

RUNNING HEAD: Enrichment of Captive Cats

Emotional Enrichment of Captive Big Cats

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In ancient Rome, when captive lions and other big cats were kept for gladiatorial games in the *Circus Maximus*, presumably there was little concern for the well-being of animals intended for public amusement. In contrast to ancient practice, big cats today are mainly kept for scientific, conservation, and educational purposes. The health and well-being of felines are carefully monitored in modern zoos and wild animal parks. Although, these felines are well cared for, other felines are kept in private menageries where the owner's practices are often less humane. The exact population of captive big cats worldwide is unknown, but estimates range as high as ten thousand in the United States¹ where regulations controlling the possession of exotic felines until recently were limited or nonexistent. Therefore, a large number of big cats are being kept by private individuals with insufficient knowledge, skill, and ability, as well as insufficient financial means to properly care for a dangerous predatory animal. Private owners of big cats may consider them as pets, and consequently rearing practices often resemble the hand-raising of a domesticated cat or dog.

The emergence of captive animal sanctuaries is in large part a response to the failings of private ownership in states like Texas, which has one of the highest populations of privately kept big cats. The International Exotic Feline Sanctuary (IEFS) located in Boyd, Texas is a fully accredited American Zoological Association facility that provides for the long-term care of approximately seventy big cats. The big cats housed at IEFS typically have had many interactions with humans prior to their arrival at the sanctuary. Unfortunately some were inhumanely treated or poorly hand reared by unknowledgeable owners. Such poor treatment prior to sanctuary living has often resulted

in the development of maladaptive behavioral problems in captivity. This paper describes practices that IEFS has implemented for big cat enrichment involving human/feline interactions

Captive Feline Enrichment

Enrichment is a general term that refers to the modification of the environment or behavior of an animal typically in held in a man-made environment. Approximately 4 decades ago, scientists discovered that simply enriching the sensory environment of the normal impoverished lab animal enclosure could have profound behavioral and physiological effects on laboratory animals. Since the early scientific studies, the beneficial effect of enrichment has been investigated in a wide variety of academic disciplines and species. Due to this solid basis in science, enrichment has emerged as a common practice in applied animal behavior settings such as zoos.

Environmental enrichment and behavioral enrichment are terms used interchangeably in most scientific literature. However, we wish to distinguish between the two terms, based on whether the enclosure (i.e., environment) is enhanced or whether a behavior is altered through the introduction of a device or operant conditioning. Thus, in environmental enrichment the context affords additional behavioral opportunities for the captive feline, whereas in behavioral enrichment the additional behavior opportunities are afforded through interaction with a toy or a device such as an operant manipulandum (e.g., a lever that can be pressed to deliver a food reward). A third form of enrichment can also occur when the purpose is to enhance the animal's emotional state through social interaction with humans. We refer to this as emotional enrichment because of its heavy

reliance on human interaction to enhance the animals' well-being. All three types of enrichment are employed at IEFS, as we shall describe in the following sections.

Environmental Enrichment. The American Zoological Association defines environmental enrichment as “a process for improving or enhancing zoo animal environments and care within the context of their inhabitant’s behavioral biology and natural history. It is a dynamic process in which changes to structures and husbandry practices are made with the goal of increasing the behavioral choice available to animal and drawing out their species-appropriate behaviors and abilities, thus enhancing their welfare. As the term implies, enrichment typically involves the identification and subsequent addition to the zoo environment of a specific stimulus or characteristic that the occupant(s) needs but which was not previously present.” In other words, enrichment is primarily concerned with physical objects and structures that seem to make life a bit more interesting for the species.

At IEFS, we practice environmental enrichment in many ways. We build very large naturalistic habitats with ample shade, terrain changes, and vegetation (see example of IEFS enclosure in Figure 1). Such elements provide for the cat’s needs of prospect and refuge (i.e., having characteristics of a visual vantage point and a sense of security). Additionally, ramps and high perches are provided for the climbing cats such as cougars, leopards, bobcats, lynx, and jaguars. We build perches for the lions, whereas large dirt mounds serve the same purpose in cheetah habitats. We build perches and pools with running water for the tigers and jaguars, as well as other cats. The complexity of the habitat can reduce stereotypy, decrease aggression, and increase species-typical behaviors.

