



## Conceptual Definitions and Meaningful Generalizability in Cognitive Enhancement

Christian Carrozzo

To cite this article: Christian Carrozzo (2020) Conceptual Definitions and Meaningful Generalizability in Cognitive Enhancement, AJOB Neuroscience, 11:4, 261-263

To link to this article: <https://doi.org/10.1080/21507740.2020.1830873>



Published online: 16 Nov 2020.



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



View related articles [↗](#)



View Crossmark data [↗](#)

## OPEN PEER COMMENTARIES



## Conceptual Definitions and Meaningful Generalizability in Cognitive Enhancement

Christian Carrozzo<sup>a</sup>

University at Albany

I have argued elsewhere in this journal that the purview of an appropriate neuroethics ought to include analyses of the practices employed by neuroscience (and not merely its theoretic conclusions or their practical applications) if we wish it to embody the sorts of epistemic values that constitute a guiding framework by which we can attempt to assure that any scientific endeavor is meeting the standards required by the empirical principles that ground its method. The underlying assumption is a direct association between meeting a certain epistemic standard, and whether a resulting belief is thus a good one to have. Science that is both epistemically and morally responsible cares not just about what knowledge can be legitimately generalized, but also the ethical consequences of generalizing that which does not warrant generalization. Thus, an ideal scientific practice occupies itself as not only an empirical endeavor, but a moral one (Carrozzo 2019). By assuring that a study is meeting certain epistemic standards, we can perhaps attest to the endeavor as constituting a moral good. One way in which we employ epistemic values in this sort of examination is engaging in an analysis as to the *conceptual clarity* of the object in question. That is, whether we have constructed and included a formal definition of the relation or phenomena we wish to study.

A formal definition is required of any concept should we be interested in generalizing what our empirical measures conclude in terms of logical relationships (theory) and if we wish to predict those relationships to be the case across a variety of contexts and conditions (transferability). Authors of the study,

“Public Opinion on Cognitive Enhancement Varies Across Different Situations,” (Dinh et al. 2020) in their attempt to determine statistically the social acceptability of cognitive enhancement, fail to provide a formal definition of the concept in question. Thus, whether such a study results in statistical significance or no, the conclusions are meaningless, as the human subjects whose propositional dispositions are in question are likely to be reporting on vastly different understandings of the notion at hand.

### CONCEPTUAL PRAGMATISM

The very purpose of empirical design and experimentation is to offer conclusions that are *meaningful*. Pragmatically, in the tradition of C.I. Lewis at least (Lewis 1956), for a concept to be meaningful is to say that its definition must bear some practical implication, a determination which requires a valid measure of the logical relations between concepts, which in turn requires conceptual clarity and distinction about what is being measured. For instance, if I were to conduct a study that sought an answer to the question: “What is the public opinion on how human beings manage time?,” my epistemic responsibility would clearly indicate the need to provide a definition of the concept in question, viz. *time*. The logic of “managing time” (roughly, what it *means*) will depend on the empirical verifiability of the logical relations implied by the definition used. If I presented a definition of “time” that stated it to be: “the subjective experience of the passing of perceptually distinct events as occupying a relative phenomenal space and

duration,” I might find myself in trouble when it comes to generalizing to the degree of public opinion any quality reported by my sample population given *each subject* has been instructed essentially *via the definition provided*, to report opinions on the basis of their subjective experience of what “time” is. The inquiry defeats itself, logically, as the notion of *public opinion* is predicated on what can be generalized, and the concept *as defined* is differently realized by each subject. On the other hand, if the definition provided had a clear practical implication: “an abstraction grounded by the objective mathematical instruments which we employ to provide a shared measure of duration, e.g., clocks, calendars, a sun-dial, the rotation of the earth,” we have safeguarded against phenomenally relative properties in defining and thus apprehending our object of study, allowing for as many individual subjects as we wish to offer an opinion on how they manage a *one and the same*, practical concept.

When our object of empirical study is either inherently lacking clarity, presented via a common or “folk” definition (non-formal) or lacking precise distinction from the variety of ways in which the idea has already been presented, any scientific investigation of which the concept is object with the intended goal of generalizability will fail given the lack of precision in the conceptual language (Bishop 1992; Wacker 2004). It will fail to refer to any particular thing in the world about which we hope to solicit public opinion.

The notion of cognitive enhancement resists generalization even more so than our example of time. Unlike our ability to ground a definition of time via the objective ways we keep shared track of it, we have no instruments to ground a definition of cognitive enhancement that entirely avoids relative or subjective components. Indeed, many of our assessments of whether something constitutes a cognitive enhancement can *only* be determined by subjective input bearing little to no chance of generalization, given they rely on the presence of certain qualities cognitively accessible only by the subject, in a particular context, and as a result of a particular mode.

## CONTEXT, NORMATIVITY, AND MODE

The concept of cognitive enhancement is notoriously *contextually-reliant, norm-reliant, and mode-specific* in the face of empirical analysis. When measuring cognitive ability, the challenges presented by the requirement for generalizability are even greater, because so often a measure of enhancement is a causal

assessment between a *potential* mode of enhancement, of which there are quite a few (Singh and Narang 2014), verified against the reported subjective human experience of a cognitively accessible improvement in function (i.e., something the subject can *feel* has improved about *his or her own cognitive processes*, whether memory, attention, language, visual/spatial, logical/rational, and so on). The importance of considering *situational* context also cannot be overstated. The notion that “Public Opinion on Cognitive Enhancement Varies Across Situations” is *a priori* explained by the idea that what *defines* cognitive enhancement itself varies across situations. In other words, under an epistemically responsible definition of cognitive enhancement, the title of the study states a self-evident conclusion.

