

Guest Editorial

Broadening the Focus

TOM BULLER, ADAM SHRIVER, and MARTHA FARAH

The Humanistic Focus

Over the past dozen or so years neuroethics has become a rich and dynamic field that has brought together individuals from a variety of disciplines and interests to consider issues that lie at the intersection of ethics and neuroscience. During this period there has been a significant amount of important empirical and philosophical work on a range of topics at this intersection; however, there has been comparatively little work on this intersection as it applies to nonhuman animals. In fact, it is fair to say that neuroethics has had a distinct and almost exclusive “humanistic focus.” Our hope with this special section is to broaden this focus and to provoke and encourage discussion of nonhuman animals within neuroethics.

There are a number of explanations for neuroethics’ humanistic focus.

Mind and Agent

According to a familiar description, neuroethics examines issues pertaining to the ethics of neuroscience and the neuroscience of ethics.¹ Within the first of these elements, discussion has focused on a variety of existing and future neuroscientific interventions that enable the monitoring and manipulation of the brain, for example, the use of neuroimaging to “read” the brain and detect thoughts, lies, and other psychological states, and the use of pharmacological and other means to enhance cognition. Discussion of these interventions has focused, in particular, on potential invasions of privacy and threats to “cognitive liberty,” and concerns about authenticity and fairness.

Underlying the interest in the monitoring and manipulation of the brain lies a humanistic view of mind: to have a mind is to have thoughts, beliefs, and other “higher-level” psychological states, and these states are generally accessible only in a privileged first-person way. What interests and concerns us about neuroimaging is that it can, in principle, reveal a person’s conscious inner mental life; that is to say, it can access mental intentions and other mental contents that we previously thought to be private. Similarly, the worry that cognitive enhancement poses a threat to authenticity presupposes that there is an authentic self, and authenticity is commonly understood in terms of psychological integration.

If this is correct, it is obvious why neuroethics has had little interest in non-human animals. For a common belief in regard to the minds of animals is that they lack such a sophisticated conscious mental life. In general, we may be quite

willing to accept that animals are sentient, that they have preferences, and that there is a rich variety of animal cognition; but we are skeptical that they have thoughts and beliefs. This skepticism is aided by a fear of uncritical anthropomorphism.

In regard to the second of the aforementioned elements—the neuroscience of ethics—the matter is, perhaps, even clearer. One of the core questions that has been addressed is, “What are the implications that advances in neuroscience have for the law and morality?” This question is, obviously, dependent on the initial belief that we are, for the most part, intentional agents capable of moral decision-making and acting responsibly, and that the law and morality assume this to be the case. Our initial belief about nonhuman animals, however, is that it is inappropriate to view them in this light: the behavior of nonhuman animals is judged to be predominantly instinctive or hardwired, rather than intentional and voluntary. This is not to deny that some animals, for example, chimps, have complex social and group behaviors and are capable of morally questionable actions like deception, but even in these cases we are reluctant to conceive of these animals as moral agents.

Epistemic and Methodological Concerns

One of the reasons why neuroscience is thought to be compelling, and, perhaps, challenging, is because it is thought to be in a privileged position to explain the mind. Although there may be no agreement as to the specific relationship between mind and brain, within neuroethics there is general agreement that this relationship is robust, if not even necessary. In broad terms neuroethics follows neuroscience in adopting an internalist, brain-based understanding of the mind. Accordingly, we seek to identify the neural processes that underlie psychological states, and these processes are viewed as evidence of what is “really going on.” For conceptual and practical reasons, however, a different approach has been adopted in regard to animal cognition. In contrast to the internalist perspective of the human mind, the approach taken to the study of animal minds has been broader and more externalist in nature. For example, one of the influential approaches to the study of animal minds, cognitive ethology, supports the “comparative, evolutionary and ecological study of animal thought processes.”² In other words, in order to understand the animal mind, we should take fully into account the place and nature of the animal within its natural environment and evolutionary history, in addition to focusing on the underlying neurophysical states.

