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Book Review

The Mind Incarnate, by Lawrence Shapiro

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Lawrence Shapiro begins his book *The Mind Incarnate* by lamenting the fact that Ryle's 'ghost in the machine' has survived the naturalist transformation that has occurred in the philosophy of mind. Despite the general abandonment of traditional Cartesian dualism, philosophers of mind continue to investigate properties of the mind and the mental without regard to the physical realization of those properties in the brain. According to Shapiro, the ghost conception of the mind survives the death of dualism *via* the multiple realizability thesis (MRT) and the separability thesis (ST). The MRT is the claim that the various cognitive capacities of the human mind might be realized in any number of physical kinds of brains. The ST is not a synchronic claim about realizability but a claim about the diachronic relation that exists between the mind and the body. Specifically, it's the claim that the mind or the brain that realizes the mind can be partitioned off (causally) from the rest of the body. As a result of this alleged causal separation, ST maintains that virtually any physiology might accommodate any brain type. In opposition to MRT and ST, Shapiro offers the mental constraint thesis (MCT) and the embodied mind thesis (EMT). The MCT maintains that because of physical and historical constraints on evolution, brains that realize the capacities of human minds are not likely to be multiply realizable. Further, the EMT claims that minds with humanlike capacities are causally related to bodies in multifarious ways and therefore largely determine the anatomy and physiology of the bodies they inhabit. Science fiction notwithstanding, any organism with the mental capacities of a human is very likely to have a humanlike brain and a humanlike body.

Strictly speaking, MCT does not logically entail EMT nor does MRT entail ST. Nevertheless it is almost certainly true that if the MCT is true ST is false and if MRT is true EMT is false. If there are many types of brains that might realize a human mind, it is unlikely that there will only be one type of human body that could accommodate those brains. Likewise, if it turns out that the constraints on how a brain that can give rise to human consciousness might evolve are so severe that we can predict significant brain structure based solely on mental function, it seems likely that similar constraints will determine the body's physiology more generally. As a result I shall follow Shapiro's lead and proceed as though the pairs of theories (MRT/ST and MCT/EMT) go together and compete with one another.

The point of departure for Shapiro is that MRT/ST is an empirical rather than logical claim. The claim is not merely the *logical* possibility of MRT/ST but rather that it is *nomonologically* possible for a mind with human capacities to be realized in any number of physical kinds of brains and

housed in many different kinds of anatomical bodies. Shapiro's empirical argument is stated in terms of likelihood. Specifically, he claims that the observation of evolutionary convergence shows it to be more likely that MCT/EMT is true rather than MRT /ST. All this requires some explanation because evolutionary convergence has been taken by Ned Block, Jerry Fodor and others to *support* MRT. Likelihood is the degree to which an observation supports a specific thesis. Thus likelihood, unlike probability, is based on the relation between a particular observation and an explanation of the observation.

Specifically, the hypothesis that provides a better explanation of the observation is more likely true. In this case, the observation is evolutionary convergence and the two competing hypothesis are MRT/ST and MCT/EMT. Evolutionary convergence occurs when two distinct species, from independent lineages, evolve a similar trait. In other words, the same trait evolves independently, multiple times. A famous example of convergence is vision. Vision has evolved independently in a number of different species. Now if one takes each instance of an independently evolved trait to be a distinct realization, the fact of convergence seems to suggest MRT/ST over MCT/EMT. However Shapiro shows this line of thinking to be a mistake. In order to explain why this is a mistake I first need to explain Shapiro's account of multiple realizability. One of the significant accomplishments of *The Mind Incarnate* is to provide a way of distinguishing significant from trivial cases of multiple realizability. According to Shapiro, a functional kind is multiply realized in a significant sense if its various realizations differ with respect to those properties that make a causal contribution to its being classified as being a member of that kind. Thus silver and gold watches are trivial whereas digital and analogue are significant cases of multiple realization of the functional kind *watch*. Whereas the former difference has nothing to do with being classified as a watch, quartz crystals and gear-spring mechanisms are significantly different ways of accomplishing the same task or achieving the same function of 'portable timepiece'. Shapiro refers to the properties that play a causal role in the realization of an object's function as R-properties.

A realization is distinct only when it differs with regard to its R-properties. Thus compound and camera eyes count as different realizations of vision, whereas camera eyes that differ merely in their molecular or chemical properties do not. It should now be clear why Shapiro thinks it is a mistake to think that each instance of an independently evolved trait is a distinct realization of that trait. Take a very simple example of evolutionary convergence: the torpedo shape of the shark and the dolphin. It is true that the torpedo shape of these animals is not the result of a common ancestor but rather the result of independent evolution in response to similar selection pressure. Nevertheless this does not count as a significant case of multiple realizability because the only difference between the realizations of the torpedo shape in the two animals is the material—cartilage in the shark and bone in the dolphin—that supports this shape. The convergence on the torpedo shape is thus better explained by the constraints on any evolutionary solution to selection pressure rather than the multiple-realizability of a particular trait. In this case it's the fact that only the torpedo shape can accommodate the hydrodynamics of quick and efficient swimming that explains why both the shark and the dolphin have independently evolved the same shape.

