How to Apply Behavioral Science to Daily Avian Healthcare

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A solid understanding of standardized methods for the identification, description, evaluation and address of these problems still remains inconsistent for most veterinarians caring for birds in general practice. In the absence of standardized ability to recognize and document problems or proactively discuss behavior, relatively advanced states of behavioral problems can logically be expected to be seen in practice. Iatrogenic behavioral problems are more likely to occur in avian practice, where behavioral science is not critically applied. The use of force and coercion as a first option, rather than seeking less intrusive and often more effective options still remain common ethical problems in the daily delivery of avian healthcare. By using and critically applying the principles of applied behavioral analysis, practical methods with which behavioral science can be applied in daily practice will augment ethical healthcare delivery.

The ABC's of describing behavior

The simplest manner of describing and initial evaluation of a behavior is through the use of the ABC's of behavior. The letters stand for the three elements of a simplified behavioral "equation" which includes the ***A**ntecedents*, ***B**ehavior*, and ***C**onsequences.* With this simple descriptive and analytic strategy, we seek to identify through careful observation the events and conditions that occur before a specific behavior – ***A**ntecedents*, as well as identifying the results that follow the ***B**ehavior;* its ***C**onsequence*s. When paired with keen observation skills and creative problem solving abilities, the ABC's help us clarify the way in which the basic components of behavior are interrelated. It is this clarity that leads us to important insights and more effective teaching or training strategies. The ABC's can also be used to help us identify problem situations and consequences that have a formative role in some behaviors too. By describing a behavior in the context that it is occurring, one is more optimally positioned to describe problem behavioral situations and therefore has more opportunity to alter them. There are six steps to analyzing and utilizing the ABCs in a behavior-change strategy: (1) describe the target behavior in clear and observable terms; (2) describe the antecedent events that occur and conditions that exist immediately before the behavior happens; (3) describe the consequences that immediately follow the behavior; (4) examine the antecedents, the behavior and the consequence in sequence; (5) devise new antecedents and/or consequences to teach new behaviors or change existing ones; (6) evaluate the outcome.

The liabilities of constructs

A common and pervasive barrier to our ability to ability to scientifically break down a behavior and quantify the conditions under which it occurs is the use of constructs as descriptors for what we see. A *construct* is an interpretive assessment of a characteristic of an animal, often used to describe and explain its behaviors. A *behavior* is a specifically described action, and would ideally be described in context with antecedents and consequences. The use of constructs can function as a trap of categorical thinking or interpretation that can very easily lead the best avian veterinarian astray from a more complete and multidisciplinary approach to integrating behavioral science into exam room experiences and patient treatment regimes. These constructs or labels can result in the following liabilities for the animal: (1) Labels are based on circular reasoning that is not scientifically verifiable. (2) Labels can become self-fulfilling prophecies, (3) Labels can predispose us to using ineffective, forceful, or harmful strategies, (4) Labels create a false sense of having explained behavior, when all we've done is named it, thereby ending the search for actual causes we can do something about, and (5) Labels provide excuses to get rid of the animal or write off treatment failures.[1] Some examples of constructs that are commonly encountered in avian practice may include: The bird is a psychogenic feather picker", "This bird knows that I respect it", "This bird is a mutilator", "That bird is hormonal", "This bird is angry" (or jealous or mean, dominant or bored). The indiscriminate clinical use, application and acceptance of these constructs can easily predispose veterinary healthcare providers and their patients to the liabilities listed above, and departures from evidence-based medical principles.

