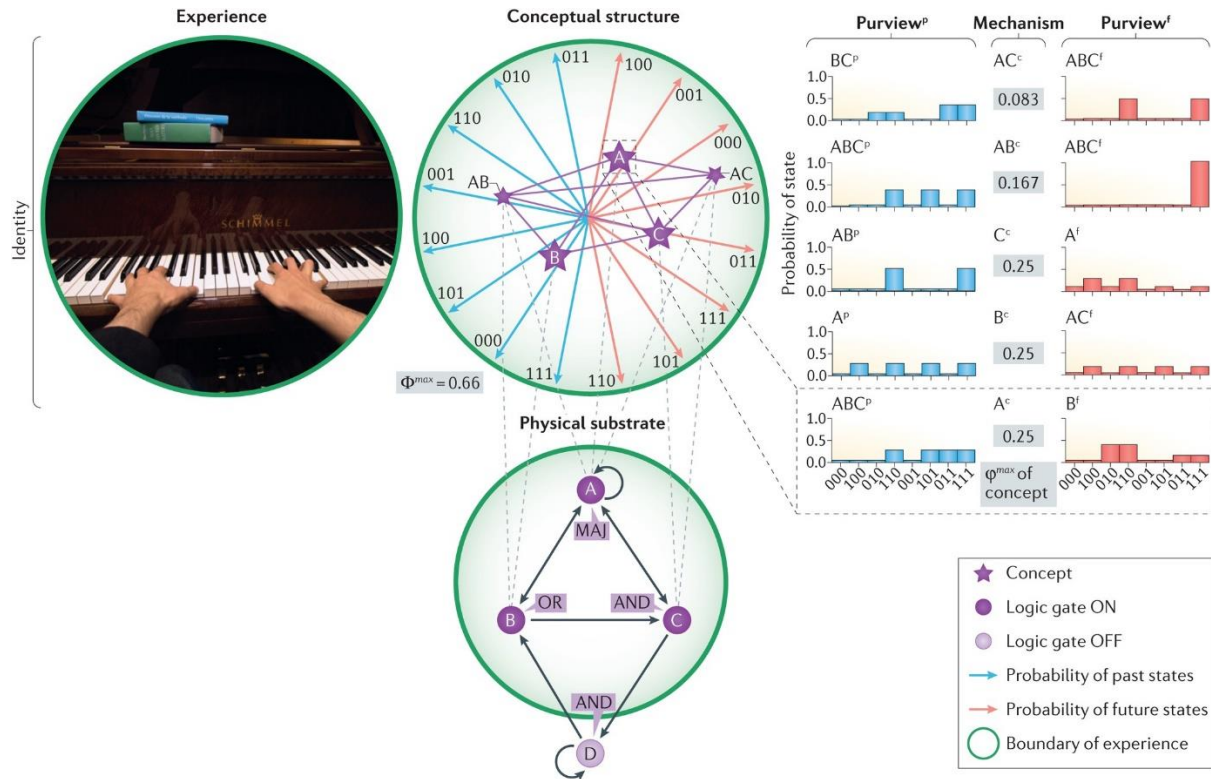


The Psychocentric Predicament, The Impossibility of Any and Every Hard Science of Consciousness, and Soft Sciences of the Mind

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“The Integrated Information Theory of Consciousness” (Tononi et al., 2016)

1. Introduction

In an essay called “The Circularity of Human Rationality” (Hanna, 2023a), I pointed out the profoundly significant fact that any and every attempt to *explain* or *justify* human rationality—and also, equally significantly, any and every attempt to *criticize* or *debunk* human rationality—must already *presuppose* and *use* our manifestly real innate capacity for human rationality. For all explanation and justification—and also all critical arguments and debunking arguments—are, by their very nature, human rational activities. So human rationality is inherently circular. For convenience, let’s call this *the*

