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A Moderate Utilitarian Account of the Use of Animal Models in Biomedical Studies

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ABSTRACT

"Animal testing" is a term that often refers to use of non-human animals, like rodents or non-human primates, in scientific studies meant to enhance the understanding of a biomedical or psychological phenomenon. Animal models are organisms used in such studies to simulate, or "model," an analogous feature found in human beings without the need to subject a human participant to such experimental conditions. While I will discuss the claim that animals deserve moral patient status, I will argue for a monitored, limited continuation of biomedical experimentation on non-human animals on the grounds that applicable human interests should have greater weight than non-human interests. Using a modified utilitarian calculus, one might be able to weigh what kinds of animal testing ought to be acceptable or unacceptable.

Keywords: Animal; Biomedical; Human beings

DISCUSSION

Moral agency is a status ascribed to individuals who can autonomously make thoughtful decisions appealing to one's own moral judgement. Meanwhile, moral patient hood is another status ascribed to beings who must be accounted for while decisions are made by a moral agents. Fully functional human adults are generally considered as both moral agents and moral patients, but human infants, children and the cognitively-disabled are examples of beings who are moral patients but not moral agents. Different moral perspectives clash when deciding the appropriate status of non-human animals. Because they lack the ability to properly consent to a decision, non-human animals may be granted moral patient hood while others like Cohen[1] dispute the idea. All moral agents ought to have interests, or individual stakes in matters regarding one's own "overall well-being, needs, or personal aims".[2]

Biomedical testing on nonhuman subjects can be denied on the basis of utilitarian moral theory. In utilitarianism, all sentient beings are capable of experiencing pain–an undesirable outcome associated with suffering–pleasure–a desirable outcome associated with gratification. Applying Jeremy Bentham's "principle of utility," a utilitarian considers a moral action as that which brings the greatest net pleasure to the greatest number of constituents implicated (Bentham, 2018).[3] In general, utilitarian theory values consequence rather than the means when

considering an action moral. Peter Singer's "Principle of Equal Consideration of Interests" (ECOI) may be considered an extension of the principle of utility.[4] ECOI posits that if there is an action or decision to be made by a moral agent, there must be equitable consideration of the interests of all beings implicated independently of the moral patients they are accountable to. In a household setting, parents or guardian figure acting in accordance with ECOI will ideally make family decisions with an understanding and respect for the implications they have on both themselves and their children without direct consideration of who such outcomes apply to. Similarly, biomedical research using animal models ought to be monitored in the same way. A weighted utilitarian calculus could consider the interests of every moral patient implicated in a given research study, including the non-human animal subjects, the researchers, and those who would learn from the potential medical knowledge, including patients in hospitals and the greater scientific community.

Sentience, or the ability to consciously experience suffering or pleasure, is often used by utilitarians, like Singer[5] or Bentham [3], as a sufficient criterion for moral patient hood. Such thinkers might argue that not wanting to suffer or desiring a pleasurable outcome might be enough to qualify as interests. However, I will push back on this and say instead that in accordance with ECOI, non-human animals of certain cognitive ability must be considered as moral patients.

In contrast to the utilitarian perspective, contrarianism is a political moral theory which proposes that a population of moral agents can only be governed under the contract of their mutual agreement.[6,7] The contractarian "speciest" Cohen[1] argues that nonhuman animals cannot have rights, which essentially means they would lack moral patient hood, because they will never capable of exercising the moral autonomy required to exercise claims or assume responsibility. Non-human animals lack the ability to explicitly articulate and comprehend means required to live in a human civilization with explicit laws, contracts, and boundaries. The nonverbal communication demonstrated by many social non-human animals would presumably not be satisfactory to individuals like Cohen who argue that non-human animals lack sufficient contracting skills. It should be noted that via such means as varied vocalizations primates can at least express very basic ideas, like the types of predators nearby or visualizations like beating of the chest or teeth display to show social rank.[8] It's clear that these non-human mammals exhibit some ability to articulate specific ideas from one to another. This is a skill that even many developing humans–beings who are widely accepted as moral patients–require some time after birth to develop. The average human infant cannot communicate beyond basic nonverbal expressions of emotion until about the age of about twelve to eighteen months, where one enters the "one-word stage" in which one-word sentences are articulated.[9] Many other primates are at least able to use nonverbal communication to communicate with greater precision than human infants who can merely bawl; make sounds of joy; and other basic displays of emotion, pleasure or distress too.

Thinkers like Cohen, however, can immediately push back and argue that moral patients like human infants have a "future-like-ours" (FLO), a concept that argues all human life has value on the grounds that their future holds value (Maquis, 2018).[10] Deontologists, like Kant (2018),[11] posit that rationality is what gives a moral agent value and that to strip such a being of their ability to reason is to rob them of their personhood. Non-human animals can never develop this level of rationality, allowing non-human animals to be denied moral patient hood on the basis of

lacking a FLO. While the Kantian view of human value may be a bit extreme, those who hold a position like Cohen's may argue that human adults who are cognitively disabled or in a vegetative state or coma have value for their humanity via extension permissible within contractarian moral theory.