Behavioral Enrichment. Some argue that environmental enrichment by itself does not provide an incentive for increasing species typical behaviors of the animals within a so-called enriched environment. Advocates of behavioral enrichment, such as Dr. Hal Markowitz, have pointed to the lack of behavioral contingencies inherent in captive settings. They argue that creating enrichment activities that afford opportunities to self-control schedules of feeding, for example, is far more mentally stimulating than a quasi-naturalistic enclosure. An operant manipulandum that activates artificial prey or that delivers food will encourage hunting-like behavior and have been successfully used for zoo felines. Providing the opportunity to capture live fish has also been shown to be effective feline enrichment. The current enrichment practice at IEFS minimizes associations between humans and food, thus does not employ food reward for training. However, we employ enrichment devices that elicit species-typical prey behaviors. For instance, we give large and small balls to the cats to paw, chase, and chew. We give boat buoys and large plastic “pickles” to the larger cats to carry and bite. In the fall, we give the cats pumpkins to play with (see Figure 2), and in the summer, we give cats ice blocks embedded with food objects to play with.

One limitation of an enrichment approach based on operant learning theory may be its dependence on motivation factors such as hunger in order to be most effective. The cat’s interest in toys may also be limited by short-term motivational factors and therefore becomes less effective when the novelty wears off. A system of periodically exchanging toys may be required to minimize the cat’s boredom. Considering the apparent inadequacy of environmental and behavioral enrichment to provide sufficient mental

stimulation, another enrichment technique based on social contact with human may serve to enhance the captive feline's total well-being.

Emotional Enrichment. Emotional Enrichment is defined as the enhancement of an animal's psychological well-being through social interaction with humans. The premise for emotional enrichment stems largely from scientific research involving animal personality theory together with the acceptance of animal emotion currently flourishing in modern animal cognition theory. Furthermore, recent research on the underlying neurological mechanism and behavioral benefits of early handling suggests that emotional enrichment exists separately from environmental enrichment. Early handling is simply the human contact and taming of domestic and laboratory animals during early phases of development. The effects of social contact with people in caged domestic house cats has been shown to have an ameliorating effect on stress, which implies the existence of an identical response in captive big cats. Contrary to a prevailing attitude that denies the need for human social interaction, a human-feline relationship with captive exotic felines has been shown to increase reproductive success in some small exotic felines in a zoo setting. Thus taken together there is emerging evidence to suggest that enhancing the emotional state of a captive big cat is a distinct form of enrichment.

The purpose of enrichment in sanctuaries is often different than that set forth in zoos because it is employed as a therapeutic technique for felines. Thus, emotional enrichment is based on individual differences in big cat personalities rather than prompting species-typical behavior. Developing a theory that explains environmental/behavioral enrichment has been difficult. One problematic reason is the behavioral variation within a species is usually unknown. Thus we can not fully know

what is or is not species typical behavior. In addition, common behavioral measures of enrichment often lack relevancy to overarching biological theory. The ability to link enrichment with evolutionary biology theory is important because it could provide a valid assessment of the outcome in terms of Darwinian fitness. On the other hand, the emotional enrichment program for captive big cats at IEFS while aware of need to create behavioral variation, could be described as less aligned with an evolutionary biology model and more likened to a biomedical model of animal health using a protocol to establish emotional contentment.

Emotional enrichment is practiced in a variety of ways at IEFS. One frequent mistake that is made is to categorize a species in general terms vis-à-vis its personality and emotional characteristics. We work with each individual according to its personality and emotional needs. In general, we have our staff and volunteers treat each cat with the respect and dignity that would be accorded another human. Care is taken not to agitate, irritate, or unduly excite any cat. No demands are placed upon it, other than the necessary movement into and out of its separated area to be locked down for feeding and cleaning of the habitat. Volunteers and staff sit outside the habitats of various cats and give them companionship and company. When the keepers are working in the cat's area, they take the time to softly talk to the cat and reassure the cat before moving on, thereby having protected interaction that is beneficial to the cat without risk to the keeper. Keepers also take the time to relax the animal and make it comfortable with the keeper's presence before initiating maintenance or other activities (e.g., operating gates, feeding, and moving the animal).

The reverse might be more appropriate: to consider behavioral enrichment programs based upon the animals instinctual and emotional desires rather than what a human would consider enriching, and to recognize the possibility that the animal's emotional ranges are more far more complex than we choose to recognize. For instance, frequently facilities give exotic cats items filled with food that the cats have to dig out or hang something just out of reach for the cat to jump at. In truth, exotic cats, when not needing to obtain food for existence, want nothing as much as to be relaxed and free of stress. The enjoyment of seeing a cat working at a frustrating item is perhaps pleasurable to the human, but not the cat. They enjoy relaxing or sleeping without any stress more than most anything. A relaxed cat is considered to be a happy cat; where as, an excited cat is quite often an agitated cat. Altering their behavior to increase activity may be to their detriment.

The point is that we find that emotional enrichment not only heightens the behavioral enrichment and acts as an important adjunct to it, but the two activities in concert substantially improve the emotional and physical lives of the individuals involved. Enrichment items that would otherwise not be given much attention are used much more when they are a source of play and interaction with a human, and the cats seem to derive much more pleasure from the activity. Also, our experience is that the whole attitude of our cats is much more positive and peaceful as a result of our emotional enrichment program.

