Please cite as:
Browning, H. & Veit, W. (2020). Improving Invertebrate Welfare. *Preprint*.
Check `www.walterveit.com/publications` for citation details once published

Improving Invertebrate Welfare

Abstract

Mikhalevich and Powell (2020) argue that it is both scientifically and morally wrong to dismiss the evidence for sentience in invertebrates, though they refrain from offering any insights into how their welfare may be considered or improved. Here, we draw on animal welfare science to make several suggestions on possible ways forward in this area, in particular to avoid the demandingness objection by showing that these need not require overly demanding actions.

In their target article, Mikhalevich and Powell (2020) review the extant literature on invertebrate sentience to undermine the widespread assumption that invertebrates are a 'lower class' of life and hence do not require the protection we grant to vertebrates. They bring together current findings in invertebrate cognition, physiology and behaviour to argue that there is sufficient evidence to grant that at least some invertebrates possess the type of sentience necessary for welfare consideration. Their goal, however, was not to answer the more practical question of how invertebrate welfare can be improved:

> Our goal here has not been to determine whether invertebrates can suffer under specific experimental conditions or live well in others; rather, we addressed a more foundational question: whether these animals are capable of suffering or flourishing at all.
>
> – Mikhalevich and Powell (2020: 18)

Once we have established that there is sufficient evidence for sentience in a species (or, as suggested by Birch 2017, an order), there is then a further question as to what we should do about this. This contains both a moral and a practical question. The moral question concerns what sort of moral status we should award to a species, given that it is sentient - that is, what role should these animals play in our moral deliberations? Although this is an interesting question, and one on which there is much to say, it is not the one we will address here. Instead, we look at the practical question, i.e. how

we can act to improve the lives of these animals, a question that was not covered in their paper. In this commentary we will draw on animal welfare science to provide a quick look at what such recommendations may look like.

One worry about admitting concern for invertebrate welfare is that it may be too demanding. That is, that there are so many invertebrates used in so many ways, that it would require radical changes in the political and public sphere in order to protect them. As Mikhalevich and Powell argue, this is not reason enough to deny admission to the moral community. We further contend that moral consideration of invertebrates does not have to be as demanding as may be presumed. In particular, we should not presuppose that awarding moral status to invertebrates places duties on us that we don't even apply to non-human vertebrates. The existence of trade-offs between human and non-human interests have long been recognized and we can also grant that something may be harmful, without considering it impermissible. Take for instance the example of zoo management euthanasia (Browning 2018), a practice that has received much criticism but may be permissible in the face of other countervailing values.

Consider the worry they cite from Carruthers (2007): that moral consideration of invertebrates would lead to an obligation to take on the Jain practice of constantly sweeping the floor in front of us in order to ensure we never step on an insect. But it is not the case that this necessarily follows from moral recognition. On the one hand, we could recognize sentience in insects while denying them the awareness and higher-order cognition of persisting through time that creates future-regarding preferences. This thus diminishes the harm caused through premature death (Browning and Veit 2020) and decreases our duty to avoid doing so (though we reject the argument of McMahan 2002 that it would eliminate it completely). However, even if we were to take premature death as a more significant harm, it would still not necessarily follow that we must take substantial actions to prevent it.

For example, it is a well-known fact that driving cars results in many deaths for mammalian species (see e.g. Coffin 2007 for the ecological impact of roadkill). This is not taken to be sufficient reason to cease driving, despite the fact that we are certain these are sentient animals and have welfare we otherwise wish to protect. The request to stop driving would be simply too demanding and thus not morally required. We could similarly acknowledge that while it is harmful to insects to be stepped on, it is too demanding to take measures to ensure this is entirely prevented and thus while we should

not deliberately step on insects where we can avoid doing so, we are not required to sweep our paths to this end. Simply because invertebrates are granted some moral status, it does not automatically follow that this requires us to make large sacrifices on their behalf.

Instead, we can look at some of the small and feasible ways in which we can take invertebrate welfare into consideration. There is of course not space here to even begin to explore the range of policies that might be relevant to invertebrate welfare. However, we will provide a few examples of what this could look like. In particular, animal welfare science will be crucial for providing an understanding of how to achieve improved welfare for invertebrates. Animal welfare science is concerned with discovering the conditions under which an animal will suffer or flourish. Naturally, the science of invertebrate welfare would be intricately connected with the science of invertebrate sentience. In particular, the types of sentient experience that invertebrates are capable of will determine the range of possible benefits and harms. Take, for example, the controversy over whether some insects can feel pain (Klein and Barron 2016; Adamo 2016; Sneddon et al. 2014; Eisemann et al. 1984). If it turns out that they cannot, then perhaps we do not need to be concerned about causing tissue damage to these animals, but if they experience other states such as hunger and thirst, we should be concerned about ensuring adequate provision of food and water. What is important here is determining what interests the animals in question possess - *what makes their lives go better or worse.*

One potential example is in the use of pest control. The fact that, say, cockroaches are capable of suffering does not mean that we are forbidden from killing them to prevent outbreaks in homes or food storage areas. However, we may want to minimise or prevent the use of neurotoxins that cause a prolonged death and instead investigate quicker and more humane methods of killing (this has been the focus of recent work by the Wild Animal Initiative (Howe 2019)). This is similar to work done in the humane control of rodents (Littin et al. 2014). These are species which are known to be sentient and capable of suffering, but this does not prevent the practice of pest control entirely, rather just guides how it is carried out.

