



Exotic Animal Training: The Constructional Approach to Addressing Extreme Fear Responses and Aggressive Behavior

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Introduction

In zoological settings caregivers are training everything from snarling big cats to flighty herds of antelopes. Traditionally the first step has involved delivering preferred food items. But some animals present such extreme fear responses or aggressive behavior in the presence of humans, that food holds little value. Trying to use desensitization, counterconditioning and keeping animals below threshold can be challenging to apply for many reasons. Results are often slowly realized in these cases, if at all. The constructional approach empowers animals to replace fear or aggressive behavior with desired responses. Using this procedure, the animal is approaching to accept appetitives often within one or two sessions. When applying the constructional approach in zoos, there are a number of different challenges to address such as enclosure design, limited visibility, needing to know the natural history of the species, and how to apply the protocol to a group of animals. This article addresses questions such as what is maintaining undesired behavior, why the usual advice of superimposition of positively reinforced behavior is less successful, and why behavioral interventions are non-linear. It will also explore how the constructional approach has helped a variety of species of animals commonly cared for in zoos.

The Constructional Approach

Israel Goldiamond was a leader in the experimental analysis of behavior. His research led to effective methods for addressing challenging problem behaviors. One such contribution is the constructional approach. The work of Goldiamond (1975) often involved patients who were unable to communicate using verbal language (aphasic). This was often the result of stroke, brain injury, dementia, or other pathology. Traditionally, patients identified as experiencing distress were treated following a medical model with the focus being on the pathology, and relief of symptoms. The constructional approach rejected this model and encouraged practitioners to build (construct) new repertoires of behavior as an alternative. For

example, instead of decreasing stuttering, the client was taught to increase his vocabulary of words. Instead of decreasing a phobic response to spiders, a new behavior was selected that resulted in the desired consequences of attention and touch from a spouse (Goldiamond, 1975; Goldiamond 2002).

Goldiamond (1975) observed that typical treatment plans focused on what the patient could not do as opposed to what the patient could do. It was also noted that the behavior of patients frequently resulted in reinforcement. However, behavior that was increasing was often identified as undesired, possibly resulting from frustration when the patient did not have an alternative way to communicate desired outcomes. Examples included a patient who would cry until taken for a walk, a recovering stroke patient going into a rage to get food delivered quickly, and another who would scream to avoid physical therapy (Goldiamond, 1975).

The constructional approach recommends identifying a target behavior and looking for behavior that is currently available for a starting point, as opposed to looking for what is absent (Goldiamond, 2002). From this point a desired behavior can be shaped. The constructional approach has also inspired the animal training community. A significant impact has been the introduction of a nuanced application of procedures for addressing undesired behaviors identified as being maintained by negative reinforcement, such as aggressive behavior (Snider 2007). As Snider (2007) describes, this procedure involves the presentation of an aversive stimulus at extremely low potency or under a context that allows the stimulus to be at extremely low potency. This allows the animal the opportunity to present desired behavior in the presence of the aversive stimulus. The aversive stimulus can then be removed upon presentation of desired behavior. This procedure can allow the construction of a new response in the presence of the stimulus. It can also facilitate transition to the use of positive reinforcement or be used in conjunction with positive reinforcement (Snider 2007). This has been extremely useful in my work as a zoo training consultant when trying to establish a starting point with exotic animals presenting extreme fear responses (or aggressive behavior) in the presence of humans, for example with a wild caught herd of antelope.

The constructional approach was significant in that it asked clinicians to focus on the ability rather than the disability of their patients. It also demonstrated that pathology does not have to be an obstacle to reaching behavioral targets (Goldiamond, 1975). And in the animal community it is now helping trainers make progress in cases of extreme fear responses and/or aggressive behavior wherein the past it had been difficult to demonstrate considerable long lasting success rates (Snider, 2007).

