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COMMENTARY

Justifying a Capability Approach to Brain Computer Interface

Nancy S. Jecker[1,2,3] · **Andrew Ko**[4]

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Abstract
Previously, we introduced a capability approach to assess the responsible use of brain-computer interface. In this commentary, we say more about the ethical basis of our capability view and respond to three objections. The first objection holds that by stressing that capability lists are provisional and subject to change, we threaten the persistence of human dignity, which is tied to capabilities. The second objection states that we conflate capabilities and abilities. The third objection claims that the goal of using neuroenhancements should be preserving capabilities, not altering them.

Keywords Artificial intelligence · Brain-computer interface · Ethics · Neurotechnology · Human dignity · Human capabilities

1 Introduction

Previously, we introduced a capability approach to assess the responsible use of brain-computer interface (BCI) (Jecker & Ko, 2022). We demonstrated that it provides practical guidance in a series of cases, ranging from treating patients with severe disease to enhancing healthy people. This filled an important gap in the literature, which Burwell et al. characterize as a "lack of practical solutions to the ethical challenges of BCI" and a failure to furnish much in the way of "concrete recommendations" for addressing practical ethical issues (Burwell et al., 2017, pp. 18, 60).

✉ Nancy S. Jecker
nsjecker@uw.edu

[1] Department of Bioethics and Humanities, University of Washington School of Medicine, 1959 NE Pacific Street, Box 357120, Seattle, WA 91895-7120, USA

[2] Faculty of Medicine, Centre for Bioethics, Chinese University of Hong Kong, Shatin, New Territories, Hong Kong

[3] Department of Philosophy, University of Johannesburg, Johannesburg, Gauteng, South Africa

[4] Department of Neurological Surgery, University of Washington School of Medicine, Seattle, WA, USA

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In this commentary, we say more about justifying our capability view in response to concerns raised by Lindia (2023).

As noted in our original paper, the underlying philosophical basis for a capability view is human dignity. As we use the term, "dignity" indicates having a threshold level of central human capabilities. We proposed a capability list adapted from Nussbaum (2011) and defended by Jecker (2020) at greater length elsewhere. The list included capabilities to author a life narrative or story; be physically, mentally, and emotionally healthy; have bodily integrity; exercise senses, imagination, and thought; feel a range of human emotions; deliberate about plans and goals; affiliate with others; relate to nature and other species; recreate and play; and regulate the immediate environment. Respecting human dignity requires that societies take reasonable steps to safeguard each central capability at a threshold level and also that societies treat people as ends-in-themself, never as mere means to carry out others' purposes. We operationalized dignity's dual features by means of two tests and applied the tests to proposed BCI uses. The *threshold test* asks, "Does a BCI application reasonably protect the BCI user's minimum capabilities?" The *flourishing test* asks, "Does a BCI application enhance the BCI user's capabilities, enabling them to lead better lives?" Passing these tests is necessary to ensure the responsible use of BCI.

2 Three Conceptual Challenges

In response to our proposal, Lindia questions whether the capability view as we present it is up to the task of evaluating new BCI applications and raises three specific concerns.

Provisional Lists First, while we stress that any capability list should be set forth provisionally and thus, open to change, Lindia maintains that it is strategically better to stress the constancy of capabilities, because that ensures the persistence of human dignity, which is tied to capabilities. For example, if BCI creates new capabilities or causes us to lose existing ones, human dignity would be diminished because some of the human capabilities it is tied to would no longer exist.

In reply, unlike Lindia, we hold that *human dignity is not necessarily tied to a particular capability list, but rather applies to having a threshold level of whatever the central things are that human beings can do and be.* In this way, although the human species gradually evolves (thus far, on an evolutionary time scale) and capabilities can evolve too, human dignity remains intact.

Yet what if neurotechnologies like BCI transform human capabilities radically, resulting in a new species, a 'posthuman' (Porter, 2017)? Our view is that whether the new kind of being has dignity depends upon a fuller account, which sets out the necessary and sufficient conditions for saying that a species (human or nonhuman) has dignity. If we suppose a posthuman species has dignity, then respecting their dignity would require safeguarding *their* species-typical skills and capacities at a threshold level. Nussbaum puts the point this way: the "basic moral intuition [of a

capability view] concerns the dignity of a form of life that possesses both abilities and deep needs. Its basic goal is to address the need for a rich plurality of life activities" typical for that being (Nussbaum, 2006, p. 346). In the case of human beings, Nussbaum notes that "there is a more general attitude behind the respect for human powers that is basic to the capabilities approach" (Nussbaum, 2006, p. 347). The more general attitude is that *any being with dignity should be helped to flourish as the sort of thing they are.*

One way to think about this is to say that dignity is conferred at the species level, such that "the dignity of humanity, or of any other species, precedes and furnishes the basis for the dignity of individual species members" (Jecker, 2020, p. 36). Vukov offers a variation: an individual is a person, with full moral status and dignity, "just in case that individual belongs to a natural kind that is normally characterized by advanced cognitive capacities" (Vukov, 2017, p. 261). On both accounts, dignity relates to the kinds of beings we are, and individuals of a certain kind have a valid moral claim to respect, regardless of their particular achievements and regardless of whether their specific capabilities are intact (Darwall, 1977).

