Encyclopedia of ANIMAL BEHAVIOR

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Foreword by JANE GOODALL
some cases, the stereotyping animal may injure itself, causing physical harm through biting skin or whiskers, or neglecting its offspring, leading to mortality. However, sometimes, providing resources which the animal needs, such as tunnels and burrows for caged mice, or social companions for chimpanzees, can reduce or remove abnormal behavior.

In conclusion, we can tell a lot about whether an animal is suffering through behavior. Interpretations of behavior must be cautious since there could be many explanations for why an animal acts in a particular way; however, abnormal behaviors or those that are associated with fear and pain should be used as a warning sign that an animal may be suffering. Sometimes taking physical measurements such as heart rate, or measuring the amount of hormones in the blood associated with stress responses, can help in understanding whether a behavior shows that an animal is in distress. But do all animals, even those that are newly born, or insects and invertebrates like ants, feel pain? Should we worry when stepping over the cracks in the pavement, in case we squash a bug and cause suffering? In the past, even newborn human babies were not believed to be capable of experiencing pain; however, as scientific knowledge has grown, more evidence has shown that human babies and newborns of many species can feel pain. We are less sure about the ant; they may have the same basic neuronal “wiring” as humans and higher mammals, but it is unclear that they would be aware of sensations. Mammals, birds, and fish clearly have complex neural systems, and although we cannot be sure they are fully aware in the way that humans are, the likelihood is that they are sentient, or capable of feeling pain and fundamental kinds of unpleasant distress like fear and anxiety. Indeed, animals are also used in laboratories in order to study pain, fear, and anxiety. The ability of nonhuman animals to experience pain, fear, and distress means they are not like machines. Their ability to feel means humans have a responsibility to ensure that their suffering is minimized or prevented.

See also Welfare, Well-Being, and Pain—Behavioral Assessment of Animal Pain
Welfare, Well-Being, and Pain—Psychological Well-Being

Further Resources
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Welfare, Well-Being, and Pain
Carnivores in Captivity

Monotonous pacing is a remarkable and disturbing sight in zoos. It is a stereotypy—a repeated, unvarying behavior with no apparent goal or function, and pacing is particularly favored by carnivores like the cat, bear, and weasel groups (other mammal families instead specializing in other forms such as repeated head nodding or rhythmic object biting). The Dutch even term
such pacing "jibbers," literally "to pole bear," sometimes using this to describe agitated, restless people. Welfare research shows that such stereotypes generally signify that something is missing from the environment—that the animal is denied some opportunity to forage, build a home, socialize, or escape from threats, so that it becomes stuck in a behavioral rut, repeatedly attempting to carry out the draped activity. Scientifically identifying the precise roots of a stereotype can be difficult in zoos, however. Unlike animals in research laboratories or on farms, usually only a few individuals per species occur at any one site, making statistically sound conclusions difficult. Furthermore, it is often impractical to alter zoo animals' environments in substantial ways (imagine running an experiment to find out if caged tiger benefits from hunting, for example?). But one way to investigate why zoo animals respond to captivity in the ways that they do is to unravel why different species vary so much in their responses to zoo life.

The pacing of captive carnivores had long been thought to derive from frustrated hunting. Its energetic nature and tendency to be most common and rapid just before feeding time, led many researchers to speculate that it derived from the urges these animals may have to hunt and chase prey. Pacing was hypothesized to be an outlet for these natural activities so impossible in the typical zoo. But other researchers had other ideas. They observed how the behavior hugged enclosure boundaries, and suggested that instead it represented territorial parading, or the daily forays that carnivores would naturally make over their home ranges. So how can we tell which idea is right? And could conscious or natural behavior lead to further signs of poor welfare, over and above pacing? My colleague Bob Ceballos and I were sure that species differences would yield the answers. Polar bears may be infamous for their repetitive pacing in zoos, but their cousins the brown or grizzly bear seems far more relaxed and well-adapted in captivity. In 2000, these animals pace only rarely and in further contrast to the polar bear, they breed well, showing good mothering abilities and excellent cub survival rates. If species differ that much in how they react to zoo life, could looking at their natural behavior in the wild explain why? We reasoned that if the foraging hypothesis were correct, species that naturally hunt for 100% of their prey or that track and pursue them over great distances, should face least well in captivity, while in contrast, species that are naturally opportunistic (like raccoons), can strip-eating (like hyenas), or that forage by waiting, still and silent, for passing prey (like hyenas), should all adapt well to the captive life. However, if the ranging hypothesis was instead the correct idea, then it should be species that naturally have large home ranges that show most pacing in 2000, and perhaps other signs of poor welfare, too.

Testing this idea involved over 2 years' worth of intense library work. We needed data on stereotypy, on other variables affected by welfare (we chose infant mortality, since plenty of data were available on this), and on carnivores' natural time budgets in the wild. We found good quality reports of pacing in over 100 studies of over 300 stereotyping individuals, spread over 400 zoos and representing 35 species. From this, we could calculate the mean proportion of time spent stereotypically by the pacing individuals within each species. We then collated figures from the zoo community's International Zoo Yearbooks to calculate infant mortality; over the last decade or so, these volumes provided data on around 26,000 births for our target carnivores, from about 500 zoos worldwide. Finally, we needed to quantify these animals' typical activities in the wild. An exhaustive trawl through many books, and the last 8 decades' worth of relevant biology journals, generated over 500 good quality sources of data. From this, we could calculate each species' typical natural home range size, time spent hunting, time spent active, distance covered while hunting, and several other variables. At last we were ready to test the two ideas. To our surprise, natural foraging did not predict captive welfare. Naturally active hunters were no more likely than other species to be very stereotypic when caged, or to have high captive infant death rates.
Instead our data backed the second hypothesis. Species with large natural home ranges, and that naturally travel great distances each day, were the most likely to produce highly stereotypic individuals in zoos and have relatively low cub survivorship. Thus grizzlies thrive better than polar bears in zoos because in the wild, their typical home range is around 162 km² (70 mi²) a mere fraction of the 79,500 km² (30,700 mi²) covered by the typical polar bear.

This result demonstrates, for the first time, that particular natural lifestyles can make animals consistently more or less vulnerable to welfare problems in zoos. For carnivores, this allows zoos either to better select the species they keep (if naturally small-ranging species are inherently likely to fare better, maybe zoos should specialize in these?), or to alter carnivores' husbandry to incorporate features of their naturally wide-ranging lifestyles. This of course raises the key question: What exactly is it about having a naturally large home range that is so important? The simple answer is that we do not know, but we have a number of ideas. It could be that naturally wide-ranging carnivores simply need more space in captivity, but other things may well be important. For instance, wide-ranging carnivores' lives in the wild are typified by enormous day-to-day and season-to-season environmental variety: Over time, they shift between different subsections of the vast areas they call home, and so naturally do not spend month after month in the same locale. Perhaps if zoos can provide sustained, relevant environmental variability, they can help adapt these animals better to the captive life.

See also Welfare, Well-Being, and Pain—Sanctuaries
Welfare, Well-Being, and Pain—Psychological
Well-Being

Further Resources

Georgia Mason

Welfare, Well-Being, and Pain
Enrichment for Chickens

Just like people, chickens seek stimulation. However, they are often housed in barren, monotonous environments that provide little to occupy their interest. This practice was claimed to eradicate fear and stress, but, in reality, it is misguided and dangerous. Such environmental impoverishment compromises normal behavioral development. For instance, it reduces the