

30. The ethics of remedial animal enhancement: what can we learn from other (dis)enhancement debates?

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Abstract

In the Anthropocene, many non-human animals face anthropogenic challenges. Farmed animals suffer as a result of (intensive) rearing conditions, while in the wild animals have difficulty adapting to human-induced pressures such as climate change and invasive species. Biotechnologies such as gene editing could be applied to improve or add capacities that would enable animals to cope with such challenges, in the interest of those animals themselves (or their offspring). This paper argues that such ‘remedial animal enhancements’ deserve a special ethical debate, although such a debate can draw some arguments and perspectives from other (dis)enhancement debates.

Keywords: biotechnology, gene editing, transhumanism, ideal and non-ideal ethics

Introduction: remedial enhancement and other types of animal (dis)enhancement

New biotechnologies such as gene editing open up new ways to ‘enhance’ not only humans, but also non-human animals. First, what could be called ‘anthropocentric’ animal enhancements involves biotechnologically adapting animals to meet human purposes or challenges (cf. Hauskeller, 2016). Gene editing could for example be applied to increase farmed animals’ yield or to reduce their environmental impact, thus addressing some of the challenges that population growth and climate change pose to humans in the Anthropocene. Second, transhumanists have argued that we humans have an obligation to biologically ‘uplift’ animals’ cognitive capacities, once we have developed proper means to do this, so that animals can participate in human society more meaningfully and have better lives (Dvorsky, 2008). Third, ethicists have been discussing the desirability of ‘dumbing down’ animals that are destined to live under very unfavourable conditions by diminishing their capacity for suffering (e.g. Thompson, 2008). Although the latter type of intervention has usually been called a *disenhancement* because it involves limiting rather than improving or adding capacities, Shriver (2021) has proposed to call it an enhancement because the aim is to improve the welfare of animals.

In response to these biotechnological developments, burgeoning debates on the ethics of human and animal ‘enhancement’ – as it has generally come to be called even though the appropriateness of this term is disputed – have arisen. With this paper we aim to start ethical discussion about a fourth type of animal enhancement, which we dub ‘remedial enhancement’. Like many anthropocentric animal enhancements, the type of enhancement we have in mind aims to adapt animals to anthropogenic challenges. However, remedial enhancements would be performed for the supposed sake of animal rather than human interests. It is in that respect closer to the type of enhancement proposed by transhumanists, who propose to enhance animals cognitively for the supposed benefit of those animals themselves. However, remedial enhancement does not necessarily require cognitive enhancement and does not presuppose that having enhanced cognitive capacities is good per se – in our view transhumanists employ a narrowly anthropocentric view of what should be considered valuable capacities. The point of remedial enhancement would rather be to enable animals to cope with specific anthropogenic threats to their existence, and this may or may not involve boosting their cognitive capacities. Finally, while

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disenhancement would supposedly also be in the interests of animals, remedial enhancement would involve ‘improving’ or adding animals’ capacities rather than limiting them.

The concept of remedial enhancement, as we see it, includes (at least) applications in farmed animals as well as wild animals. Gene editing could for example be applied to make farmed animals more resistant to diseases which are prevalent in animal agriculture – either in particular agricultural systems or more generally – or more robust against environmental challenges that result from climate change. Animals living in the wild could also benefit from the latter type of application: some specialized animal species are unable to survive in their original habitat because of changing environmental conditions, which could in principle be halted by increasing the animals’ resilience to these conditions (so called ‘facilitated adaptation’; Palmer, 2016). Moreover, wild animals whose numbers are declining due to predation by or competition with invasive animal species could be adapted genetically to improve their chances of survival and reproduction. It has been argued, for example, that many Australian animal species never had to deal with cunning predators such as cats and foxes until these were introduced by human settlers, and that enhancing the cognitive capacities of the prey species may be necessary to avoid extinction (Rohwer, 2018).

