



Recognizing the Diversity of Cognitive Enhancements

Walter Veit , Brian D. Earp , Nadira Faber , Nick Bostrom , Justin Caouette ,
Adriano Mannino , Lucius Caviola , Anders Sandberg & Julian Savulescu

To cite this article: Walter Veit , Brian D. Earp , Nadira Faber , Nick Bostrom , Justin Caouette , Adriano Mannino , Lucius Caviola , Anders Sandberg & Julian Savulescu (2020) Recognizing the Diversity of Cognitive Enhancements, AJOB Neuroscience, 11:4, 250-253, DOI: [10.1080/21507740.2020.1830878](https://doi.org/10.1080/21507740.2020.1830878)

To link to this article: <https://doi.org/10.1080/21507740.2020.1830878>



Published online: 16 Nov 2020.



Submit your article to this journal [↗](#)



Article views: 134



View related articles [↗](#)



View Crossmark data [↗](#)

ORCID

Sebastian Sattler  <http://orcid.org/0000-0002-6491-0754>

REFERENCES

- Akers, R. L., and C. S. Sellers. 2013. *Criminological theories: Introduction and evaluation*. Oxford, UK: Oxford University Press.
- Cialdini, R. B., C. A. Kallgren, and R. Reno, 1991. A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. *Advances in Experimental Social Psychology* 24:201–34. doi:10.1016/S0065-2601(08)60330-5.
- Cutler, K. A. 2014. Prescription stimulants are “a okay”: Applying neutralization theory to college students’ non-medical prescription stimulant use. *Journal of American College Health* 62 (7):478–86. doi:10.1080/07448481.2014.929578.
- Deutsch, M., and H. B. Gerard. 1955. A study of normative and informational social influences upon individual

- judgement. *Journal of Abnormal Psychology* 51 (3): 629–36. doi:10.1037/h0046408.
- Dinh, C. T., S. Humphries, and A. Chatterjee. 2020. Public opinion on cognitive enhancement varies across different situations. *AJOB Neuroscience* 11 (4):224–237.
- Sattler, S., C. Forlini, E. Racine, and C. Sauer. 2013. Impact of contextual factors and substance characteristics on perspectives toward cognitive enhancement. *PLoS One* 8 (8): e71452. doi:10.1371/journal.pone.0071452.
- Sattler, S., C. Sauer, G. Mehlkop, and P. Graeff. 2013. The Rationale for Consuming Cognitive Enhancement Drugs in University Students and Teachers. *PLoS One* 8 (7): e68821. doi:10.1371/journal.pone.0068821.
- Sattler, S., G. Mehlkop, V. Bahr, and C. Betsch. under review. Why parents abuse prescription drugs to enhance the cognitive performance of healthy children: The influence of peers and social media.
- Sutherland, E. H. 1947. *Principles of criminology*. Chicago, IL: Lippincott.
- Sykes, G. M., and D. Matza. 1957. Techniques of neutralization: A theory of delinquency. *American Sociological Review* 22 (6):664–70. doi:10.2307/2089195.

AJOB NEUROSCIENCE
2020, VOL. 11, NO. 4, 250–253
<https://doi.org/10.1080/21507740.2020.1830878>



Taylor & Francis
Taylor & Francis Group

OPEN PEER COMMENTARIES



Recognizing the Diversity of Cognitive Enhancements

Walter Veit^a , Brian D. Earp^{b,c} , Nadira Faber^{d,e}, Nick Bostrom^d, Justin Caouette^{f,g}, Adriano Mannino^h, Lucius Caviolaⁱ, Anders Sandberg^d, and Julian Savulescu^d

^aThe University of Sydney; ^bYale University; ^cThe Hastings Center; ^dUniversity of Oxford; ^eUniversity of Exeter; ^fNortheastern University; ^gBridgewater State University; ^hLudwig Maximilians University of Munich; ⁱHarvard University