Rosales-Ruiz (2021) has also pointed out that fear responses and aggressive behaviors are generally regarded as respondent behaviors. And traditionally trainers have been advised to use only respondent conditioning techniques, such as desensitization or counterconditioning. The focus of these procedures is on changing the animal's emotional state towards the aversive stimulus. However, these can many times be almost impossible to apply in zoological settings with animals presenting such extreme responses that no appetitive will overcome the strength of the aversive stimulus, even over many days, possibly even months. Often no significant changes in behavior are observed, or the response is that of an obviously uncomfortable animal attempting to collect the desired item while forced to tolerate the presence of the aversive stimulus. Additionally, the respondent behavior may have occurred in the initial interactions with the stimulus. Subsequent responses are likely operant in which

behaviors emitted by the animal in the presence of the stimulus result in desired outcomes, such as increased distance (Snider, 2021).

Other common procedures to address fear responses and aggressive behavior include trying to directly shape a calm response using food or other appetitives. Again, if the animal is unreceptive to appetitives there is often little option for success unless the trainer is willing to consider deprivation tactics that may have the potential to compromise animal welfare.

As has been discussed, another option is to recognize that fear responses and aggressive behaviors can be seen as successful behaviors that are maintained by negative reinforcement. Engaging in these behaviors leads to giving the animal a desired outcome, increased distance from something that the animal finds aversive. For example, a tiger learns that when he growls, keepers go away and leave him alone (Rosales-Ruiz, 2021). This view offers an alternative approach to addressing these problem behaviors. When applied properly distance can be used as a reinforcer to shape calm behaviors that replace fear responses or aggressive behaviors. Using this approach has the potential to expose the animal to a much less potent aversive stimulus than using counter conditioning in which the pressure for the animal to tolerate the presence of the aversive stimulus may be greater.

Application of the Constructional Approach

To address an animal that has history of presenting a fear or aggressive response to the presence of the trainer, the following steps can be applied:

1. Start far enough away that the animal is aware of the person but shows calm and relaxed body language.
2. Approach so that the animal can see the person until the slightest body language (or none) is observed and so that the animal acknowledges the person has moved. When this happens, stop moving.
3. Wait until the animal presents any behavior that is acceptable that would be considered calm (looks away, scratches, rests its head, eats, closes eyes, etc.), then walk away.
4. Repeat this and raise criteria (move closer.)
5. Continue this process until the animal is only presenting calm body language in the presence of the trainer.
6. At this stage, several things may happen. Some animals may begin to approach the trainer, which can be negatively reinforced by walking away. Others may appear to be very relaxed and be willing to be close. Either way this is a signal to try to introduce an appetitive stimulus (desired item) such as food.
7. Trainers may need to use desensitization to slowly introduce offering food or may need to toss food closer and closer to encourage animals to approach.
8. This step is called the switchover and can happen fast. The training strategy can now focus on positive reinforcement for desired behaviors.

An important feature of using the constructional approach to address fear responses and aggressive behavior is that the trainer is using a function-based intervention. When a behavior is maintained by negative reinforcement that is not contrived, in other words aversive stimuli that are already existing in the environment when removed increase the undesired behavior,

then the intervention should be based in negative reinforcement. When trainers use the constructional approach, they are using a non-coercive application of this procedure. This allows caregivers to address the actual contingency maintaining the behavior as opposed to attempting to superimpose positive reinforcement for some other behavior on top of the already existing negative reinforcement contingency for fear responses or aggressive behavior. Affiliative behaviors (approaching, investigation, sniffing, etc.) are also often observed when the procedure is applied correctly. This seems to indicate the characteristics of the stimulus transition from aversive to appetitive. Additionally, trainers are very quickly able to transition to positive reinforcement when affiliative behaviors are observed.

Challenges in Zoological Settings

The constructional approach can be challenging to apply properly because it does require sensitivity to animal body language. Excellent shaping skills are required whether using positive or negative reinforcement. Trainers may need to practice refining their skills. It is important animals have the opportunity to be far enough away that they can present behavior that is relaxed and comfortable. Animals also need time to relax and reach hormonal homeostasis in between repetitions in the event criteria was raised too quickly. (Stress hormones return to baseline) It is possible to flood an animal if it cannot escape the approaching stimulus. An indicator this may have happened is if the animal gives little to no behavior to reinforce.

