

ANIMAL SENTIENCE

AN INTERDISCIPLINARY JOURNAL ON ANIMAL FEELING

Hughes, Barry O. (2022) *Defining and assessing sentience*. *Animal Sentience* 31(13)

DOI: 10.51291/2377-7478.1744



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Defining and assessing sentience

Commentary on [Rowan et al.](#) on *Sentience Politics*

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Abstract: Precisely what is meant by the term sentience and how does it overlap with being conscious? We accept that animals have feelings but how do we know what they are and can we measure them? It is important that we clarify the terminology underlying these difficult concepts. Over the last 50 years a scientific discipline has developed to tackle these questions in a systematic way. We have to avoid thoughtless anthropomorphism yet we have to try to relate sentience in animals, as appropriate, to corresponding experiences in humans.

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1. What should we understand by the term “Sentience”

The subject we are grappling with here is a complex but fascinating one which is at the interface where philosophy and science collide. The philosophical aspect of sentience concerns understanding, while the scientific aspect concerns measurement. And both are necessary. Rowan et al’s (2022) excellent target article covers both at a historical level – as well as how our advances in knowledge should be implemented in practice and incorporated into legislation. It is important, however, that we pay careful attention to terminology. Moreover, the subject is internationally relevant, so when terms are translated into languages other than English, it is vital that the meaning be understood and retained. The word sentience is derived from the Latin verb *sentire*, meaning *to feel*, but it has many elements and has been understood to mean very different things by different writers.

2. Five Freedoms

The only major omission I noted in Rowan et al’s target article was a mention of the relationship between sentience, welfare and the Five Freedoms. Until the 1960s there was little public concern regarding the increasingly intensive housing of farm animals – mainly cage-housed hens and penned veal calves. Ruth Harrison triggered public attention in 1964 with the ground-breaking publication of *Animal Machines*, arguing that animals had feelings; but farmers resisted on the grounds that there was no evidence that confinement was in any way cruel.

In response the UK Government set up the Brambell Committee (1965) to judge whether any action was necessary. They sought opinions, viewed intensively-housed animals, concluded that Harrison was right and in 1965 formulated Five Freedoms. They recommended that farmers should ensure the freedom of confined animals to stand up, lie down, turn around, groom themselves and stretch their limbs. This was a pioneering response to the recognition that intensively-housed animals are sentient and have needs which were not being met in

their confined environment. The Committee also recommended that ethological research should be funded to provide firm scientific evidence for future policy.

In 1979 the Farm Animal Welfare Council re-formulated the Brambell recommendations as (1) freedom from hunger and thirst, (2) freedom from fear and distress, (3) freedom from discomfort, (4) freedom from pain, injury and disease and (5) freedom to exercise most normal expressions of behaviour. The first four have been criticised as being overly focussed on avoiding negative attributes rather than identifying positive ones, but they have nevertheless been very influential in helping to draw up codes of welfare that have now been adopted on a Europe-wide basis. For a full discussion of their value and limitations see McCulloch (2012).

3. Categorising and clarifying sentience

The confusion between the terms used by different people is addressed and admirably clarified by the commentary of Webster (2022). In its broadest sense sentience can be regarded as relatively straightforward: it is the ability of an organism to make an appropriate response to a stimulus. In this sense, as Reber et al (2022) write in their commentary, it is a trait possessed by all organisms – down to the level of single cells. Given this meaning, sentience is even possessed by plants, which are sensitive to stimuli in the ways they respond and adapt to their environment. However, this definition is so broad that it is not especially useful when applied to animal welfare. Here, the approach proposed by Webster is an admirable one: the classification of sentience as a hierarchy similar to Buddhist skandhas – from simple reactivity right up to subjective self-awareness. It is essential, though, to have a clear definition of what should be understood by each term. I agree with Webster that it is important to assign a position in this classification to each animal species and then to treat it accordingly, so that its welfare is not compromised. A parallel route, though more ambitious, has been explored by Birch et al (2020) who suggest that a linear scale is inadequate and that each species should be assigned a multi-dimensional profile. [See target article by [Crumpp et al. \(2022\)](#) and accompanying commentaries -- Ed]

4. Assessing sentience

To understand what an animal is feeling and then to be able to assign it a position in a hierarchy, one needs to do more than merely observe its behaviour and draw inferences. Just as one would ask human beings how they feel, one needs to ask nonhuman animals. Setting them preference tests has proved invaluable in this and has begun to give us access to their minds. Extensive experimentation, based initially on simple choice tests (Hughes and Black, 1973), suggests that, in addition to protection from aversive stimuli which are likely to cause suffering, all species of farm animals should be provided with a sufficiently rich environment to allow them to express a range of their natural behaviours.

