

**Embodying Psychology through Neuroscience:
conceptual and political issues**

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Introduction

For the most part psychology is disembodied, the processes and mechanisms it proposes as capable of being enabled by silicon and wire as by flesh and blood. This disembodiment means that analyses tend to grant unwarranted primacy to the cognitive realm, the realm of conscious thought and discourse. As a result, much of psychology lends itself to idealism, voluntarism and a notion of the subject as more-or-less transcendent, bounded, insightful, consistent and controlling. By contrast, in sociology, social theory, anthropology and other social sciences there has in recent years been a renewed interest in notions of embodiment, an interest that may currently be mutating into a focus on affect, emotion and feeling. These are topics on which neuroscience has much to say – indeed, the subdiscipline of affective neuroscience is concerned primarily with these aspects of our experience.

Neuroscience today is not what it was when we were undergraduates. Its findings can no longer be so readily dismissed as speculative, or criticised as crassly reductive or naively deterministic, and nor can they necessarily be characterised as simply reactionary in their implications. Indeed, neuroscientific evidence is now accumulating that the fine structure of the brain is plastic and capable of being molded by experience, habit, repetition and activity. For example, one well known study showed that the brains of London taxi drivers had significantly larger hippocampi than those of controls (Maguire, Gadian et al. 2000). The hippocampus is associated with memory, including spatial memory, and extensive memory and learning are needed to learn how to navigate the streets of London. This learning is assessed by a test called ‘the knowledge’ which licensed drivers are required to take. The study not only showed that the taxi drivers’ hippocampi were larger than those of controls, they also demonstrated a dose-response relationship between hippocampal size and years spent taxi-driving. This suggests that the taxi-driving caused the increased hippocampal volume, rather than this brain feature being a predisposing feature for people to become taxi drivers. Other imaging studies have shown that learning to play the piano rapidly causes changes to the connections between auditory and motor cortices (Bangert and Altenmueller 2003), and that just 12 weeks of cognitive therapy causes significant changes to patterns of brain activation (Wykes and Brammer 2002). And similarly at the level of brain chemistry, work with animals has shown that changes in social status impact causally on levels of the neurotransmitter serotonin (Raleigh, McGuire et al. 1984), and that stressful situations increase the availability of dopamine (Weiss, Glazer, & Pohoresky, 1976). The social significance of these findings is that serotonin may be implicated in diagnoses of ‘depression’, and dopamine in diagnoses of ‘schizophrenia’.

In short, such studies are showing that the *brain itself* is socialised. Of course, this is not how neuroscientists themselves typically speak of their findings, even within the emergent discipline of social neuroscience (e.g. Cacioppo and Berntson 2005). Nevertheless, evidence that the brain is socialised may provide new opportunities for social scientists to engage critically with reductionist, individualising tendencies within psychology, to formulate ways of thinking that undercut the troubling dualisms that structure psychological knowledge, and to ground social science thinking about the body and subjectivity in a valid empirical base.

However, the kind of integration of social science and neuroscience which this work will demand is fraught with problems. In what follows I will first set out some of the potentials of any such integration, and then discuss some of the difficulties and problems with which it may be associated. Throughout, I will take Damasio's work, and in particular his three books, as my primary focus. Damasio is an influential popular scientist, one of the best known neuroscientists to come to wider attention during the 1990's "decade of the brain". Although he publishes widely in neuroscience journals, Damasio's books are relatively accessible and he is not frightened of theorising, a characteristic which may allow non-specialists to better appreciate the import of his work. For these reasons he is perhaps the most 'social science friendly' of the major neuroscientists currently writing: consequently, problems encountered by social scientists trying to use his work may be indicative of those likely to arise when *any* neuroscientists' work is used.

Potentials

Damasio's first book is "Descartes Error" (1994). This book sets out his somatic marker hypothesis: that learned body state profiles associated with prior experience get reactivated on future occasions when we consider options. They provide valences that quickly rule some options out and others in, so that 'rational' decision making then occurs for the smaller set of remaining options. These body state profiles or somatic markers are the neural mechanism that produces "gut feelings" and intuition, and they may also operate outside of conscious awareness to produce biases that we only notice retrospectively, if at all. They are, in short, a means whereby affective and somatic responses get socialised and may feed forward into future activity.

Despite the concerns of some commentators, it must be emphasised that this is not merely revived behaviourism. Somatic markers have a probabilistic effect, not a deterministic one: we can ignore them, we just have to "talk ourselves" into doing so. They are the product of social conventions and ethical rules not an asocial environment, so their influence is normative rather than mechanistic. Moreover, somatic markers operate through subjectivity, which therefore retains a central role, rather than being relegated to the status of epiphenomena as it is in behaviourism.