ratio-centric predicament.¹ In that essay, I also argued that the ratio-centric predicament expresses a logico-philosophically *good* or *virtuous* circularity, not a logico-philosophically *bad* or *vicious* circularity. Now, an extremely important implication of the ratio-centric predicament is that what holds for our innate capacity for human rationality as such, *also* holds for each and every innate *sub*-capacity of human rationality—for example, consciousness. That such a sub-capacity actually exists, follows directly and self-evidently from the fact that you, the reader of this very sentence, are now consciously reading this very sentence (Hanna, 2023b). Therefore, any and every attempt to explain consciousness or justify a theory of consciousness, must already presuppose and use our manifestly real innate capacity for consciousness. Again for convenience, let’s call this *the psychocentric predicament*. In this essay, I want to deploy the psychocentric predicament as a critical weapon against *any and every hard science of consciousness*—by which I mean any and every science of consciousness that’s either *materialist* or *physicalist*, or *naturally mechanistic*, or in any other way reductive: for example, any *computational* or *informational* theory of consciousness. Correspondingly, it’s important to recognize from the outset that my critical argument, if sound, also fully leaves open the real possibility of a *soft science* of consciousness—by which I mean any science of consciousness that’s *neither* materialist nor physicalist, *nor* naturally mechanistic, *nor* in any other way reductive, for example, computational or informational (see, e.g., Hanna and Maiese, 2009; Hanna, 2011, 2022a).

2. Cognitive Neuroscience and Pseudoscience

On 17 September 2023, a large group of high-status hardnosed professional academic cognitive neuroscientists published an open letter not only criticizing but also decrying The Integrated Information Theory of Consciousness (aka IIT), even going so far as to call it “pseudoscience” (PsyArXiv, 2023). And for hardnosed scientists, *them’s fightin’ words*. Without naming any names, here’s the basic content of the letter:

The media, including news articles in both *Nature* and *Science*, have recently celebrated the Integrated Information Theory (IIT) as a “leading” and empirically tested theory of consciousness. We are writing as researchers with some relevant expertise to express our concerns.

¹ The ratio-centric predicament is a generalization of the classical hard problem in philosophical logic known as *the logocentric predicament*, formulated in 1926 by Harry Sheffer:

[i]n order to give an account of logic, we must presuppose and employ logic. (Sheffer, 1926: p. 228)

See also (Hanna, 2006: ch. 3).

The media coverage sprang from a public event where the authors of a large-scale adversarial collaboration shared their findings, which were reported as empirically testing and partially supporting. This message was communicated directly to journalists and the general public prior to the preprint being available, and hence, prior to peer-review. The experiments seem very skillfully executed by a large group of trainees across different labs. However, by design the studies only tested some idiosyncratic predictions made by certain theorists, which are not really logically related to the core ideas of IIT, as one of the authors himself also acknowledges. The findings therefore do not support the claims that the theory itself was actually meaningfully tested, or that it holds a “dominant,” “well-established,” or “leading” status. This important nuance was unfortunately lost in the media coverage. These claims of dominance have also been questioned in the scientific community, yet they have been repeatedly broadcast to the public by proponents of IIT over the years.

IIT is an ambitious theory, but some scientists have labeled it as pseudoscience. According to IIT, an inactive grid of connected logic gates that are not performing any useful computation can be conscious—possibly even more so than humans; organoids created out of petri-dishes, as well as human fetuses at very early stages of development, are likely conscious according to the theory; on some interpretations, even plants may be conscious. These claims have been widely considered untestable, unscientific, “magicalist,” or a “departure from science as we know it.” Given its panpsychist commitments, until the theory as a whole—not just some hand-picked auxiliary components trivially shared by many others or already known to be true—is empirically testable, we feel that the pseudoscience label should indeed apply. Regrettably, given the recent events and heightened public interest, it has become especially necessary to rectify this matter. If IIT is either proven or perceived by the public as such, it will not only have a direct impact on clinical practice concerning coma patients, but also a wide array of ethical issues ranging from current debates on AI sentience and its regulation, to stem cell research, animal and organoid testing, and abortion. Our consensus is not that IIT and its variants decidedly lack intellectual merit. But with so much at stake, it is essential to provide a fair and truthful perspective on the status of the theory. As researchers, we have a duty to protect the public from scientific misinformation.

Therefore, we hope to make clear that despite its significant media attention, IIT requires meaningful empirical tests before being heralded as a “leading” or “well-established” theory. Its idiosyncratic claims and potentially far-reaching ethical implications necessitate a measured representation. (PsyArXiv, 2023: pp. 1-2)

To be sure, this highly polemical open letter is interesting from the standpoints of not only (i) *the metaphysics of mind*, especially as focused on the mind-body relation and mental causation (see, e.g., Hanna and Maiese, 2009), but also (ii) *the political philosophy of mind* (see, e.g., Maiese and Hanna, 2019), especially as focused on the social-institutional profile and structure of contemporary professional academic cognitive neuroscience.