Shapiro shows that many cases of convergence are not, in fact, significant cases of multiple realizability but rather cases where evolutionary constraints have produced traits that are identical in terms of their R-properties. As a result, the observation of convergence in these cases shows the MCT to be a better explanation (and therefore more likely true) than the MRT. After all, it would

be surprising if different species independently evolved the same realizations of a given trait (the same R-properties) if that trait were vastly multiply realizable. On the other hand, convergence is not at all surprising if universal and historical constraints explain why traits are realized in particular ways. Shapiro further shows that even in the cases of genuine multiple realizability, it is often the case that the number of realizations is fixed (and thus can be predicted) by the physical and historical constraints of the situation. Again, vision is a prime example. The science of optics predicts that there are roughly five solutions to the problem of forming an image of light reflecting objects—exactly the number of significantly different realizations of vision found in nature.

We are now ready to turn to the case of the humanlike mind; to ask whether the human mind is multiply realizable. One thing the torpedo shape of the shark and the dolphin show is that a brain simply made of different material—say silicone—would not automatically count as a different realization. To count as a different realization, the brain would have to differ in regard to its R-properties—in this case the mechanisms whereby human cognitive capacities are realized. Thus in order to determine this, one ought to look at the different (independently evolved) realizations of the humanlike mind and determine whether they differ in regard to their R-properties. The problem with this, of course, is that we only have the one case—the human brain. Thus Shapiro suggests that we look to features of the human brain that are shared by other kinds of independently evolved brains. He then looks to see whether these convergences are better explained by MCT or MRT.

In his evaluation of whether the human mind is multiply realizable, Shapiro focuses on whether our sensory and perceptual capacities significantly determine brain structure. He focuses on these lower level mental capacities for two reasons. First, it is these capacities that are shared by other organisms. Second, not enough is known about how the brain realizes propositional attitudes such as beliefs and desires. Shapiro's strategy is to look for examples of convergence in the brains of different independently evolved organisms that realize these perceptual capacities. He then examines whether these convergences are better explained by MRT or MCT. Specifically, Shapiro examines our capacity to determine the intensity and detail of visual, tactile and auditory stimuli. He discovers that all brains capable of humanlike sensible discrimination must have very specific types of receptor fields that significantly determine brain structure. Brain structure is further determined by universal constraints that require specific topographical maps to accommodate these receptor fields. Further constraints on the relation between conductivity and diameter of cables place severe constraints on brain wiring. These constraints in turn lead to the necessary modularity of any brain that realizes humanlike perceptual capacities.

All of this strongly supports MCT over MRT. Shapiro has demonstrated how our particular perceptual capacities determine significant structural features of the brain. This allows us to predict that any organism with humanlike perceptual capacities will have a brain that is significantly similar in structure to a human brain. MRT says that mental function tells us nothing about brain structure. MCT claims the opposite. The fact that we can predict brain structure from mental function shows MCT to be a better explanation (more likely true) than MRT in regard to humanlike mental capacities.

Shapiro's argument for MRT/EMT is remarkably clear, convincing and well articulated. Still, it seems to me that at least some advocates of MRT in the context of the human mind will be left feeling cold, as though the spirit of their proposal is left untouched. My first comment may seem to be little more than a quibble, but I think it ultimately leads to an important objection to Shapiro's

main claim—his complaint about the survival of Ryle’s ghost in the philosophy of mind. In the section entitled: Conceptual Arguments for the Multiple Realizability Thesis, Shapiro suggests that MRT is the *conclusion* that has been (in his view, incorrectly) drawn from the functional state identity theory of the mind.

“Multiple realizability seems to follow quite naturally and immediately from the suggestion that mental states are Turing Machine functional states” (Shapiro; *The Mind Incarnate*, 15).

“Multiple Realizability follows as a consequence of the fact that structures that differ in physical description may play the same contributing role in systems of which they are parts.” (Shapiro; *The Mind Incarnate*, 21)

But this seems to get things the wrong way round. It’s not that multiple realizability *follows* from the suggestion that mental states are functional states (Turing machine states or not) but rather that the possibility (plausibility?) of multiple realizability of at least some mental states *motivates* the research strategy of adopting topic neutral versions of functionalism. As long as multiple realizability remains plausible, there is no reason to limit mental models (functional or otherwise) to those that parallel human brain physiology. Consider what Block and Fodor say in summary of the reasons to reject both physicalism and behaviorism and to adopt functionalism as a research strategy:

“What these arguments seem to show is that the conditions that behaviorism and physicalism seek to place upon the type identity of psychological states of organisms are, in a relevant sense, insufficiently abstract. ...Of course it is *possible* that the type-to-type correspondences, required by behaviorism and physicalism should turn out to obtain. The present point is that even if behavioral or physical states are in a one-to-one correspondence with psychological states, we have no current evidence that this is so; hence we have no warrant for adopting philosophical theories which require that it be so.” (Block and Fodor; “What Psychological States are Not” *Readings in the Philosophy of Psychology* Vol. 1, 238).