We propose the term ‘remedial’ enhancement to signify that such interventions would aim to help animals facing anthropogenic challenges to deal with those challenges, for the sake of those animals themselves and for reasons of restorative justice. We call this type of intervention an ‘enhancement’ to connect to ongoing ethical debates concerning human and animal ‘enhancement’, and to signify that such interventions would at least *aim* to benefit animals in some respect, but without intending to imply that such intervention do *in fact* benefit animals or are *ultima facie* ethically desirable (see also the next section). In this paper we argue that remedial enhancement merits an ethical debate of its own. Although this debate can draw arguments and perspectives from other (dis)enhancement debates, remedial enhancement arguably differs from anthropocentric animal enhancement, transhumanist animal enhancement, and animal disenhancement in ethically relevant respects. First, however, we need to discuss in what sense the interventions we have in mind can be considered ‘enhancements’.

Defining ‘enhancement’

Although all of the interventions discussed in the previous section have been called ‘enhancements’ by some authors, there is no consensus on how enhancement ought to be defined and, accordingly, no agreement on whether the term ‘enhancement’ properly applies to each of these interventions. This will also affect any discussion of ‘remedial enhancements’: are these called ‘enhancements’ appropriately? We obviously cannot settle the debate on how ‘enhancement’ should be defined, but we can explain how we understand this term and show how this understanding relates to definitions that have been offered by others, taking Shriver (2021) as our main point of reference.

The term ‘enhancement’ has sometimes been used in an attempt to demarcate a class of ethically unacceptable biotechnological interventions. It has then typically been used in opposition to ‘treatment’, which would cover ethically acceptable interventions. Such a strongly normative conceptualization seems unhelpful, however: it implies that the question of whether particular interventions can properly be called ‘enhancements’ can only be settled *after* thorough ethical debate. How such a conceptualization of enhancement serves ethical debate is unclear, in particular because it is generally agreed in human bioethics that there is no strict conceptual distinction between treatment and enhancement on which a strict normative distinction between the two could be based.

At the same time, the term ‘enhancement’ as we understand it does have some normative import. As Burgat (2015) argues, this term is not used univocally across human and animal ethics if it is applied

to interventions that are not performed for the benefit of animals. Because human enhancements are intended to benefit the individuals undergoing the enhancement (or their offspring) and this is the main argument in their favour, Burgat submits that it is misleading to call biotechnological interventions in animals that do not benefit those animals 'enhancements'. Burgat (2015) goes on to argue that no biotechnological intervention in animals should be called an enhancement: animal 'enhancement' would (at least in animal agriculture) only serve animal interests *given* a context that is not in their interest to begin with. We agree that this context is usually not in their interest, but disagree that this excludes applying the concept of enhancement. Some proposed human enhancements also serve humans interests given circumstances that are not in the interest of those who would be enhanced. For example, having certain cognitive capacities enhanced may primarily be important in undesirably competitive labour markets (Pustovrh, 2018). Considering the context and what alternative options it offers is important to determine whether a human or animal enhancement would be (*ultima facie*) ethically desirable, but it does not help ethical debate to set strict normative conditions on the application of the term 'enhancement'. This becomes even clearer when considering the enhancement of wild animals facing anthropogenic threats such as climate change or invasive species. Although it is not in the interest of most animals to live in an environment that is rapidly changing due to climate change or in which introduced predators decimate members of prey species, it is not clear in these cases that reverting to more favourable circumstances is a realistic or desirable option. Biotechnological interventions that are at least *prima facie* ethically desirable because they aim to benefit animals deserve to be discussed, and discussing these interventions as 'enhancements' helps to embed such discussions in wider ethical debates and conveys that these interventions are proposed, at least by some, to benefit animals. However, this choice of words should not be taken to imply that 'enhancements' are necessarily *ultima facie* ethically acceptable.

That enhancements must be performed in the supposed interests of the animals themselves (or their offspring) means that they must not merely increase animals' functional capacities in certain respects, but must pertain to the flourishing of the animal as a whole organism. In Shriver's (2021) words, animal enhancements must not merely be 'domain-specific' but 'holistic'. Although enhancement as we understand it may involve adapting animals in a limited functional respect, the point must be to benefit the animal as a whole organism. What it means to benefit an animal can be cashed out in a variety of ways. Shriver distinguishes between definitions that conceptualize holistic enhancement in terms of: (1) normal species functioning; (2) welfare; and (3) evolutionary fitness. He argues that normal species functioning and evolutionary fitness are not directly relevant for animals under human supervision, as companion animals and farmed animals are, and that holistic enhancement should hence be conceptualized in terms of increased welfare. Although we agree with Shriver's argument as applied to animals under human supervision, a conceptualization of enhancement in terms of normal species functioning or evolutionary fitness may be helpful when considering the remedial enhancement of wild animals.

