

Point of View: Recognizing Animal Suffering and Pain

by Nancy S. Mroczek, PhD

The research community has increased its attention to animal pain and what animals feel, but the barriers to accepting and dealing with animal sentience and the psychobehavioral position of the experimental animal subject remain great. As a psychologist, I spent many years studying and synthesizing the principles of animal behavior, learning, and experimental research in psychology, physiology, medicine, and related disciplines. Many of my colleagues have been animal researchers. I first began to consider the life of an animal in an experimental setting during an undergraduate course that involved experimenting with rats. During my first year of graduate school, I read and discussed experimental animal research and its results, but I was not prepared for the actual sight of live rabbits with electrode implants and nonhuman primates that were the subjects of invasive procedures and shock experiments.

I had never read about how experimental subjects looked, acted, or felt; only about the results of experimental manipulation and design. Studies I read about – for instance, limb deafferentation in nonhuman primates with discussion of their motor-disabled disorganized, and disparate post-operative free-ranging behavior – lead me to wonder if the authors considered the experimental subjects' pain.

Some of the impetus behind the research community's endeavors to stop animal pain and suffering has been a result of political pressure and the legislative process, but genuine care and understanding are the only effective means to spur change. I pose this article as a framework for understanding; however, the researcher must choose to care.

Animal suffering and pain is valid, difficult, broad, and, like all good knowledge, an unlimited domain. Current conditions and manipulations that are in keeping with ethical guidelines can be stressful and painful to animals. Do we expedite and objectify research and experimental results by rejecting or ignoring apparent animal suffering and pain? The task before us is not easy, and the topic still needs further discussion.

The biomedical definition of pain is an “unpleasant sensory and emotional experience associated with actual or potential tissue damage”[1]. The word “unpleasant” suggests an intangible quality. Pain, however, is experiential and subjective.

Despite the inexact and subjective nature of pain, scientists have undertaken voluminous research concerning nociceptive stimuli, pain thresholds, receptors, pathways, biochemistry, and avoidance behavior, all of which assume that animals do indeed feel pain. It is rare, however, to read discussions about the behaviors or the experiences of pain in animals. Unless it is the object of the study, pain inherent in

The author is a behavioral psychologist. She is a consultant with the Boston Pain Center, Neurobehavioral Associates, and Mental Health Resources, all in Boston, MA. Send reprint requests to Nancy Mroczek, 183 Marlborough St., Boston, MA 02116

SOME AREAS OF PSYCHOLOGICAL AND BIOLOGICAL DEPRIVATION ASSOCIATED WITH PAIN, STRESS, AND SUFFERING:

animal research is often ignored to rarely addressed in journal articles. The reasons why come from a number of dynamics, including:

a) The pragmatic denial of subjective animal reality in an attempt to objectify animal life in order to reduce it to measurable data;

b) Frequent intensive, circumscribed, relatively exclusionary experimental focus on questions of critical experimental interest and manipulation, or which the latter can entail varying degrees of unpreventable animal suffering;

c) The human tendency to dissociate from pain-provoking circumstances. (It is emotionally uncomfortable to keep animal suffering in the forefront of one's concerns);

d) The extension of traditional ideas that humans may use animals in the service of human interest and design;

e) Human conditioning to the incongruous position that considers animals dissimilar to humans with respect to drive, need, or sensation, yet similar enough to be used as models for the study of humans themselves. The doctrine of biological materialism dictates accepting verifiable pain based on the great similarities between animals' and humans' pain receptors, pathways, and centers. Pain neurostructural similarities, in fact, are more striking than those of morphology, chemistry, or behavior specificity and breadth, all of which are used by researchers to draw conclusions from animals to humans.

Animal pain is sentience, sensation, and feeling that humans can understand through observing either behavior or the lack of behavior. Physiochemical parameters of pain and stress constitute indirect, gross, and complicated interactive systems of biological function which can never precisely represent the intricate changes in subjective state. These changes are dependent on constellations of stimulus-variable cues acting inside and around an organism together, and each upon the other. Also, intra- and inter-species differences confound unitary, generalizable physiochemical bases; many of the ways we measure physiochemical parameters often induce more pain and stress. To know how and what an animal is doing affectively, cognitively, psychologically, and behaviorally, and to know whether it is in pain, we must carefully observe it and know about it in the way we know or think about other humans and ourselves; that is, with feeling and interest.