Fundamental laws of behavior and their applications

One of the most fundamental principles of behavior is known as The Law of Effect. Simply, this law states that "behavior is a function of its consequences". In other words, the frequency of a response is changed by the consequences that follow that response. The Law of Effect is applied with two basic concepts: reinforcement and punishment. (Table 1) Any behavior that is being maintained or increased is being reinforced. Conversely, a behavior that is being decreased is being punished. Both of these changes in the frequency of a specific behavior can be influenced by the introduction of a stimulus, or the removal of one. The most functional stimulus that drives how a behavioral response by an individual is learned is the consequence(s) of that behavior in the past. Reinforcement is not necessarily a good thing, and punishment is not necessarily a bad thing. It all depends on context and details. Reading from the left, if a stimulus is added to the animal's environment as a result of its behavior, this is defined as positive. Then, evaluating the observed or probable frequency of the behavior in the future if there are no antecedent or consequence changes made, we can assess if the stimulus is functioning as a positive reinforcer (+R), or a positive punisher (+P). If the behavior increases or is maintained, the introduced

stimulus is functioning as a reinforcer. Although people often think of reinforcers as rewards, that can be misleading. Rewards generally refer to prizes, trophies or accolades, but many reinforcers in reality don't fit that image. Conversely, if the behavior decreases, the introduced stimulus is a punisher. If an animal's behavior results the removal of a stimulus from its environment, this is defined as negative. Based on the observed or probable frequency of the behavior in the future assuming that there are no antecedent or consequence changes made behavioral consequence of this removed stimulus, we can assess if the stimulus is functioning as a negative reinforcer (-R), or a negative punisher (-P).

Table 1: The Basic Paradigms of Reinforcement and Punishment

	Operant Response Increases	**Operant Response Decreases**
Stimulus Presentation	Positive Reinforcement (R+)	Positive Punishment (P+)
Stimulus Removal	Negative Reinforcement (R-)	Negative Punishment (P-)

Ethically, behavior change is most ideally accomplished through the use of positive reinforcement, followed by negative punishment, negative reinforcement and finally and lastly, positive punishment. In any one give specific behavior change strategy, combinations of these methods may be selected and mixed, in order to emphasize consequential (and reinforcing) value of desired behaviors, while at the same time de-emphasizing consequential (punishing) value of undesired behaviors. Frequent punishment increases the probability of four side effects detrimental to the quality of life of all animals. These side effects include increases in aggression, apathy, generalized fear, and escape/avoidance behaviors. Unfortunately, these side effects are often seen among captive parrots and other avian species, and may be more commonly seen during or following veterinary treatment procedures than we believe. When we recognize them, observations could lead us to consider if they could represent a failure, collectively, on our parts to train or teach our patients with more truly effective methods. There are almost always positive reinforcement alternatives to punishment.

"Capture and restraint"

Most of the major veterinary textbook references describe methods of capture and restraint of birds for examination and/or treatment. Some describe more forceful techniques than others, but all tend to gloss over such an important and ethical/moral issue of "best practice" for handling and restraint of companion and aviary birds. Often there is an emphasis on the need for speed to get the job done, and the outcome of this effective job completion is used as justification for the methods utilized. Effectiveness, however, does not justify methods. Well documented problems associated with time and repetition using these forceful and intrusive approaches to restraint and patient treatments can include: (1) Increases in learned fear-eliciting stimuli, (2) Increased probability of learned aggression, (3) Increased risks to the bird and handlers when the birds are being examined, (4) Increased risk of problems during medical procedures, and (5) Increased difficulty interpreting some laboratory diagnostics, due to iatrogenic and stress-influenced changes.

Using food for reinforcement and motivation

A primary reinforcer is any item which is necessary for the survival of the species, and that when acquired, functions to increase or maintain the frequency of a behavior (typically the acquisition of the item). Secondary reinforcers are those that are dependent on their association with other reinforcing items. These secondary reinforcers are also referred to as conditioned reinforcers, in that there was conditioning or learning required in order for them to become effective, as opposed to the innate value of a primary reinforcer. Both primary and secondary reinforcers can be used as valuable training and behavior modification tools. When trying to optimize the use of food as a motivating reinforcer, one should be aware of factors that can reduce the bird's motivation. These can include (1) New environment, (2) New trainers/people, (3) Other environmental distractions, (4) Physical exhaustion, (5) Illness, (6) Excess heat or cold, (7) Objects blocking the identified path animal is to take, (8) Confusion, unclear cues, or too many people requesting behavior at the same time, and (9) Poor training strategies, reinforcing inappropriately. Although some of these factors are certainly present when working with hospitalized birds that may be physically ill, they should not be viewed as insurmountable obstacles to teach and shape behaviors in-house. With clear antecedent arrangement strategies, deliberate actions and careful interpretation of the bird's behavior, successful avoidance of teaching new fear-eliciting stimuli as well as desired behavior-change can be occur.

