

WHAT IS IT LIKE TO BE A BEE?

Brian D. Earp

Do bees have feelings? What would that mean? And if they do have feelings, how should we treat them? Do we have a moral obligation towards insects? A short commentary on M. Bateson, S. Desire, S. E. Gartside, and G. A. Wright, 'Agitated Honeybees Exhibit Pessimistic Cognitive Biases', Current Biology 21.12 (2011), 1070–3.

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Introduction¹

Honeybees 'exhibit pessimism' according to a 2011 study² published in *Current Biology*, and summarized in a popular article for *Wired Science*.³ Pay attention to the *Wired* headline, to begin with: 'Honeybees might have emotions'. Then there are these choice clippings: 'You can't be pessimistic if you don't have an inner life'. And, 'invertebrates like bees aren't typically thought of as having human-like emotions'. The implication, of course, is that *these* invertebrates have been shown to have them.

Inner life? Human-like emotions? Is there 'something it is like', then, to be a bee?⁴

From an ethics standpoint, questions like these make a big difference. As many philosophers have argued, and as common sense generally confirms, morality has much to do with a set of concerns about the well-being of conscious creatures – that is, creatures with inner life, felt emotions, or 'qualia' to use the technical term. Humans are a paradigm example of qualia-possession beings, and most of us would agree that there are certain ways we should (and shouldn't) treat each other, based in large part on the principle that it's bad to cause unnecessary suffering. Why is it

bad? Among other reasons, because suffering *hurts* – it feels bad, subjectively – and it would be supremely selfish for any of us to avoid suffering only for ourselves.

Ethicists like Peter Singer have done a great deal of work to get us thinking about the suffering of non-human animals,⁵ and have urged that we have a moral responsibility not to harm them. That is, we have a responsibility to extend the ‘do no harm’ principle beyond the realm of *homo sapiens*. This feels intuitively right when it comes to the family dog or cat; and it’s certainly no surprise that many vegetarians come from the ranks of former meat-eaters who read a popular account of animal maltreatment, or who saw a documentary film or YouTube video showing the conditions of factory farming. Clearly other animals feel pain, and we shouldn’t inflict it on them willy-nilly. Maybe we shouldn’t inflict it (all else being equal) at all.

But bees? Those stinging little buggers from the garden? Who cares?

Let’s not raise the morality alarm just yet. First, we should take a more detailed look at the bee experiment, due to Melissa Bateson from Newcastle University and her colleagues, to see what it actually involved, and what it can reasonably be taken to show.

The experiment

Here is what they did. The researchers trained a handful of worker bees – strapped in little tiny bee-harnesses, by the way – to associate a certain distinctive odour (call it odour A) with a reward, namely a lick of sugar. In addition, they trained those same bees to associate a certain different odour (call it odour B) with punishment: a lick of quinine, which tastes bitter and unpleasant. Spray the odour, give the sugar or quinine, rinse and repeat. It’s ‘Pavlov’s Dog’ for bees.⁶ The actual behaviour they looked at – to measure the ‘association’ – was the extension or retraction of mouthparts. Pushing mouthparts outward

showed the bee was reaching for an anticipated reward; pulling mouthparts inward meant it was avoiding anticipated punishment.

After this training session, the researchers took half of the bees and shook them for 60 seconds (leaving the other half alone) and then exposed both groups to some odours that were gradient between odour A and odour B. (Shaking is stressful for bees, as it can signal an attack by a predator.)

Bateson and her colleagues found that the all-shook-up bees were more likely to associate the in-between odours with punishment compared to reward. That is, they were more likely to retract their mouthparts when faced with the ambiguous smells than they were to extend them. This pattern of behaviour can pretty fairly be called a bias, and the agitated bees clearly exhibited it, when compared to their undisturbed counterparts, to a statistically significant degree.

That is an interesting finding, and it tells us something about how bees respond to ambiguous stimuli after they've been rattled around a bit. Maybe it's an evolved survival strategy with a logic something like this: when you're in a dangerous or stressful situation, it's best to play it safe when it comes to (possible) poison. OK – so far so good.

But what is all this talk about human-like emotions and inner life? Are we supposed to bee-lieve (sorry) that the jangled-up insects subjectively *felt* pessimistic – or maybe even depressed? Are bees 'conscious' in the way that humans are?

Two senses of emotion

Not necessarily. I think there is some confusion going on here about the word 'emotion' – and I'll explain what this confusion is in just a moment. First, though, let us walk through the scientists' argument, paying special attention to their reasons for suggesting that bees may have (some kind of) emotion.

Step one: Human beings sometimes show ‘pessimistic’ cognitive biases, as when a depressed person sees a frown in a neutral expression.

Step two: We know that these cognitive biases correlate with certain felt emotions in humans – like the sad feeling that comes with depression – as well as with certain chemical and physiological signals that can be measured objectively.

Step three: Human beings have a handy self-report tool – language – which they can use to tell other human beings about their internal states. In addition, each of us knows, from our own experience, what it feels like to be in a state like sadness, and we assume that others feel *that* way when they tell us, ‘I’m feeling blue’. Other animals, and insects like bees, don’t have this nice language tool, so we’re stuck with using the ‘objective’ measures only when trying to decide what’s going on inside their heads.