We must also determine appropriately a functional norm from which we can measure what precisely by our formal definition constitutes an actual “enhancement.” If the assessments are careful, and the functional norms themselves can be generalized, we might be one step closer to generalizing a given instance or type of subjective experience as an instance or type of enhancement. This extends to the type for which we employ moral language in describing what cognitively accessible “good” has come about as a result, which can play for the subject a fundamental role in whether one judges something to be appropriately an improvement qua enhancement, at all (Carrozzo 2015).

Lastly, formal definitions can be employed to identify logically deductive modes, as opposed to what results of this study’s terminology of “Stimulants like Adderall and Ritalin ... used by healthy people,” which presents to the study subject a single mode in an undefined context *first*, and implies that we can inductively reason from its properties what turns out to be some folk definition: “The general use of Adderall by healthy people constitutes a cognitive enhancement,” as opposed to the deductive, “Cognitive enhancement is  $x$  and thus Adderall’s subjective effects when similar to  $x$ ’s constitute a cognitive enhancement.” The latter at least attempts the difficult work of forming an experiential definition, perhaps based on third-person interpretations of first-person, subjective reports, despite the phenomenological challenges (Dreyfus and Kelly 2007). This study simply ignores the subjective input required and suggests that a single mode (the central nervous system stimulant), lacking any assessment of a subjective functional norm from which to gauge an enhancement, nor any well-defined situational context, can be

employed in a study that seeks to generalize for public opinion, with meaningful results.

Any scientific endeavor the conclusions of which state something of generalizable import about human dispositions regarding a proposition such as cognitive enhancement, deserves a high degree of epistemic rigor for its intended general influence on the philosophy of neuroscience as well as its ethical and social implications.

## REFERENCES

- Bishop, M. A. 1992. The possibility of conceptual clarity in philosophy. *American Philosophical Quarterly* 29 (3): 267–277.
- Carrozzo, C. 2015. Moral relevance in the concepts and language of human synthetic moral enhancement. *American Philosophical Association Newsletter on Philosophy and Medicine* 14 (2):6–11.
- Carrozzo, C. 2019. Scientific practice and the moral task of neurophilosophy. *AJOB Neuroscience* 10 (3):115–117. doi:10.1080/21507740.2019.1632967.
- Dinh, C. T., S. Humphries, and A. Chatterjee. 2020. Public opinion on cognitive enhancement varies across different situations. *AJOB Neuroscience*. 11 (4):224–237.
- Dreyfus, H., and S. D. Kelly. 2007. Heterophenomenology: Heavy-handed sleight-of-hand. *Phenomenology and the Cognitive Sciences* 6 (1–2):45–55. doi:10.1007/s11097-006-9042-y.
- Lewis, C. I. 1929. *Mind and the world order: An outline of a theory of knowledge*. New York, NY: Charles Scribner's Sons. Reprinted in paperback by Dover Publications, Inc. New York, 1956.
- Singh, M., and M. Narang. 2014. Cognitive enhancement techniques. *International Journal of Information Technology & Knowledge Management* 7 (2):98–107.
- Wacker, J. G. 2004. A theory of formal conceptual definitions: Developing theory-building measurement instruments. *Journal of Operations Management* 22 (6): 629–650. doi:10.1016/j.jom.2004.08.002.

AJOB NEUROSCIENCE  
2020, VOL. 11, NO. 4, 263–265  
<https://doi.org/10.1080/21507740.2020.1830871>



## OPEN PEER COMMENTARIES



## Cognitive Enhancement: Toward a Rational Public Consensus

Eman Ahmed<sup>a,b</sup> and Kristien Hens<sup>a,c</sup>

<sup>a</sup>University of Antwerp; <sup>b</sup>Suez Canal University; <sup>c</sup>KU Leuven

In their article “Public Opinion on Cognitive Enhancement Varies Across Different Situations,” Dinh et al. (2020) gave credence to the hypothesis that opinions about cognitive enhancement (CE) use are malleable. The authors pointed out that their respondents regarded CE use as more admissible the more authority figures endorsed its use. Moreover, they postulated that public opinions are guided by the beliefs and actions of the people in their surrounding environment.

Dinh and colleagues acknowledged in their conclusion that public authorities and members of society at large should be aware of their responsibility for shaping the discourse on current and future CE use. Furthermore, the authors emphasized that their respondents were more vigilant about their own behavior than about others' behavior regarding CE

use. This suggests that broadening public debates can unveil hidden concerns and encourage the public to speak out their unease about CE. We thus propose that open dialogue and deliberation are the pillars for reaching a rational public consensus on CE use. We argue that qualitative research has an important role to play here. We will follow by outlining the approaches that could be adopted by the public authorities to enrich the public opinion on the ethics of CE.

### OPEN DIALOGUE AND DELIBERATION ON CE USE THROUGH QUALITATIVE RESEARCH

Public engagement through open dialogue and deliberation over scientific and medical advancements is a key ethical requirement. It is important to engage the