Furthermore, as we are aware, there are substantial practical and ethical challenges to the study of animal minds. Our ability to use neuroimaging to “read” a person’s thoughts is in part the result of our ability to design highly structured and specific tasks, and of the subject’s ability to comprehend and follow what he or she is being asked to do. To take a somewhat fanciful example, during the 2010 World Cup, Paul the Octopus showed a remarkable ability to predict the results of matches during the tournament—he guessed 8/8 matches correctly. It is fair to say that there is considerable debate about the validity of Paul’s predictions, with critics pouring scorn on the claimed abilities of this cephalopod. If Paul were human, then we could, in theory (and maybe in practice) use neuroimaging to determine whether he does genuinely recognize the flags of various countries, or, perhaps, whether he is making a decision or has a preference for one outcome rather than another. Because Paul is a cephalopod, however, and, according to our

understanding, lacking in the appropriate cognitive and linguistic capacities to participate in an experiment that could, in principle, determine what is “really going on,” we cannot readily use neuroimaging to validate his “predictions” or determine whether, in fact, he is making any predictions at all.

There is also a further challenge presented by nonhuman animal minds, namely, their difference from human minds. Our ability to identify the neural processes that underlie mental events rests, in considerable part, on our familiarity with the human brain and its very specific functions. This familiarity can be confirmed or revised through the use of further neuroscientific investigation, particularly neuroimaging, and enables us to discover the empirical correlations. In the case of nonhuman animals we can gain some understanding of their minds through comparison of brain architecture and function to human and other animal minds; however, the more different the animal mind is from the human mind, the more difficult it will be to understand the animal mind.

The Scope of Animal Neuroethics

A reasonable definition of animal neuroethics would encompass all of the ethical issues raised by neuroscience in connection with animals. These arise from the many different ways in which humans intervene on animal brains.

The most common goal of brain interventions with animals is the reduction of unwanted behaviors that arise in reaction to their human-controlled environments. Pets and zoo animals often endure severely restricted freedom of movement, and confinement of livestock in factory farms is extreme, with enclosures so small or crowding so dense that an individual may be unable to turn. These environments cause anxiety, aggression toward other animals and humans, and compulsive self-injurious behaviors. Psychopharmacology has been used to lessen these problem behaviors in pets, zoo animals, and livestock, with a marked increase in the use of neuropsychiatric medications such as selective serotonin reuptake inhibitors, tricyclic antidepressants, and benzodiazepines in pets.³

Animals are also used as subjects in medical research on neurological and psychiatric disorders and in basic research on the brain, generally as models for human beings. Although all animal research raises ethical dilemmas, research on animal brains evokes some unique quandaries. Such research affects animals' experience more directly than research on other bodily systems, and research involving the important but aversive phenomena of pain, depression, and anxiety is especially problematic.⁴ In addition, the greater the similarity of an animal species' brain to the human brain, the more valid the model, and also the greater the likelihood of awareness and risk of suffering.

A distinctive set of issues arise in connection with relatively new research methods for crossing boundaries between species and between animals and machines. These include the creation of transgenic animals whose brain function has been altered by genes from a different species and neural chimera, in which an animal incorporates functioning neural tissue from another species.⁵ They also include brain-machine interfaces, in which animals' brains are implanted with electrodes that enable brain activity to control robotic devices.⁶

Finally, neuroscience is giving us new ways of inferring the psychological states of animals, including the state of suffering. These developments build on endocrine and autonomic nervous system measures of stress to include measures of

central nervous system function from postmortem samples or functional brain imaging.^{7,8} Such developments have the potential to move forward the debate over whether, and to what extent, animals suffer.