Psychological organismic properties including awareness, adaptability, instinct, and behavioral malleability dictate that those working with animals show sensitivity and alertness to whole-subject response and to the subjective dimensions of animal life, in order to truly see and understand pain.

The dimensions of pain are various. as established by the *Journal of the American Veterinary Medical Association*[2] and British legal standards attempting to identify the concept of pain[1], kinds of suffering include: physically acute and chronic pain, anxiety, fear, stress, distress, and pain from disease or injury. Suffering is the ongoing condition of any of these

- Denial of:**
- social relations
 - contact comfort
 - privacy
 - sensory stimulation
 - food
 - water
 - space
 - executable environmental challenge
 - aggressive outlet
 - sleep
 - care of body surface
 - natural skeletomuscular movement space
 - exploration
 - choice
 - avoidance
 - cleanliness
 - analgesics for pain
 - natural environment
 - opportunity for complete and natural panoply of instinctive behavior

SOME TYPES OF ENVIRONMENTAL VARIABLES WHOSE RANGE AND QUALITY CAN CAUSE PAIN, STRESS, AND SUFFERING:

- noise (quality and level)
 - quiet
- temperature
- luminosity
- humidity
- air quality
- food and water composition
- food and water availability

SOME SITUATIONAL VARIABLES WHICH CAN CAUSE PAIN, STRESS, AND SUFFERING:

- unpredictability
- forced exercise
- invasive procedure
- manipulatory procedure
 - change
 - electric shock
 - burning or heat
 - freezing or cold
 - radiation
- inhalation or ingestion of foreign, toxic, irritative, or pathogenic agents
- externally and internally applied toxic, irritative, or pathogenic agents
 - physical and psychological trauma
 - abuses from co-animals under stress
 - disease
- caretaker's insensitivity to animal sentience or environmental welfare
 - crowding
 - rough handling by personnel
 - disruption of circadian rhythm
 - frustration of instinctual response
 - frustration of learned response
- disordered and/or incompatible groupings
- aversive signals from predictable or unpredictable appearance of humans or other animals
- coerced proximity to intra- and inter-species counterparts which effect agonism and/or fear
 - suffering and death of other animals

All of the delineations below are subject to additions and species-specific refinements for individual animals. All are compounded by lack of control by the animal, lack of behavioral sanctuary, and by humans in the environment who are distanced from animal interest and need.

Although there will be both individual and species differences in

behavior, the factors listed below can be signs that an animal is suffering, based on a continuum of psychological and biological dimensions, including stress, anxiety, fear of pain, and reactions to disease or injury. Suffering responses will differ within and between species regarding the quality and intensity of suffering.