Empirical investigations into ordinary people’s bioethical intuitions have steadily grown throughout the last decades. A new study by Dinh, Humphries, and Chatterjee (2020) provides a paradigm example of what has been recently dubbed experimental philosophical bioethics or “bioxphi” (Earp et al. 2020; Lewis 2020). A descendant of both experimental philosophy (“x-phi”)¹ and empirical bioethics, bioxphi goes beyond merely describing people’s moral attitudes and opinions: it uses experiments to actively test the factors which influence, and processes which underlie, the normative views of various stakeholders, with an eye to informing substantive debates in bioethics. Dinh and colleagues hypothesized that public opinion about the

acceptability of pharmacological cognitive enhancements (CE) would be sensitive to the experimental manipulation of framings and contexts. They found that study participants reported greater acceptance of hypothetical CE use among employees than students, if more peers used CE, if the environment was less competitive, and if authority figures encouraged CE use.

Other researchers have also found that attitudes toward CE are susceptible to framing effects. Bergström and Lynöe (2008), for instance, found that such attitudes were affected by whether different forms of CE were described as either an herb or a chemical pharmaceutical, and if the reason for use was individualistic or altruistic. Riis, Simmons, and Goodwin (2008)

CONTACT Walter Veit  wwwveit@gmail.com  The University of Sydney, Sydney 2006, Australia.

¹See Cova et al. (2018) for an overview, along with data showing greater replicability among x-phi studies compared to studies in psychology among other disciplines.

© 2020 Taylor & Francis Group, LLC

found that framing CE as “reaching one’s potential” versus “increasing one’s potential” boosted participant interest in CE. And Fitz et al. (2014) found that side-effects were judged as more tolerable when CE was framed as restoring versus enhancing cognitive abilities (both within the normal range). Like Dinh et al., Fitz and colleagues also studied the effects of hypothetical peer pressure and indicators of the social class of the potential CE user.² Reflecting on their findings, Fitz et al. (2014, 185) noted:

The history of the debate over CE has been one in which expert opinion has dominated and public opinion has been relegated to the back seat, if indeed a role has been considered at all. We suggest that empirical data demonstrating that the public’s judgments are sensitive to the reasons commonly discussed by experts provides compelling evidence that public attitudes, or even the public themselves, should be included in the development of future policy.

We agree that public attitudes should be taken into consideration when developing future policy in this area. And the fact that there is a correspondence between certain aspects of “expert judgement” and public attitudes about CE may suggest more nuanced views among the latter than has sometimes been assumed. But *how* public attitudes should be incorporated remains an open question. The challenge going forward will be to develop empirically informed and normatively justified frameworks for getting from “public attitudes” to “public policy” under various conditions (Savulescu, Kahane, and Gyngell 2019).

What happens when ordinary people and the “experts” *disagree*, for instance? Plausibly, bioethics studies could play a role in adjudicating at least some such disagreements: for example, by testing whether the intuitions of one group or the other are inappropriately responsive to normatively irrelevant factors—a so-called “debunking” strategy—or by otherwise helping to guide a process of reflective equilibrium between the intuitions of different stakeholders and more explicit ethical theories or principles (Davies, Ives, and Dunn 2015; Earp et al., *forthcoming*; Savulescu, Kahane, and Gyngell 2019).

What the work of Dinh et al. (2020), Fitz et al. (2014), and others show, however, is that “public attitudes” are not monolithic. Rather, they are multifaceted—and malleable. In the realm of CE, so-called folk intuitions are often reasons-responsive and track distinctions between different *kinds* of CE used in different contexts toward different ends. We therefore

strongly agree with Dinh et al. that policymakers will have to give up on the idea of a “one-size-fits-all” solution encompassing the diverse kinds of CE. Here, we want to take the opportunity to further advance a more nuanced approach toward CE.

THREE EMPIRICAL LESSONS FOR THE BIOETHICS OF COGNITIVE ENHANCEMENTS

One problem in the literature on CE has been a tendency toward “philosophical detachment”—a common feature of much philosophical analysis throughout the 20th century, but one which is coming in for more and more criticism in recent years (e.g., Blumenthal-Barby et al. 2020). It is a philosophical style that seeks to find general conclusions on a fairly formal level by abstracting away from the context and empirical complexity of the situation.

