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A Physicalist Solution to the Skeptical Problem of Other Minds

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ABSTRACT:

The skeptical problem of other minds has a long history. The main difficulty is that attempts to overcome it have depended on an inference by analogy, which has two problems: it is a generalization from one case and it is logically impossible to check up on the conclusion. Evidence is presented of the necessary and sufficient conditions for a physicalist identity between a mental and a brain process which shows that the same mental process occurs in all subjects. This is shown by an objective third party measure of the mental process across all subjects. Thus, the other minds problem has been given one solution that does not depend on an inference by analogy.

The skeptical problem of other minds has a long and controversial history (Plantiga 1965/1966; Hyslop 1973,1976,1979, 1995; Hyslop and Jackson 1972; Malcolm 1962; Locke 1968; Pargetter 1984; Libet 2003: Avramides 2001). In a recent book, Avramides (2001) has shown that the problem goes back to Descartes, Berkeley, Hume, Reid and Mill. She argues that the main problem of other minds being an argument from analogy. Hyslop (1995, p. 41), also in a recent book, has stated the problem with analogical inference as: "There are two classical objections to the analogical inference to other minds as an inductive argument. One is that it is *logically impossible* to check up on its conclusion. The other is that it is a generalisation from one case (often poignantly referred to as a solitary instance). If the two objections are put together, then the argument will be a generalisation from one case, as a matter of logical necessity."

Hyslop (1995) has pointed out that he and Frank Jackson (Hyslop and Jackson ,1972) discussed various problems for this analogical inference to other minds. They concluded that:

The problem this paper has been concerned with is whether, given that there are some sound analogical arguments, there is any good reason for denying{ that this} analogical argument is such an analogical argument. We conclude that there is not. (Hyslop and

Jackson, 1972, p.176). They based this conclusion largely on the notion of the mental being the cause of behaviour. They go on to say :

How does one know that the cause in the sample case is the cause in unsampled cases? It is a perfectly reasonable question. But, as we have in effect already noted, it is a question that can be raised against *any* analogical argument. The fact is that we know that the cause of certain behaviour in our own case is mental. To suppose, in the absence of any plausible alternative cause, that the operative cause in the case of others is different would be to indulge in a fantastic piece of *a priori* speculation. (Hyslop and Jackson, 1972, p.175).

Hyslop (1995), in his book on the topic, agreed to the criticism of Hill (1984) that he and Jackson had made the mistake of accepting the analogical inference on the basis of similar effects to similar causes. Hyslop then went on to argue that the inference could be sustained by basing the inference on a different form of causation. He says that:

We reach other minds by inferring in our own case that our mental states are produced by (certain of) our physical (brain) states and then inferring that it will be the same with others. Similar physical (brain) states will have the same consequences. The relevant principle is benign; not like effects have like causes but like causes have like effects. In effect, this is an appeal to the Uniformity of Nature. (Hyslop, 1995, p.53).

However, while this response does appear to overcome the problem of like effects and like causes, it does imply that we can readily identify individual brain states with individual mental states. There is an enormous literature of disputes about the identity of mental phenomena with brain processes since the original proposals of Place (1956) and

Smart(1959). A limited citation of the early part of this literature is covered in a number of books reviewing the topic (Presley, 1967; Borst, 1970).

In more recent years, there has been a tendency to deny the possibility of either obtaining any form of identity and reduction of mental events to brain processes or there being any examples of such a reduction. (Warner and Szubka, 1994) There have been some major individual criticisms of all materialist or physicalist types of explanations of the mind/body problem, which are worth citing in detail. For example Nagel (1994, p.67) denies the possibility:

No correspondingly straightforward psychophysical reduction is imaginable, because it would not have the simple character of a relation between one objective level of description and another. We at present lack the conception of a complete analysis of subjective, phenomenological features of mental reality in terms of an objective, physical basis, and there is no possibility to believe that such a thing is possible.

Block and Fodor (1980, pp. 238-239) say there has been no instance:

Of course, it is possible that the type-to-type correspondences required by behaviorism or by physicalism should turn out to obtain. The present point is that even if behavioral or physical states are in one-to-one correspondence with psychological states, we have no current evidence that this is so.

Boyd (1980, p. 94) denies both the possibility and the occurrence of reduction when he says that:

It is plain that the upsurge of recent interest in materialistic theories of mind reflects growing--- though by no means conclusive---evidence favouring materialism. The evidence is not as 'direct' as some theorists seem to require: no one has identified the

particular brain mechanisms that realize a particular mental or psychological state in any higher animal.

He goes on to say that:

We are unable to imagine exactly how any arrangement of physical parts could interact so as to manifest a feeling of pain, or so as to make a decision. Indeed, we (most of us anyway) have strong intuitions (at least some of the time) that physical realization of mental phenomena is impossible. Such ‘intuitions’ are not to be dismissed lightly. (Boyd 1980, p. 94).