The somatic marker hypothesis places the socialised, enculturated body at the core of decision-making, and in this way subverts the disembodied rationalism of mainstream psychology. It endows decision making with biases derived from previous experience, and so challenges the presumed rationality and coherence of the subject. In describing a pathway by which the ways we experience and feel our bodies is open to socialisation, it may also help us to understand how social class (Bourdieu 1977) and gender (Young 1990) come to be both profoundly embodied and phenomenologically experienced.

Damasio's second book "The Feeling of What Happens" (1999) sets out a theory of consciousness which focuses on how the body-brain system generates knowledge of world and organism at one and the same time, to produce a 'self in the act of knowing'. In this book Damasio differentiates between two forms of consciousness which we typically experience as a seamless whole. Core consciousness is enabled by systems rising from the brainstem, and consists of second-order maps of changes in the brain-body system. Anything impinging upon the body-brain, whether externally

or internally, produces a change in these systems and in so doing generates a “pulse” of core consciousness. The contents of any one of these pulses is the difference between the organism first in one state, and then in another. Core consciousness consists of a flow of such pulses, and in normal circumstances is ceaseless during waking hours.

Core consciousness arises in evolutionarily old parts of the brain. As events registered there activate the higher cortices in networks of spreading neural activation they produce extended consciousness. Extended consciousness uses the capacity for memory, symbolic and linguistic representation to interpret, situate and understand, in fully human ways, the significance of events first registered in core consciousness.

However, consciousness is much more complicated than this brief description suggests, since it is also constituted both by other brain systems and through the operation of multiple feedback loops. For example, the meanings in extended consciousness are subtended by neural events that are themselves changes in the brain-body system and hence can generate new pulses of core consciousness. Thus in our lived experience there is a dialectical, fluid relationship between core consciousness and extended consciousness: through their transactional operation the social and the embodied become thoroughly intertwined and, together, provide the basis of our being and knowing.

Damasio’s third book is called “Looking for Spinoza” (2003). In many ways the least substantial and useful of the three books, this work attempts to set out the role of feelings in everyday life. Damasio identifies some of the major brain systems involved in the generation of feelings, and shows their centrality to our experience. More problematically in this book he also attempt some social theorising: we will return to this later.

Problems

Before looking at the difficulties for social scientists of using Damasio’s work, it should be acknowledged that within neuroscience itself there are both critiques of and alternatives to his position. For example, Panksepp (2004) described Damasio’s theory of emotion as a cognitive one, for its emphasis on brain areas such as the prefrontal and cingulate cortices; for Panksepp, emotion proper is generated by systems arising from the brainstem and the limbic area (Panksepp 1998). Rolls (1999) is critical of Damasio’s theory of how emotion and feeling play a part in decision-making, on the grounds that including the body in a feedback loop is simply too slow and hence, evolutionarily, unlikely to have arisen. Cognitivist alternatives reinstate cognition and rationality as the core constituents of human mental functioning, minimising the strong contributory role that Damasio gives to emotion and feeling and largely relegating them to the effects of evaluations (Lambie and Marcel 2002). There are echoes here of the Zajonc-Lazarus debate concerning the possibility of affect-laden evaluations preceding, or occurring independently of, cognitive processing (Zajonc 1980; Lazarus 1982; Zajonc 1984). Some of this dispute now appears to have been largely semantic (to do with broader or narrower definitions of cognition), and some may have arisen as a consequence of the existence of both ‘high’ and ‘low’ roads for the generation of emotion in the mammalian brain (Le Doux 1999), a fact which may explain why there is empirical evidence in support of both

positions. It is unclear for the moment whether the distance between current cognitivist positions and Damasio's stance can be similarly reduced. Leaving these issues aside, however, there are problems specifically for social scientists who wish to engage constructively with Damasio's work.