This sort of hypothetical abstraction has similarly been criticized in ethical thought experiments such as the trolley dilemma, which “filters out” such crucial factors as who is involved in the dilemma and what their relationship-specific obligations might be (Clark, Earp, and Crockett 2020). At such an abstract level, participants in empirical studies that include such dilemmas may rely on general principles rather than engage in the more concrete, “messy” moral reasoning that people use in everyday life. This likely makes such studies unrepresentative of real-world moral decision making.

But even if one wanted to take an abstract philosophical approach to CE as a class of interventions, this would only work if there is (i) a general concept that covers all the different things we commonly label as CE, and (ii) this concept can be captured by “armchair” analysis alone. Neither of these ambitions we think are justified. CE are too much of a disunified kind to allow a general moral analysis at the level that is often employed, for example, by its critics. An analogy can be drawn with scientific modeling. Whereas young scientific disciplines tend to operate with a small number of simple, general, and fairly abstract models, mature disciplines—at least within the biological and social sciences—tend to embrace a richer “model pluralism.” According to this approach, a diversity of models is needed to account for the diversity of the scientific phenomena at hand (Veit 2019, 2020, *forthcoming*). The work—and findings—of Dinh et al. (2020), among other researchers, suggest that the enhancement literature is reaching a stage of maturity in which we should both (a) recognize the disunified, multifarious nature of the phenomena in

²Dinh et al. (2020) manipulated the blue-collar vs. white-collar work environment; Fitz et al. (2014) manipulated the source of wealth of a student who either could or could not afford a CE pill.

question, and (b) examine them through a more pluralistic theoretical lens.

There is a related elephant in the room of debate around cognitive enhancement. Cognitive enhancement usually refers to functional enhancement (Savulescu, Sandberg, and Kahane 2011). It refers to enhancement of memory, or attention, or general intelligence, or some other cognitive capacity or function. These are non-normative properties, like height. It is impossible to judge whether they are good or bad without reference to normative properties, or normative reasons. These reasons will be derived from values, like well-being, autonomy, justice, etc. These reasons can conflict, or push in different directions, depending on the circumstances. So we can never evaluate a non-normative property like cognitive enhancement without reference to normative reasons and facts. It is a futile question to ask: is cognitive enhancement good? Or even, is enhancement of memory good? It is like asking: is it good to be tall? Or to be able to hear? It will depend on our normative values and the precise context (Kahane and Savulescu 2009). In particular, we advocate:

1. **Realism:** the results of Dinh et al. (2020) show a need for realistic scenarios—perhaps even derived from observational studies. No generalized statements about CE can be made without a recognition of their context. From the more commonly discussed cases of modafinil, ritalin, coffee, and antidepressants, to doping in various competitive settings such as sport (Faber, Savulescu, and Douglas 2016; Veit 2018), to relationship-affecting drugs (Earp and Savulescu 2020), or moral enhancers (Earp, Douglas, and Savulescu 2017), distinctions will need to be drawn about the actual substances that might be used, the ends toward which they are put, their likely modes of delivery, and so on.
2. **Individual differences:** another aspect of realism, but one which needs to be highlighted in its own right, is the range of effects enhancers can have. Not only do different substances have different typical effects, but one and the same substance can have different effects on different people depending on their individual characteristics, also depending on the dose used. Moreover, enhancement in one domain is often accompanied by impairment in another (Caviola and Faber 2015). This makes gaining coherent information from the public and assessing their opinions about CE “in general” even less logical or feasible.
3. **Context matters:** in addition to individual differences, attention must be paid to both interpersonal relational context as well as wider group-level social situations. These factors change the way—and extent to which—cognitive enhancers actually improve performance along various dimensions. In many cases, individuals do not work alone, but rather cooperate in dyadic pairs or in groups (Clark, Earp, and Crockett 2020). In the case of groups, how group members evaluate a given enhancer can change the performance effects it has on a group level. For example, when group members view an enhancer negatively and hence judge its user negatively (Faulmüller, Maslen, and Santoni de Sio 2013), the group will be less cohesive and performance may suffer. Or if group members overestimate an enhancer’s effects, they might contribute less to the joint performance, again impairing performance on the group level (Faber, Häusser, and Kerr 2017).