Most of the cats in our facility were either intentionally or unintentionally mistreated or abused. They come to the sanctuary with an antagonistic attitude towards humans. We have found that the great majority of them have changed that attitude as they

have come to appreciate our feelings and conduct towards them. Their lives have definitely been improved in obvious behavioral changes that have taken place. Their stress level is minimized. There are almost never see any defensive/aggressive actions towards directed towards human. Cats at our facility are rarely seen pacing, bare its fangs, or charger at humans. Pacing is very minimal and is generally associated with specific causal stimuli such as a new piece of machinery and unusual group of people.

In certain cases unprotected physical contact interaction is initiated with some of our large cats that have had direct contact prior to arriving at the Sanctuary. In most cases the prior interaction was adversarial, as training methods of domination/ control were apparently utilized. Most of the cats respond surprisingly well to utilizing only affection, trust, and respect in direct interaction. In emotional enrichment, sitting near and becoming a companion through softly talking to them will give them reassurance and sense of security. Many of the larger cats will become so relaxed that they often fall asleep as a consequence of human comforting (see figure 3). They obviously enjoy and want positive emotional interaction with humans. Even the most solitary of cats in the wild, such as leopards, cougars, and tigers can be among the most affectionate of our cats with emotional enrichment. This again varies from individual to individual. Some cats respond to simply standing near them and talking. Others cats want close proximity and sit next to a person during the interaction. In some cases, an individual cat would rather play interactively with it by utilizing some of their enrichment items. For example, interacting with a cat by rolling a ball back and forth and holding one of their enrichment items or tossing it for them will direct their attention to the item. Often simply holding a dry twig for it to take in its mouth and break pieces off bit by bit (this is a favorite game

for most of the cats, actually) can be stimulating interaction. Some also enjoy direct physical contact, such as being rubbed or scratched. Some cats become contented that they will fall asleep in the presence of humans and enjoy placing a paw over a persons hand or arm. The purpose of human presence is to be a reassuring influence on their state of mind and their environment.

This program does not necessitate actual direct physical contact with a potentially dangerous big cat to be successful. Many of the elements of our program could be utilized and improve an animal's life without the need for unprotected human contact. Indeed, we have several cats that derive a great deal of benefit from our program without having any direct interaction. Again, it is all an individual determination on our part. We would again emphasize that, unless unprotected contact can be safely utilized without any adversarial consequences, it would be better to confine the technique to protected contact. The only justification for interaction in an unprotected environment with an individual animal must substantially benefit that individual animal's quality of life, and that it can be done safely without danger to either the animal or human keeper. We feel that emotional enrichment would be a vital and helpful addition to any behavioral enrichment program and would substantially benefit the lives of the affected animals.

Summary

A large number of exotic felines live in captivity .In the wild most species of big cats are designated as either threaten or endangered mainly due to loss of habitat from human incursion. It is therefore likely that big cats will for the foreseeable future face existence in captivity of some form. Their prospect for continued survival is dependent on interaction with human both in the wild and captive settings. The present paper describes

various enrichment techniques suitable for captive big cats. Of particular interest is enrichment which enhances emotional well-being through human interactions. Emotional enrichment recognizes the captive animal's psychological need and benefit and that it can be fulfilled through social contact with humans. We argue for the inclusion of emotional enrichment to ensure health and well-being, in addition, to the more widespread implementation of environmental and behavioral enrichment. Sanctuaries such as IEFS which specialize in the long-term care of a limited number of species share a common goal with other zoological institutions of providing state-of-the-art care and scientific innovation in the field of zoo biology.

Further Resources

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Authors

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Footnotes

1. Estimate is given in a paper by P. J. Nyhus, R. L. Tilson, and J. L. Tomlinson (see Further Resources section for citation). Source for estimate number of big cats in Texas is given in an article by: Siderius, C. (2002). Catch those tigers: years of little or no regulation have made Texas a place where big cats prowl-and sometimes kill. Dallas Observer. Feb., 28.

Figure Captions

Figure 1. Environmental enrichment of a typical big cat habitat at IEFS includes pools variable terrain and climbing structures among others.

Figure 2. Behavioral enrichment devices which encourage play are used at IEFS. For example, pumpkins are a seasonal treat with a strong appeal to tigers and other big cats.

Figure 3. Author (Louis Dorfman) shown engaging in emotional enrichment of an adult male lion. Note the level of contentedness exhibited by this animal.

Figure 1.



Photograph taken by Louis Dorfman

Figure 2.



Photograph taken by Louis Dorfman

Figure 3.

