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Guest editorial

Mind and body: psychology and neuroscience

Simplistic solutions to the mind-body problem will ultimately fail, and I believe that a blanket materialist reductionism will not succeed. Useful solutions to some important age-old problems may ultimately require cooperation between the fields of perceptual science and neuroscience. It is likely that the combined efforts of researchers in these areas will produce results that would not have been attainable by individuals working in isolation.

The reduction of mental events to physical ones is a common answer to the mind – body problem in psychology (P M Churchland 1988; Dennett 1991). My experience has been that most psychology students (in the USA), and many of their mentors, believe that physiological methods will ultimately provide better explanations of human mental phenomenon than behavioral and cognitive sorts of interpretations. Thus, the argument is that advances in neuroscience will ultimately lead to 'real' knowledge about people. While psychological and cognitive interpretations are to be tolerated, they are certainly questionable. From this perspective, only physiology and neuroscience have the capacity to provide the ultimate explanations of human existence.

For many individuals, it is parsimonious to adopt a materialist viewpoint, and claim that mind is just an activity in the brain. For example, P S Churchland (1997, page 127) is an advocate of the reductionist approach, and argues for the "brain-based nature of the soul". She advances what many see as a form of "promissory materialism" (Popper 1977). The assumption is that as our knowledge of neurobiology makes progress, more precise biological concepts will replace 'sloppy' folk psychology and mentalist language in the broader academic community, and in everyday life. Moreover, many individuals assume that advances in neuroscience will eventually lead to the solution of problems that have proven intractable in the past.

I am extremely optimistic about the ultimate benefits of the adoption of the methodology of neuroscience. However, I am equally uncertain about how easy it will be to realize these advances.

Some researchers are skeptical about the knowledge that has been gained from the latest techniques in cognitive neuroscience. They doubt these ostensible advances from the perspective of ecological psychology or related viewpoints that emphasize the intentionality of behavior and the external world (see Koenderink 1999). Thus, Turvey has questioned recent advances in neuroscience on the grounds of the frequent change in knowledge (see Heller 2000, page 190). According to Turvey, "I can't warm up very much to neurophysiological data, it is forever changing …" The assumption here may be that the variability that we find in neurophysiological data is an indication that our present state of knowledge is in its formative stages.

According to Van Orden and Paap (1997) we should be cautious and resistant to accepting currently questionable neurophysiological data. They note that the data from positron emission tomography (PET) imaging, for example, are variable, and they question the current subtractive methods. There are additional difficulties associated with statistical averaging, methodology, and even clinical data derived from brain damage (Van Orden et al 2001).

For my part, I would certainly like to think of myself as a scientific realist. However, I subscribe to the position that the investigation of perceptual activity operates on a different, and equally valid, level from that of the immediate study of the brain.

It is necessary to understand perceptual systems at a behavioral or cognitive level, before real progress can be made in the direct investigation of brain events. For example, magnetoencephalogram recording (MEG) requires the immobilization of subjects, and their isolation from electrical and magnetic currents. In addition, subjects are asked to lie on their backs, while speaking or while feeling patterns. At the very least, it is important to clarify the effects of these postural and motor manipulations on perception, before one can understand the patterns that are generated by the MEG. Furthermore, it is necessary to understand psychological mechanisms, before one can know which sorts of problems are solvable with the use of the MEG.

Popper has provided an interesting and useful discussion of the relationship between different forms and levels of inquiry (Popper and Eccles 1977). For Popper, the problem is in understanding the relationship between different levels of analysis, from the physical, to the chemical, to the psychological, to the social. Popper's solution is to argue that the various levels interact, and that it may not be possible to completely reduce higher levels to the lower ones. On this viewpoint, the relationship between higher and lower levels is complex, and may include enrichment. He also proposed an interactive form of dualism, and argued for the existence of mind. Thus, while some cognitive processes may reduce to physical brain events, it is not clear that all will reduce.

According to Popper (1977, page 38), the solution to the mind–body problem entails recognition of 'World 3' objects. By this, he means "… the world of the products of the human mind, such as stories, explanatory myths, tools, scientific theories …, scientific problems, social institutions and works of art". Thus, language is a real product of human evolution, and influences the development of the brain. We are biologically programmed to develop language, but the form that language development takes is dependent upon World 3. World 3 is partly physical and material (eg perceptual journals), and is partly mind. This analysis allows for the interaction between mind and body.

At present, it is not always obvious how to demarcate higher-level cognitive functions from perceptual or lower-level sensory functioning. Moreover, the study of perceptual processes is informative in its own right, irrespective of any possible benefits to neuroscience. For example, while some chemical processes reduce to physics, I do not foresee the discipline of physics replacing chemistry. Similarly, it seems unlikely that we will ever replace psychology with biology and accomplish a complete reduction of mental to brain states.

Ultimately, the cooperative integration of research from perceptual and neuroscience perspectives may lead to gains in knowledge that will not be realized from the two fields operating independently. In science, combining perspectives from fields that are intimately related is likely to prove a fruitful enterprise. While there has been a trend to integrate information from neuroscience and psychological investigations, there is still a wide gulf between the areas. Much research in these fields goes on independently, and is published in a very large number of different journals. The two fields are so broad that it is difficult for individual researchers to keep up with the literature, and it is much easier to focus one's efforts on a narrow area. However, psychology seems to be moving closer to neuroscience, indeed embracing the approach, and the general anticipation is that this trend will be positive. Hopefully, the outcome will be a productive synergism between the approaches.

There is an important caveat here. One current problem in the field is a tendency of some research-granting agencies to stress neuroscience approaches to perceptual problems. This occurs to the detriment of psychological approaches. Many universities are also moving in this direction. While neuroscience may hold some promise, it is unlikely that it will solve many problems that exist on a different, conceptual level.

What is currently needed is some sort of reasonable balance between psychological approaches to perceptual issues, neuroscience approaches, and a potentially fruitful interface between them.

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References

Churchland P M, 1988 *Matter and Consciousness* (Cambridge, MA: MIT Press)
Churchland P S, 1997 "Can neurobiology teach us anything about consciousness?", in *The Nature of Consciousness* Eds N Block, O Flanagan, G Guzeldere (Cambridge, MA: MIT Press) pp 127 – 140
Dennett D C, 1991 *Consciousness Explained* (Boston, MA: Little, Brown)
Heller M A, 2000 *Touch, Representation, and Blindness* (Oxford: Oxford University Press)
Koenderink J J, 1999 "Brain scanning and the single mind" *Perception* **28** 1181 – 1184
Popper K R, Eccles J C, 1977 *The Self and Its Brain: An Argument for Interactionism* (New York: Routledge and Kegan Paul)
Van Orden G C, Paap K R, 1997 "Functional neuroimages fail to discover pieces of mind in the parts of the brain" *Philosophy of Science* **64** (*Proceedings*), S85 – S94
Van Orden G C, Pennington B F, Stone G O, 2001 "What do double dissociations prove? *Cognitive Science* **25** 111 – 172

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