Moreover and most importantly, however, the letter is also unintentionally absurd and therefore amusingly ironic, because, if I'm correct, *then there simply cannot be a hard science of consciousness, not even in principle*. If that's right, then for *any* large group of high-status hardnosed contemporary professional academic cognitive neuroscientists to gang up on a much smaller group of some *other* high-status hardnosed contemporary neuroscientists and call *those people's* hard science of consciousness—for example, IIT—"pseudoscience," is just like *any* large and aggressive tribe of hardnosed pseudo-mathematicians living on some as-yet-undiscovered tropical island, all of whom share a magical core belief that $1=0$, ganging up on a much smaller group of some *other* hardnosed pseudo-mathematicians, one of whose magical core beliefs is also that $1=0$, and then calling *those people's* theory of arithmetic "pseudo-mathematics." Or to riff on a highly relevant text from the King James version of the Bible (Matthew, 7:3): "Thou hypocrites, first cast out the *beam* out of thine own pseudoscientific eyes; and then shalt thou see clearly to cast out *the mote* out of thy brother's pseudoscientific eye."

3. On The Impossibility of Any and Every Hard Science of Consciousness

In this section, I'll present a seven-step argument for the impossibility of any and every hard science of consciousness—that is, for the impossibility of any and every materialist or physicalist, naturally mechanistic, or otherwise reductive (e.g., computational or informational) science of consciousness.

Step 1. By *consciousness*, I mean *subjective experience*, which is to say that consciousness inherently involves (i) a first-person or self that's (ii) egocentrically-centered in orientable space and unidirectional time, (iii) relatively unified, and (iv) immanently reflexive or immediately aware of itself without further ado and without implicitly or explicitly forming judgments or propositional thoughts about itself (= *subjectivity*, aka "consciousness-in"), and also that (v) this self spontaneously and freely enacts or engages in mental acts, states, or processes of various kinds that also inherently possess not only (vi) some or another qualitative specific character, which tells us "what it's like," but also (vii) some or another semantic content, which tells us "what it's about" (= *experience*, aka "consciousness-of").

Furthermore consciousness has two basic modes: (i) *pre-reflective or non-self-conscious consciousness*, which, in being naturally directed towards cognitive or intentional targets *other than itself*, is *immanently reflexive*, without either implicitly or explicitly forming judgments or propositional thoughts about itself, and (ii) *reflective consciousness*, or *self-consciousness*, which, in being naturally directed towards, or about, *itself AS* a cognitive or intentional target, is *aware of itself allocentrically and objectively*, by

implicitly or explicitly forming judgments or propositional thoughts about itself. More simply put, pre-reflective or non-self-consciousness consciousness is *just being* a conscious mind that's directed towards other things; whereas reflective or self-consciousness is *thinking about itself AS* a conscious mind that's *ALSO* directed towards other things. For example, as you read the just-previous sentence, you were *pre-reflectively* or *non-self-consciously* consciously reading that very sentence, whereas, as you read these very words, you're now *reflectively* or *self-consciously* conscious of reading this very sentence.

Step 2. By *universal materialism* or *physicalism*, I mean the doctrine that everything in the world is grounded on contingent, fundamentally physical facts and either *logically strongly supervenient* on those facts (= reductive materialism) or *naturally* or *nomologically strongly supervenient* on those facts (= non-reductive materialism).

Strong supervenience (Kim, 1993: esp. part 1; Horgan, 1993; Chalmers, 1996: chs. 1-3) is a necessary determination-relation between sets of properties or states of different ontological "levels," a relation that is weaker than strict property/state-identity, and is usually taken to be asymmetric, although two-way or bilateral supervenience is also possible. But assuming for the purposes of simpler exposition that strong supervenience is asymmetric, then, more precisely, *B*-properties/states (= the higher level properties/states) strongly supervene on *A*-properties/states (= the lower-level properties/states) if and only if (i) for any property/state *F* among the *A*-properties/states had by something *X*, *F* necessitates *X*'s also having property/state *G* among the *B*-properties/states (upwards necessitation), and (ii) there cannot be a change in any of *X*'s *B*-properties/states without a corresponding change in *X*'s *A*-properties/states (necessary co-variation). It follows from strong supervenience that any two things *X* and *Y* share all their *A*-properties/states in common only if they share all their *B*-properties/states in common (indiscriminability).

