

# ANIMAL SENTIENCE

AN INTERDISCIPLINARY JOURNAL ON ANIMAL FEELING

Zentall, Thomas R. (2020) *Cognition, movement and morality*. *Animal Sentience* 29(11)

DOI: 10.51291/2377-7478.1594



This article has appeared in the journal *Animal Sentience*, a peer-reviewed journal on animal cognition and feeling. It has been made open access, free for all, by WellBeing International and deposited in the WBI Studies Repository. For more information, please contact [wbisr-info@wellbeingintl.org](mailto:wbisr-info@wellbeingintl.org).

## Cognition, movement and morality

Commentary on [Mikhalevich & Powell](#) on *Invertebrate Minds*

**Thomas R. Zentall**

Department of Psychology, University of Kentucky

**Abstract:** Each of the criteria for determining which should be given moral standing has its shortcomings. The criterion of cognitive is especially weak. That research on comparative cognition may default to the simplest account is not grounds for abandoning this scientific practice. Instead, we should dissociate scientific evidence of cognitive ability from moral obligation. In addition to the criteria suggested by Mikhalevich & Powell for including species in welfare protections, I would suggest a very old one — the ability to physically move.

[Thomas R. Zentall](#), University of Kentucky Research Professor, is a comparative cognitive psychologist who studies the relation between the behavior of humans and other animals in gambling, imitation, concept learning, transitive inference, and object permanence. [Website](#)



We use several measures to make distinctions among species and to decide which ones we should care about and even protect. The cognitive ability of many vertebrates has often been emphasized, but there is also growing evidence of remarkable intelligence in bees (Chittka & Thomson 2001; von Frisch 1967). Macphail (1987) suggested that (although many comparative cognitive psychologists such as Shettleworth, 1998, might disagree) most species differences in cognitive abilities can be explained by contextual differences — differences in sensory ability, response means, naturally occurring behavior, and motivation.

**The default criterion for comparative cognition.** Mikhalevich & Powell (2020) (M&P) suggest that in evaluating behavioral evidence for cognitive behavior, we should not use the criterion used by many comparative cognitive researchers — the simplest, least cognitively sophisticated explanation (otherwise known as Morgan’s Canon 1894) — because it will tend to result in false negative biases.

As a comparative cognition researcher, I feel that it is important to distinguish between the demonstrated cognitive abilities of a species and the degree that we should be interested in its welfare. After all, we keep and often dote on animal pets, whether they are intelligent or not. To judge cognition in terms of the simplest underlying mechanism is not only good science; it also forces researchers to design experiments that challenge these simpler accounts. For example, pigeons learning to match-to-sample (if a sample stimulus is red, choose the red comparison stimulus; if a sample stimulus is green, choose the green comparison stimulus) may be taken as evidence that pigeons have the concept of *sameness*. But before coming to such a conclusion,

one must rule out a simpler account — that the pigeon has learned two stimulus response chains (Skinner, 1950). By carefully designing experiments that control for such simpler learning, one can provide more convincing evidence for having the concept of sameness after all (e.g., Zentall & Hogan, 1976; Zentall, Andrews, & Case, 2018). The alternative to this more challenging route is to interpret the behavior of other animals uncritically in terms of our own behavior and often the emotions that are presumed to underlie our behavior, such as guilt, jealousy, or empathy (cf. Cook et al., 2018). For example, dogs that have “misbehaved” are said to look guilty when the behavior is discovered by their owner. But critically designed experiments suggest that the expectation of punishment based on their owner’s demeanor, independent of their own previous behavior, is a more likely cause (e.g., Horowitz, 2009).

The mistake is to conflate research on cognitive performance (a scientific pursuit) with whether other species are worthy of our concern. We can conduct rigorous research on the cognitive performance of a species while controlling for alternative accounts. Regardless of our conclusions — e.g., that the animal being studied has a particular ability or that we are still uncertain — we can still believe the animal is worthy of our caring.

**Other factors.** M&P note that the ability to feel pain might be a useful way to determine which animals we should care about. But we really do not have a good way to measure the feeling of pain in animals. Even in humans we generally rely on what they tell us about their pain: doctors ask us to indicate on a 10-point scale how much pain we feel.

As it turns out, making a cognitive distinction between vertebrates and invertebrates is a convenience of categorization. The fact that cephalopod mollusks are sometimes given the status of ‘honorary vertebrates’ allows the distinction to be maintained despite the obvious exceptions. Because the distinction very roughly correlates with differences in measures of intelligence, it has been taken as evidence that invertebrates occupy a lower rung in the *scala naturae*. However, any criterion we use to distinguish the animals that we should and should not care for will have its flaws.