More recently, Madell (2003, pp.126-127) has argued correlations are not sufficient:

No reflection on the physical facts, no matter how detailed and comprehensive, can reveal why, when some putative neural state is the object of self-scrutiny, it feels as it does, or even why it should feel any way at all ----Since no description or inspection of the physical facts will explain why any neural state feels like *that*, we clearly have an ‘explanatory gap’. But the gap cannot be dismissed as something that does not count against materialism---- It is fatal to materialism ---- Most of the discussion of the so-called explanatory gap has focussed on a rather different aspect: the claimed identity between the phenomenal and the physical. A full understanding of the micro-structure of water allow one to infer that where the micro-structure is realized, the relevant surface features are also realized. But no understanding of neural states will allow one to infer that where neural state N is realized, so will phenomenal state P--- There is

no such discovery in the case of the claimed identity between neural and phenomenal state; we discover only a correlation.

Madell is talking about Levine's (1983) concept of the explanatory gap, although he does not acknowledge this source. Levine (1983) has argued that even the most detailed physiological information that does not explain why a particular quality occurs, and thus leaves an explanatory gap about identity. Thus correlations are not adequate for identity.

Strawson (1994, p. 79) has also stressed the problems of finding only correlations, instead of identities. He says:

Now there are various problems with the idea that we could produce well-confirmed exceptionless statements of correlation linking experiential predicates and non-experiential predicates----For even when it is allowed that we can produce them the essential point remains; mere correlations cannot be seen as providing any sort of explanation or understanding of the existence of experience or " what-it's-like-ness" or qualia in physical-science terms.

Given this overall situation with brain/mind identities, it would appear that Hyslop's proposal is difficult to sustain. It would appear to be very difficult to say that one brain process lines up with a specific mental process and that this occurs across all persons.

However, some recent work (Virsu and Laurinen, 1977; Webster, 2002) has shown for the first time, a one-to-one correspondence and identity between a mental and a brain process and an explanation of the identity that bridges the explanatory gap. This identity is based on necessary and sufficient conditions and is not a mere correlation. It meets Shaffer's criteria for an identity between a mental state and a brain process. Shaffer, who

does not believe in the possibility of any identity, has argued that any successful identity must meet three necessary conditions which are jointly sufficient (1970, p. 117). The two processes must be in the same place and at the same time. The third condition is that one process should be an (empirically) necessary condition for the other.

Shaffer (1970) lays great stress on this third condition. He says:

In the case of Identity Theory, the linguistic innovation consists of modifying our concept of C-states (mental states) by giving criteria for the spatial location of C-states. Only future discoveries in neurophysiology can tell us how fruitful this innovation might be. If, for example we never get beyond the point of having gross, brute correlations between C-states and B-processes (brain processes), then I can see no advantage in the claim they are identical. But suppose we can, some day, discover certain physical features which distinguish the physical processes that are identical with C-states from those which are not; suppose we can break down B-processes into structures that correspond to the internal structures of C-states: suppose that the detailed theories could be worked out for showing that, given particular neural variables, we get one C-state rather than another and we can infer new C-states from novel configurations of B-processes. If these developments occur, then, --- it would be unreasonable to hold out against identity theory; (pp. 121-122).

Shaffer (1970) and others do not believe this can happen. For example, Malcolm (1970) has argued even more strongly that we cannot even localize a mental state. He says:

I surmise that his so-called 'strict identity' (e.g. Smart (1959) is governed by the necessary condition that if x occurs in a certain place at a certain time, then y is strictly

identical with x only if y occurs in the same place at the same time. But if x is a brain process and y is a sudden thought, then this condition for strict identity is not (and cannot be) satisfied. Indeed, it does not even make sense to set up a test for it. Suppose we had determined, by some instrument, that a certain process occurred inside my skull at the exact moment I had a sudden thought about milk bottles. How do we make a further test of whether my *thought* occurred inside my skull?. For it would have to be a *further* test: it would have to be logically independent of the test for the presence of the brain process, because Smart's thesis is that the identity is *contingent*. But no one has any notion of what it would mean to test for the occurrence of the thought inside my skull *independently* of testing for a brain process. The idea of such a test is not intelligible. (p. 175).

These arguments about two of Shaffer's criteria are very strong but they do not appear to have been met so far in the literature. However, I wish to assert that the data I now report overcome these problems and allow a strict identity to be claimed.

