

Baboons

Linda Brent, Ph.D.
Chimp Haven, Inc.
Southwest Foundation for Biomedical Research

Thomas M. Butler, D.V.M., M.S., DACLAM
Southwest Foundation for Biomedical Research



enrichment
for nonhuman primates



Introduction

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Nonhuman primates maintained in captivity have a valuable role in education and research. They are also occasionally used in entertainment. The scope of these activities can range from large, accredited zoos to small “roadside” exhibits; from national primate research centers to small academic institutions with only a few monkeys; and from movie sets to street performers. Attached to these uses of primates comes an ethical responsibility to provide the animals with an environment that promotes their physical and behavioral health and well-being. Thus, an obligation is entailed that those individuals/institutions caring for captive primates should make every effort to ensure adequate veterinary care and husbandry are provided, that the animals are housed in appropriate facilities, and that as broad a range of species-typical behaviors are able to be expressed by the animals as is possible for the captive environment.

This book serves as an introduction to the basic behavior and environmental enrichment of several species of nonhuman primates that are more commonly used in education, research and entertainment. In many ways, this book is meant to be a “how to” manual; it is not intended to be a broad scientific review of the primate behavior and enrichment literature. The fundamental premise taken throughout each chapter is that for an enrichment program to be effective, there must be a basic understanding of the biology and behavior of the primate species. The species addressed in this series are: baboons, capuchins, chimpanzees, macaques, marmosets and tamarins, and squirrel monkeys. Each species-section can be read as a stand-alone document without need to reference the other sections. This then allows the user to distribute the different sections to personnel caring for the specific animals.

Each section is divided into five parts: 1) Background, comprised of the habitat of the primate, the physical features of the primate, its psychological and/or



social behavior, and its mating and reproductive behavior; 2) Social World; 3) Physical World; 4) Special Cases, describing any age-related considerations and concerns associated with individual housing; and 5) Problem Behaviors. The content of this series has been provided by members of the Association of Primate Veterinarians (APV) and the American Society of Primatologists (ASP) who have special expertise in the species addressed. This book is intended to be a primer because it is, indeed, an introduction to the subject of environmental enrichment for primates housed in a diversity of conditions. A list of references and/or other resources (principally on-line) is provided at the end of each chapter that provide additional guidance. The use of scientific references has been limited, but should the reader desire more information about a specific subject, the links at the end of the sections will provide direction to obtaining additional detailed information. Readers are also directed to the National Research Council publication, the Guide for the Care and Use of Laboratory Animals (1996) and the U.S. Department of Agriculture's (USDA) Animal Welfare Regulations to review the regulatory requirements of the Public Health Service and the USDA for the provision of environmental enrichment.

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—Kathryn Bayne, M.S., Ph.D., D.V.M., DAACLAM, CAAB
Editor, Working Group

This project is dedicated to the memory of Dr. Sylvia Taylor, Veterinary Medical Officer, Animal Care, U.S. Department of Agriculture, who was a proponent of providing enrichment to nonhuman primates and was generous in sharing her knowledge and expertise in this regard.

Baboons

Background

Habitat

Baboons live in many parts of Africa, primarily in dry savannah woodlands. They are the largest and most terrestrial, or ground dwelling, of the cheek pouch monkeys (Cercopithecines). There are five types of baboons--olive, yellow, red, chacma and hamadryas--which may interbreed to form hybrids in captivity and, in some places, in the wild. Olive and Yellow baboons are found in many areas of equatorial Africa and are typically called savannah baboons. Hamadryas baboons inhabit the highlands of Ethiopia. Red or guinea baboons live in gallery forest and woodland savannas of West Africa. Chacma baboons reside in southern African woodland to semi-desert habitats. Home ranges of baboons may cover approximately 10,000 acres.

Physical Features

Baboons walk on all four limbs, and their forelimbs and hindlimbs are approximately the same size. Males (44 to 53 lbs.) are much larger than females (26 to 35 lbs.) and have long canine teeth. The tail is moderately long and is typically held in a characteristic U-shape. Baboons have prominent ischial callosities, which are bright red in some species. They have a prominent muzzle. The life span of a baboon ranges from 20 to 30 years.

Behavior

Baboons have a number of distinct vocalizations, including:

- Alarm bark – loud, rapid, sound to indicate potential threat or challenge
- Lipsmack – short, repeated clicking of the lips or tongue, associated with friendly behavior and approaches to a dominant individual or infant

- Grunt – low, snort-like sound, often associated with group unity or communication
- Oer – moo-like sound made by infants in distress
- Gek – quick “aaack” indicating disturbance
- Scream – shrill, loud, high-pitched sound made when aggressive or fearful

Other gestures that indicate a threat or aggression include brow raises that display white eyelids, yawns directed at a specific individual, hitting the ground or object rapidly (slapping), teeth grinding, and staring intently at another individual.