Special Section on Neuroethics and Animals

The articles that are included in this section focus on two issues that are central to the discussion of neuroethics and animals: the use of animals in research and sentience and the moral status of animals. In his article, Andrew Fenton argues that we should adopt a different moral framework in regard to the use of chimpanzees in research. According to Fenton, chimpanzees have the capacity to dissent from participating in research, because they possess the capacity to feel pain, can anticipate future occurrences of pain and distress, and can express the preference that the pain be stopped. In this regard, although there are substantial differences between chimpanzees and children, these capacities suggest that the appropriate perspective that should be adopted in regard to the use of chimpanzees in research is through the lens of pediatric ethics. In their article, Michael Rollin and Bernard Rollin question the validity and ethics of animal models of human psychiatric disease. In broad terms, we may say that the use of animals in research is justified (if at all) to the extent to which the animal can be legitimately be regarded as a valid model, that is to say, the extent to which the information gained in the research can be appropriately translated to the human context. Rollin and Rollin argue, however, that this condition cannot be met, because “the shaky construct validity of the diseases as described in humans renders them impossible to translate to animal models.” Furthermore, if there were a valid animal model, then this would mean that the phenomenology of the animal’s experience would be closely similar to a human’s; but if this were the case, then one might wonder what moral difference exists between animal and human.

The articles by Adam Shriver and by Sherry Loveless and James Giordano focus on the matter of animal pain. In his article, Shriver argues that, contrary to a common understanding, there are good reasons to think that pleasure and pain are not “symmetrical,” that is to say, that pleasure is not simply the absence of pain. Rather, the evidence suggests, as Shriver states, that “pleasure and pain are not just two different experiences but in fact are two wholly different *types* of experience.” Accordingly, as Shriver argues, pain and pleasure might not be measurable along a single scale, and, hence, we should be wary of judging actions in terms of the ratio of pleasure to pain. This conclusion has important implications for animal research, for it suggests that the use of animals in research that seeks to minimize suffering in humans should be viewed differently than the use of animals in research that seeks to understand positive experiences. The issue of an animal’s capacity to feel pain is central to the article by Loveless and Giordano. In their article, the authors argue that an organism’s capacity to feel pain “represents a minimum criterion on which to base and predicate moral consideration and actions,” and that there is clear neuroscientific evidence to conclude that animals can feel pain, fear, and distress. Furthermore, this means that we have a responsibility to develop and institute protections for animal welfare. Finally, in his article, Tom Buller attempts to show how a neuroethics framework can inform current debates about the mentality and moral status of animals and can narrow the “epistemic gap” between science and ethics. Buller argues that neuroscience can help

identify properties relevant to the mentality of animals that might satisfy both science and ethics, and that neuroethics can provide a framework for evaluating these properties.

Notes

1. Roskies A. Neuroethics for the new millennium. *Neuron* 2002;35:21–3.
2. Allen C, Bekoff M. *Species of Mind: The Philosophy and Biology of Cognitive Ethology*. Cambridge, MA: MIT Press; 1997, at ix.
3. Vhalos P. Pill-popping pets. *New York Times Magazine* 2008 Jul 13; available at <http://www.nytimes.com/2008/07/13/magazine/13pets-t.html?pagewanted=all> (last accessed 1 Sept 2012).
4. Institute of Medicine of the National Academies. *International Animal Research Regulations: Impact on Neuroscience Research—Workshop Summary*; 2012 May 29; available at <http://www.iom.edu/Reports/2012/International-Animal-Research-Regulations-Impact-on-Neuroscience-Research.aspx> (last accessed 6 Aug 2012).
5. Price D, Jarman AP, Mason JO, Kind PC. *Building Brains: An Introduction to Neural Development*. Hoboken, NJ: John Wiley and Sons; 2011.
6. Nicolelis M. *Beyond Boundaries: The New Neuroscience of Connecting Brains with Machines—and How It Will Change Our Lives*. New York: Times Books; 2011.
7. Farah MJ. Neuroethics and the problem of other minds: Implications of neuroscience for the moral status of brain-damaged patients and nonhuman animals. *Neuroethics* 2008;1(1):9–18.
8. Shriver A. Comments on Sir Patrick Bateson's *Hunting and Science*. *On the Human* blog [invited comment]; 2009; available at <http://onthehuman.org/2009/11/hunting-and-science/comment-page-1/#comment-573> (last accessed 1 Sept 2012).