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Cognition, movement and morality

Commentary on **Mikhalevich & Powell** on *Invertebrate Minds*

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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.

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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 dessert 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.

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