WHERE IS THE BIOETHICS OF COGNITIVE ENHANCEMENT HEADING?

It is time to give up on “lines in the sand”—ultimate distinctions that are thought to help us discriminate between enhancements and treatments, or morally required and morally repugnant interventions. The same substances can have different effects for different people under different conditions at different dosages, and may be used for different (conscious and unconscious) ends. The large class of interventions that might fall under the “CE” label is too diverse to allow sweeping generalizations.

Instead, what is needed is robust, empirically informed philosophical work, with careful weighting of the conflicting moral values, tradeoffs, and contexts of the specific CE at hand. We think the proper response is to recognize that any societal policy or indeed any ethical stance on CE will have to be complex and tailored to the situation. To point to the complexity of CE may be unsatisfying, but is not fundamentally different from any other part of medical ethics where important principles often clash, public and official normative views are contradictory and situation-dependent, and attitudes evolve with society and technology.

Recognizing this should not stop us from looking for underlying, more general patterns that are widely shared or relatively consistent across contexts. If, as Dinh et al. (2020) suggest, enhancers are seen as more acceptable in less competitive, more altruistic situations, then that may suggest a different set of

guidelines—or empirical research programs to understand why and how—than approaches according to which the nature of the enhancer (or the properties of the “enhancee”) are the primary focus. Looking at the interpersonal and situation contexts of CE use open up a range of important questions about the nature of consent, diversity of values, commitments of cultures or subcultures, and how enhancement fits into particular lived experiences. Injecting such sociological nuance into evaluations of CE will be less simple, but more useful in elucidating what we want to be and become.

ORCID

Walter Veit  <http://orcid.org/0000-0001-7701-8995>
 Brian D. Earp  <http://orcid.org/0000-0001-9691-2888>