Baboons travel and feed during the day and sleep in trees or cliffs at night for protection from predators. Being very good scavengers, baboons can survive in areas that other primates cannot. They spend about half of their waking hours looking for, processing, and eating food. They may dig up roots and eat insects, lizards, small mammals, and even crabs or fish if near water. In captivity, they spend more time in social interaction and much less time feeding. Captive baboons can be fed a complete, commercially available diet, supplemented with a variety of other fruits and vegetables.

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Mating and Reproduction

The female’s skin on her rump, or perineal area, swells greatly according to her menstrual cycle. This is usually referred to as sex skin. Hamadryas females have a particularly large sex skin swelling. During the period of maximal swelling, she will ovulate and be most receptive to mating. The sex



Prominent sex skin on a baboon (photo by E. Glover, Southwest Foundation for Biomedical Research (SFBR)).

skin becomes flat and takes on a bright red or purple hue when she becomes pregnant. Gestation lasts from 18 to 24 weeks. Infants are born black with pink faces and bottoms. They need the mother's protection, milk and transportation to survive. At about four to six months, the infant begins to change to the color of the adults. They are generally weaned by colony managers around five to six months of age, and although the natural weaning process will vary among baboon species, it generally occurs between one to two years of age. They become sexually mature at about three to five years.

Social World

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Baboons live in a strict society. They clearly know their rank in the group and the rank of others, and behave toward others as appropriate for their dominance status. Baboons are very protective of infants and tolerant of juveniles, and males may carry and groom infants on occasion. Friendships have been reported between particular males and females.



A social group of baboons (photo by E. Glover, SFBR).

Baboons are incredibly social animals and should not be kept isolated. Infants should be kept with their mothers for at least a year to develop normal social skills. Compared to most other primates, baboons are fairly easy to put together into groups. Preferably, subspecies should be kept together, or at least in groups with similar structure as found in the wild, which can differ among and within species, probably based on the nature of the habitat in which the animals are found. Groups that combine a single male with multiple females are most common in captivity, but all-male groups also can be formed. Groups with multiple females and males are more difficult unless there is enough space for them to avoid aggression, especially fights over mates.

Physical World

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Housing

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4 In general, baboons are quite hardy and adaptable. They can be successfully housed in a variety of captive conditions, from indoor cages to large outdoor semi-free ranging enclosures. Sturdy cages are required because baboons are



Baboon sleeping off the ground on a high shelf (photo by E. Glover, SFBR).

strong and will manipulate the cage a great deal. Cages should be constructed to prevent the baboons from pulling off pieces of the cage and eating them. Baboons favor high perches. While some facilities have successfully used old tires and ropes for resting areas and swings, others have reported that the baboons eat

the items and become sick. Alternative swings and resting areas can be constructed from metal or polyvinyl chloride. Large areas and/or visual barriers are necessary so that low-ranking individuals can avoid others. If aggression within the group is a problem, elevated resting areas or hiding areas should be added to help mitigate the aggression.

Enrichment

Feeding is a popular enrichment activity for baboons, who are very motivated by food. Due to their strict dominance hierarchy, only the most dominant male and female may eat food items provided to a group. To avoid this type of monopolization, it is best to scatter smaller food items all around the enclosure. In addition to feeding commercially available, nutritionally balanced diets, baboons can be offered food enrichments such as grains, fruits, vegetables, vegetation, bark, coconuts, peanut butter, dry fruit, honey, candy, cereal. The feeding of treats should not compromise the baboon's appetite for the nutritionally balanced food, so the quantity of treats provided should be monitored closely. Baboons will also ingest items that are not healthy for them, such as rocks, wire, metal or other harmful materials. Bloat has been reported if baboons eat too many orange peels or gas-producing vegetables (e.g., broccoli), and they may become impacted if they eat too much hair, hay or wood.



Baboon using a recycled and modified soap barrel for perching (photo by E. Glover, SFBR).

Objects containing food must be heavy or they will be destroyed quickly. Puzzles made of sturdy materials, such as polyvinyl chloride (PVC), can be filled with treats. Toys on short chains can be coated with honey and dipped in grain, then frozen and hung on the cage, for a treat. Once the baboons eat the food, they can then play with the toy that remains. Frozen blocks of juice or water with fruit inside can be given to the baboons in the cage or enclosure, or hung from the roof with a chain. Locking nuts are necessary so the baboons do not unscrew the devices. Also, sturdy clips should be used to attach the device, and puzzles

should be removed when empty to keep the baboons from breaking them.

Since baboons manipulate and chew many objects, very sturdy dog toys make good baboon toys (e.g., rigid plastic balls; large, thick rubber toys; hard nylon dog chews). Hard, nontoxic logs or wood pieces can

be used for chewing and even as perches. Pieces at least two to three inches in diameter are best so that they are not immediately destroyed. Wood items must



Baboon with durable toy (photo by E. Glover, SFBR).

be replaced on occasion and should be monitored so that large pieces or slivers do not endanger the baboons.