In turn, *logical* strong supervenience is a super-strong version of strong supervenience which says that the necessitation relations between the *B*-properties/states and the *A*-properties/states are *logical* and *a priori*. Or more simply put: The *B*-properties/states are "nothing more than" and "nothing over and above" the *A*-properties/states. If logical strong supervenience holds, then if there were such a being as an all-powerful and all-knowing creator God, and if They were to create and/or know all the *A*-properties/states, then They would have nothing more to do in order to create and/or know all the *B*-properties/states. By contrast to logical strong supervenience, *natural* or *nomological* strong supervenience is a modally weaker notion which says that the necessitation relations between the *B*-properties/states and the *A*-properties/states are

determined by laws of nature, and hold in all and only the worlds in which those natural laws obtain.

As a specification of universal materialism or physicalism, *materialism or physicalism about the mind-body relation and mental causation* says that all facts (i.e., instantiated properties or states) about the human mind are constitutively determined by contingent, fundamentally physical facts. But there are three interestingly different types of materialism or physicalism: (i) *reductive* materialism or physicalism, (ii) *eliminative* materialism or physicalism, and (iii) *non-reductive* materialism or physicalism. Reductive materialism or physicalism—a prime example of which is the mind-brain identity theory so famously criticized by Kripke in *Naming and Necessity* (Kripke, 1972/1980: pp. 144-155)—says that all facts about the human mind are wholly constitutively determined by contingent, fundamentally physical facts, i.e., all mental facts are logically strongly supervenient on contingent, fundamentally physical facts. That is: the human mind is really *nothing over and above* the contingent, fundamentally physical world. Eliminative materialism or physicalism, by contrast, says that, given the truth of reductive materialism, minds are really *nothing at all*: our belief in the existence of minds is a mere illusory folk belief and a conceptual myth. Non-reductive materialism or physicalism, by another contrast, says that some but not all facts about the human mind are wholly constitutively determined by fundamentally physical properties or facts, nevertheless, at the very least, all mental facts are naturally or nomologically strongly supervenient on contingent, fundamentally physical facts. That is: certain causally inert or epiphenomenal facts about the human mind—for example, facts about the normative character of rational human intentionality, or about the qualitative specific character of consciousness—vary independently of contingent, fundamentally physical facts, even though all of the human mind’s causally efficacious properties or facts are still wholly constitutively determined by fundamentally physical facts.²

Step 3. By the thesis of *universal natural mechanism*, I mean the doctrine which says (i) that everything in the world either just is or is a sub-part of natural or physical processes that are either deterministic, indeterministic, or some mixture of both (say, macroscopically deterministic but microscopically indeterministic at the quantum level), and (ii) that all the causal and quantitative characteristics of those happenings are not only (ii.a) strictly fixed by the general causal laws of nature and/or the mathematical laws of probability, especially those laws governing the conservation of quantities of matter or energy, together with all the settled facts about the past, especially including The Big

² For canonical discussions of the varieties of materialism or physicalism about the mind-body relation and mental causation, see (Kim, 2005, 2006).

Bang, but also (ii.b) calculable from those laws and facts on a Turing machine, i.e. a digital computer (see, e.g., Boolos and Jeffrey, 1989).

In turn, the thesis of universal natural mechanism properly belongs to a larger conception I call *the mechanistic worldview*, which says that

everything in the world is fundamentally either a formal automaton or a natural automaton, operating strictly according to Turing-computable algorithms and/or time-reversible or time-symmetric deterministic or indeterministic laws of nature, especially the Conservation Laws (including the First Law of Thermodynamics) and the Second Law of Thermodynamics, which also imposes always-increasing entropy—i.e., the always-increasing unavailability of any system’s thermal energy for conversion into causal (aka “mechanical”) action or work—on all natural mechanisms, until a total equilibrium state of the natural universe is finally reached (see also Hanna and Paans, 2020).

