BEHAVIORAL MANAGEMENT

Definition

Behavioral management is a pro-active approach to managing captive animals that is designed to provide the best care and the highest level of well-being. The primary techniques are environmental enrichment, positive reinforcement training, and problem solving. It involves giving consideration to operational procedures, social setting, and facility issues, and the modification of these when necessary. A behavioral management approach also includes assessing and measuring the efforts we make in order to determine if what we are doing really works.

Components of Behavioral Management

- Positive reinforcement training
- Environmental enrichment
- Facilities issues
- Operational considerations
- Problem solving
- Social situation
- Assessment

Comprehensive behavioral management programs require support and/or involvement of all departments including animal care, administration, operations, facilities, veterinary, horticulture, education, and public relations. Behavioral management programs should include:

- Accountability
- Efficient approval process and multi-directional information flow
- Animal and handler safety protocols
- Well trained staff with continuing education for animal care and support staff
- Record keeping

The techniques of behavioral management require time, staff training, and practice to master. When given the opportunity, often a core of skilled keepers and care staff will emerge and be instrumental in program implementation and growth, as well as mentor new staff.

Benefits

Behavioral management programs offer many benefits for animals, staff, and the institution as a whole by integrating all 5 components to meet behavioral, social, psychological, and physical needs of the animals. It also provides a formal approach to problem solving that includes and offers more options for resolving problems.

An animal's behavior is the standard for judging physical and psychological well-being.

The presence of abnormal behavior (e. g. stereotypic behavior like pacing, swimming in repetitive patterns, head rolling, over-grooming, etc.), may be an indication of poor well-being. The absence of appropriate and species-typical behavior (e. g. foraging, reproductive and maternal behaviors, locomotor skills, body maintenance, territorial behavior, etc.) may also suggest a reduction in well-being. A behavioral management approach has tremendous potential to directly and positively affect changes towards enhanced well-being.

Behavioral management programs can:

- Enhance psychological well-being
- Address governmental and/or accreditation regulations
- Enhance public relations
- Improve visitor and community education
- Reduce risk of staff injuries
- Reduce animal restraint situations
- Reduce animal aggression towards staff, conspecifics, and enclosure mates
- Reduce animal costs
    - enhanced health care of animal
    - reduced use of anesthesia
    - reduction of aggression-related injury
- Improve job experience
    - enhanced keeper/animal relationship
    - increased job skills and marketability

Positive reinforcement training to improve well-being:

- ✓ Give animals more choices to promote control and yield agency - Participation is voluntary!
- ✓ Increase behavioral diversity with a repertoire of natural species-typical behaviors
- ✓ Use desensitization to reduce fear and anxiety which reduces stress
- ✓ Increase physical activity, mental stimulation, and behavioral diversity to promote fitness, flexibility and resilience
- ✓ Increase physical activity contributing to good health and physical fitness
- ✓ Improve social interactions by increasing affiliative behaviors and reducing aggression
- ✓ Reduce stereotypic and abnormal behavior
- ✓ In a nutshell, use PRT to teach animals to: cope with stressors, not be afraid, build confidence, teach normal social behavior, accept novelty, learn to explore, and engage within their environmments

Enrichment to improve well-being:

- ✓ Mental stimulation
- ✓ Physical health and stimulation
- ✓ Feeling of safety and security
- ✓ Dynamic spaces
- ✓ Provide behavioral alternatives for aberrant behaviors

Reducing Stress

Stress is a part of everyone's life, both people and animals. But when an animal is exposed to high levels of stress over extended periods of time or with no opportunity to escape the stressor (called "distress") negative consequences ranging from behavioral abnormalities, to stereotypic and neurotic behaviors, to illness can result. If an animal is fighting an illness or injury, any excessive stress can cause that condition to become a more serious problem. Stress can come from many different sources, including:

- Social problems within a group of socially housed animals, normally social animals housed alone or in inappropriate social groupings, or in animals normally solitary that are group housed
- Exposure to fearful or uncomfortable situations, events, places, and people
- Boredom and sensory deprivation
- Sensory overload or exposure to excessive visual, auditory, or olfactory stimuli
- Negative or inappropriate training techniques
- Inappropriate physical environment
- Inappropriate behavioral requirements (most often in a show setting)
- Unreasonable training objectives and criteria

Stress is a normal part of life. But when levels are high, and the ability to cope is reduced or hampered, physical and psychological problems may result. Therefore, stress is something anyone caring for animals must always think about and attempt to minimize and address.

TRAINING INTRODUCTION

There are probably as many different ways to train an animal as there are trainers attempting the task. What makes our job even more confusing is that there are often several correct ways to teach an animal the same behavior. There are also numerous wrong ways and mistakes that can be made. Recognizing those problems is an important part of being a good trainer. Consider this information as a guideline to help make best decisions when planning, designing, and implementing training activities.

Simply put, training is TEACHING! Being trained is LEARNING. It takes a cooperative effort by both teacher and student to make any training situation successful. And teaching and learning goes both ways – Sometimes we are the teacher and sometimes the student. Listen and learn from the elephants; they have a lifetime of experiences they use to make choices about how they will react to a given situation and we, as their keepers and trainers can never forget this.

Training is a dynamic and responsive process. It is 'in the moment' and you must be prepared to make minor adjustments based on the animal's behavior and situation. Training involves communication between the animal and the trainer. Training ALWAYS happens – each interaction with an animal is a learning opportunity . . . so make it a positive and meaningful experience for the animals.

