



## **Managing Monkey Behavior: Advancing the Social Management of Old World Monkeys**

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### **INTRODUCTION**

Old World monkeys are appealing to zoo professionals and public alike. They are behaviorally diverse, of significant conservation value, and offer tremendous potential for exciting and attractive exhibitory that can raise awareness about the many threats to their wild counterparts. The vast knowledge and experience among our AZA institutions should yield the capability to successfully manage healthy groups Old World monkeys. Yet many challenges, particularly relating to social management, continue to test our capacity for successfully maintaining these animals in natural groupings.

Captive wild monkeys experience constraints of the captive environment that will drive their behavior. They are spatially confined in enclosures that are often unchanging compared to the wild. They may be kept in even smaller holding areas for up to 15 out of 24 hours, requiring close proximity for socially housed animals. The diet is standardized and relatively unvaried, and foraging is limited in comparison to the wild. The opportunity to interact with and encounter other species is minimal, and most often static. They have little choice over immigration, emigration, and mate selection. We separate, introduce, isolate, capture, restrain, examine, and anesthetize, but all for very good reasons. Still, the overall result is monkeys living in environments where they control very little about the events and circumstances of their daily lives.

From the perspective of social housing and management, captivity can yield some detrimental results. We find that many species of Old World monkeys are extremely difficult to maintain in species typical groupings. They may exhibit elevated levels of aggression and submission, serious wounding during introductions (Erwin, 1979), and a lack of appropriate social behaviors both affiliative and agonistic. Animals must be provided with the opportunity to learn the skills necessary for competent social interaction. In some cases, captive primates have not developed this basic component of their behavioral repertoire due to various circumstances associated with captivity. It is important to note that aggression and submission are absolutely normal for any social animal, and it is never the intent to eliminate these crucial aspects of Old World monkey behavior. Rather, we must discover innovative management strategies and methods to facilitate Old World monkeys living in healthy, social groupings, and exhibiting species appropriate behaviors.

Positive reinforcement, as a method to modify captive animal behavior, has achieved wide recognition as a valuable tool for gaining animals' cooperation in routine husbandry activities, veterinary procedures, and research protocols while maintaining a high level of animal well-being, and human and animal safety. (Abadie, 1997, Laule et al, 1992, Laule, 1995, Loehe, 1995, Schapiro, 2005, Videan, 2005, Whittaker et al, 2000). The synergy of positive reinforcement training, environmental enrichment, exhibit design, and operational procedures yields a pro-active, versatile, and responsive system known as behavioral management (Desmond, 1994). As a suggested next step in captive Old World monkey management, this paper will explore challenges specifically relating to the management of Old World monkey social behavior that can be addressed through behavioral management. Objectives for socialization of Old World monkeys include: meeting the social needs of all group members; reducing aggression to normal,

acceptable levels; increasing pro-social behavior; and gaining access to all individuals within the group. Monkey behavior is dynamic; therefore the program needs to be flexible and responsive to changes in group behavior.

Positive reinforcement training can be used to directly and indirectly address social issues. Many institutions have implemented training programs to facilitate husbandry and veterinary procedures. In developing these programs, a core of staff versed in operant conditioning theory and positive reinforcement technique typically evolves. The same set of skills and methods that are used to train animals to cooperate for veterinary procedures can also be used to elicit pro-social behaviors, and minimize aggressive social behaviors. Although training for social behaviors is far more subtle and may take more time compared to other behaviors typically trained, this training can be essential to creating a captive environment that enables social groups to live in harmony.

Two situations that often cause distress among captive managers of Old World monkeys are introductions of new animals to an existing group, and new group formation. Old World monkey introductions can be explosive and may result severe wounding. I think we could all agree that this type of social interaction should be minimized; however, it is also imperative that monkeys be moved among institutions for the purposes of maintaining genetically, demographically, and socially healthy captive populations, and to meet exhibit needs. Therefore, it is our responsibility and obligation to insure that introductions of Old World monkeys are carried out in a manner that will best protect all individuals involved.

## METHODS

Targeting is used to elicit both gross and fine movements, and to teach animals to hold a position or location. Communicating to the animal where and how he should be positioned facilitates a wide array of management needs, and is also helpful when mitigating the negative aspects of group housing.