Conceptual issues

The first set of problems are described by Bennett and Hacker (2003). Bennett is a neuroscientist and Hacker a philosopher: together, they draw upon the later philosophy of Wittgenstein to analyse and critique the work of many contemporary neuroscientists, including Damasio. Mereology is the study of part-whole relationships, and central to their arguments is what they call the 'mereological fallacy': their term for a tendency amongst neuroscientists to ascribe psychological predicates, attributes, activities and characteristics to the brain. They provide detailed evidence and examples to illustrate their contention that neuroscientists frequently attribute to the brain psychological characteristics (such as believing, interpreting and guessing) which, logically, can only be attributed to persons - of whom the brain is but a part. As they put it:

“It is not that as a matter of fact brains do not think, hypothesise and decide, see and hear, ask and answer questions; rather, it makes no sense to ascribe such predicates *or their negations* to the brain. The brain neither sees, *nor is it blind* – just as sticks and stones are not awake, *but they are not asleep either*. The brain does not hear, but it is not deaf, any more than trees are deaf. The brain makes no decisions, but nor is it indecisive. Only what *can* decide can be indecisive. So, too, the brain cannot be conscious; only the living creature whose brain it is can be conscious – or unconscious. *The brain is not a logically appropriate subject for psychological predicates*”
(Bennett and Hacker 2003 p. 72, emphases in original).

Bennett and Hacker suggest that this tendency is a 'mutant' or 'degenerate' form of Cartesian dualism. Cartesian thinking applied psychological predicates to the mind, and only derivatively to the human being: current neuroscience simply applies them to the brain instead. It is important to realise that their critique is not an empirical one: because the activities and functions that they list are attributes of organisms, and not of the organs of which they are constituted, no amount of empirical evidence concerning the brain mechanisms that enable them is likely to overcome the objections they raise. The error is a logical or conceptual one, and so empirical research cannot resolve it: what is needed instead is a different way of interpreting and situating empirical research.

The mereological fallacy within neuroscience may cause problems for constructive integration with social science because it introduces forms of dualism, reification, and biological reductionism. By treating the brain as though it has psychological characteristics, it seems at first glance that mind-body dualism is removed. But this appearance is merely superficial (as the continuing relevance of the 'hard problem' in fact illustrates). In fact, this move simply pushes the problem of mind-body dualism 'inside' the brain, translating it into something that arises at the level of neurones and synapses, rather than at the level of minds and their corresponding bodies. Not only is

dualism thereby reinstated; at the same time, its basis is moved deep inside the organism, making social science contributions appear less relevant.

Reification becomes an issue because we humans use our bodies and material resources to organise, arrange and conduct our activities in social and collective ways. We have evolved shared traditions of symbolic representation and tool use, and ritualised practices which organise the activities vital for our own reproduction, survival and wellbeing. Because the entire body and its capacities are central to our understandings of these social and material practices, equating the brain with the organism mystifies or negates social scientific understandings of these dimensions of human life. Whilst the brain is clearly a critical organ in their conduct, treating it as their sole instigator and vehicle may lead to their reification – either as disembodied, cognitive processes, or alternatively as neural capabilities or synaptic events.

Equating the brain with the organism is also, most obviously, a form of reductionism. It minimises important qualitative distinctions between different kinds of brains (rats and humans, for example) and makes it easier to imagine that our analytical focus should be upon the biological, rather than also being concerned with social and material space and time. It tends to produce a relatively exclusive focus on events at the level of brain region, synapse or neurone, as though the brain were not already a collection of massively open systems thoroughly imprinted with the character of our social relations.

Bennett and Hacker make numerous specific points concerning the ways in which the mereological fallacy plays itself out in Damasio's conception of emotion, arguing that emotions need not be caused by mental images, are not about somatic changes, and are independent of cognitive knowledge concerning causation. They also suggest that his somatic marker hypothesis is 'misconceived' because events in the world (an injustice, for example) rather than feelings are the source of our judgements concerning good and evil (see Bennet and Hacker 2003, p.213-216). Whilst some of their objections can be refuted as either based upon partial readings or presupposing some kind of linguistic dominance (a tendency to which Wittgenstein's ideas are suited – see Parker 1996), others are more telling. In particular, they challenge Damasio's claim that feelings are the first-person experience of somatic changes, whose meaning derives from their bodily character. From their Wittgensteinian position, the sources of experience are not within us, in some veiled inner life, but publicly available in the shared social world. Emotions and feelings are public events, called out in social interactions within which they are dynamic, variable, and constitutive of the ongoing trajectories that emerge. Consequently, their meaning and character is derived from this ongoing social situation, and not from their somatic character: "What makes the blushes blushes of shame rather than of embarrassment or of love, is not the 'thought' or mental image, *if any*, that accompanies them, but the circumstances and the object of the emotion" (Bennett and Hacker 2003 p.213, emphasis in original)