We teach animals to do four basic things:

- Make a movement
- Hold a location
- Recognize a cue or stimulus/stimuli and respond correctly
- Tolerate the presence of various sensations or stimuli (feelings, sights, sounds, etc.)
- Additionally, train for emotional state such as calm and relaxed behavior

Behavior is modified through the use of operant conditioning which offers three methods to train, maintain, and eliminate behavior (see terms list for definitions):

- Positive reinforcement – increases chance of a behavior recurring
- Negative reinforcement/escape avoidance – increases chance of a behavior recurring
- Punishment – decreases chance of a behavior recurring or eliminates behavior
- Extinction – decreases chance of a behavior recurring or eliminates behavior
- Combinations of all or some of these influence behavior and are used

Operant conditioning occurs in a step-by-step process that looks like the following:

STIMULUS → **RESPONSE** → **REINFORCEMENT/PUNISHMENT**

It is important to understand that training occurs all the time, whether intentional or not. Every time anyone interacts with an animal, there is some training/communication occurring. This includes keepers, trainers, veterinarians, and other staff, and even the public. The more frequent the interaction, the more established the resultant behaviors become. Training also goes both ways, and sometimes we are being trained very effectively by the animal.

Reinforcement and Punishment (see terms list)

Comparing Positive Reinforcement Training (PRT) and Negative Reinforcement Training (NRT): NRT works and it works quickly, but consider the animal's experience with PRT compared to NRT:

- The animal MUST dislike the negative reinforcer otherwise it wouldn't be effective
- Therefore the animal reacts out of fear and aversion
- The animal's current behavior or state is punished in order to negatively reinforce the desired behavior or state

Punishment

- An action whose purpose is to decrease the frequency of, or eliminate a behavior.
- Punishment is delivered after the behavior has already occurred, and therefore offers the subject no opportunity to correct the misbehavior.
- When punishment is used, there is no information about to how to correct the misbehavior.
- Physical punishment is not acceptable in positive reinforcement training.

Consequences of Punishment: Animals trained with punishment show:

- Increased levels of aggression
- Increased self-directed and abnormal behavior
- Decreased exploratory behavior
- Secrecy – hide behaviors (e.g. aggression, abnormal behaviors)
- Avoidance and fear of people carrying out punishment
- Unwillingness to participate in training or decreased willingness to interact with people

IMPLEMENTING POSITIVE REINFORCEMENT TRAINING

Basic tools of PRT

- Primary and Secondary Reinforcers – food, tactile, enrichment, etc.
- Bridge – whistle or clicker
- Targets

Primary reinforcers and Secondary reinforcers (see terminology list for definitions) are used to tell an animal when they've done something you wanted. Food, a primary reinforcer, is almost always the most effective and frequently used reinforcement in PRT.

Conditioned or secondary reinforcers, like tactile contact, toys, and enrichment devices, are particularly useful when animals may not feel like eating or are on a restricted food intake diet. Because conditioned reinforcers rely on learning and may be more dependent on the relationship between the trainer and the animal, using them reliably is likely to take time (especially when compared to using primary reinforcers).

The Bridge, a conditioned reinforcer, is an initially meaningless signal (click, whistle, verbal "good") that when paired repeatedly with a primary reinforcer (food) takes on reinforcing properties of its own. The bridge performs the following functions:

- Pinpoints an exact moment in time or an exact experience

- Provides concise Information about what's done right
- Signals that the primary reinforcer is coming

Mechanical bridges such as the clicker and the "silent" dog whistle are preferred to a verbal bridge like "good" because the sound is the same no matter who makes it. Voices are not the same. The whistle or clicker is also more concise, pinpointing an instant in time more effectively than the verbal "good". Finally, most trainers like to talk to the animal and encourage positive behavior during training. "Good boy" or "good girl" is used frequently in a variety of situations and contexts (beyond the scope of formal training sessions). The mechanical bridge on the other hand, occurs only in the context of training. It remains a discreet sound delivering precise information, even if the trainer is simultaneously talking to the animal and verbally encouraging them.

The bridge often coincides with the end of the behavior but should not be the signal that the behavior is complete. Other things will indicate that the behavior is finished e.g. trainer reaches for food, trainer changes position or tone of voice, a verbal release like "alright", or the presentation of another cue.

Using the bridge during a behavior offers greater flexibility and opportunity to communicate specific bits of information to the animal while continuing the response. This is sometimes called an "intermediate bridge" but we refer to it simply as a "bridge" and is important for the following reasons:

- Builds duration, particularly during extended behaviors like veterinary procedures
- Delivers precise information throughout a behavior, telling the animal what they are doing correctly, and reinforcing the continuation of the behavior
- Provides reinforcement throughout the behavior and delivery of food reinforcement where appropriate
- Allows the use of a variable schedule (for food rewards) with the bridge reinforcing the behavior alone or with the primary reinforcement

It can be confusing to decide when to bridge and when to give food or when to do both. In general:

- Each correct behavioral response should be bridged
- The trainer can decide WHEN and HOW MUCH primary reinforcer should follow the bridge
- Decision is based on the behavior (i.e. difficulty, how established, other distractions, etc)
- A difficult behavior or significant step in the training process deserves a greater magnitude
- Also consider the external stimuli, social situation or pressures, frightening stimuli, etc.