- All group members should be trained to come to, go to, and stay at targets. This provides better access to all individuals within the group. Stationing dominant animals gives subordinates the opportunity to approach.
- Stationing is most successful when more dominant animals are trained first. Once control over these individuals is established, less dominant animals can be stationed, and lastly, the most subordinate animals should be accessed.
- It is essential to reinforce dominant animals for holding station, building the time they remain at station to a sufficient amount that will allow the subordinates to receive food, enrichment, attention, or other needs.
- Stations can be used as a 'cool down' spot when tension grows; this can be particularly useful during introductions.

Shifting, or moving animals between different spaces, is necessary to insure the safety of the care staff, animals, and facilitates sound husbandry practices.

- Training the group to shift at any time of day offers many benefits including improved exhibit access for emergencies, enrichment, etc., increased activity, and the ability to reinforce the group for moving together.
- All opportunities to reinforce the group for cooperation (shifting inside as a whole) will yield a more cohesive group that must work towards a common goal, in this case, shifting.

Separation and isolation of group housed monkeys will be necessary for various management and veterinary purposes. Separating individuals from their groups can cause undue stress and anxiety for all members of the group, may compromise animal health, and problems may arise upon reintroduction of separated individuals.

- Training animals to voluntarily separate into sub-groups or isolated from group members can alleviate the anxiety often associated with this.

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- Reintroducing animals to their groups may result in an escalation of aggressive bouts. When animals are trained to voluntarily separate, they are more relaxed, making re-introductions calmer too.
- Voluntarily separations provide less dominant animals the chance to occasionally escape the rigors of social housing. Care should be taken so that the normal social behavior is not disrupted, reconciliation is not interrupted, and animals are housed in their group the majority of the time.

Cooperative Feeding is a technique that is used to enhance pro-social behavior while minimizing adverse consequences of social housing. It has been successfully used with many species, including a variety of primates (Bloomsmith et al, 1994, Cox, 1987, Desmond et al, 1987). Dominant animals have social savvy, particularly primates with complex social networks. It has been suggested that aggression, as socially defined, is an acquired, instigated, maintained and modified behavior. When it enables us to satisfy our wants or desires, it is rewarded, or when non-aggressive behavior is less successful, aggression increases (Rummel, 1977). Dominant non-human primates are accustomed to surveying other group members, being sentries, and managing the group they lead. Both in the wild and captivity, they are reinforced for these behaviors. In captivity, this is more significant when they steal food or other resources from group members who are unable to escape. When attempting to provide subordinate animals with food, enrichment, or other desirable resources, many of have used the “distract the bully, and sneak it to the poor guy on the bottom” technique. This actually exacerbates the problem. When we ‘sneak’ food (or other resources) to less dominant animals, the dominants often become more intent on their sentry duties and may chase group members who attempt to get their fair share of desirable foods. Frequently, this will result in heightened levels of agonism (aggression and fleeing).

Cooperative feeding breaks this cycle of reinforcement and provides a feasible alternative for all parties by making it ‘worth while’ for the dominant animal to allow the subordinate to receive resources. Desirable aspects of social behavior are carefully increased using positive reinforcement training techniques. A thorough understanding of species-typical and individual animal’s behaviors is essential for successful cooperative feeding. Operationally, this means:

- Pro-social behaviors such as proximity, greeting, grooming, and reproductive behaviors are reinforced.
- Normal social behavior is increased through careful application of positive reinforcement.
- Dominance is recognized and even reinforced; no attempts to diminish it are made. However, dominant animals are expected to allow sub-dominants to have resources most of the time.
- Dominant animals are reinforced for allowing subordinates to receive food, enrichment, and other desirable resources.
- Two behavioral changes often become apparent and typically indicate successful cooperative training. These include: a boost of the dominant animal’s patience and tolerance of subordinates; and a decrease in submissive and fear behaviors from the subordinate animals.
- The dominant’s change towards tolerance and patience is of obvious benefit relating directly to improved compatibility. The subordinate’s behavior shift towards bravery often raises the question “won’t the dominant go after her if she’s too bold”. It is the simultaneous occurrence of tolerance and bravery that create success.