Finally, we disagree with Shriver (2021) that interventions which entail removing or diminishing capacities should properly be called 'enhancements' rather than 'disenhancements'. Defining a disenhancement as a change that has a negative impact on the welfare of the organism, as Shriver does, ignores that disenhancement has always been discussed as a specific type of attempt to improve animal welfare that raises specific ethical conundrums because it involves removing or diminishing animals' capacities. We prefer to stay closer to the usual application of the terms 'enhancement' and 'disenhancement', according to which disenhancement implies removing or limiting some animal capacity for the benefit of that animal while enhancement implies improving or adding some capacity for the animal's benefit (e.g. Thompson, 2008). The distinction between domain-specific and holistic (dis)enhancements can largely accommodate Shriver's insight that enhancing one capacity may sometimes limit other capacities: such an intervention can be considered 'mixed' at a domain-specific level but should still aim to improve the animal's overall situation.

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In conclusion, what we call ‘remedial animal enhancements’ can be considered enhancements in the sense that these are biotechnological interventions that add or improve capacities of animals and thereby offer an overall benefit to the animals themselves (or to their offspring). This benefit can be conceptualized in terms of welfare, as Shriver (2021) does, but possibly also in other terms, such as flourishing.

What a debate about remedial animal enhancement can and cannot learn from other (dis)enhancement debates

We submit that what we have called remedial animal enhancement deserves a separate ethical debate. Such a debate can draw on related (dis)enhancement debates, but only to a limited extent, as we show in this section.

First, even though the word ‘enhancement’ seems inappropriate here, debates on anthropocentric animal ‘enhancements’ might offer relevant arguments and perspectives for ethical debates on remedial animal enhancement. Some arguments concluding that animals should not be ‘enhanced’ for human benefit can perhaps be extended to debates on remedial animal enhancements, especially if these arguments go ‘beyond welfare’: one could perhaps argue, for example, that remedial enhancement violates animals’ integrity, is unnatural, or comes down to ‘playing God’. Such arguments have been more in focus in the animal disenchantment debate, however, and ethical debate is at any rate required to settle whether such arguments trump arguments referring to how animals would supposedly be benefitted by remedial enhancements.

Second, the debate around what we have called ‘transhumanist’ animal enhancement may seem relevant because these enhancements *would* be performed in the supposed interest of animals. However, the type of benefit that would be conferred to animals differs significantly between transhumanist and remedial animal enhancement, and this limits the relevance of debates on the former for debates on the latter. Transhumanists (e.g. Dvorsky, 2008) have been arguing that humans have a duty to enhance animals’ cognitive capacities, as this would significantly improve those animals’ lives, which has been contested by authors (e.g. Hauskeller, 2016) who object that transhumanists fail to appreciate animals’ ‘animalness’ and paternalistically assume that they know that it would be best for animals to have more human-like mental faculties. This discussion seems relevant only for remedial enhancements that would significantly change the animal’s cognition, for example when greatly improving the intelligence of animals who are being preyed by invasive species (Rohwer, 2018).

Third, although debates around animal disenchantment (as we understand it) concern biotechnological interventions that would remove or limit animal capacities and remedial enhancement consists in adding or improving certain capacities, the connection is again that both types of intervention would be performed for the supposed benefit of animals. At first sight, the relevance of disenchantment debates may seem limited, as precisely the *removal* or *diminishment* of animal capacities is often considered intuitively objectionable about disenchantment (e.g. Thompson, 2008). However, some concepts that have been developed and applied to articulate intuitive concerns with disenchantment – such as *telos* and integrity – do seem to be applicable to changes to animals more generally. A debate on remedial enhancement could thus draw concepts from the disenchantment debate and address to what extent applying these concepts leads to valid ethical concerns about remedial enhancement.

