

THE ROLE OF FEAR IN ABNORMAL BEHAVIOR AND ANIMAL WELFARE

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ABSTRACT

Fear and anxiety have been defined as emotional states induced by the perception of actual or potential danger. In the "natural" state, these emotions are adaptive and trigger behaviors such as flight or fight, which are critical to the survival of individuals. The realities of captivity can present an entirely novel set of fearful experiences and events for an animal, while at the same time inhibiting or even prohibiting the expression of these important behavioral responses to fear. This paper provides an in-depth look at fear and anxiety for the captive animal and highlights the importance of recognizing the role these emotional states play in individual animal welfare and the expression of abnormal behavior.

INTRODUCTION

Humans have been debating the question of whether or not animals have feelings or emotions for a very long time. Yet, in that debate, even the most hard-bitten skeptics admit that animals feel fear, and recognize it as a primary emotion. And from our own human experience, it is a very powerful emotion indeed. It needs little explanation or detailed description because we can all recall, in an instant, just how it feels. And, I would suggest, that we could reasonably say that it feels very similar to an animal.

DEFINING FEAR

In reviewing the literature, fear is described alternatively as an emotional or motivational state. Webster's Dictionary defines fear as "an unpleasant often strong emotion caused by anticipation or awareness of danger". The Oxford Companion to Animal Behavior defines it as "a state of motivation which is aroused by certain stimuli and normally gives rise to defensive behavior or escape". Boissy (1995) describes fear and anxiety as "emotional states that are induced by the perception of any actual danger (fear state) or potential danger (anxiety state) that threatens the well-being of the individual, and which are characterized as a feeling of insecurity."

Fear has a very real set of physiological responses experienced by all animals, including humans. Fear triggers changes in blood circulation, constricting peripheral blood vessels and diverting blood flow to heart, lungs, brain, and muscles. Heart rate increases and adrenalin is released. Appetite is suppressed and there is an urge to vacuate bowels. Hormonal changes occur, with an increase in glucocorticoids. (Frieden and Lipner, 1971; Selye, 1976) All this contributes to the flight response, which is a most effective survival technique.

Why is this recognition of a shared experience between humans and other animals important to animal welfare? First, if we recognize that animals and humans experience fear in similar ways, we will have greater empathy for the captive animal who experiences fear on a regular or long-term basis. Second,

and more importantly, we can recognize the cost to animals that live in captive environments that do not allow for the expression of those critical survival responses that lead to alleviation of the fear. Third, we can recognize the role we play in escalating, or diminishing, the level and frequency of fear captive animals experience, and actively work towards the latter.

FEAR STIMULI AND RESPONSE IN THE WILD

Fear is triggered through two types of stimuli. Sign stimuli are visual, auditory, or olfactory stimuli that trigger an innate or reflex response. For example, when a prey animal reacts to the presence of a predator. The second types of stimuli are those to which a fear response has become attached through conditioning. (McFarland, 1987) For example, when an animal experiences pain or stress in relation to a particular stimulus.

When experiencing fear, animals have several functional options of response – flight, fight, display, avoidance, and species-specific defense reactions. Escape or flight is most often the first strategy employed. Animals show “a characteristic escape reaction, specific for (species) sex, age, enemy, and surroundings...” (Hediger, 1950)

Inability to escape leads to the fight response. This response, “...always with the character of self defence (emergency), is called the defence reaction, and is characteristic for each species.” (Hediger, 1950)

Display behaviors are used to warn off enemies to protect both the individual or the group. For example, alarm calls warn group members of approaching danger. Pilo-erection, facial expressions, body posture are all physical signs of warning. (Boissey, 1995)

Avoidance behavior, innate or learned, has obvious survival value. “Physically avoiding areas where predators may lurk, or choosing not to consume potentially poisonous substances are typical examples.” (McFarland, 1987) If the animal can stay away or withdraw from the danger, he may or may not reduce fear, but he avoids the aversive outcome.

Finally, some animals employ species-specific defense reactions to fear. These include hiding, camouflaging, color changing, freezing, and death feigning. (McFarland, 1987)

FEAR STIMULI AND RESPONSE IN THE CAPTIVE ENVIRONMENT

With a basic appreciation for how fear impacts animals, it is important to identify specific factors that relate to the fear response within the captive environment.

Socialization

Rearing history has a profound impact on the development of fear responses in captive animals. Animals raised in social isolation or even moderately restricted environments show enhanced fear of novel objects, of conspecifics, and are often unable to develop normal social behavior or form attachments with other individuals. (Bloomsmith and Baker, 2001; McFarland, 1987)

Physical Environment

The size and qualities of the physical space available to captive animals is very important. For example, space size should be adequate to allow the animal to achieve flight distance from a fearful stimulus. Species-appropriate physical features that allow animals to hide, climb, burrow, and camouflage must also be present. But what if an animal can't escape? What if the cage is too small, or too crowded, or too barren for the animal to put sufficient flight distance between himself and the "enemy"? Hediger (1950) points out that if that flight distance is not possible, an animal cannot rest and remains in a state of tension. If this occurs, fear is maintained, and the animal can ultimately remain in a chronic stress response or what is referred to as a state of distress. (Moberg, 1985; Toates, 1995) This state has significant and detrimental physiological effects including slower growth, lower reproductive success, and immunosuppression. (Broom and Johnson, 1993; Selye, 1976; Wielbnowski, 2002) It can also lead to an array of behavioral responses, including abnormal behaviors. (Meyer-Holzappel, 1968; Bloomsmith and Baker, 2001)