More recently, this approach has become more developed, sophisticated and quantitative so that it can measure the strength as well as the direction of motivation. The technique is now also being applied to lower vertebrates and to some invertebrates, and has proved enlightening. For example, many people considered it sufficient to merely avoid inflicting pain on a fish. However, motivation experiments have shown this to be overly simplistic. Cichlids will work (pushing a weighted door) to gain access to food, social partners or increased space (Galhardo et al, 2011). Likewise, goldfish will swim against a current to gain access to real plants, artificial plants or extra space (Sullivan et al, 2015). Both approaches are quantitative

in that the weight of the door or the strength of the current can be varied, allowing motivation to be calibrated.

5. Consciousness

At the top of the sentience hierarchy we have consciousness, around which discussion has ranged for centuries with little advance in understanding until recently. As a term it suffers from the same terminological inexactitude as sentience. The [Wikipedia entry](#) puts it well. “Consciousness remains puzzling and controversial, being at once the most familiar and also the most mysterious aspect of our lives. Perhaps the only widely agreed notion about the topic is the intuition that consciousness exists.” For some, it means the subjective awareness of internal and external existence, a personal brain-based model of reality. This is my preferred definition, and I suspect (though of course I cannot know) that it is unique to humans. For others, it is a synonym for sentience. For example, some researchers in AI (Ananthaswamy and Douglas, 2021) are starting to wonder whether their robots could ever be “conscious” because they can be programmed to respond to stimuli like humans. It is especially important for both clarity and effectiveness of discussion that all the various terms be clearly defined and then used in a consistent way.

References

- Ananthaswamy, A. and Douglas, K. (2021) Can a robot ever be conscious and how would we know if it were? *New Scientist* July 7 2021
- Brambell, F. W. R. (1965). [Report of the technical committee to enquire into the welfare of animals kept under intensive livestock husbandry systems](#). (Command Rep. 2836). London: Her Majesty's Stationery Office.
- Birch, J., Schnell A. K. and Clayton N. S. (2020) Dimensions of Animal Consciousness. *Trends in Cognitive Sciences*, 24 789-801
- Crump, A.; Browning, H.; Schnell, A.; Burn, C.; and Birch, J. (2022) [Sentience in decapod crustaceans: A general framework and review of the evidence](#). *Animal Sentience* 32(1)
- Galhardo, L. Almeida, O. and Oliveira, R. F. Measuring motivation in a cichlid fish : An adaptation of the push door paradigm. *Applied Animal Behaviour Science* 130 60-70
- Hughes, B. O. and Black, A. J. (1973) The preference of domestic hens for different types of battery cage floor. *British Poultry Science* 14 615-619
- McCulloch, S. P. (2012) A critique of FAWC’s Five Freedoms as a framework for the analysis of animal Welfare. *Journal of Agricultural and Environmental Ethics* 26
- Reber, A. S., Baluska, F. and Miller, William B, Jr. (2022) [All living organisms are sentient](#). *Animal Sentience* 31(3)
- Rowan, A. N., D’Silva, J., Duncan, I. J. H. and Palmer, N. (2022) [Animal Sentience: history, science and politics](#). *Animal Sentience* 2022, 401
- Sullivan, M., Lawrence, C. and Blache, D. (2015). Why did the fish cross the tank? Objectively measuring the value of enrichment for captive fish *Applied Animal Behaviour Science* 2015 174 181-188
- Webster, J. A. (2022) [Sentience and sentient minds](#). *Animal Sentience* 31(6)