Step four: Other animals, and now insects like bees, have been shown to exhibit the following things: (1) pessimistic cognitive biases (as shown through their behaviour), and (2) some of the chemical and physiological signals that correlate with felt, subjective emotions (like sadness) in humans. (I haven’t mentioned this part yet, but the researchers took a separate group of bees, shook them up, and extracted chemical samples to prove the point.)

Step five: Given that the bees show the very same type of behaviour (as well as the same chemical markers) that humans show when they experience certain emotions, shouldn’t we suppose that bees experience those emotions, too?

For my part, I am not entirely convinced. Here is where I shall try to tease out that confusion about the word ‘emotion’, because it will help me to explain why. ‘Emotion’

can refer to any number of things, but there are at least a couple of major senses of the term as it applies to human beings. On the one hand, 'emotion' can refer to certain brain processes and physiological states of arousal that are triggered by stimuli and which guide behaviour – a sort of 'brain-level' or unconscious sense of emotion, and the sort we can measure 'objectively' in ourselves and other animals. On the other hand, it can refer to that first-personal, private, subjective, self-reportable *feeling* people have when their brains and bodies are going through those processes and states.⁷

It should be pretty easy to believe that bees have emotions of the first kind. But to call those emotions 'human-like' assumes that the first sense always goes together with the second sense, as it seems to do in humans. But whether it does or doesn't is an open question, and different theories of consciousness will give very different answers.⁸

To be fair to the scientists, they were careful to address this point in the original *Current Biology* article:

Although our results do not allow us to make any claims about the *presence of negative subjective feelings* in honeybees, they call into question how we identify emotions in any nonhuman animal.⁹

So what does all of this mean for morality? In the case of humans, we think it is wrong to cause needless pain, in large part because we know, from our own, first-person experience, what it is *like* to feel pain. And we sense that there is something unfair about wishing that felt experience on someone else – specifically someone else capable of subjectively having those very same sorts of feelings. In other words, it isn't that we want to avoid triggering certain *brain states* in our fellow humans; we want to avoid triggering the way those brain states *feel* to them.

To extend this reasoning to bees, then, we shall have to make up our minds about the relationship between

objective 'brain states' and subjective, felt experiences in the case of other animals and now insects as well. The stakes are pretty high. As Kelsey Horvath and her colleagues have pointed out, 'invertebrates make up the majority of animal species', and yet 'their welfare is [often] overlooked compared to the [moral] concern shown to vertebrates'.¹⁰

Perhaps it is time, then, to raise the morality alarm after all.¹¹

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Notes

¹ This article is adapted from an informal blog post written by the author, Brian D. Earp, with the same title, originally published on 19 June 2011 at the *Practical Ethics* website, hosted by the University of Oxford Faculty of Philosophy. The original post can be accessed here: <<http://blog.practicaethics.ox.ac.uk/2011/06/what-is-it-like-to-be-a-bee/>>.

² M. Bateson, S. Desire, S. E. Gartside, and G. A. Wright, 'Agitated Honeybees Exhibit Pessimistic Cognitive Biases', *Current Biology* 21.12 (2011), 1070–3.

³ B. Keim, 'Honeybees Might Have Emotions', *Wired Science* (17 June 2011), <<http://www.wired.com/wiredscience/2011/06/honeybee-pessimism/>>.

⁴ I'm alluding, of course, to T. Nagel, 'What Is It Like To Be a Bat?', *The Philosophical Review* 83 (1974), 435–50.

⁵ E.g. P. Singer, *Animal Liberation* (New York: Random House 1995).

⁶ For a nice introduction, see T. Tully, 'Pavlov's Dogs', *Current Biology* 13.4 (2003), R117–R119.

⁷ For further discussion of the different 'levels' of analysis at which different subjective experiences can be described and understood (with an emphasis on romantic love), see, e.g., J. Savulescu, and B. D. Earp, 'Neuroreductionism about Sex and

Love', *Think: A Journal of the Royal Institute of Philosophy* 13.38 (2014), 7–12; B. D. Earp, A. Sandberg and J. Savulescu, 'The Medicalization of Love: Response to Critics', *Cambridge Quarterly of Healthcare Ethics* 25.4 (2016), 759–71.

⁸ For further discussion, see: B. D. Earp, 'An Anti-Anti-Functionalist Account of Consciousness', *Annales Philosophici* 4.1 (2012), 6–15; B. D. Earp, 'I Can't Get No (Epistemic) Satisfaction: Why the Hard Problem of Consciousness Entails a Hard Problem of Explanation', *Dialogues in Philosophy, Mental and Neuro Sciences* 5.1 (2012), 14–20; B. D. Earp, 'Does Rationality + Consciousness = Free Will?', *Journal of Consciousness Studies* 20.1–2 (2013), 248–53.

⁹ See reference at note 2, at page 1072.

¹⁰ K. Horvath, D. Angeletti, G. Nascetti and C. Carere, 'Invertebrate Welfare: An Overlooked Issue', *Annali dell'Istituto Superiore di Sanità* 49.1 (2013), 9–17, at p. 9.

¹¹ For further scholarly discussion of some of the ideas presented in this article, see, e.g., M. Mendl, E. S. Paul and L. Chittka, 'Animal Behaviour: Emotion in Invertebrates?', *Current Biology* 21.12 (2013), R463–R465; R. A. Crook, 'The Welfare of Invertebrate Animals in Research: Can Science's Next Generation Improve their Lot?', *Journal of Postdoctoral Research* 1.2 (2013), 1–20.