Human/Animal Relationship

One of the benefits of captivity we often cite is the elimination of the threat of natural predators. However, Hediger (1950) warned of the potential of an enemy/prey relationship developing between humans and captive animals. As caregivers we are the ones in the position of power – controlling food, water and other resources, access to physical spaces, choice of conspecifics, movement patterns, daily routines, and so on. (Laule, 2002) We are also the stimuli for all kinds of negative experiences. How many captive animals have come to view a particular vehicle, or colored uniform, or individual carrying a familiar tray of supplies as the "enemy" better known as "veterinarian"? The more negative events the animal experiences in relation to humans, the stronger the link between the stimuli (humans) and the fear response. (Hemsworth and Coleman, 1998) From perfectly appropriate actions, designed to take care of animals, we become the "predators" in the captive animal's experience. This, too, can leave an animal in a state of chronic stress. (Broom and Johnson, 1993) What is important to note is that aggression towards humans is often characterized as an animal behavior problem. However, it may in fact be a fear response that is triggered when escape is impossible.

Negative Handling Methods

The types of handling methods we employ with captive animals can have a significant impact on the level of fear, and stress, they experience. The use of negative reinforcement to modify and control behavior is achieved by pairing pain, discomfort, or an unpleasant experience with a particular object. (Pryor, 1999) Fear of the pain or discomfort triggers an escape/avoidance response, which leads to performance of the desired behavior. The bit in a horse's mouth, a choke collar on a dog's neck, an ankus at the back of an elephant's leg, all trigger an avoidance response because of fear of the pain or discomfort.

Studies with farm animals have shown a high degree of fear response associated with negative handling methods that is surprising since these are domesticated species. In one study on handling of heifers

using negative methods including hits, slaps, and kicks, remote blood sampling through indwelling jugular catheters showed both acute and chronic stress response in fearful animals. (Breuer et al, 1998)

A study on dog training methods found that dogs trained exclusively using reward-based methods were reported to be significantly more obedient than those trained using either punishment or a combination of reward and punishment. Dogs trained using punishment also exhibited more problematic behaviors including chewing household objects, stealing food, and over-excitement. (Hiby et al, 2004)

BEHAVIOR PROBLEMS AND FEAR

Considering the various factors that can impact a captive animal and trigger fear, it is important to recognize behaviors that may be related to fear, and address them proactively. For example, it is likely that any or all of the following behavioral responses could be related to a fear state.

- Fear of people – avoidance, moving away from person, refusal to cooperate, aggression
- Fear of medical procedure – failure to cooperate, avoidance prior to the event
- Fear of conspecifics – excessive submissiveness, refusal to cooperate, failure to bond
- Fear of objects or places – refusal to shift, uncomfortable in location, avoidance of object

ADDRESSING FEAR IN THE CAPTIVE ENVIRONMENT

With an increased awareness of the detrimental impact of fear on captive animals, particularly when there is limited or no ability to relieve it, we can adopt a pro-active approach to diminishing the level and frequency of that fear. The following are some suggestions for addressing these fear producing elements.

Socialization

As much as possible, animals should be mother-reared. If that is not possible and hand-rearing is the only choice, these animals should be concurrently provided as much time as possible to interact with conspecifics. This is especially true during the “attachment period” when they form attachments to parents and common features in their world. (Bloomsmith and Baker, 2001)

Physical Environment

The obvious strategy is to provide environments for animals that are large enough for them to achieve and maintain flight distance when needed. However, that is not always possible, particularly for animals living in a laboratory environment. Therefore, another key element is to provide some measure of comfort to animals through the ability to hide from or avoid fearful stimuli, or at least have the ability to control visual contact. (Laule, 2001)

Human/Animal Relationship

Our objective with captive animals should be to occupy the role of friend, not enemy. Patience and empathy for the animal goes a long way to accomplishing that objective. One of the most effective ways

to establish a positive relationship with captive animals is to have some positive interaction with them on a daily basis. Bayne (1993) found that 3-5 minutes of positive interactions daily with rhesus macaques (*Macaca mulatta*) decreased overall fear. A study of chickens found that visual contact between the experimenter and chickens involving slow, quiet movements, twice a day, resulted in reduced fear and stress reactions to handling and crating, and improved antibody response. (Zulkifli et al, 2002) Training staff to interact with animals with a positive attitude is an important part of this process. (Hemsworth and Coleman, 1998)

Positive Handling Methods

It is clear that negative handling methods should be avoided at all cost. Instead we should adopt a positive reinforcement approach to the handling and training of captive animals that includes minimizing the use of negative reinforcement, and avoiding any physical punishment. (Laule and Desmond, 1994; Reinhardt, 1992) We need to recognize fear in non-compliance, and adjust our behavioral objectives accordingly. Positive reinforcement training also offers specific techniques for addressing fear, including habituation and desensitization. (Laule, 2003) A technique called “cooperative feeding” has been shown to have the dual effective of reducing aggression and increasing affiliative behaviors in studies with primates. (Desmond et al, 1987; Bloomsmith et al, 1992)

Environmental Enrichment

Enrichment can be a very valuable tool in reducing fear in captive animals. (Shepherdson, 2002; Laule, 1997) Purposeful enrichment can provide visual barriers and screening as well as hiding places for animals. Enrichment can also be used to encourage cooperative behavior in socially housed animals.

CONCLUSIONS

Fear is a powerful emotion that is linked to stress responses in animals, both acute and chronic. It seems logical to assume that alleviating fear and anxiety to the greatest extent possible would contribute to a greater level of welfare for captive animals. Therefore, I would suggest that the following points be applied to our care and management of all captive animals.

- Recognize fear
- Acknowledge its effects
- Adjust behavioral criteria and expectations accordingly
- Develop and implement pro-active strategies to address it
- Practice patience and empathy

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