Step 4. *Neither materialism or physicalism, whether reductive or non-reductive, nor the mechanistic worldview, can explain or justify logic, mathematics, or even natural science itself, because materialism or physicalism says that everything is ultimately grounded on contingent, fundamentally physical facts known only a posteriori, and also because the mechanistic worldview says that everything in the world works according to Turing-computable algorithms, whereas logic, mathematics, and even natural science all include not only (i) many irreducibly necessary facts known only a priori about truth, falsity, logical connectives, logical operations, logical consistency and inconsistency, logical validity, logical soundness, logical proofs, numbers, other mathematical objects, mathematical operations, mathematical laws, mathematical proofs, the non-mechanical causal powers and operations of living organisms, and the non-mechanistic laws of nature that govern those causal powers and operations (Hanna, 2015, 2022b), but also (ii) many irreducibly uncomputable functions applying to truth, falsity, logical connectives, logical operations, logical consistency and inconsistency, logical validity, logical soundness, logical proofs, numbers, other mathematical objects, mathematical operations, mathematical laws, mathematical proofs, the non-mechanical causal powers and operations of living organisms, and the non-mechanistic laws of nature that govern those causal powers and operations (Torday, Miller Jr, and Hanna, 2020; Hanna, 2023c).*

Step 5. *Any attempt to explain the nature of consciousness or justify a theory of consciousness must presuppose and use our manifestly real non-materialistic or non-physicalistic, non-mechanical, and more specifically uncomputable innate capacity for human rationality (Hanna, 2023a), which in turn necessarily includes our manifestly real non-materialistic or non-physicalistic, non-mechanical, and more specifically uncomputable innate*

sub-capacity for consciousness-of not only (i) all irreducibly necessary facts known only a priori about truth, falsity, logical connectives, logical operations, logical consistency and inconsistency, logical validity, logical soundness, numbers, other mathematical objects, mathematical operations, mathematical laws, mathematical proofs, the causal powers and operations of living organisms, and the laws of nature that govern those causal powers and operations (Hanna, 2015, 2022b), but also (ii) many irreducibly uncomputable functions applying to truth, falsity, logical connectives, logical operations, logical consistency and inconsistency, logical validity, logical soundness, logical proofs, numbers, other mathematical objects, mathematical operations, mathematical laws, mathematical proofs, the causal powers and operations of living organisms, and the laws of nature that govern those causal powers and operations (Torday, Miller Jr, and Hanna, 2020; Hanna, 2023c). For example, insofar as you read and understand logic texts, mathematics texts, physics texts, biology texts, chemistry texts, and so-on through all the formal and natural sciences, or philosophy texts—including this very one—then you *consciously* read and understand them.

Above all, in order to be able to write any legible text in *cognitive neuroscience*, we must already presuppose and use our manifestly real non-materialistic or non-physicalistic, non-mechanical, and more specifically uncomputable innate capacity *to read and understand that text consciously* (Hanna, 2023b).

Step 6. Therefore, any and every attempt to explain consciousness or justify a theory of consciousness must already presuppose and use our manifestly real non-materialistic or non-physicalistic, non-mechanical, and more specifically uncomputable innate capacity for consciousness. Or in other words: *the psychocentric predicament*.

Step 7. Given the psychocentric predicament, any and every materialist or physicalist, naturally mechanistic, or otherwise reductive (e.g., computational or informational) science of consciousness whatsoever must already presuppose and use *that which is the exact denial of what it's attempting to prove*, and therefore any and every such science is self-refuting. Or in other words: any and every hard science of consciousness is impossible.

QED

4. Conclusion

This brings me to my (admittedly and indeed intentionally edgy) conclusion. Since, by virtue of the psychocentric predicament, any and every hard science of consciousness is impossible, but at the same time, as per section 2 above, contemporary professional

academic cognitive neuroscience is dogmatically and uncritically committed to, and indeed predicated upon, the very idea of a hard science of consciousness, then it follows that contemporary professional academic cognitive neuroscience is in fact a pseudoscientific enterprise *par excellence*.

By a diametric contrast, a *soft* science of consciousness can fully accept, accommodate, and indeed affirm the psychocentric predicament, by directly incorporating our manifestly real non-materialistic or non-physicalistic, non-mechanical, and more specifically uncomputable innate capacity for consciousness *as a primitive datum for the theory* (see, e.g., Hanna and Maiese, 2009; Hanna, 2011, 2022a).

Therefore, in order for contemporary professional academic cognitive neuroscience to become authentically scientific and progress beyond its present sorry state of being, in effect, *nothing but a large and aggressive tribe of high-status hardnosed pseudoscientists*, then it must accept, accommodate, and affirm the psychocentric predicament, give up the very idea of a hard science of consciousness, and resolutely face the soft scientific music.