Political issues

A second set of problems with regard to the constructive use of Damasio's work are more explicitly political. Van Ommen (2005) observed that Damasio fails to

recognise dimensions of social class that are present and significant in some of the literature that he cites. For example, with respect to a description of Netherlands politics in the 17th century he says that senior government positions could be held by an “intelligent commoner”, suggesting agreement with a stereotype of “commoners” as generally unintelligent. And when Damasio engages with culture it is generally high culture that he cites – for example opera, classical music and the paintings of Rembrandt – examples suggestive of a leaning towards a particular elitist strand of culture. Moreover, throughout Damasio’s third book the normativity of the profit motive and a fundamentally capitalist form of liberal democracy appears to be taken for granted, almost naturalised. Damasio’s apparent acceptance of capitalist economics appears wholly consistent with his own strategy of self-marketing. He is, it seems, self-consciously striving to be a ‘superstar’ neuroscientist in the mold of, say, Oliver Sacks. Damasio has an agent, and charges substantial fees for speaking engagements; photographs of him are carefully posed, they are copyrighted, and their use is controlled.

Damasio also seems to accept relatively uncritically the framework of ‘psychopathology’ promoted by the APA’s Diagnostic and Statistical Manual (DSM), despite the known problems of over-inclusiveness, validity and reliability associated with it. In fact, by taking this framework as given Damasio appears to tie himself in a knot by hypothesising that the callous disregard for others that a diagnosis of ‘psychopathy’ typifies might be the outcome of an inability to form somatic markers. The problem for Damasio is that such people are typically described as charming or even charismatic, and are clearly highly socially skilled, whereas people unable to form somatic markers are said to be deficient at social interaction. An alternative explanation would be that, rather than having some kind of organic brain injury, people receiving this diagnosis have been enculturated in ways that mean selfish disregard for others is ‘normal’ and ‘natural’ for them. Such an explanation could even draw upon Damasio’s own hypothesis, and associate it with the strong epidemiological relationship between forms of psychopathology and abusive upbringings of various kinds (Read, van Os et al. 2005), yet Damasio’s acceptance of the integrity of the DSM categories seems to have blinded him to this interesting possibility.

Related to this issue, evolutionary psychology is endorsed at numerous points in Damasio’s writings. The problem here is not with attempts to include an evolutionary perspective in the widest sense, since sometimes this is clearly appropriate. Rather, the problem is with Damasio’s apparent readiness to accept as ‘true’ the flimsy, ideologically convenient “just so stories” propagated by those who seek to explain significant parts of contemporary human behaviour with primary reference to our ancestors who lived in caves or on the savannah (Rose and Rose 2001). This problem is particularly troubling since Damasio often invokes evolutionary psychology as a possible explanatory mode at precisely those points when a societal explanation, derived from social theory and empirical evidence, would be appropriate.

The problems associated with Damasio’s own political proclivities become most apparent in this third book, “Looking for Spinoza”, where he attempts to make links between the brain and social structures. His efforts are rooted in a relatively individualist reading of Spinoza which simplistically equates ethical behaviour with self-interest, and for the most part he attempts to simply infer the social from the

biological, using the notion of ‘homeostasis’ as a bridging concept. Again, the problem is not that he attempts to integrate the social and the biological but rather the way in which he does so, which simply gives primacy to the biological rather than recognising mutual interdependence and influence. In this book Damasio infers the social from the biological without any proper recognition that, over time, the social becomes embodied, and that this occurs in both ontogenetic and phylogenetic senses. His neologism “social homeostasis” may be particularly revealing in this regard, since elsewhere in his writings he recognises the conceptual inadequacy of the term “homeostasis” (because the biological equilibria it references are typically dynamic rather than static). As a consequence, elsewhere in his writings he favours the term “homeodynamics”, so it is perhaps significant that when he exports this concept to the social realm he reverts to “homeostasis”, with its implications of stability, fixedness, and the maintenance of an immutable status quo.

The introduction of the concept of social homeostasis accompanies a description of social life as homeostatically regulated by institutions of governance in the broadest sense (i.e. government, laws, judiciary and legislature, as well as religious and other organisations) where it is stated that the “ultimate goal of these institutions revolves around promoting life and avoiding death and enhancing well-being and reducing suffering” (Damasio 2003 p.167)”. Whilst it cannot be denied that for a minority at least these institutions do serve these functions, and whilst the officers of these institutions might even agree with Damasio’s description of their ultimate goal, it is also true that most of these institutions also have as their goal the preservation and furtherance of capitalism and its associated social systems. Consequently, what life and wellbeing they do promote is necessarily unevenly distributed, and always dependent upon competition, exploitation, colonisation and the forcible maintenance of inequitable power structures and systems of social inequality.