Other types of enrichment include video-tapes, mirrors, and wind chimes, which are especially helpful enrichment for singly caged baboons. Several commercially available enrichment items, including fleece boards made for grooming and plastic balls with holes in them and filled with treats, are not as useful for baboons and



Baboon on a shelf in enclosure (photo by E. Glover, SFBR).



probably not worth the expense.

New items may receive a lot of attention, but baboons will quickly tire of them. Replacement of toys or devices at regular intervals is important to keep the animal's interest high.

*Baboon with Kong® toy
(photo by E. Glover, SFBR).*

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Special Cases

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Older animals usually will become more isolated from the troop, but not always. Since they can't climb as well as their younger counterparts, they should have plenty to do at ground level. Food and water must be accessible near the floor, and food will have to be softened by soaking in water if the older baboon has lost some teeth.

Infants are curious creatures and will explore any opening. It is essential to make sure that all possible openings are covered to prevent entrapment or escape.

Problem Behaviors

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Like other monkeys, baboons can develop problem behaviors for a number of reasons. Being taken away from the mother and raised by humans is a major cause of later abnormal behavior patterns, as the infant must learn to cope with the loss of the mother and grow up in an artificial environment. Boredom, stress and, ultimately, problem behavior may result from confinement in small enclosures, lack of enrichment activities, solitary housing, or housing that does not afford the animal ways to avoid more dominant individuals or frightening situations.

Examples of abnormal behavior patterns to watch for are hair eating and regurgitation. Extra feeding with food or “toys” can help to alleviate these behaviors that are related to boredom and not enough time spent feeding. Orphaned baboons often develop self-directed behaviors, such as self-sucking and clinging. They need appropriate attachment figures if they cannot be kept with the mother. One possibility is a mobile surrogate made of fleece-wrapped, three-inch PVC hung from the top of the cage. Exposure to peers or other friendly adults is critical to the orphan for normal development. It is very difficult to eliminate problem behaviors developed during infancy, but some individuals may be helped by gradually introducing them to friendly, perhaps younger, social partners.

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More severe problems, such as self-biting, also have been reported in captive baboons. Intensive efforts are required to reduce or eliminate this problem. A daily program of enrichment, with documentation of items that seem to reduce the frequency of self-biting is required and may need to be continued for the life of the baboon. For individuals that increase self-aggressive behaviors when new enrichment items are provided, enrichment provided outside of the cage (such as in association with positive reinforcement training) can be more effective until the behavior is under control. Abnormal behaviors in baboons housed alone are greatly decreased when the animals are placed into social groups.

Some baboons are also very aggressive to one another, causing problems when they are put into new groups. This “hyper aggression” is more common in males and difficult to control, and it may be necessary to try multiple different partners, including females or even juveniles. It is important to observe the individual to determine what sets off the aggression, since it may be related to commotion

in the environment, feeding time, etc. This can help to indicate options that may reduce the behavior (e.g., moving to another cage, separating during feeding).

It is far more humane for the baboon and less work for the person to keep abnormal behavior patterns from developing. This can usually be accomplished by doing two things. First, keep infants with their mothers for about one year. Second, house baboons in social groups in large enclosures with enrichment to occupy their time.

Safety Issues

While they may have a reputation for being aggressive due to their size and large canines, baboons actually are mild-mannered and easy to work with compared to other primate species. They have elaborate threat displays that help to keep the peace in large groups, but actual aggression resulting in injury is not common. Given the size of baboons, it is not easy to “force” them into doing something, such as moving into a new cage. Greater success and a better relationship will develop if the baboons are treated with respect and positive interactions – and they will respond with cooperation and friendly behavior.

Baboons can be trained with positive reinforcement to cooperate during a variety of management procedures, including transferring them to new areas, getting them to show parts of their body for inspection, and performing certain medical tests (i.e., blood pressure measurement). Given their keen interest in food rewards, ability to learn quickly, and generally relaxed attitude around humans, they make good pupils. People can maintain positive interactions with baboons by providing treats to the baboons and taking care not to frighten them by staring at them or moving suddenly.

Baboons should be sedated during physical examinations and other procedures that require physical handling, especially if they weigh more than about 11 to 15 lbs. The best way to move them is via a system of chutes and doors.

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Common Names of the Baboons

- Papio anubis* or *P. hamadryas anubis*: Olive baboon, Anubis baboon
P. cynocephalus or *P. hamadryas cynocephalus*: Yellow baboon, Savanna baboon
P. hamadryas or *P. hamadryas hamadryas*: Hamadryas baboon, Sacred baboon
P. papio or *P. hamadryas papio*: Western baboon, Guinea baboon
P. ursinus or *P. hamadryas ursinus*: Chacma baboon

enrichment for nonhuman primates

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For more information, contact OLAW at NIH
tel: (301) 496-7163, e-mail olaw@od.nih.gov
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