Bridging and primary reinforcement:

- As trainers, we all will make mistakes and accidentally bridge a behavior we wish we hadn't. If it hasn't happened to you yet . . . be patient because it will!
- When this happens and you immediately recognize it, simply don't follow the bridge with primary reinforcement. If you feed the bad bridge, you communicate to the animal "yes that was what I wanted" and it will strengthen the incorrect behavior
- The trainer's decision to give primary reinforcement and how much is a critical one. This is the information the animal uses as he's making changes in his behavior

How much food to give?

- How much and what type of food to give is called the Magnitude of Reinforcement

    - The size, strength, and duration of reinforcement
    - Consider value of reinforcement to the animal
    - Use different reinforcers for different behaviors
    - Try to have variety of reinforcers available
    - Very helpful to use magnitude in the context of continuous schedule
- Refers to the WHAT food to give
- Compared to the Schedules which refer to the WHEN to give food
- Generally, more difficult behaviors or significant steps in training a new behavior earn a greater magnitude of reinforcement
- Greatest magnitude can be a bonus or jackpot, which is a larger or better food item given and comes as a surprise to the animals with the specific purpose of communicating that they did something very well! See terms list

Targets – *a target is a point of reference that the animal always moves towards*. Targets are used to direct and teach both gross and fine movements, and to teach animals to hold a position or location. It is useful to have various types of targets including stationary and movable, and targets of varying lengths. Recognize when to use which type of target or combinations of each. You can use different target types once the animal understands the concept of moving towards an object.

Keep safety in mind for the animal (edible target) and human (hand target vs. inanimate object). Select a target type that is safe and appropriate for the behavioral outcome and the individual animal. Some targets are perceived by senses other than sight (e.g. auditory, electrical).

Once an animal learns the initial target (usually nose, head or hand), a 2nd or Body Target can be taught. This target is used to access various body parts.

Targets are a training tool. There is typically a behavior called "target" which typically refers to the first target the animal is taught to touch. But referring to "target training" means that this is the tool used to communicate to the animal where he/she should be spatially positioned. Targets are typically used to shape new behaviors and are often replaced by discrete hand signals or other cues. Targets are important should the animal regress at any point in training (established behavior or one in progress.

Selecting the appropriate target for the species and individual should take into account whether or not the animal can perceive it, for example, if the animal cannot see color, teaching him to target a yellow vs. a green target is not practical. When selecting the target, in addition to safety points (i.e., 'edible target'), take into consideration how the animal perceives its world and use this to help select an appropriate target; think about the color, size, shape, sound, smell, or other senses (e.g., electric) when choosing a target.

Animal's history and experience – has the animal been darted or pole syringed? Are they fearful of novel objects? Learn as much as you can and select a target most likely to work. If animal is frightened, use desensitization BEFORE training to touch the target. Consider the orientation of the target and how it is presented – does it look like a dart gun or pole syringe? Is it held high and scary? Etc.

Types of Targets- there are a number of different types of targets. They all have benefits and may have drawbacks. It's important to understand how each type can and will be helpful.

- Stick
  - Easy to use
  - Moveable so can move animal
  - Can make any size and shape
  - Use for nose and body
- Stationary
  - Teaching station
  - A to B
  - Work social group
  - Moveable vs. Fixed
- Hanging
  - Good for station
  - Use with body target
  - Use caution when attaching and removing
- Hand
  - Easy to use
  - Always with you
  - Danger – might not always be with you

Why use targets?

- Associated only with PRT
- Can direct movement and positioning
- Helpful when teaching new behaviors
- Useful to cue behaviors
- Can 'fade' target as cue and replace with hand signals
- Targets act as an extension of arm which can be useful with large animals
- Safety

Stimulus = Cue = Command = SD Effective Cueing

- Consistency among trainers – NO CUE DRIFT!
- Concise and Discrete cues
- Animal MUST be able to perceive cue (hearing range, color vision)
- Types of cues:
  - Verbal or other Auditory
  - Physical or other Visible
  - Electric
  - Others
- Benefits of multiple types of cues used together

Delivery of Reinforcement

When an animal does something correctly, the trainer will deliver the positive reinforcement (primary and/or conditioned). Schedules of reinforcement govern when the reinforcement is delivered. There are many schedules of reinforcement that can be found in the operant conditioning literature, but we focus on two as the most useful. These include: 1) the continuous schedule of reinforcement, and 2) the variable schedule of reinforcement (see terminology list).

The intensity of the reinforcement being delivered is called the magnitude of reinforcement, which refers to the size, amount, and duration of reinforcement as well as the perceived value of the reinforcement to the animal. The greatest magnitude of reinforcement is a jackpot or bonus.

It is most beneficial to have a variety of reinforcers available for training, using them flexibly based on the animal's preference for different rewards, and the difficulty or complexity of the behavior being reinforced. It is helpful to use magnitude in the context of a continuous schedule, emphasizing different quality of responses, rate of progress, and the animal's individual successes during the training session.