Virsu and Laurinen (1977) carried out the research. They used the technique of reversible pressure blinding of the eye to demonstrate a mental process/neural identity. The pressure blinding was achieved in less than 30 sec by pressing the lateral canthus by a finger supported by the zygomatic bone. (see Virsu and Laurinen, 1977 and Webster, 2002 for details). There are two sources of blood supply to the eye (Brown 1968). The choroid blood supply goes to the receptors and the retinal blood supply goes to the neural elements in the eye. The pressure blinding blocks the retinal blood supply, but does not block the supply to the receptors. (Brown 1968). Permanent blocking of the retinal blood supply leads to degeneration of neural elements of the retina, largely the ganglion cells,

without effecting the receptors (Brown, 1968). Virsu and Laurinen (1977), like Craik (1940), found that pressure blinding did not effect long lasting negative afterimages (AI's) produced by intense adapting sine-wave gratings, which also produced photochemical bleaching in the receptors. However, when weaker, non-bleaching sine-wave gratings were used, then pressure blinding prevented any long lasting negative AI being produced. Thus this AI was occurring in the neural part of the retina, which has its blood supply blocked, most likely in the ganglion cells, as these degenerate and disappear when the retinal blood supply is blocked (Brown, 1968). When pressure blinding was applied after negative AI's were established to moderate gratings, then the AI was abolished, showing it was not occurring more centrally than the retina. Thus the mental process was occurring in an identifiable neural process and the necessary and sufficient conditions for this identity had been established. (Shaffer, 1970). These results meet Malcolm's arguments as the location of the neural elements is shown by anatomical methods (Brown, 1968), whereas the location of the AI's is shown by the pressure blinding and these experiments are independent of the anatomical experiments.

Virsu and Laurinen (1977) then carried out an outstandingly clever experiment that produced an even stronger identity. They knew that the neural part of the retina was non-linear for stimulus intensity. They tested for the effects of linearity on sine-wave gratings generated electronically. They showed that if linear sine-wave gratings are presented 180° out of phase and summed on a computer then this would lead to cancellation of any sine-wave gratings on the screen. If however, non-linear sine-wave gratings are presented at 180° out of phase, then cancellation does not occur and sine-wave gratings of double the spatial frequency of the initial spatial frequency appeared on the screen. This occurs

because the bright part of each sine wave lined up with the dark part of the 180° out of phase sine wave. The results clearly show that if the system was linear this would lead to a cancellation of any residual effect and if it was non-linear it would lead to sine-wave gratings of double the spatial frequency. They knew that the retinal ganglion cells were non-linear to stimulus intensity, so they were able to predict that the AI's produced by alternate moderate gratings would not cancel. Thus there would occur an AI at double the spatial frequency of the individual grating. They observed this doubling of spatial frequency to moderate stimuli, but no doubling with intense stimuli that produce linear responses in the receptors. The AI's of double the spatial frequency were also prevented from occurring by pressure blinding and were also abolished by pressure blinding after they were established, thus showing that they occurred in the same place at the same time. Shaffer's third criteria is met as the neural non-linearity must produce an AI of double the spatial frequency and thus in Shaffer's terms, the nonlinearity and the moderate strength of the grating ensured that a particular quality of the AI could not occur without their presence and the nature of the quality was determined by the neural properties. In fact, the results meet Shaffer's strongest criteria for condition three, in that the doubling of spatial frequency is new feature of AI's that was not known before these experiments. That is, the intensity structure of the neural elements led to the particular structure of the mental process. And even more importantly, Virsu and Laurinen went on to measure the spatial frequency of the AI's by a computer method and all the subjects were measured as having double the spatial frequency. Webster (2002) has replicated their results and has also shown the third person measurement of the double spatial frequency.

I have concluded from this necessary and sufficient evidence that we have examples of mind/brain identities¹ in the case of an AI to moderate gratings and especially in the case of the doubling of spatial frequency in AI's. An AI is surely an example of a mental process and they are clearly identical to the brain process as they occur in the same place at the same time and the physical conditions ensure the doubling of the spatial frequency. From the point of view of the problem of other minds, I would argue that I have established that a mental process occurs in other persons and it has been demonstrated that it occurs in all subjects tested. Even though this is only one instance, it is the first time that more than a one-to-one correspondence has been established between a mental state and a brain process, in that the brain process explains the qualitative nature of the mental state. There is no other technique in neuroscience that is as powerful as pressure blinding in establishing an identity. It lead Craik and Vernon (1941, p. 70) to describe it as a:

convenient 'tap' between the eye and the brain which can be turned on and off at will.

These features overcome the explanatory gap (Levine, 1983) in this small instance. Of course the explanatory gap remains for more complex mental phenomena, such as thoughts and intentions. It is a pity that we don't have more simple 'taps' in the brain. Thus the skeptical problem of other minds has been overcome in this instance without the necessity of attempting to use an inference by analogy.

(1): I have called this a brain process as Bailey (1981, p. 211) has pointed out that: " The retina differs from the somatic receptor structures of the skin, such as the touch corpuscles. Or even the ear, because it is not a peripheral organ but a direct

extension of the central nervous system. Embryologically, skin receptors derive from ectoderm. In contrast, the retina derives from the neuroectoderm, the part of the ectoderm that gives rise to the brain. Indeed, the structural organization and physiological diversity of the cellular components of the retina are sufficiently complex to warrant our considering the retina as a small brain. ” .

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