One might surmise that Shapiro has taken up this challenge. He has provided empirical evidence that suggests there are reasons for thinking MRT to be false with regard to at least some human mental capacities. As a result philosophers of mind in general and functionalists in particular would be well advised to pay close attention to the physical constraints that determine evolutionary brain development. More specifically, Shapiro seems to be suggesting what is sometimes called a functional specification version of physicalism in regard to mind. But what kind of evidence has he offered? In particular, is it the kind of evidence that should persuade someone attracted to a functional approach to psychological explanation? It seems to me that he has not.

The question of whether the direction of argument is from functionalism to MRT or from MRT to functionalism is significant. Putting it the way Shapiro does (from functionalism to MRT) mischaracterizes some of the most attractive aspects of functionalism. For example, functionalism allows us to abstract from or de-emphasize the importance of realization and focus on analyzing general, teleological capacities into conceptually simpler non-teleological capacities. Consider the commonly used example of digestion. It’s not as though people take the fact that digestion can be characterized functionally that makes people think it’s multiply realizable. Rather it is the obvious multiple realizability of this capacity that motivates people to discuss it as a teleological system

abstracted from any particular physical realization.

Shapiro tells us that by the “mind” he means something like the collection of mental capacities that constitute the distinctively human psychological profile (Lawrence Shapiro; *The Mind Incarnate*, 70-1). He specifically cites memory, attention, language use and perception. In his argument for MCT, however, Shapiro focuses exclusively on the more peripheral aspects of the mind such as perception and the types of brain states that are required to realize the specific perceptual capacities that we have as human beings. He does this because they are the only aspects of the mind about whose realization we have even the most basic understanding. Shapiro is quite explicit about this:

“I have said nothing so far about the states of the mind that have perhaps received most notice in contemporary philosophy of mind. These are the so called folk psychological states, that is, beliefs, desires and other propositional attitudes. ... If the current state of knowledge about a given mental capacity contains little or no information about how it might be realized, then it seems hardly worth discussing the possibility of its multiple realizability. To date there is simply not enough known about how propositional attitudes might be realized. Indeed, a number of prominent philosophers believe that folk psychological states attributed to a subject do not correspond in any interesting way to structures in the subject’s brain.” (Shapiro; *The Mind Incarnate*, 70)

It’s interesting to note that the prominent philosophers he cites here are Churchland, Dennett and Stich—all eliminativists about propositional attitudes.

What Shapiro says about the realization of propositional attitudes is obviously true—no one has any idea how these might be realized. In fact it seems likely that they will never be realized in the sense that the physicalist has in mind. Consider the fact that a functional specification version of physicalism will never be able to deal with Putnam’s famous twin earth examples involving narrow belief states. Another example of the implausibility of higher level mental states having straightforward realizations conditions in the brain is expressed by Arthur Collins’ master argument (Collins, *The Nature of Mental Things*). This argument appears to establish that attributed beliefs cannot be identified with any physical state of an organism. Jonathon Dancy uses Collins’ result to argue that motivating reasons cannot be states of the agent. (Dancy, *Practical Reality*, 108-12). But surely *eliminating* the ‘folk psychological’ concepts of belief and motivating reasons from the philosophy of mind isn’t the only available response. Further, its not just propositional attitudes, but much simpler cognitive states, that have realization troubles. Consider singular thought. It seems clear that we will never be able to explain the difference between general and singular thought by appeal to brain states alone. At the very least we haven’t a clue how to go about it, but we do have some good ideas once we abandon the mind-brain identity thesis. An even more obvious problem for the mind-brain identity thesis is the realization of colors and qualia.

The general point that I am trying to make is that our very limited knowledge of how mental states and capacities are physically realized in the brain makes the question of multiple realizability largely irrelevant to the vast majority of issues in contemporary philosophy of mind. Until we have some idea of how these mental capacities are realized by the brain (or even whether speaking about realization in the brain makes sense in reference to these capacities) we should not, to echo Block and Fodor, adopt only theories of the mind that speak in terms of properties of the brain. I need to be perfectly clear here. Shapiro never makes bold statements or predictions about the realization of

these sophisticated mental capacities. He never overstates his conclusion. Nevertheless, it does seem clear that that Shapiro seems ghosts in any attempt to investigate properties of the mind independently of those of the body and brain. According to these criteria, most of the work currently being done in the philosophy of mind is a paranormal adventure.

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