Bribe vs. Reinforcement

- Reinforcement occurs in conjunction with, and immediately following, the desired behavior.
- A bribe is offered BEFORE the behavior has been performed to elicit the desired behavioral response.
- Example #1: You want to teach the goat to turn 360 so you toss a bit of food so the goat will rotate to get the food, toss a second bit to encourage more of a turn; repeat until the full turn is completed.
- Example #2: You want to teach the bear to move backwards so you toss a piece of food between his front legs so that he will move back to get it.
- Bribes can be an effective way to initiate movements necessary for a new behavior.
- Bribing and reinforcing are not mutually exclusive. When using a bribe, be sure to bridge and reinforce the behavior once it occurs, and try to make the reinforcer of greater value than the bribe.
- When bribes are used, be sure to acknowledge this technique, and make a plan to replace the bribe with a cue and reinforcement as quickly as possible.

BASIC TRAINING OBJECTIVES

<u>1) Gain access to animals, and manage their movements to facilitate daily management and husbandry</u>

When animals are trained with PRT to voluntarily move to all enclosure spaces and within their enclosures, shift reliably at any time of day, and approach keeper and vet staff for visual inspections, staff have greater ability to view and access animals for routine management, husbandry and veterinary needs. The stress on the animal associated with these procedures is significantly diminished. For many species, shifting and moving traditionally involved aversive escape/avoidance techniques, which do little to improve animal well-being, remove choice and control, and should only be used in instances when all positive reinforcement options have been exhausted.

<u>2) Gain animal's voluntary cooperation in veterinary, research, and husbandry procedures</u>

Training can reduce the stress of handling by teaching animals to voluntarily cooperate with daily management and husbandry, medical procedures, and research behaviors. If animals voluntarily cooperate in these

procedures good preventative medicine, and illness and injury treatments become viable options because of more direct physical contact with relaxed, cooperative animals who are voluntarily participating in their own health care and treatments.

3) Reduce anxiety associated with potentially stressful situations.

During times of acute and intense stress, human-directed aggression may escalate or be maintained as a direct result of an aversive situation between animal and human. Reducing or eliminating the fear that is associated with many procedures or situations can be done through two different techniques: 1) acclimation or habituation, and 2) desensitization (see terminology lists and further discussion). Recognizing that fear or anxiety exists and implementing techniques to address these will not only facilitate a required procedure, but will also improve animal well-being dramatically.

4) Reduce animal-animal aggression, enhance socialization, and facilitate introductions

These techniques allow for the positive manipulation of social dynamics. Specific PRT techniques can enhance sociality by decreasing aggression and increasing positive social interactions between group members. These same techniques are also useful to increase the success of animal introductions, as well as helping animals to be comfortable separating from other group members. Techniques include cooperative feeding, gentle touch, proximity training, and collaborative training.

5) Reduce abnormal and stereotypic behavior

PRT can be used to reduce or eliminate abnormal, neurotic, or stereotypic behavior by helping us determine why these behaviors happen, and then providing strategies to address underlying causes while giving the animal alternatives to satisfy the need of the abnormal behavior. Sometimes training behaviors to replace them is an effective treatment/therapy of these behaviors. Determining the underlying causes is facilitated by the problem-solving process and the application of behavioral management strategies to address these causes. All the activities described above provide opportunities for positive human/animal interactions, which improves the relationship between humans and animals.

6) Enhance environmental and behavioral enrichment programs

PRT can enhance enrichment programs in several ways. Positive reinforcement training itself should be enriching. It provides animals with the chance to earn something they like (e.g., food and attention) AND it challenges them to think and 'work' for a living – research shows that animals choose to engage in working to find, obtain and process foods over food presented in an 'unenriching' manner. PRT is also used to teach animals to use complex devices or feeder puzzles that they cannot learn to use on their own, thus expanding the enrichment options available to them and teaching them important problem solving skills that generalize to other situations.

7) Improve public and professional image; provide appropriate visitor experience

Demonstrating the effective use of PRT techniques to achieve all the above objectives is an excellent message to provide to the professional and non-professional communities. It can help the public gain an understanding and appreciation for the level of care provided to the animals and help them understand that training is an essential part of animal care. We conduct training sessions in a respectful manner and in a way that promotes agency and autonomy.

Desensitization is one of the most important techniques a trainer will use. Through desensitization, animals learn to tolerate scary or uncomfortable stimuli. It can be applied to many different situations. In basic terms, desensitization is a process designed to "train out", or overcome, fear. By pairing positive rewards with any action or object that causes fear, that fearful entity slowly becomes less aversive, less scary, and less stressful. Effective desensitization relies on two elements: precise bridging, and good judgment in determining where the process should start and how fast to move through the steps to the completed behavior. When working on any desensitization training, always bear in mind that the pain and discomfort of the procedure are not diminished – the needle stick will always hurt – but the fear and anxiety associated with receiving the injection will be significantly reduced. Therefore, repeatedly or frequently piercing the skin when training for injection or blood draw should not be done. The animals need to understand what is happening and be willing to allow it, but there's no point in making a 'pin cushion' of them.

Precise bridging occurs at the exact moment that the animal experiences the stimulus. For example, if you are training an elephant to accept a needle so you can draw blood, the feeling of a needle piercing the skin can be a frightening and painful experience. To make that experience or stimulus less frightening, use a blunt needle to simulate the stimulus and pair lots of positive rewards directly with that experience. To do that effectively, bridge at the exact moment the animal feels the blunt needle touch the skin, and then follow with a big reward. If the bridge is too early, the bridge has no meaning. If the bridge is too late, the animal may be reinforced for reacting to the needle or reinforced as the needle is pulled away. Only by allowing the animal to experience the blunt needle many times without an aversive consequence will they learn that the needle is not frightening. Then when the skin is actually pierced the animal should tolerate the pain and discomfort without fear.