5. Postscript: On Soft Sciences of the Mind

Of course, that conclusion leaves several important questions unanswered. What, more precisely, *is* a soft science of the mind; in particular, what would be the role of *reformed cognitive neuroscience* in such a science; and which *contemporary approaches to the philosophy of mind*, if any, could adequately support soft sciences of the mind? Here are some preliminary answers to those important questions.

By definition, a soft science of the mind is any science of the mind that's *neither* materialist nor physicalist, *nor* naturally mechanistic, *nor* in any other way reductive. But more specifically, a soft science of the mind is the holistic result of systematically triangulating (i) evidence from empirical psychology, including evidence from cognitive neuroscience, along with evidence from other formal or natural sciences, (ii) phenomenological evidence (Hanna, 2013, 2020), and (iii) classical philosophical evidence, including the results of conceptual analysis, rational intuition, and transcendental argument: analytic a priori truths and knowledge, and synthetic a priori truths and knowledge (Hanna, 2015: esp. chs. 4-8). Let's call this *the triangulation method* (Hanna and Maiese, 2009: pp. 26-27). Most specifically, then, something X is a soft science of the mind if and only if

1. X is a science, i.e., an organized body of knowledge aimed at a posteriori and/or a priori truth, and constrained and guided by basic logical and mathematical principles, that also generates testable empirical or non-empirical predictions,
2. X fully accepts, accommodates, and affirms the psychocentric predicament,
3. X fully accepts, accommodates, and affirms the ratiocentric predicament, and
4. X fully accepts, accommodates, and affirms the triangulation method.

In this way, by virtue of the psychocentric predicament and the ratiocentric predicament, every soft science of the mind must directly incorporate phenomenological evidence about our innate mental capacities as *primitive data* for that science, along with primitive data from empirical science and from classical philosophical investigation. Therefore, any account of psychological causal mechanisms, operations, or structures that's provided by cognitive neuroscience for that soft science of the mind, will also have to be fully consistent and coherent with the primitive data provided by phenomenology and by classical philosophical investigation, and thus, by virtue of the triangulation method, it will also have to play an inherently *collaborative* role in that soft science of the mind. And so it would be for the soft science of consciousness in particular.

Since soft sciences of the mind are by definition, neither materialist or physicalist, nor naturally mechanistic, nor in any other way reductive, then it follows immediately that no philosophy of mind that's either materialist or physicalist, naturally mechanistic, or in any other way reductive, could adequately support a soft science of the mind. Having screened out materialist or physicalist theories, naturally mechanistic theories, and any other reductive theories, then that leaves only some *dualist* theories, some *panpsychist* theories, some *idealist* theories, and the theory I favor, *the essential embodiment theory*, which says (i) that physically irreducible minds like ours are necessarily and completely embodied, (ii) that physically irreducible minds like ours are complex dynamic global structures of our living organismic bodies, i.e., forms of life, (iii) that physically irreducible minds like ours are therefore inherently alive, (iv) that physically irreducible minds like ours are therefore also inherently causally efficacious, just like all forms of organismic life, and (v) that physically irreducible minds like ours emerge over time and in space in all and only certain kinds of living organisms. Elsewhere, I've criticized dualism, panpsychism, and idealism, and I've also presented and defended the essential embodiment theory in detail and at length (Hanna and Maiese, 2009; Hanna, 2011, 2013, 2022a). So my working proposal is that *only* the essential embodiment theory can adequately support soft sciences of the mind.

Supposing that this working proposal is correct, then the next step forward towards the development of a set of true soft sciences of the mind, including of course a true soft science of consciousness, would be to bring about a collaboration between the essential embodiment theory and empirical psychology, especially including reformed cognitive neuroscience. But what are the real-world prospects for this? Although I'm hopeful, frankly, I'm far from optimistic. For, again as per section 2 above, I think it's likely that the large and aggressive tribe of high-status hardnosed contemporary professional academic cognitive neuroscientists will be fairly unhappy about playing *only* an inherently collaborative role in the creation and development of soft sciences of the mind, and also about *not* being permitted to go on pretending to be Masters of the Mental Universe. If so, then *cry us a river*: they need to wake up and smell the coffee.³

³ I'm grateful to Elma Berisha for drawing my attention to (PsyArXiv, 2023), thereby inspiring me to write this essay, and also to Scott Hefler for raising the important leftover questions discussed in the Postscript.

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