Conclusion

Despite these conceptual and political problems, and perhaps despite his own leanings and tendencies, Damasio has nevertheless written an account of how social influence becomes an integral part of the body/brain and feeds forward into individual activity through the deployment and constitution of states of embodiment. In this sense he has, seemingly accidentally, laid the foundations for a bridge between neuroscience and those branches of social theory that address the social body in its fleshy actuality –for example the works of Norbert Elias, Pierre Bourdieu and Iris Marion Young (Cromby 2005). There are also associations between his work and the emergent field of neuropsychanalysis (Solms & Turnbull, 2002) which, like other branches of psychoanalysis, might have the potential to inform and contribute to social and political critiques. Hence, and possibly despite himself, Damasio’s work may provide part of the basis for new ways of thinking about subjectivity that intertwine the social, the phenomenological and the biological in ways that make redundant the tired dualisms of the past.

REFERENCES:

Bangert, M. W. and E. O. Altenmueller (2003). Mapping perception to action in piano practice: a longitudinal DC-EEG study. BMC Neuroscience. **2006**.

Bennett, M. R. and P. M. S. Hacker (2003). Philosophical Foundations of Neuroscience. Oxford, Blackwells.

Bourdieu, P. (1977). Outline of a Theory of Practice. Cambridge, Cambridge University Press.

Cacioppo, J. T. and G. G. Berntson, Eds. (2005). Social Neuroscience. Hove, Psychology Press.

Cromby, J. (2005). "Theorising Embodied Subjectivity." International Journal of Critical Psychology(15): 133-150.

Damasio, A. R. (1994). Descartes Error: emotion, reason and the human brain. London, Picador.

Damasio, A. R. (1999). The Feeling of What Happens: body, emotion and the making of consciousness. London, William Heinemann.

Damasio, A. R. (2003). Looking for Spinoza: joy, sorrow and the feeling brain. Orlando, Harvest.

Lambie, J. A. and A. J. Marcel (2002). "Consciousness and the Varieties of Emotion Experience." Psychological Review **109**(2): 219-259.

Lazarus, R. (1982). "Thoughts on the relationship between emotion and cognition." American Psychologist **37**: 1019-1024.

Le Doux, J. (1999). The Emotional Brain. London, Phoenix.

Maguire, E. A., D. G. Gadian, et al. (2000). "Navigation related structural change in the hippocampi of taxi drivers." Proceedings of the National Academy of Science (USA) **97**(8): 4398-403.

Panksepp, J. (1998). Affective Neuroscience. Oxford, Oxford University Press.

Panksepp, J. (2004). Emotional Consciousness: animalian sources of affective values and the core self. Science, Self and Meaning conference (annual conference of the Consciousness and Experiential Psychology Section of the British Psychological Society), Oxford.

Parker, I. (1996). "Against Wittgenstein: materialist reflections on language in psychology." Theory and Psychology **6**(3): 363-384.

Raleigh, M. J., M. T. McGuire, et al. (1984). "Social and environmental influences on blood serotonin concentrations in monkeys." Archives of General Psychiatry **41**(4): 405-10.

Read, J., J. van Os, et al. (2005). "Childhood trauma, psychosis and schizophrenia: a literature review with theoretical and clinical implications." Acta-Psychiatrica-Scandinavica **112**: 330-350.

Rolls, E. T. (1999). The Brain and Emotion. Oxford, Oxford University Press.

Rose, H. and S. Rose (2001). Alas Poor Darwin: arguments against evolutionary psychology. London, Vintage (Jonathan Cape).

Solms, M., & Turnbull, O. (2002). *The brain and the inner world: an introduction to the neuroscience of subjective experience*. New York: Other Press.

van Ommen, C. (2005). Damasio's Subject: constructions of self in contemporary neuroscience. International Society for Theoretical Psychology Conference, Cape Town.

Weiss, J. M., Glazer, H. I., & Pohoresky, L. A. (1976). Coping behaviour and neurochemical change in rats: an alternative explanation for the original "learned helplessness" experiments. In G. Serban & A. Kling (Eds.), *Animal Models in Human Psychobiology* (pp. 141-173). New York: Plenum Press.

Wykes, T. and M. Brammer (2002). "Effects on the brain of a psychological treatment: cognitive remediation therapy." British Journal of Psychiatry **181**: 144-152.

Young, I. M. (1990). "Throwing Like a Girl" and other essays in feminist philosophy and social theory. Bloomington, Indiana, Indiana University Press.

Zajonc, R. B. (1980). "Feeling and Thinking: preferences need no inferences." American Psychologist **35**(2): 151-175.

Zajonc, R. B. (1984). "On the Primacy of Affect." American Psychologist **39**(2): 117-123.