The second key to effective desensitization is being able to determine the starting point, and how fast to progress. Using the same example, if an animal has had a bad experience with someone using a needle, they may be frightened at just the sight of the syringe. If that's the case, the first step may be just showing the syringe. At the exact moment the animal looks at the syringe, bridge and then reinforce. After doing that several times, the next step may be moving the syringe towards the animal at the same time the bridge occurs. How quickly progress occurs will be determined by the animal's tolerance of the training. How big each step is, depends on how the animal reacts. If they run away as soon as they syringe moves towards them, it's necessary to spend more time just reinforcing them for looking at it. If they hold still while you move the syringe, you may be able to move onto the next step of touching them with it. This will be determined by the animal's reaction. Progress may be too fast if the animal continues to be fearful and too slow if the animal appears to be bored or disinterested.

Desensitization can be used in many situations. Animals can be desensitized to husbandry and veterinary procedures, new enclosures, unfamiliar people, negatively-perceived people like the veterinarian, novel objects, strange noises, and so on. Desensitization is the basis of husbandry and veterinary training.

Acclimation or Habituation is a passive process in which an animal gradually overcomes a situation it normally avoids by prolonged exposure. For example, opening the chute and allowing the elephant access to the chute, to explore the chute (or not) gives the animal the opportunity to gain comfort on his/her own terms and time frame. The process can be enhanced by placing food in the chute to encourage (bribe) movement and exploration. There is no active and direct pairing of positive reinforcers with the 'scary' event when acclimation is used, which is different from desensitization. Acclimation is highly effective for getting an animal accustomed

to a new area, transport crate, squeeze cage, etc, but is not as effective when the animal is very fearful of the situation. Because acclimation does not specifically form the association between the 'scary' thing and reinforcers, it may take longer, especially if animals are quite tentative about a situation.

Both desensitization and acclimation can be effective training techniques, but the significant advantage to desensitization is that the trainer is there directly and specifically reinforcing the animal's behavior. It is often advantageous to use both techniques in conjunction with each other. For example, give the animal access to the squeeze chute so she can explore it on her own and add some food treats to the chute to further entice her to investigate. This is acclimation. Desensitization training can also be done by asking the animal to enter the chute and specifically reinforcing progressive movement into it.

Training animals to present various body parts is an excellent starting point because:

- No pain involved; there may be some fear or apprehension but address with desensitization
- Excellent foundation for many procedures
- Allows you to plan for future treatments
- Set priorities based on individual animal's needs (e.g. upcoming procedure, medical need, management or husbandry need)
- See Master Behavioral Lists for possible behaviors to train for various taxa

Once body parts are trained, begin training for veterinary behaviors, exams, procedures, and treatments. Include restraint training if appropriate. Forced restraint is very stressful, but through careful application of PRT, can desensitize animals to various methods of restraint including chute, squeeze cage including squeezing, hand restraint, and limiting movement of certain body parts.

REDUCING AND ELIMINATING UNDESIRABLE BEHAVIOR

There are three appropriate and acceptable techniques that can be used in a positive reinforcement training system to reduce or eliminate undesirable behavior. *These include: 1. Extinction; 2. Time Out; and 3. Incompatible Behavior*. Whenever we take a look at undesirable behaviors, we must focus observations and discussions beyond just the animal's behavior; we must also consider human behavior and how it influences animal behavior. Understanding as much as we can about the animals' histories and this history may effect their behavior *today* is imperative as we try to diagnose and treat these undesirable behaviors (including stereotypies, aggression, etc.).

Extinction is the removal of the reinforcement that maintains a behavior. Without reinforcement, over time the behavior will disappear. In order to effectively use extinction to eliminate a behavior, one must identify what exactly is reinforcing the behavior. Once the reinforcement is identified, it must be withheld. In the early stages of extinction, an extinction burst (see terminology list) may occur. While this temporary increase in the undesirable behavior can be an unpleasant phase of the training, as long as the trainer continues to withhold the reinforcement, the behavior will begin to diminish. In order to make extinction most effective, it should be paired with reinforcement of the desired behaviors so the animal learns what you don't want, and perhaps more important, they learn what you do want.

Time Out is an effective means of reducing or eliminating unwanted behavior and it is the only acceptable form of punishment in a PRT system. The length of the time out can vary from seconds to minutes, but should not be

so long that the animal doesn't remember why the time out occurred. The intensity of the time out can vary from looking away from the animal to leaving the work area all together. Following a time out, don't hold a grudge. Give the animal a fair chance to succeed and reinforce appropriately. You may choose to go right back to the behavior that led to the time out in the first place, or do something entirely different.

Time outs are punishment and run the risk of adverse consequences associated with the use of punishment (aggression, self-directed behaviors, etc.). Because there is potential for unwanted consequences when time outs are used, first consider alternatives for a TO as the first choice to mitigate undesirable behavior. Remember the burden of responsibility to get successful results is on the trainer, not the animals. Punishment shifts that burden more towards the animal.

