

Neuroscience and Metaphysics

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In “Imaging or Imagining? A Neuroethics Challenge Informed by Genetics,” Judy Illes and Eric Racine (see this issue) argue that “traditional bioethics analysis” (TBA), as developed in the field of genethics, is insufficient to deal with moral and metaphysical challenges endemic to recent developments in neuroscience. They claim that “the link between the brain and the self is far more direct than the link between genes and personal identity. . . . [Neuroscience] will fundamentally alter the dynamic between personal identity, responsibility, and free will in ways that genetics never has. Indeed, neurotechnologies as a whole are challenging to our sense of personhood . . .” (2005, 10). There are at least two different readings of these claims:

KIND: Neuroscience and neurotechnologies have moral and metaphysical implications that differ in *kind* from implications of previous sciences and technologies, especially genetics.

DEGREE: Neuroscience and neurotechnologies have moral and metaphysical implications that differ in *degree* from implications of previous sciences and technologies, especially genetics.

Presumably, Illes and Racine think that KIND is the correct thesis; they write that “while the ethics of genetics [i.e., TBA] provides a legitimate starting point—even a backbone—for tacking ethical issues in neuroimaging, they do not suffice” (Illes and Racine 2005, 1). However, they could conceivably reject KIND, but accept DEGREE; this weaker, and more plausible, claim could still be used to undermine the adequacy of TBA. In this commentary, we want to challenge the metaphysical implications of neurosciences and neurotechnologies postulated by Illes and Racine. In particular, we will argue that the neurosciences and neurotechnologies are unlikely to have *any* metaphysical implications, much less implications robust enough to provide support for KIND, or even DEGREE.

Illes and Racine are guilty of overstating the case for KIND for two reasons, and both of these reasons stem from their dubious metaphysical assumptions. The first assumption attaches to Illes and Racine’s discussion of the perils of *interpretation* of neuroimaging data:

New to neuroethics will be the need to tackle responsibly—with the *inevitable* and *omnipresent* working hypothesis (or the “astonishing hypothesis” to quote Crick 1995)—that the mind *is* the brain. (Illes and Racine 2005, 9 emphasis added)

The assumption at issue here is the assumption that the mind literally *is* the brain (i.e., is numerically identical to the brain). If this is correct, then one might think that viewing states of the *brain* via neuroimaging technology is tantamount to viewing states of the *mind*. If true, this would ground a disanalogy with other ethical disciplines, such as genethics, since information regarding another person’s genome bears no necessary relationship to his or her particular mental states. However, the assumption that the mind is identical to the brain is metaphysically problematic. We shall note two difficulties.

First, many philosophers believe that mental states such as belief, desire, intention, and so forth—so-called propositional attitudes—are *multiply realizable* (see, for example, Putnam 1975). If this view is correct, then no *particular* physical state is identifiable as a necessary condition for a particular belief, desire, or intention. Alternatively, some philosophers do hold that every particular mental state is indeed identical to a particular physical state (see, for example, Davidson 1980). However, these arguments often hold that physical states are mental states in virtue of the *functional* role played by the state (i.e., the relationship the state bears to perceptual inputs, behavioral outputs, and other mental states). In humans, brain states would presumably be the realizers of such roles. At first glance, this view might seem congenial to the claims of Illes and Racine, but the problem is that such a theory of mind gives no support to the *practical* possibility of directly identifying mental states using neuroimaging. Even if brain states realize such roles, the particular mental state the brain state realizes (and perhaps the content of such a state) will depend upon the brain state’s relations to numerous other entities. This *relational* information is certainly not contained in neuroimaging data.

Furthermore, some philosophers have argued that being in a particular physical state is not even a *sufficient* condition for being holding a certain propositional attitude (see, for example, Putnam 1975 and Burge 1979). So-called “externalists” believe that factors external to an agent are essential to determining the content of many of the agent’s propositional attitudes. According to these claims, the full nature of an agent’s propositional attitudes would be *underdetermined* by information insufficiently informed by external environmental factors—neuroimaging data would certainly lack these inputs.

The second assumption we shall question concerns the relationship between neuroimaging and personal identity.

Illes and Racine state that neurotechnology in general, and presumably neuroimaging in particular, will have important implications for personal identity, especially diachronic identity claims. They write:

[Neurotechnology] will fundamentally alter the dynamic between personal identity, responsibility, and free will ways that genetics never has. Indeed, neurotechnologies as a whole are challenging our sense of personhood and providing new tools for society for judging it. (Illes and Racine 2005, 10)

For these claims to be true, it would have to be the case that various neurotechnologies (including their generated data) were metaphysically informative. If this were true, we might have a disanalogy with genetics and an argument for KIND.

However, it is highly unlikely that neurotechnologies will be metaphysically informative. Theories of personal identity can typically be divided into one of two camps: those that hold that persistence across time is predicated upon various psychological continuities and those that hold that persistence across time is predicated upon biological continuities. Consider a variation of John Locke's classic example: imagine that the cerebrum of a prince is transplanted to the body of a cobbler while the cerebrum of the cobbler is transplanted to the body of the prince (Locke 1694/1994, 241–256). Who is the prince? Perhaps the prince now resides in the body of the cobbler: given a psychological account of personal identity, the identity of the prince is tied, at least in the case of humans, to this part of the brain. Alternatively, perhaps the prince has not moved at all: just as identity would persist given the amputation of, let's say, an arm, it could persist given the loss of his cerebrum since the organism itself remains.