In further reply to Lindia, we note that emphasizing the provisional character of a capability list not only is compatible with preserving dignity, but carries its own strategic advantages (Jecker, 2020). First, a provisional list is nondogmatic, open to the possibility that new information or arguments could come to light. Second, a provisional list recognizes that major changes in human beings or the world in which they live could modify the central things that human beings can do and be. Not only future brain-machine interface, but also other technologies, like germline gene editing, could dramatically alter human capabilities, as could shifts in the natural or built environment in which humans live, such as changes to earth's atmosphere from continued burning of fossil fuels.

Ability Versus Capability Lindia's second concern is that our capability analysis conflates ability and capability. According to Lindia, BCI enhancements rarely alter human capabilities, but instead alter human abilities, which are the means to realize capabilities. Lindia gives as an example future BCI applications enabling direct brain-to-brain communication, and judges that this would represent a change in ways human affiliate, rather than a change in the capability for affiliation.

In response, we distinguish, as others do (Nussbaum, 2011, ch. 2), between capability and functioning. *Capabilities* designate a person's real freedoms or opportunities to do and be what they have reason to value; *functionings* refer to the actual exercise of those opportunities, i.e., the doings and beings. When BCI is used to help people with severe disease regain mobility by operating a wheelchair with their thoughts, their functioning improves, and their computer-mediated capability for bodily integrity rises closer to a threshold level.

Yet, we can imagine other cases in which BCI interventions do not just restore lost functioning but are transformative. Referring to an example discussed in the literature (Coeckelbergh, 2011), Lindia suggests that if humans sprout wings, this is simply a change in ability, not capability. However, we are not so sure. Suppose a technology modified humans in ways that enabled moving from place to place by

tunneling underground like a mole or swimming underwater like a dolphin. Are we the same kind of beings since we still have the capability for moving from place to place? We think not. If a human lived in the sky, or lived an underground or underwater existence, humans would be a different kind of being. After all, many species possess capabilities like we do — they can be healthy; affiliate with others; relate to nature; have emotions; sense, imagine, and think; play; and regulate their environment, but that does not suffice to show they are the same kinds of beings we are. *Once we start to speculate about humans with wings, we are already talking about a different species.* A creature with a bird-like form, lives a bird-like life, doing and being what birds can do and be.

Respecting Human Dignity Lindia's third concern is that our analysis does not do enough to safeguard human dignity. For Lindia, respecting human dignity requires preserving, not altering, human capabilities. Underlying this claim is the belief that our human "essence" (Lindia's term) consists of having the particular set of capabilities we do. Thus, the current list of capabilities is "what comprises human dignity" (Lindia, 2023, p. 1–6).

In reply, we question Lindia's claim that human dignity is necessarily tied to the particular set of capabilities that humans currently have. We hold the contrary view, that dignity could conceivably apply to human (or other) beings with diverse capability sets. Thus, to take Lindia's example, if humans developed new capabilities and evolved into a posthuman form, they might, on our view, possess posthuman dignity rather than no dignity at all. This aligns with views espoused by Nussbaum and others, who hold that *some nonhumans are capable of a dignified existence and respecting them requires respecting the capabilities central to them.*

Yet Lindia worries about "human and technology fusing into a single indissoluble information system" (Lindia, 2023, p. 1–6). What would dignity look like then? We are unsure what sort of entity Lindia has in mind. Yet, there is no reason to exclude out of hand the possibility that it has its own sort of dignity. Many Western philosophies require consciousness for dignity; yet, a fused human/machine might be conscious. Even if it lacked consciousness, many philosophies outside the West, including sub-Saharan African (Jecker et al., 2022a, b; Wareham, 2020), indigenous (Næss, 1973), Japanese (Jensen & Blok, 2013), and others (Jecker, 2021), hold that consciousness is not required for dignity and moral worth. These debates raise larger questions that fall outside the scope of our inquiry.

3 Conclusion

In conclusion, a capability view not only provides unique and practical advantages for evaluating the ethics of BCI and other neuroenhancements, it has strong backing in the normative principle of respect for dignity.

Neuroenhancements challenge us to imagine a future where we acquire new capabilities and evolve into different sorts of beings. Lindia is concerned that losing human capabilities implies losing dignity. Yet, we have stressed that future versions of ourselves might retain dignity and worth.

Abbreviation BCI: Brain computer interface

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