Food can be used for motivation for a variety of enrichments that can add to the quality of life for in-patients as well as birds at home. Enrichments are generally designed to add to food acquisition behaviors (foraging), to enable play behaviors, to add to social engagement activities. These enrichments of daily maintenance behaviors are taught using solid principles and often through a series of approximations. Attention to detail can be the difference between success and failure. The "Best" conditioner for an individual bird could be food or social interaction.

Desensitization and counter-conditioning

In the examination and consultation rooms, most veterinarians are "trapped" in many ways. There is a finite time in which a physical examination must be performed. There will be events that must occur which could be painful, will be frightening, and unpleasant. Many birds are physically ill, malnourished, confused, and have been sometimes pre-conditioned with inappropriate behaviors for this type of setting. Many birds have already learned to react with fear when they recognize stimuli that are associated with transportation to the veterinary office or examination procedures. These may include specific people, the carrier, the car, the towel, or the general consultation room environmental setting. Desensitization (habituation) gradually accustoms an animal to a stimulus to which it initially has an undesirable response. In most cases, the undesired response is anxiety or fear and the animal's consequent behaviors. Desensitization is generally preferred to flooding, in which an animal is forced to experience a fear-inducing stimulus until its fear response extinguishes. Counter-conditioning refers to the teaching / training of alternative behaviors that may be physiologically and/or behaviorally incompatible with the undesired response. Executed properly, desensitization and counter-conditioning are not stressful, can be conducted in a series of short sessions whenever the owner has even a few minutes to work on the treatment, and often strengthens the human-animal bond.

Applying behavioral science in the hospital setting

Antecedent arrangement

By making changes in the environment in which a desired behavior occurs, one can increase the probability of its occurrence. In the hospital environment, a bird is understandably in a new environment and there are new stimuli present. By working to reduce or eliminate stimuli in the environment that can generate or augment fear or anxiety, training can be implemented more successfully to teach and shape desired behaviors. The manner in which a hospitalized bird is approached, handled and restrained is also a necessary set of antecedents requiring critical evaluation. The associated stimuli and experiences a bird encounters with forceful handling and restraint methods can have a marked effect on how the bird learns undesired and new fear-eliciting stimuli. What was merely fear of being physically restrained can easily become linked to the specific people present, sounds that occurred at the same time, the carrier, towels the owner or trainer, or other stimuli. Generalized fear easily functions as a barrier to the ability of caretakers to teach new behaviors (medical behaviors, etc) or other behaviors that can aid in its recovery. Procedures that predictably generate fear-associated behaviors should be identified and reduced, with efforts to counter-condition more ethical alternatives whenever possible.

Diet conversion

An overabundance of food, foods high in fat and calories, and too many food choices can all contribute to a myriad of medical, nutritional and behavioral problems in birds. As a result, dietary modification is a common necessity of the medical care or preventative husbandry changes to be provided for many birds. More traditional methods of dietary conversion that rely on force or coersion often use negative reinforcement methods, where a desired behavior (diet change) is increased in order to avoid an undesired stimulus (hunger). Accompanying the use of these types of methods is the risk of starvation and stress. These teaching methods often lack the strategy of teaching a mechanism to maintain or strengthen the behavior (a primary or secondary positive reinforcement) in the absence of the aversive stimulus (hunger). Modeling and the use of other innate social feeding stimuli can be incorporated with a dietary conversion plan, using these stimuli can: 1) reduce perceived stress, 2) add in a variety of potential reinforcement for diet change, and 3) increase the strength and desire of the bird to do the new behavior (diet change) for increased consequential value. These types of strategies that seek to structure, teach and incorporate primary and secondary reinforcement for the target behavior (dietary change) generally offer a more balanced and ethical alternative than force and coercion alone.