Allegiances to either of these solutions to persistence criteria still divide contemporary debates over personal identity (see, for example, Parfit 1984 and Olson 1997). If we think that biological continuity offers the right theory of personal identity, then neuroscience will be *completely* irrelevant to this metaphysical debate. For this camp, our mental states and the respective contents of such states are simply irrelevant to issues of personal identity.

Alternatively, Illes and Racine might be presupposing some psychological account of personal identity (for which, of course, they would have to argue). But even if this were true, it is hard to see how such a thesis would provide support for KIND. A standard psychological account of personal identity would hold that A is identical to B if and only if A at t_1 stands in a certain psychological relationship to B at t_2 . While people disagree as to what psychological relationship must obtain for diachronic identity, a standard neo-Lockean suggestion would hold that B at t_2 must remember

at least one event experienced by A at t_1 .¹ While *confirming* claims of diachronic identity would, we might imagine, be possible, *disconfirming* such claims would be virtually impossible. The reason is that disconfirmation would require us to canvas *all* the memories of B at t_2 , to compare them to all the memories of A at t_1 , and to determine whether psychological connectedness attained.² This would be pragmatically impossible.

It is even debatable whether neuroimaging could confirm psychological connectedness since it could at best identify neural activity associated with the cognitive process of remembering, not the *contents* of the memories themselves. So how could neuroimaging show whether two people in fact had memories with the same contents? We could try to show them pictures which represented the content of some memory and see whether the "memory recollection center" of the brain was activated. But now problems of underdetermination would be profound as would could not tell, for example, whether the stimulus (e.g., a red car with a certain license plate) triggered the *same* memory or not (e.g., A might have owned the car and B might have seen it, thus both would "remember" it, but the context of the memories would be different). Obviously we would try to control for alternative interpretations of similar stimuli, but the pragmatics would be onerous to say the least. Ultimately, then, we think it is probably impossible for neuroimaging to disconfirm diachronic identity claims, and highly unlikely for it to confirm them.

In these comments, we have raised skepticism about the metaphysical implications that might reasonably be thought to follow from neuroscience and neurotechnologies. More generally, the thesis that the sciences should have limited metaphysical impact should not be surprising. Many metaphysical debates, such as the relationship between universals and particulars, the existence of deities, the nature of moral facts, and so on, are simply not privy to

1. Alternatively, to avoid Reid-like criticisms, we might say that A at t_1 is B at t_2 if and only if A and B are psychologically connected in the sense that B at t_2 can either remember an event experienced by A at t_1 , or can be linked to A at t_1 by a chain of such memories; see (Reid 2002). For ease of exposition, we are ignoring circularity problems that arise for such memory-based accounts; (see Perry 1975).

2. The problems actually get worse for more sophisticated accounts that would have been formulated in response to Reid's objections. The reason for the further complication is that now the neuroscientist would have to not only show that B at t_2 did not share a memory with A at t_1 , but that there were no intermediary points between t_1 and t_2 at which some other person, C, could be connected to A at t_1 and B at t_2 . And now we could get Zeno-like paradoxes because C might not be linked to A, but through some intermediary D, and D might only link to A through E, and so on. So, pragmatically, the neuroscientist could never show that A and B were psychologically disconnected.

scientific resolution. This perhaps says more about metaphysics than it does about science, but the point stands. Even the metaphysical debate most congenial to scientific aid, the debate between free will and determinism, has not crumbled in the face of science (despite appeals to chaos theory, quantum indeterminacy, etc.). The resistance of metaphysical resolution to scientific results is often that the physics (or, by extension, the chemistry and the biology) *underdetermines* the metaphysics. In other words, multiple (if not always all) metaphysical positions are compatible with most conceivable scientific results. Neuroscience and neurotechnologies certainly have thrilling ethical implications, though we have tried to argue that metaphysical debates over personal identity and personhood will not succumb to these new sciences and technologies. ■

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Neuro Exceptionalism?

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Claims that unprecedented advances in biomedical science necessitate a discipline wholly dedicated to grappling with attendant legal and ethical concerns may sound familiar to those who witnessed the arc of 'genethics' over the past two decades. As science and the media fueled the public's fascination with potential gene therapies and strides in human self-understanding, fears of how genetic technologies might be misused brought an influx of funding for 'genethics' research that set the agenda for an important segment of the bioethics community (Turner 2003) and encouraged legislation designed to privilege genetic information (Suter 2001). Much of the promise of genomic technologies has yet to be fulfilled, and in hindsight it appears that 'irrational exuberance' infiltrated bioethical discourse. Similar claims regarding emerging developments in neuroscience now present an opportunity to consider whether we have learned to move past the need for exceptionalism to invigorate new bioethics research.

Illes and Racine (2005) argue that advances in functional neuroimaging present unique problems and introduce new ethical challenges that cannot be adequately ad-

dressed in established bioethical frameworks. What are the putatively new ethical challenges unique to neuroimaging research? First, the authors suggest that as genetics research has come to the forefront of public concern, bioethicists have capably explored the gamut of possible ethical, legal, and social ramifications. In this context there are ample precedents for discussing the near-term, practical applications of neuroimaging. In the few cases where genetics and neuroimaging diverge, other models are usually evident. For example, while genetics has little application in lie-detection there is a long history of debate on the use of physiological tests to assess truth-telling (Greely 2004, 128–137). And while neuroimaging may present a technological step forward in gauging intent to deceive it is hard to see why it would necessitate an entirely new discussion of the subject. Consequently, when the authors finally turn to the "key ethical challenge" uniquely posed by neuroimaging, it is not a practical question of application, but an epistemological question that is front and center.

The authors present the "strict epistemological challenge at the core of neuroethics" as having two facets. The