When time outs are used, they should be given immediately when the undesirable behavior occurs so the animal has the best opportunity to understand the consequence (TO) of the misbehavior. Time outs should be assessed for efficacy; if you give a time out repeatedly for the same behavior or similar conditions, the time out isn't having the desired outcome (reduce the misbehavior), and a new strategy should be used. You also need to look more closely and determine why the misbehavior is occurring.

There are situations when time outs are not appropriate and other more positive strategies must be used; these include:

- The animal is learning a new behavior
- The animal is frightened of the behavior, situation, social pressure, etc.
- The animal is confused
- The animal is new to training
- The trainer is new to training

Incompatible Behaviors are behaviors that are physically impossible for the animal to perform at the same time as the undesirable behavior. For example, an animal who is chasing another animal during a feed is trained to go to and remain at a station during the feed. It is physically impossible to station and chase at the same time. By cuing and reinforcing the incompatible behavior of station, the animal earns positive reinforcement for doing something correctly and at the same time is no longer doing the unwanted behavior.

In general, when you are trying to mitigate undesirable behavior, you should try to do the following:

- Reinforce what you want. We'd much rather provide positive reinforcement than any other technique!!
- Carefully examine what might be reinforcing the misbehavior. Remember, reinforcement of any type sustains a behavior; in the absence of reinforcement, the behavior should diminish over time (extinction).
- Carefully examine human behavior, external influences on the misbehavior, etc. See if you think these influence the misbehavior. Be honest about your behavior!! Sometimes humans are unintentionally reinforcing misbehavior.
- Look for patterns. If you see something happen once, don't draw broad sweeping conclusions that it's a huge problem. Isolated events of misbehavior will happen and should be noted, but of most interest and significance is emerging patterns of misbehavior.

IMPLEMENTING POSITIVE REINFORCEMENT TRAINING

Training and behavior programs should be designed to meet the needs of the animals, facility, while insuring the highest level of welfare and safety. Start small where you can be successful! Be realistic about available resources, including staff time, facilities (modifications needed), staff training level, equipment needed, etc. When initiating a program, we try to incorporate the following points:

- Set clear goals and objectives
- Start small and not with the most challenging case
- Involve and train appropriate staff (managers, CGs, vets, facilities, etc.)
- Learn theory, terminology, and techniques
- Know natural history of target species
- Use resources (ABMA, AAZK, IMATA, listserves, etc.)
- Develop and practice problem solving skills
- Document effectively with a good record keeping system
- Evaluate progress
- Make adjustments as needed

PRT OFFERS MANY BENEFITS TO ANIMALS AND PEOPLE

<u>Training is good for animals</u>

- Facilitate daily management, husbandry, and medical care while reducing stress often associated with these procedures
- Reduce the use of anesthesia and physical restraint
- Enhance psychological well-being and combats boredom by providing increased behavioral opportunities, physical activity, and mental stimulation
- Provide greater choice and control
- Provide the opportunity to work for food
- Enhance environmental enrichment programs
- Enhance positive social interactions, reduces aggression, facilitates introductions as well as separations
- Decrease or eliminate abnormal or stereotypic behavior
- Enhance trust and improve human/animal relationship

<u>Training is good for staff:</u>

- Reduce risk of injury
  - Less physical restraint required
  - Less aggressive behavior directed toward humans
- Improved job experience
  - Enhance keeper/animal relationship
  - Greater likelihood of animal cooperating in necessary behaviors
  - Greater skills and more options to proactively address behavioral problems
  - Increase overall job skills and marketability

<u>Training is good for the institution:</u>

- Respond to and exceed Animal Welfare Act (USA) and Accreditation standards

- Improve health care of animals
- Demonstrate high level of care for animals
- Enhance public education – show people how we care for the animals
- Reduce risk of staff injuries
- Reduce animal health care costs
- Reduce aggression-related injury
- Enhance environmental and behavioral enrichment programs

TRAINING TERMS AND TECHNIQUES

Operant conditioning comes with its own set of terms, some of which have been discussed in detail above. In order to use the techniques that operant conditioning provides, and to communicate with others about them, it is necessary to understand the terminology. Following is a partial list of operant conditioning terms that are most relevant to the training of animals.

Training - The art of using operant conditioning techniques to obtain desired behaviors. Teaching. Communication. It is 2-way between human and animal(s).

Operant Conditioning - A type of learning in which the probability of a behavior recurring is increased or decreased by the consequences that follow. This includes positive reinforcement, negative reinforcement, and punishment.

Reinforcement - Anything positive or negative which, occurring in conjunction with an act, tends to increase the probability that the act will occur again. It is information that tells the subject what you like or don't like. Reinforcements are relative, not absolute

Positive Reinforcement - Following an action or response with something the subject wants: food, praise, tactile contact, play, favorite toy, release to a favored place, etc. which will increase the chance of that action or response being repeated.

A bear responds to a signal correctly by lifting his front paw and is rewarded with verbal praise and a piece of apple.

Negative Reinforcement - Following an action or response by removing an unpleasant event or stimulus, no matter how mild, that the subject wants to avoid, which will increase the chance of that action or response being repeated. For example, a loud buzzer, spray from a hose, the side of a restraint chute moving inward, an ankus, etc.

> *When a lion refuses to shift from one cage to another, a spray of water is directed into the cage near him. When he then moves to the other cage, the spray of water stops.*

A training relationship is built on trust, which would be quickly destroyed if we rely on negative reinforcement. The animals are responding correctly because they have to, not because they want to. *This is not voluntary cooperation*. There may be times when it is necessary to use negative reinforcement but before doing so, follow this simple rule: EXHAUST THE POSITIVE REINFORCEMENT OPTIONS BEFORE MOVING TO AVERSIVE METHODS.

