulation?
 - c. To what extent does the animal's natural environment support the behavior (i.e., what function might it serve)?
4. Develop a summary statement describing the relationships among the antecedent predictors, the behavior, and consequence for each situation in which the behavior occurs (Figure 1).

<p style="margin: 0;">Distant Antecedents: This 1 year-old dog was re-homed after spending its first 6 months loose in a dark basement with 7 others dogs. It was malnourished and under-socialized.</p> <p style="margin: 0;">Antecedent: When I offer my hand</p> <p style="margin: 0;">Behavior: dog growls</p> <p style="margin: 0;">Consequence: to remove my hand</p> <p style="margin: 0;">Prediction: Growling will continue/increase</p>

Figure 1. Functional Assessment Summary Statement

After the functional assessment summary statements have been developed, the primary caregiver can respond to the following questions to design the behavior-change program.

1. Replacement behavior: What existing alternative behavior would meet the same purpose for the animal?
 - a. Rather than _____
(Identify the problem behavior)
 - b. This animal can _____
(Identify the replacement behavior)

Example: Rather than growling, this dog can take a step back.
2. Desired behavior: What behavior do you ultimately want the animal to exhibit?
 - a. When _____
(Summarize antecedents)
 - b. This animal _____
(Identify desired behavior)
 - c. In order to _____

(Summarize “payoffs”)

Example: When I offer my hand, this dog will walk to my hand and touch it with his nose, in order to get a treat.

3. What has been tried so far to change the problem behavior?
4. Preliminary strategies: Can I do something differently or change something in the environment so that the behavior doesn't occur in the first place?
 - a. I could make adjustments related to WHEN the problem behavior is likely to occur by:
 - b. I could make adjustments related to WHERE the problem behavior is likely to occur by:
 - c. I could make adjustments related to the ACTIVITY during which the problem behavior is likely to occur by:
 - d. I could make adjustments related to the PEOPLE present when the problem behavior is likely to occur by:
 - e. I could teach/re-teach a behavior such as:
 - f. I could adjust some aspect of the environment by adding, removing or changing an item or condition such as?
 - g. Other adjustments that can be made are:
5. Training strategies: What skill(s) will the animal need to be taught in order to successfully demonstrate the replacement behavior?
 - a. Who will provide the training?
 - b. When will the training take place?
 - c. Where will the training take place?
 - d. How often will training take place?
 - e. How and how often will opportunities for practice be provided?
6. Reinforcement procedures: What will I do to increase the occurrence of the replacement/desired behavior?
 - a. Identify potential reinforcers: What preferred items, activities or people might be used as incentives in an intervention for this animal?
 - b. Establish specific behavior criteria: What exactly must the animal do to earn the above reinforcers?
 - c. Determine the schedule of reinforcement: How frequently can the animal earn the above reinforcers. Typically, continuous reinforcement (a reinforcer for every correct behavior) is best.

7. Reduction Procedures: What will I do to decrease the occurrence of the problem behavior?
 - a. I will ignore all occurrences, immediately attending to something else by:
 - b. I will stop and redirect each occurrence of the behavior by:
 - c. I will implement time out from positive reinforcement by:
 - d. Other strategies:
8. Implementation details: What other details or explanations would help another person implement this plan accurately and consistently?
9. Tracking change: How can I monitor the animal's behavior so I have a reliable record of progress and can continue or modify the plan as needed?
 - a. Describe exactly how data will be collected and recorded.
 - i. Frequency count of the target behaviors across the day.
 - ii. Frequency count from ___:___ am/pm to ___:___ am/pm
 - iii. Timing duration of target behaviors.
 - iv. Other
10. Evaluating outcomes: This program will be considered successful if what outcome is achieved by both the animal and the caregivers, under what conditions?

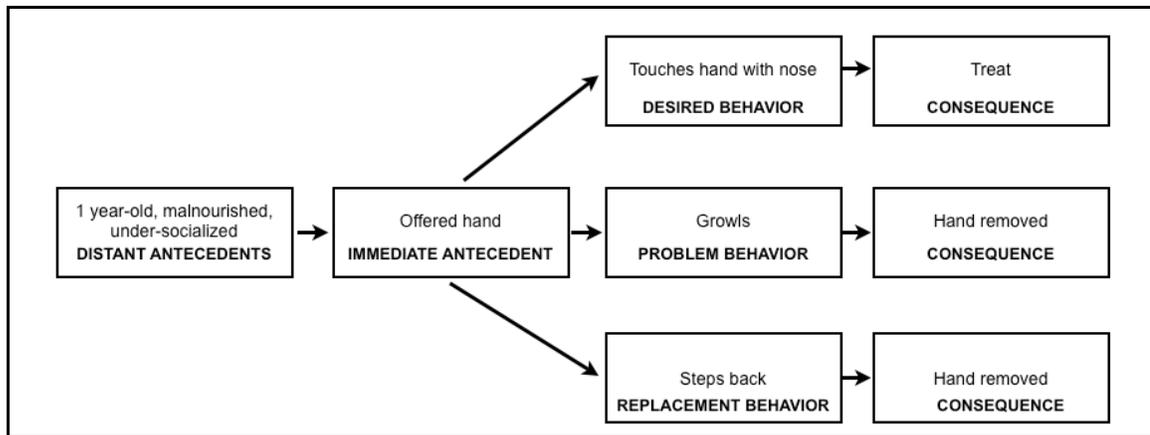


Figure 2. Diagram of Problem Behavior, Replacement Behavior, and Desired Behavior Paths

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