In zoological parks it can be difficult to get far enough away and still have line of sight due to enclosure design. There can be pressure to apply procedures in a timely manner. There are challenges with visibility with animals in areas that are dark, and it is difficult to see the animal's body language. Of greater challenge is working with herds and flock animals. For these animals it is important to not push for an observable reaction at all. Approach and retreat before any observable reaction is noticed. There are responses occurring, just not ones that are easily observed. Reinforcing this much calmer response is desired over pushing for any noticeable body language associated with fear (or aggression.) Tipping one animal into a fear response can cause the entire group to alert and the process may need to begin again at lowered criteria. Those inexperienced with the procedure may wish to seek guidance from an experienced mentor.

Success Stories

Despite these challenges, my clients and I have had excellent success utilizing the constructional approach to address fear responses and aggressive behavior with the species listed below:

Fear Responses:

- Kudu (*Tragelaphus strepsiceros*) – herd captured from the wild
- Gemsbok (*Oryx gazella*) - herd captured from the wild
- Springbok (*Antidorcas marsupialis*) - herd captured from the wild
- Blesbok (*Damaliscus pygargus phillipsi*) – herd captured from the wild
- Red Fox (*Vulpes vulpes*)

- Somalian Wild Asses (*Equus africanus somaliensis*)
- Grey Wolves (*Canis lupus*)
- Grant's Zebra (*Equus quagga boehmi*)
- Bald Eagle (*Haliaeetus leucocephalus*) - rehabilitated wild caught individual

Aggressive Behavior:

- Sumatran Tiger (*Panthera tigris sondaica*)
- Proboscis Monkey (*Nasalis larvatus*)
- Western Lowland Gorilla (*Gorilla gorilla*)
- Arabian Tahr (*Hemitragus jayakari*)
- Wildebeest (*Connochaetes gnou*) (wild caught male)
- Ocelot (*Leopardus pardalis*)
- Spectacled Owl (*Pulsatrix perspicillata*)
- Rhinoceros Iguana (*Cyclura cornuted*)

Many of these examples involved single session transformations in which animals went from displaying fear responses or aggressive behavior to switching over to accepting food or other appetitives while presenting calm body language within one 20-40-minute training session. (Video of many of these sessions can be seen in the course by Heidenreich (2019) in virtual learning program AnimalTrainingFundamentals.com)

Conclusion

Many animal trainers have been taught that negative reinforcement is inherently coercive. Others might argue, myself included, that it is more coercive to force an animal to try to accept food in the presence of an aversive stimulus when its body language is demonstrating a clear fear or aggressive response. It is also important to avoid confusing principles with procedures. While there is one (generally) accepted definition for each principle, there are literally thousands of procedures. When negative reinforcement is described as used in the constructional approach it is very different than when using coercive applications (for example, using a sheep dog to herd sheep through a gate.) It is the same *contingency*, but a very different procedure. The impact of the two different procedures can result in very different welfare for the learner. And because procedures can be endlessly complex and varied, it is overly simplistic to funnel it down and say because the trainer used a specific contingency it is therefore labeled humane, or inhumane. The most accurate evaluation would be to look at an *individual* procedure and measure it for its impact on animal welfare.

Also important to consider is if the existing contingency is not contrived, then giving the animal the reinforcer it desires (an aversive stimulus to go away) is the opposite of coercive. It can be empowering and used to shape desired behaviors. Coercion would be trying to superimpose a positive reinforcement contingency on top of the already existing negative reinforcement contingency maintaining the fear response or aggressive behavior (for example as stated earlier, trying to force the animal to accept food in the presence of people it finds aversive.) Instead with the constructional approach the quality of the stimulus can be changed from aversive to appetitive.

The constructional approach offers a highly effective, more function-based strategy in which the animal is empowered to present a new behavior to control its environment without being pushed over threshold. It can be used to introduce new people, objects, and when used in reverse can even help address animals who are uncomfortable being separated from conspecifics. It also often produces results relatively quickly. While there are challenges in applying it in the zoo environment, it is without doubt a procedure that can greatly help caregivers quickly connect with the animals once thought impossible to train, thus opening the door to many more opportunities to improve animal welfare with evidence-based training technology.

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