Punishment - An unpleasant action whose purpose is to reduce the likelihood that a behavior will occur again. Examples: hitting an animal, withholding food or water. Routine events can be used as punishment, for example, separating or isolating an animal, moving him to less desirable location, or bringing a more dominant animal closer - all in response to undesired behavior.

> *The lion leaps at the cage front when the keeper approaches, so he is sprayed with the hose.*

The problems with punishment are many. Punishment occurs after the response, so the animal cannot change the behavior; additionally, punishment gives the animal no information about how to change what's been done, only that it was wrong. Secondly, punishment can be used for the wrong reason, i.e. out of anger or revenge. With the use of punishment, the animal may cease the undesired or punished behavior, but replace it with

another undesirable behavior. The elephant stops swinging her truck towards the keeper but begins to throw rocks. Or the animal may learn not to engage in the behavior in the presence of the person carrying out punishment but continues to do it when the person is not around. For example, a monkey punished for being aggressive towards another monkey may shift that aggression to a time when the person is not present. Punishment used in response to aggression may actually result in escalating aggression, especially when an animal acts aggressive and the person gives a 'time out' – if the animal didn't want to engage or do a particular behavior and acts aggressive resulting in the trainer's departure, this could actually reinforce the aggression. Animals that are punished often times become timid or frightened, and thus less willing to engage and therefore less cooperative.

Time Out - A mild form of punishment in which positive reinforcement and/or the opportunity for positive reinforcement is withheld for a brief period of time immediately following an inappropriate or undesirable response.

> *During training session, otter continues to break from position. On third time, trainer immediately picks up treats and walks short distance away, stopping with back turned toward otter. After 2 minutes, and when otter is back in position waiting, trainer returns and begins session again.*

Bribe – Presenting or providing the reward prior to the occurrence of the desired behavior; using the reinforcement to elicit a behavioral response.

> *The keeper throws a piece of meat into the shift cage to encourage the tiger to enter.*

Magnitude of Reinforcement – The size, strength, and duration of reinforcement given to the subject following the correct behavioral response. Magnitude is important to help the animal differentiate when something is done 'better' or a significant step has been taken. When gauging what magnitude to use, consider all aspects of the behavior including environmental conditions and other stimuli.

> *A monkey prefers grapes over apples over carrots; therefore giving a handful of grapes is better than a handful of apples is better than carrots. For a new behavior or a significant step, the monkey receives grapes; for a well-established behavior, the monkey receives a slice of carrot. This is a general rule of thumb and different aspects or parts of a behavior can be reinforced with different levels of magnitude; for example, if the monkey does a well-established behavior but does it during separation from his best friend, that's 'harder' and it would be good to pay with a higher magnitude.*

Stimulus, Discriminative Stimulus, or Sd- Anything that causes some kind of behavioral response, a cue or signal. It can be anything the subject can perceive.

> *A verbal cue ("scale") and hand signal (point to scale) are used to inform the iguana to move onto the scale. In PRT, this would be followed with reinforcement.*

Stimulus Control - When a behavior occurs consistently (~85-90% requested) in response to specific cue.

> *The trainer asks the baboon to present "leg" and he consistently responds correctly, instead of presenting an arm or foot.*

It is helpful, and speeds up the process of stimulus control, to introduce the cue early in the shaping process. So, every time the target is presented to shape a 'leg' with a baboon, say "leg" as the target is presented and

reinforce any movement towards it. If done in association with the cues, the animal will begin to associate that verbal cue with the action that follows – touching the leg to the target.

Response - The actual performance of the behavior.

Primary Reinforcer - An event that is naturally reinforcing, satisfies biological drives, and is not dependent on learning.

Food, water, sex.

Conditioned Reinforcer (aka 'Bridge') - Any stimulus that has acquired its reinforcing properties through association with a primary reinforcer. Through this process it gains value as a reinforcer. In training, it is a precise way of communicating exactly what will earn the reward. See discussion on bridge use.

Clicker, verbal "good", dog whistle.

Secondary or Conditioned Reinforcers include actions or items the animals *learn* to enjoy. Secondary reinforcers do not satisfy a biological need like primary reinforcement.

Tactile contact, verbal praise, a favored toy or enrichment device.

Secondary reinforcers are particularly useful when animals may not feel like eating or are on a restricted food intake diet. Even though food is used for reinforcement most of the time, the more reinforcers available, the more interesting and enjoyable training becomes.

Shaping and Successive Approximations - Building a behavior by dividing it into small increments or steps, and then teaching one step at a time, until the desired behavior is achieved is referred to as "shaping with successive approximations". Steps become a series of intermediate goals.

The nurse shark is trained to swim onto a stretcher using these steps: reinforced for touching a target; touching the target near the stretcher; targeting near the edge of the stretcher, then the target is slowly and in as many steps as needed, moved further onto the stretcher.

Schedules of Reinforcement - Rules that govern the delivery of reinforcement, the 'when' reinforcement is given. The two types we will describe are 'continuous' and 'variable'; there are other types. Note: This refers to the delivery of primary or secondary reinforcement, not the bridge which is used for each correct behavioral response and may or may not be followed by additional reinforcement.