The disenchantment debate also includes a relevant discussion on what can be called ‘non-ideal’ and ‘ideal’ solutions to animal suffering (Schultz-Bergin, 2014). Roughly put, there is agreement that disenchantment is not the ideal solution to animal suffering in animal agriculture and animal experimentation: ending these practices or at least adapting them much more to the needs of animals would be more ethical. However, some argue that these ethically preferable solutions are unrealistic on

the short and the middle-long term and that we therefore have a duty to develop methods to disenchant animals – as a second-best but more realistic alternative – while others object to this type of argument as these interventions would bring us further away from the ideal situation. This type of discussion is also likely to occupy debates on remedial enhancement. When thinking about increasing farmed animals' resistance to some disease or their resilience against environmental stress, for example, some may argue that changing the animals' living conditions is ethically preferable. This is a valid suggestion, but there may be remedial enhancements for which changing living conditions is not a realistic alternative on the short and middle-long term. First, some agricultural animal diseases (e.g. PRRS, porcine reproductive and respiratory syndrome) are prevalent in a wide range of husbandry systems. If so, only the abolition of or a quite radical change in animal husbandry practices would actually be an effective alternative to animal enhancement, a change which may not be realistic. Second, wild animals face environmental challenges that, although they are anthropogenic, are difficult for humans to remove. Even if human societies succeed in reversing climate change, for example, this will presumably take many decades, and many animal species may go extinct in the meantime. There may, however, be other alternatives to animal enhancement, such as assisted migration of members of endangered species to more favourable environments. Ethical debate on remedial animal enhancement should in any case address whether potential alternatives are both ethically preferable *and* realistic, and if not, whether enhancement is perhaps acceptable as a 'non-ideal' solution.

Finally, a debate on remedial animal enhancement may be able to draw on a debate that does not concern non-human animals at all: the human enhancement debate. Although there clearly are ethically salient differences between human and remedial animal enhancement, the human enhancement debate is more advanced than animal (dis)enhancement debates and may include ethical concepts and perspectives that can be extended to remedial animal enhancement. Without claiming completeness, one relevant perspective from the human enhancement debate is that some enhancements bring only 'positional' goods, meaning that a capacity is increased that brings only benefits *relative to* unenhanced people (Bognar, 2012). The standard example is height: although taller people experience some advantages over shorter people, there is no net benefit in biotechnologically creating taller people. The relative advantages that would accrue to 'enhanced' people would be offset by the relative disadvantages experienced by 'unenhanced' people, and making everyone taller would cancel out any relative advantages associated with increased height. Debates on remedial enhancement should arguably address whether particular interventions do offer an overall benefit across all morally considerable parties, or whether the enhancement would instantiate a zero-sum game or even a negative-sum game. Some remedial enhancements may offer what might be called 'intraspecies positional benefits' or what might be called 'interspecies positional benefits'. Having certain capacities enhanced may give some animals a competitive edge over their conspecifics; similarly, enhancing members of prey species may give them an advantage relative to members of predatory species. Whether the enhancement offers a net benefit overall is relevant in both cases. Other relevant perspectives from the human enhancement debate – which we have no space to further elaborate here – may be that enhancements can threaten the 'authenticity' or 'nature' of those who are enhanced or that they violate the 'giftedness of life'. Are animals who have been enhanced still authentic members of their species? Would we be turning animals that we enhance into (partial) artefacts, thereby losing a sense of giftedness?

Conclusions

We have argued that an ethical debate about remedial animal enhancement may draw relevant perspectives from other (dis)enhancement debates but cannot coincide with any of these debates, because the context in which remedial enhancement is proposed is different and this leads to different moral concerns. Remedial enhancement intuitively seems to be the most acceptable form of animal (dis)enhancement, as it not only serves the welfare or even the continued existence of the animals without

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removing or limiting their capacities, but also partially restores harms that we humans have caused to (previous generations of) these animals. It is all but clear that remedial animal enhancement is *ultima facie* desirable, however, which calls for ethical debate.

One question remains. Why is a debate on remedial animal enhancement necessary at all? Why not discuss particular interventions such as improving farmed animals' disease resistance or improving wild animals' resilience against climate change separately instead? Although it remains important to discuss ethical issues associated with particular biotechnological interventions, discussing these *as* enhancements embeds them in wider bioethical debates, from which relevant perspectives and arguments can be derived. For example, regarding interventions in wild animals as enhancements suggested that arguments surrounding positional goods might be relevant. Moreover, by seeing these interventions as instantiations of a class of 'enhancements', they can be positioned in wider developments or tendencies that are ethically significant, including a tendency towards 'interventionism'.

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