Another example is the use of invertebrates in research, such as looking at appropriate methods of analgesia for use in painful experiments (Cooper 2011), the same way in which this is typically required for vertebrate species (National Research Council 2011). It may also require a revision of the call of 'replacement' under the 3Rs (Russell and Burch 1959) to, wherever possible,

replace vertebrates with invertebrates, as we would consider the latter to also be potentially harmed in research. We might also call for improved housing conditions for captive invertebrates, whether in research, agriculture or zoos, providing appropriate shelter areas, diet and enrichment, depending on their specific needs and desires (see e.g. Crook 2013; Horvath et al. 2013).

These are just some broad suggestions, but we hope that they give some indication as to some feasible ways in which invertebrate sentience and welfare could be given practical consideration in everyday behaviour and decision-making. More specific examples and suggestions will come from research into the capacities and requirements of different invertebrates (see e.g. Carere and Mather 2019). More specific proposals have, for instance, already been given for octopuses as a result of our increasing knowledge as to their capacities and preferences (Browning 2019). Importantly, it is clearly not impossible to take some action to improve the lives of sentient invertebrates, and thus we should not let the demandingness objection prevent progress on this front. Tests such as cognitive bias tests (see Mendl et al. 2009, 2010) that have been developed in mammals can in many cases be straightforwardly applied to invertebrates (as has already been done in bees (Bateson et al. 2011)), thus providing us with evidence as to what can improve or decrease their welfare. Sentience researchers should therefore engage with welfare scientists to begin the process of discovery of those conditions that harm and benefit different invertebrates, so we know how to take their welfare into consideration.

References

Adamo, S. A. (2016). Do insects feel pain? A question at the intersection of animal behaviour, philosophy and robotics. *Animal Behaviour 118*, 75–79.

Bateson, M., S. Desire, S. E. Gartside, and G. A. Wright (2011, June). Agitated honeybees exhibit pessimistic cognitive biases. *Current Biology 21*(12), 1070–1073.

Birch, J. (2017). Animal sentience and the precautionary principle. *Animal Sentience 16*(1).

Browning, H. (2018). No Room at the Zoo: Management Euthanasia and Animal Welfare. *Journal of Agricultural and Environmental Ethics 31*(4), 483–498.

Browning, H. (2019). What is good for an octopus? *Animal Sentience 26*(7).

Browning, H. and W. Veit (2020). Is Humane Slaughter Possible? *Animals 10*(5), 799.

Carere, C. and J. Mather (Eds.) (2019). *The Welfare of Invertebrate Animals*. Springer.

Carruthers, P. (2007). Invertebrate minds: a challenge for ethical theory. *The Journal of Ethics 11*(3), 275–297.

Coffin, A. W. (2007). From roadkill to road ecology: a review of the ecological effects of roads. *Journal of transport Geography 15*(5), 396–406.

Cooper, J. E. (2011). Anesthesia, analgesia, and euthanasia of invertebrates. *ILAR journal 52*(2), 196–204.

Crook, R. (2013). The welfare of invertebrate animals in research: can science's next generation improve their lot. *Journal of Postdoctoral Research 1*(2), 1–20.

Eisemann, C., W. Jorgensen, D. Merritt, M. Rice, B. Cribb, P. Webb, and M. Zalucki (1984). Do insects feel pain?—A biological view. *Experientia 40*(2), 164–167.

Horvath, K., D. Angeletti, G. Nascetti, and C. Carere (2013). Invertebrate welfare: an overlooked issue. *Annali dell'Istituto superiore di sanità 49*, 9–17.

Howe, H. (2019). Improving Pest Management for Wild Insect Welfare. `https://www.wildanimalinitiative.org/blog/humane-insecticides`.

Klein, C. and A. B. Barron (2016). Insects have the capacity for subjective experience. *Animal Sentience 9*(1).

Littin, K., P. Fisher, N. J. Beausoleil, and T. Sharp (2014, April). Welfare aspects of vertebrate pest control and culling: ranking control techniques for humaneness. *Revue Scientifique et Technique (International Office of Epizootics) 33*(1), 281–289.

McMahan, J. (2002). *The ethics of killing: Problems at the margins of life*. Oxford University Press, USA.

Mendl, M., O. H. Burman, R. M. Parker, and E. S. Paul (2009). Cognitive bias as an indicator of animal emotion and welfare: Emerging evidence and underlying mechanisms. *Applied Animal Behaviour Science 118*(3-4), 161–181.

Mendl, M., O. H. Burman, and E. S. Paul (2010). An integrative and functional framework for the study of animal emotion and mood. *Proceedings of the Royal Society B: Biological Sciences 277*(1696), 2895–2904.

Mikhalevich, I. and R. Powell (2020). Minds without spines: Evolutionarily inclusive animal ethics. *Animal Sentience 29*(1).

National Research Council (2011). *Guide for the Care and Use of Laboratory Animals* (8th ed.). National Academies Press.

Russell, W. M. S. and R. L. Burch (1959). *The principles of humane experimental technique*. Methuen.

Sneddon, L. U., R. W. Elwood, S. A. Adamo, and M. C. Leach (2014). Defining and assessing animal pain. *Animal Behaviour 97*, 201–212.