Going back to the issue of the use of animal experimentation, the benefits of much biomedical testing on animal models are undeniable from a utilitarian perspective. Animal models are used for analogous features of their physiology useful to pharmaceutical trials and other physiological research. Due to the nature of the comparative physiology between humans and animal models, research on animal models can also be extended directly to veterinary medicine in many instances, benefiting nonhuman animals both domesticated and wild. Many diseases in humans have been suppressed due to advancements in biomedicine specifically enabled by the use of animal models. In a study led by Chain and Florey in 1940,[12] a preliminary trial involved injecting a sample of eight mice with a deadly Streptococcus bacterium to verify the therapeutic effects of penicillin. Only four mice in the experimental group receive penicillin treatment and lived, but the four mice in the control group died.[12] During World War II, biomedical researchers associated with the Allied Powers produced large supplies of penicillin–the first available antibiotic–saving millions of lives. Meanwhile, the new study of antibiotics was established, becoming an essential part of biomedical and biotechnological research. With the introduction of antibiotics, the primary cause of death in the Western World switched from transmissible illnesses to noncommunicable diseases during the latter half of the twentieth century.[13]

However, in recent years, researchers in biotechnological sciences have found a means of culturing three-dimensional clusters of tissue that resemble miniature complete organs called "organoids". Unlike traditional two-dimensional cultures of tissue, organoids have the increased utility of being able to actually effectively (1) mimic the physiological features of the real organ, like proper endocrine section or neurological function and (2) containing a more representative distribution of organ-specific cell types specific with the proper spatial orientation.[14] Human organoids especially have the added benefit of being able to better resemble the specific features of a human organ an animal model cannot,[14] so why would one not conduct studies using organoids rather than animal models? The separation of organoids from complete biological systems isolates them from coordinated physiological processes of communication and regulation. Thus, pharmaceutical trials and other studies observing the effects of some biomedical treatment on a complete organism need an entire animal model to obtain valid results.[15]

ECOI as a principle also has limitations that ought to be discussed further. Zuolo[2] argues that ECOI as devised by Singer[4,5] cannot stand on its own as a moral principle, requiring a ground for equal status to hold up. Zuolo reports that Singer rejects the need for a range property, a morally-relevant criterion or set of criteria attributable to an individual after a certain threshold. Singer, according to Zuolo, believes that there are no range properties that humans could equally possess. Zuolo pushes back on Singer and argues that there must be some basis of equality to consider the interests of different individuals equitably, because interests that appear similar on the surface, like a desire to eat to satisfy hunger or avoid suffering, may differ in the magnitude of their implications between individuals. He believes it would be unreasonable to consider the "similar" shared interest of hunger shared by a pregnant woman and an average non-pregnant human as equal if the pregnant woman was deprived in some aspect

like having dietary restrictions that make her hunger stronger. This difference in the personal circumstances of the pregnant woman and the average person could arguably make application of ECOI unfair to the pregnant woman who would presumably have a greater magnitude of hunger, ignoring the fact that there is literally another being to feed inside of her. To justify equally considering the possibility of giving food to the non-pregnant person over the pregnant woman, Zuolo suggests that one would need to equitably compare the moral status of the two individuals on some other grounds.

Because of the previously mentioned issue in ECOI, Zuolo also cautions that the requirement for some means of equal status to support ECOI would not protect moral patients, including non-human animals, as Singer may have hoped. This need of a grounds for equal status thus leaves the potential for leaving moral patients on a totem-pole of importance. For example, if we abide by that rationale is the basis of consideration, only moral agents' interests matter. If intelligence the basis of consideration, then there would be a stratification not only of the animal kingdom but also of the general human population. Tacking on the "future-like-ours" clause would not help this matter either since it would simply result in stratification of perceived human value from birth. In this instance, it makes most sense to return to Bentham's[3] formulation of pain and pleasure as discussed near the beginning. Using sentience as a basis for moral status would at least not include many non-human animals' interests on an equal playing field to those of humans, especially since the basis is reduced to the sensation of physiological or psychological experience–an interest in itself. Ultimately, however, human interests will frequently supersede those of animals for the same reason why the pregnant woman's hunger in the Zuolo's analogy is a more substantiated interest than that of a non-pregnant person.

Now if a human and non-human animal are granted equal moral status on the basis of merely having sentience, there are many instances where the interest may differ. In the context of biomedical experimentation, a utilitarian system of equations must thus be devised to properly evaluate the need for animal models in a given research study. To maintain fairness and consistency, an act utilitarian model would be preferable. Act utilitarianism is a derivative of utilitarianism that suggests devising rules (i.e., laws, regulations, or codes) expected to bring the greatest net pleasure to the greatest number of beings implicated by the rules.[14] The act utilitarian calculus would prevent research that causes pain of greater magnitude than any findings of lesser value, like Harry Harlow's studies[15] investigating maternal attachment among chimpanzees. The Institutional Animal Care and Use Committee (IACUC) is an example of an appropriate model for weighing the interests of a proposed research study against the animal models in a reasonable fashion (Office of Laboratory Animal Welfare).[15] With IACUC regulations in place, researchers are required to inflict minimal harm and use a minimal sample size to conduct studies investigating a biomedical research question deemed valuable.

In conclusion, act-utilitarian models like IACUC ought to be used to monitor the use of animal models. Non-human animals ought to have interests and moral patient hood like humans do as ECOI suggests. However, there are many extreme examples of advanced biomedical research devised from animal models–like the invention of antibiotics–that warrant its moral permissibility from a utilitarian perspective.

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