SOME BEHAVIORS OF SUFFERING: PAIN, STRESS, DISTRESS, ANXIETY, AND FEAR

<ul style="list-style-type: none"> •aphagia •hyperphagia •adipsia •polydipsia •lack of motivation/ability to reproduce <ul style="list-style-type: none"> •self-imposed isolation •continuous sleep or sleep-like state <ul style="list-style-type: none"> •little or fitful sleep •*lack or care of body surface •staring, lack of blinking reflex <ul style="list-style-type: none"> •*ears flattened •body drawn in or continuously maximally extended •unusual positioning to relieve pressure on pain area <ul style="list-style-type: none"> •agitation, lethargy, listlessness <ul style="list-style-type: none"> •head shaking •grunting in expiration •rapid, shallow breathing; deep and staggered breathing <ul style="list-style-type: none"> •facing away from surrounds •*muscle rigidity; lack of muscle tone <ul style="list-style-type: none"> •convulsions •*unsteady gait •self-mutilation, gnawing at limbs <ul style="list-style-type: none"> •twitching, trembling, tremor •panting; shivering •hissing, spitting, biting, bared teeth <ul style="list-style-type: none"> •growling •scratching, kicking, struggling <ul style="list-style-type: none"> •whimpering, *squealing <ul style="list-style-type: none"> •growling •struggling •baring teeth •howling, *screaming •reduced awareness and response to environmental stimuli <ul style="list-style-type: none"> •hypervigilance <ul style="list-style-type: none"> •exaggerated startle response •immobility, 'freezing' position; crouching <ul style="list-style-type: none"> •apathy •grimacing; facial expression (static suspension, fullness, spread) <ul style="list-style-type: none"> •crying – plaintive and pain reactive <ul style="list-style-type: none"> •paralysis; paresis •loss of sensation; *hyperesthesia •*erected coat, matted coat, dull coat 	<ul style="list-style-type: none"> •attempts to escape; avoiding <ul style="list-style-type: none"> •tail lashing •tail erect; *tail flat, close to body <ul style="list-style-type: none"> •choice of cooler surfaces <ul style="list-style-type: none"> •hyperalgesia •*diminished, slow or absent reflexes •stereotypy; behavior not present under natural adapted fit <ul style="list-style-type: none"> •eating uncommon substances <ul style="list-style-type: none"> •*ocular discharge •*nasal discharge •increased external gland secretion <ul style="list-style-type: none"> •*change in body odor <ul style="list-style-type: none"> •*sunken eyes •*dehydration •*swelling, edema •*constipation; *diarrhea •*irregular feces – volume, consistency, color, odor) <ul style="list-style-type: none"> •weight loss; weight gain due to pathology <ul style="list-style-type: none"> •*vomiting •*salivation •*jaundice •*penile protrusion <ul style="list-style-type: none"> •*sweating •*decreased volume of urine •*increased specific gravity of urine <ul style="list-style-type: none"> •*pupillary dilation •*skin tenting •*cyanosis •increase or decrease in heart rate; change in cardiac response pattern •increase or decrease in temperature <ul style="list-style-type: none"> •change in pulse quality •piloerection to approach, handling; atypical release and <ul style="list-style-type: none"> •sustenance of same <ul style="list-style-type: none"> •inflammation •suppuration •contusion <p>*Morton, D.B., and Griffiths, P.H.M. Guidelines on the recognition of pain, distress, and discomfort in experimental animals and an hypothesis for assessment. <i>Veterinary Record</i>; 116:431-436, 1985.</p>
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systemical impinging states and others such as isolation, separation, boredom, or frustration. Further, many states become generalized and attached to a far-ranging variety of cues and complex emergent cue fields.

To determine whether an animal is suffering, one must pay close attention to it as a subject (the individual creature), and as species (prototype of a set of psychobiological characteristics). The former entails empathy and compassion; the latter entails great interest, observation, and knowledge of species-specific instincts, motives, determinations, and aims. Hence, biomedical research on the mouse, monkey, or dog, for example, must include substantial ethological and understanding

of culture pertinent to these animals.

It is the nature of behaving organisms to adapt, and unless coerced into unnatural and overwhelming helplessness, to survive. Hence, animals have a great stake in their ability to regulate themselves and their environments to get what they need in order to survive. An animal is biobehaviorally wired to require and seek milieus or niches and ranges of environmental limits. It is structures to find means of enacting motives, learned, or biologically determine behavior specific to itself and through interplay with other beings and with a compatible environment. The more severe the blocking of these capabilities and opportunities, the more severe the suffering. Similarly, as a

Although the following are routinely used in some laboratories, they are not advisable as measures of suffering, because they are stressful to the animal, complex to interpret, and/or delayed or variable. Reactions to suffering can be known more immediately and by non-physiologically invasive behavioral observation.

- **increase** in catecholamines
- **inhibition** or stimulation of hepatic enzyme activity
- **increase** in ACTH, adrenocorticoids – for short term situations, not representative of long term adaptational change
- **increase** in white blood cells
- **other** specific chemical neuro-endocrinological and immuno-modulatory changes
- **desynchronized** EEG with or without evidence of external nociceptive arousal under conditions of skelotomuscular immobilization and/or anesthesia

general rule, the more damaging the invasion of animal tissue, and the more densely innervated the area of animal tissue, the more severe the physical pain. Physical pain is a sensation and a body stress.