The fact that some arthropods carry disease and others cause us pain may have caused us to evolve a tendency to feel disgust or fear toward them, and that makes it easy for us to separate them from vertebrates. We should be smart enough to recognize, however, not only that many of those species serve us very well, but that even those that do not serve us directly, often provide food for species that we do value (such as insect-eating birds).

We can make conjectures about whether an animal feels pain by identifying brain systems similar to our own, but that assumes that similar systems have similar functions. Although bird brains are quite different from mammalian brains, they manage to demonstrate remarkable cognitive skills with virtually no cortex (e.g., Weir, Chappell, & Kacelnik, 2002; Pepperberg, 1999). It apparently does not take a large brain to generate the remarkable navigational skills of desert ants (Collett, Collett, & Wehner, 1999), or the communication skills of bees (von Frisch, 1967).

M&P’s excellent analysis of the various measures that might be used to identify characteristics of species warranting our moral concern leaves us with the conclusion that no single measure can help us draw a sharp distinction. I appreciate M&P’s suggestion that as we show that some invertebrates demonstrate the cognition and sentience of many vertebrates, ethicists and policy makers should consider extending protections to invertebrates as well.

**An old criterion to warrant welfare consideration.** I would add one more distinction to those that M&P discuss. If sentience is important and the ability to feel pain should influence how we treat other species (as suggested by Ibn Sēnā, an 11th century Persian philosopher) then an indirect measure of the ability to feel pain may be an animal's ability to physically remove itself from the source of the pain (Janssens, 1991). Although it is not obvious that an animal able to move must feel pain, and mobility may not be the only way for an animal to alleviate pain, it would certainly place most arthropods and other invertebrates in the same category as vertebrates, worthy of our moral consideration.

## References

- Chittka, L., & Thomson, J. D. (2001) Cognitive ecology of pollination: animal behaviour and floral evolution. Cambridge: Cambridge University Press.
- Collett, M., Collett, T. S., & Wehner R. (1999). Calibration of vector navigation in desert ants. *Current Biology*, 9, 1031–1034.
- Cook, P., Prichard, A., Spivak, M., & Berns, G. S. (2018). [Jealousy in dogs? Evidence from brain imaging.](#) *Animal Sentience* 22(1).
- Horowitz, A. (2009). Disambiguating the guilty look: salient prompts to a familiar dog behaviour. *Behavioural Processes*, 81, 447–452.
- Janssens, J. (1991). An annotated bibliography on Ibn Sīnā (1970–1989). LeuvenL: Leuven University Press.
- Macphail, E. M. (1987). The comparative psychology of intelligence. *Behavioural and Brain Sciences*, 10, 645-695.
- Mikhalevich, I., & Powell, R. (2020). [Minds without spines: Evolutionarily inclusive animal ethics.](#) *Animal Sentience* 29(1).
- Morgan, C. L. (1894). *An Introduction to Comparative Psychology*. London: Walter Scott.
- Pepperberg, I. M. (1999). *The Alex Studies*. Cambridge, MA: Harvard University Press.
- Shettleworth, S. J. (1998). *Cognition, Evolution, and Behavior*. New York: Oxford University Press.
- von Frisch, K. (1967). *The Dance Language and Orientation of Bees*. Cambridge: The Belknap Press of Harvard University Press.
- Weir, A. A. S., Chappell, J., & Kacelnik, A. (2002). Shaping of hooks in New Caledonian crows. *Science*, 297, 981.
- Zentall, T. R., Andrews, D. M., & Case, J. P. (2018). Sameness may be a natural concept that does not require learning. *Psychological Science*, 29, 1185-1189.



## Summer School 2020

INNOVATIVE SCIENCE  
WITHOUT ANIMALS

June 22-26, 2020

Online Virtual Conference

**Calling all students and  
early-career researchers!**

Join us for a FREE conference on innovative  
approaches in toxicology and biomedical sciences!

### This event features:

- Lecture sessions about modern alternatives to the use of animals in toxicology and biomedical sciences
- Virtual laboratory tours
- E-poster presentations
- Virtual engagement with speakers and attendees

Deadline to apply for the full program is June 10.

Registration for individual lectures is available.

For more information visit

[InnovativeScience2020.org](https://InnovativeScience2020.org)



Physicians  
Committee  
for Responsible Medicine