Desensitization is a method of reducing fear that is associated with a particular event, person, situation, location, or object. It is an active process by which fear is ‘trained out’ by pairing positive reinforcement with the frightening event or object. Over time fear associated with that event is diminished. This technique relies on the animal’s voluntary cooperation, therefore the animal is shown exactly what is happening, what tools are used, and who is present. Desensitization is one of the most important techniques a trainer can master.

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The benefits of desensitization in preparing for veterinary procedures are conspicuous. However, its implications for the management of social behavior may seem more cryptic. But, consider categories of aggression based upon various antecedent conditions which have been described by Brain (1981) as predatory attack, self-defensive behaviors, parental-defensive behaviors, and social conflict, and also described by Moyer (1968) as predatory, inter-male, fear-induced, irritable, territorial, maternal, and instrumental. Of these conditions, “self-defensive” and “fear-induced” both involve fear, uncertainty, apprehension, and likely an absence of control over particular situations. These antecedent conditions are both known to cause aggression. Therefore, it is reasonable to draw the conclusion that if animals are desensitized to various fear-inducing stimuli, aggression will be reduced. Also, if animals are trained to participate in various events, like medical procedures, they will essentially have control over how that event occurs, which will reduce anxiety (Lambeth et al, 2004), and the potential for aggression. Observing monkeys to determine if fear-induced aggression contributes to a lack of social harmony may aid in directing desensitization training efforts.

Gentle Touch and Proximity behaviors include the use of desensitization and targeting to train animals to respond to proximity of group members in a species appropriate manner. Targeting is used to elicit behaviors such as touching and grooming, presenting for grooming and breeding behaviors (Desmond, 1987), and the concept of touching someone or something gently. ‘Gentle’ can be especially helpful in managing introductions. Animals who approach others in a gentle way will less likely provoke chasing, extreme submission, or aggression.

Cox (1987) documented changes in the behavior of a group of drills (*Mandrillus leucopheus*) as a direct result of socialization training, including gentle touch and proximity training and cooperative feeding. Prior to the onset of training, the group interacted very little in spite of being housed together. The study documented a trend towards significantly increased social behavior, which persisted beyond the actual period of training. This meant the training accomplished the goal of increasing social behaviors, improved dominant animals’ tolerance towards subordinates, and subordinates became ‘braver’ when dominants approached. This critical study confirmed suspicions that socialization training could significantly impact social behavior.

Shared Goal-directed Training involves training animals to work together towards a common goal by rewarding their collaborative efforts. These behaviors have been taught to various types of animals including cetaceans, pinnipeds, and elephants. For many years, cetaceans have performed group show behaviors requiring a coordinated effort in working together. They are rewarded as a group; if one animal doesn’t perform the behavior to criteria, the group may not be reinforced. Of course it is essential to determine why the group hasn’t performed the behavior together, so the proper technique for addressing the problem is used. Animals who have complex social systems quickly grasp the concept of shared goal-directed training. In the dolphin example, if the animals are sent to do a bow behavior as a group and one animal is slower, the other animals should be heavily rewarded if they compensate so that all bow together. Marine mammal managers have reported that often animals trained to do these types of group behaviors may form an alliance and tend to socialize more with each other (Phillips, W., personal communication). Using shared goal-directed behaviors to purposefully create social ties offers potential as a method to enhance socialization. Old World monkey shared goal-directed behaviors could include retrieving an object too cumbersome for one animal, passing objects between or among animals, and participating in ‘relay’ activities that involve moving from point A to point B and passing an object.

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## CONCLUSION

In this presentation, I've discussed only one facet of behavioral management, positive reinforcement training. However, to be most effective, when elements of enrichment, positive reinforcement training, facility design or modification, and operational procedures are used in combination, a behavioral management system that is far more versatile, affective, and responsive than any single component can be realized. Staff must be provided with adequate support, including skills development, equipment, and resources, especially time, in order to effectively implement behavioral management. When planning such a program, it is advised that a diverse group carefully and purposefully outline clear objectives, methods to achieve these, and assessment techniques. Through skillful application of behavioral management, with particular emphasis on positive reinforcement techniques, appropriate social behaviors can be encouraged while harmful consequences of social housing are mitigated, thereby creating a future population of socially competent individuals.

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