Anxiety and fear also play an important role in animal suffering. Obstructing the adapted self-interest of the organism, or its protection or defense, results in aversion and organismic self-regulatory alert, which is anxiety (arousal) and fear. Arousal and fear are a function of a variety of variables such as intra- and inter-species behavior, degree and quality of deprivation, degree and quality of contradiction or opposition to natural environment and natural response, degree and quality of physical pain, and the interactive experience of these single and multiple factors combined to represent danger and threat to an animal's assurance of its own benefit and process.

Fundamental variables such as incarceration, housing, space, odors of other animals with tissue damage or who are in fear, and proximity to humans using the animals for means and ends disparate with animal instinct for self protection and survival, can cause psychological and biological stress. Similarly, laboratory variables such as air composition, humidity, temperature, luminosity, noise, quiet, and even food and water composition and their means and schedule of presentation, can affect stress and distress. Judgments about animal physical pain must include linkage with stress, distress, anxiety, and a highly trained sensitivity to the signs of suffering.

A major reason for captive animal suffering is the individual animal's lack of control, compounded by anxiety, fear, and conditioned phobic anticipation. An animal's instinctual organization doesn't "mesh" with incarceration, confinement, control, and manipulation. When there are no means to avoid these conditions or to pursue normal species-specific activities, suffering is perpetuated. Lack of control becomes an integral cause for anxiety, stress, anger, and depression.

Thus, careful attention and empathic care of the individual animal and an astute knowledge of healthy, natural species-specific behavior are required to minimize animal suffering.

It can be emotionally difficult for a caring scientist or animal care worker when he or she sees that the incarceration and protocol is upsetting to an animal. Besides, there can easily be an inherent contradiction in seeing animals suffer, and in being a part of that, while at the same time trying to prevent their suffering. Focus on critical material or behavioral objectives in the experimental use of living subjects can supersede awareness and attention to suffering.

Recognizing animals in pain requires empathic observation, which in turn engenders, identification and often sympathy and positive regard. Identification, sympathy, and positive regard by a scientist or animal care worker can, most of all, help to encourage optimum care and treatment of animals in pain. Recognition of animal suffering and pain is made possible by feeling for and disinterest in animals themselves, as sentient organisms, first and foremost, and feeling for an interest in animal behavior in totality.

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References

1. Kitchen, H., Aronson, A.L. *et. al.*, Panel report on the colloquium on recognition and alleviation of animal pain and distress. *Journal of the American Veterinary Medicine Association*; **191**:1186-1191, 1987.
2. McKerns, K.W., & Pantic, V. eds. *Neuroendocrine correlates of stress*. Plenum Press, New York, 1985.2.

Bibliography

- Brown, L. *Cruelty to Animals*. London; Macmillan Press, 1988.
- Craig, J.V. *Domestic Animal Behavior*. Prentice-Hall, New Jersey, 1981.
- Dubner, R. Pain research in animals. *Annual of the New York Academy of Science*, **406**:128-132, 1983.
- Kitchell, R.L. and, H.H., eds. *Animal Pain: Perception and Alleviation*. American Psychological Association, Baltimore, 1983. Distributed by Wilkins & Wilkins.
- Melzack, R. and Wall, P.D. *The Challenge of Pain*, Basic Books, New York, 1983.
- Moberg, G.P., ed. *Animal Stress*. American Psychological Society, Baltimore, 1985. Distributed by Wilkins & Wilkins.
- Phillips, M.T. and Sechzer, J.A. *Animal Research and Ethical Conflict*, Springer-Verlag, New York, 1989.
- Rollin, B.E. *The Unheeded Cry: Animal Consciousness, Animal Pain, and Science*. The Oxford University Press, Oxford, 1989.
- Stamp-Dawkins, M. *Animal Suffering: The Science of Animal Welfare*. Chapman and Hall, London, 1980.
- Tuffery, A.A. *Laboratory animals: An introduction for New Experimenters*. John Wiley, New York, 1987.
- Wolfe, T.L. Control of Stress Using Non-Drug Approaches. *Journal of American Veterinary Medicine*; **191**: 1219-1221, 1987.