Redirection

There are situations where varying degrees of pain and stress are unavoidable in veterinary situations when treating injured or ill birds. Birds should be empowered to diffuse stress, whenever known or suspected to be present. Functional disempowerment can lead to a number of undesired effects, which may include the development of undesired behaviors, increases in escape and avoidance behaviors, aggression, apathy and generalized fear. Redirection is often used very effectively in many clinical situations to minimize or even functionally immunize birds from these types of adverse effects. A simple example of redirection may include the provision of "tabs" on a bandage that a parrot may chew, thereby reducing its probability of chewing on the bandage itself. Other examples are: providing strategically positioned rolled paper or other items to shred and chew, and scattering desired food items to increase the bird's focus toward food acquisition and chewing, rather than self-injurious behavior. Redirection temporarily removes focus from undesired stimuli in the bird's environment, and can concurrently enable the initial components of a desensitization plan. Possibly more importantly, redirection done properly provides the bird with something to do (albeit often completely unrelated often to the specific source of stress/discomfort).

Foraging

All living things are built to behave. Enrichment strategies for the inpatient and outpatient are designed to add to their behavioral inventory, thereby improving welfare. Adding to the concepts mentioned with redirection, enrichment of foraging behaviors offers even greater value to the mix. Foraging behaviors are taught in serial approximations, and are specifically tailored to meet the needs of an individual bird and its current situation. These learned food acquisition behaviors offer opportunities for redirection, counter-conditioning components to behavior-change strategies, components of a systematic desensitization plan, and often can be initiated easily during a bird's hospital stay.

Target training/medical behaviors

Target training loosely provides the trainer with the ability to tell an animal where to go (and what to do) in order to receive reinforcement. The animal is taught that when a target is provided (antecedent), by touching it (behavior), it can receive reinforcement (food item). This form of training has a foundational role in the training of many medical behaviors. The benefits of target training can be immense. By training a bird to come to, and touch a syringe, reinforcement may be delivered either from the syringe (tasty liquid), or separately with the trainer's other hand (food item, etc). Both of these scenarios can easily be expanded through a rapid succession of approximations to "hold" on the syringe, allowing oral medications to be delivered without restraint. In addition, target training can enable birds to be directed to a station for weighing, to move to different enclosures for cleaning, and to interact with veterinary personnel in a manner that offers less pain, fear or need for force. These types of experiences build confidence, enable redirection and desensitization, and favorably impact quality of life and prognosis.

Conclusions

The time to include behavior as a part of daily avian medical practice is now. Behavior needs to be discussed, recorded and addressed as a component of most physical examinations. Consideration needs to be forefront in our minds that some of our commonly accepted and "routine" capture and restraint techniques are not in reality causing behavioral problems in birds. Change is not easy, and it is hard work for us to learn to replace habit and complacency with scientific knowledge, and new methods. Three most important skills of clinical thinking are 1) stick with behavioral explanations that can be observed and measured; 2) consider alternative explanations for what you observe that are based on the interaction between behavior and the environment; and 3) ask your clients who are making assertions about their parrots, "How do you know that?" By thinking, talking and actually working towards the identification and address of behavior concerns with companion birds, the quality of healthcare for these animals can be dramatically improved, considering the current bleak reality of sound behavioral guidance in practice. Behavioral issues that are noted, explained, and that are responsive to simple corrective maneuvers during the examination are easily appreciated by most pet bird owners. This palpable recognition by the people attached to these birds of our behavioral counseling skills results in a greater probability of return visits, and more opportunity for veterinarians to deliver a more complete preventative health package in the future for bird, owner, and veterinarian.

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