Continuous Schedule of Reinforcement - Reinforcement is given after every correct response.

This schedule should be used when training new behaviors. Since the animal is trying to figure out what you want by experimenting and trying different things, each time he does the correct response, it must be communicated through positive reinforcement (bridge AND food). Each time reinforcement is delivered, important information is provided that will advance learning.

Continuous schedule is important to maintain invasive or unpleasant behaviors, like blood draw. Behaviors that are important to daily management, for example shifting between areas, should also be reinforced every time.

Variable or Intermittent Schedule of Reinforcement – Reinforcing correct behavioral responses by offering the primary reinforcement on a random or unpredictable basis.

This schedule is appropriate for reinforcing completed or established behaviors. It is also useful when running through a series of behaviors, for example with a body exam. If the orangutan is trained to present body parts on cue, in one session you may ask for 12 or more body parts, including hands, feet, head, chest, back, arms, back, and legs, plus ask him to station, target, and maintain duration on individual behaviors. Applying the variable schedule, each correct response is bridged, but primary is delivered randomly. A variable schedule can be implemented by substituting secondary reinforcers for primary in a step by step process. For example, instead of a banana following the bridge, offer tactile reinforcement, verbal praise, or a favorite enrichment.

Selective or Differential Reinforcement - Reinforcing selected responses of higher quality to improve performance. 'Higher quality" will depend on the behavior and could refer to how quickly the animal moves, reduced latency in response, longer duration, etc.

Several examples include: Rhino is reinforced for responding quicker when called; leaning in tighter when asked; holding ear steadier when being touched with blunt needle.

Jackpot or Bonus - A reward that is much bigger, in quantity and/or in value, than the normal reinforcer, and comes as a *surprise* to subject. To let the animal know that she did a superior job, use a bonus or jackpot. It should be special (i.e., used sparingly and for those moments of excellence), and should not be overused. A well-placed bonus can be a very powerful way of reinforcing desired behavior.

The coyote goes all the way into the kennel for the first time and is rewarded with a big meaty bone.

Acclimation/Habituation - The process of passively and gradually allowing an animal to get used to a situation which it normally avoids; prolonged exposure may be required. See Acclimation and Desensitization section.

The keeper allows the giraffe to explore the open restraint chute and may provide food in and around it to encourage exploration.

Desensitization - Actively pairing a positive reinforcer (bridge and reward) with an aversive event until the aversive event loses its ability to adversely influence behavior. Used to help an animal overcome anxiety or fear of event or person by pairing the 'scary' event directly with many positive reinforcers. It's important to find a starting point where the animal is not frightened. Nothing is ever hidden. See acclimation and desensitization section.

The keeper bridges and rewards the giraffe for moving progressively further and further into restraint chute, then for standing in chute, and finally for tolerating doors and sides moving (note that each of these would have many more steps)

Regression - Deterioration in learning progress or performance of a behavior; the behavior isn't performed to expected level. This is usually temporary and a normal part of training process. Also refers to when a trainer retraces the steps in the shaping process to reinforce lesser levels of performance.

One day the monitor lizard tolerates blunt needle being pushed and held against his side. Next day animal will only allow the trainer's finger to touch side. Trainer then goes back to reinforce the finger touch, a touch with the capped syringe, then finally a touch with the blunt needle.

Training and learning are complex processes. When we learn to ride a bike, we make mistakes. We forget details from one practice session to the next, like how to hold the handle bars, how fast to pedal, how to push off. We do great one day, and the next day we can barely keep our balance. When animals learn new behaviors, the same thing happens. Progress is not linear but rather occurs in steps forward and backward. Each step backward is called regression and it is a normal part of training.

Generalization - Reinforcement of specific behavior increases frequency of similar behaviors.

The hawk is first trained to come to the trainer's glove when called. It is then easier to train the bird to go to a specific stump when called.

Extinction - Method of eliminating a behavior by not reinforcing it any longer. Most effective when paired with reinforcement of alternative behavior.

The elephant has been reinforced with attention for reaching out to people with her trunk. All keepers stop giving her attention whenever she reaches out with her trunk. Simultaneously, the elephant is given attention every time she keeps her trunk down.

Extinction Burst – During the extinction process, the animal may perform the behavior for which reinforcement is being withheld at an accelerated rate or intensity in an effort to gain the reinforcement. It's critical to NOT reinforce during this phase because you risk reinforcing the more intense expression of the undesired behavior. The extinction burst doesn't always happen but if it does, it's typically prior to the decline in the behavior.

Attention (human reaction determined to reinforce spitting) is withheld when a chimp spits. Now the chimp spits 6 times more often than before. However, with continued withholding of reinforcement, the behavior begins to diminish.

Incompatible Behavior - One that interferes with, or cannot be performed at the same time as, another behavior.

Stationing dominant baboon in a "sit" at a target while other baboons are fed is an incompatible behavior with chasing another baboon and stealing its food.

Superstitious Behavior – A behavior that is unintentionally reinforced along with the desired behavior and becomes associated with it and then is fixed in the subject's mind as necessary for reinforcement. Trainer is often unaware that this is being reinforced.

As the bear is bridged for beginning to turn, she inadvertently shakes her head at the same time. On the next response she again shakes her head as she begins the turn and is again reinforced. The bear now views the behavior of "turn" as including a head shake.