REFERENCES

- Bergström, L. S., and N. Lynöe. 2008. Enhancing concentration, mood and memory in healthy individuals: An empirical study of attitudes among general practitioners and the general population. *Scandinavian Journal of Public Health* 36 (5):532–7. doi:10.1177/1403494807087558.
- Blumenthal-Barby, J., K. Boyd, B. D. Earp, L. Frith, R. J. McDougall, J. McMillan, and J. Wall. 2020. Pandemic medical ethics. *Journal of Medical Ethics* 46 (6):353–4. doi:10.1136/medethics-2020-106431.
- Caviola, L., and N. S. Faber. 2015. Pills or push-ups? Effectiveness and public perception of pharmacological and non-pharmacological cognitive enhancement. *Frontiers in Psychology* 6:1852. doi:10.3389/fpsyg.2015.01852.
- Clark, M. S., B. D. Earp, and M. Crockett. 2020. Who are “we” and why are we cooperating? Insights from social psychology. *Behavioral and Brain Sciences* 43 (e66):21–3. doi:10.1017/S0140525X19002528.
- Cova, F., B. Strickland, A. Abatista, A. Allard, J. Andow, M. Attie, J. Beebe, R. Berniūnas, J. Boudesseul, M. Colombo, et al. 2018. Estimating the reproducibility of experimental philosophy. *Review of Philosophy and Psychology* 1–36. doi:10.1007/s13164-018-0400-9.
- Davies, R., J. Ives, and M. Dunn. 2015. A systematic review of empirical bioethics methodologies. *BMC Medical Ethics* 16 (1):1–13. doi:10.1186/s12910-015-0010-3.
- Dinh, C. T., S. Humphries, and A. Chatterjee. 2020. Public opinion on cognitive enhancement varies across different situations. *AJOB Neuroscience*. 11 (4):224–237.
- Earp, B. D., J. Demaree-Cotton, M. Dunn, V. Dranseika, J. A. C. Everett, A. Feltz, G. Geller, I. R. Hannikainen, L. A. Jansen, J. Knobe, et al. 2020. Experimental philosophical bioethics. *AJOB Empirical Bioethics* 11 (1):30–3. doi:10.1080/23294515.2020.1714792.
- Earp, B. D., T. Douglas, and J. Savulescu. 2017. Moral neuroenhancement. In *Routledge handbook of neuroethics*, ed. S. Johnson and K. Rommelfanger, 166–84. Abingdon and New York, NY: Routledge.
- Earp, B. D., J. Lewis, V. Dranseika, and I. Hannikainen. forthcoming. Experimental philosophical bioethics and normative inference. *Theoretical Medicine & Bioethics*.
- Earp, B. D., and J. Savulescu. 2020. *Love drugs: The chemical future of relationships*. Stanford, CA: Stanford University Press.
- Faber, N. S., J. A. Häusser, and N. L. Kerr. 2017. Sleep deprivation impairs and caffeine enhances my performance, but not always our performance: How acting in a group can change the effects of impairments and enhancements. *Personality and Social Psychology Review* 21 (1):3–28. doi:10.1177/1088868315609487.
- Faber, N. S., J. Savulescu, and T. Douglas. 2016. Why is cognitive enhancement deemed unacceptable? The role of fairness, deservingness, and hollow achievements. *Frontiers in Psychology* 7:232 doi:10.3389/fpsyg.2016.00232.
- Faulmüller, N., H. Maslen, and F. Santoni de Sio. 2013. The indirect psychological costs of cognitive enhancement. *The American Journal of Bioethics* 13 (7):45–7. doi:10.1080/15265161.2013.794880.
- Fitz, N. S., R. Nadler, P. Manogaran, E. W. Chong, and P. B. Reiner. 2014. Public attitudes toward cognitive enhancement. *Neuroethics* 7 (2):173–88. doi:10.1007/s12152-013-9190-z.
- Kahane, G., and J. Savulescu. 2009. The welfarist account of disability. In *Disability and disadvantage*, ed. A. Cureton and K. Brownlee, 14–53. Oxford, UK: Oxford University Press.
- Lewis, J. 2020. From x-phi to bioxphi: Lessons in conceptual analysis 2.0. *AJOB Empirical Bioethics* 11 (1):34–6. doi:10.1080/23294515.2019.1705430.
- Riis, J., J. P. Simmons, and G. P. Goodwin. 2008. Preferences for enhancement pharmaceuticals: The reluctance to enhance fundamental traits. *Journal of Consumer Research* 35 (3):495–508. doi:10.1086/588746.
- Savulescu, J., G. Kahane, and C. Gyngell. 2019. From public preferences to ethical policy. *Nature Human Behaviour* 3 (12):1241–3. doi:10.1038/s41562-019-0711-6.
- Savulescu, J., A. Sandberg, and G. Kahane. 2011. Well-being and the concept of enhancement. In *Enhancing human capacities*, ed. J. Savulescu, R. Ter Meulen, and G. Kahane, 3–18. Oxford: Wiley-Blackwell.
- Veit, W. 2018. Cognitive enhancement and the threat of inequality. *Journal of Cognitive Enhancement* 2 (4): 404–10. doi:10.1007/s41465-018-0108-x.
- Veit, W. 2019. Modeling morality. In *Model-based reasoning in science and technology*, ed. Á. Nepomuceno-Fernández, L. Magnani, F. Salguero-Lamillar, C. Barés-Gómez, and M. Fontaine. Cham, Switzerland: Springer. doi:10.1007/978-3-030-32722-4_6.
- Veit, W. 2020. Model pluralism. *Philosophy of the Social Sciences* 50 (2):91–114. doi:10.1177/0048393119894897.
- Veit, W. forthcoming. Review of Nancy Cartwright’s nature, the artful modeler: Lectures on laws, science, how nature arranges the world and how we can arrange it better. *Philosophy of Science*. doi:10.1086/711505