

# Book Reviews

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**Valerie Gray Hardcastle**

*The Myth of Pain*

Cambridge, MA: MIT Press, 1999, xv + 298 pp.,  
\$37.50, £21.95, ISBN 0 262 08283 7(hbk).

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In this comprehensive book, Valerie Hardcastle argues that our current conceptions of pain misconstrue this all too familiar phenomenon. Explanations of pain as varied as its being a purely subjective sensation, an intrinsic property of damaged tissue, and a nonexistent fiction all fail to account for its true nature. Hardcastle argues that pain is best characterized as a complex biological system.

Hardcastle's main argument comes in three parts. She first shows why our conceptions of pain are in such disarray. Then, considering data in neuroscience and psychology she argues for a biological theory of pain. Finally, she suggests that our misconception of pain warrants elimination in favour of her biological account.

According to Hardcastle, disagreement about pain stems from misunderstanding dissociation data. Dissociation experiments in neuroscience aim to individuate functionally distinct neural processes. Such experiments have led to the discovery of two neural subsystems underlying normal pain experiences; one corresponding to pain perception and the other to pain's affective and motivational aspects. Such discoveries importantly invoke psychological dissociations.

For instance, subjects with lesions to the medial thalamus localize pain without the usual distress. Subjects given Fentanyl react to pain without discriminating its qualities. And subjects with hemispherectomies and Parkinson's disease report sensations of pain without being able to localize it or describe its intensity. Interestingly, sensations of pain dissociate from nociceptive stimulation — e.g. in chronic pain,

and in the 'phantom pains' amputees feel in lost limbs. Finally, the effects of hypnosis and placebos show that one's nociceptors can be activated without resulting in pain sensations. Such dissociations suggest that damage detection, pain-related distress, and pain sensations are mutually independent phenomena with mutually independent neural correlates.

Identifying pain with one of these dissociables leads theorists to disagree about whether pain is purely subjective, an intrinsic property of tissue damage, or whether it even exists at all. According to Hardcastle, these theorists mistake dissociations as individuating *processes*, as opposed to *components* of processes (p. 94). But the fact that the neurons of these systems all respond to the same kind of stimulation, coupled with the evolutionary explanation of pain — that pain serves to notify us of damage to our bodies — suggests that these dissociables comprise one system. It is thus the system as a whole that should be identified as pain.

Further, identifying pain with one of the dissociables implies that pain differs radically from other qualitative experiences. Visual perception and sensations dissociate in cases of blindsight. The blindsighter *sees* the stimulus in her blind field, even though she has no visual sensations of it. Likewise, it is plausible that one's pain system can be functioning without one *feeling* pain (p. 106).

But important anomalies — including phantom pains, and people who inflict wounds upon themselves for pleasure — provide difficulties for the perceptual model of pain. Such cases led the International Association for the Study of Pain (IASP) to conclude that pain is a purely subjective sensation. But according to Hardcastle, if pain is purely subjective, it cannot play its evolutionary role.

Hardcastle suggests that pain comprises two subsystems — the pain sensory system (PSS) and the pain inhibition system (PIS). The PSS implements the perceptual function of pain. The PIS controls the amount of pain one feels. It is the existence of the PIS that best explains the above dissociations commensurate with an evolutionary explanation of pain. It is sometimes to our advantage to feel no pain. ‘If we are fighting or fleeing from an enemy, it would be preferable to do so unencumbered by the need to nurse or protect our limbs ...’ (p. 134)

Self-injurers are simply exploiting the PIS by triggering it to mask pre-existing pains. Their pleasure derives, not from pain caused by their self-inflicted wounds, but from inhibiting the underlying pains (p. 141).

This two-system model runs against most conceptions of pain in cognitive science. Focussing on our commonsense conception (which she takes from the IASP), Hardcastle takes an eliminativist stance. Common sense identifies pain with sensations, which dissociations suggest is wrong. So pain, as we conceive of it, does not exist. ‘We might play at revising this theory, but any change that remains faithful to what we know about pain processing is going to entail that pain no longer refers to a simple conscious percept. This sort of change crosses the line from mere revision to outright replacement’ (p. 159).

Hardcastle concludes that pain research and treatment must adopt a new outlook. Pain exists even in the absence of sensations and there may be ramifications of ignoring this.

Hardcastle’s arguments for the complexity of pain are convincing. However, I have some concern over her eliminative conclusion.

It is unclear that common sense discards beliefs, desires, and emotions in characterizing pain as a sensation. For instance, we wonder if someone who gets pleasure from harming oneself really is in pain, even if they claim they are. David Lewis (1972) offers a version of functionalism that can accommodate Hardcastle’s dissociations while respecting the commonsense view that pain is a sensation. According to Lewis, ‘pain’ is defined in terms of its *normal* causes and effects. Dissociations are just *abnormal* cases.

In fact, Hardcastle argues against eliminativism and reductionism for intentional states (chapter 3). So, inasmuch as pain involves

beliefs and desires, it must be explained in mental terms.

Also, Hardcastle assumes that sensations of pain are always conscious. This damns the commonsense view, since conscious sensations are dissociable from other pain-related states. But, as David Rosenthal (1991) argues, it is unclear that common sense takes sensations to be intrinsically conscious. We describe a headache as lasting all day, though interesting conversations may have distracted us from it. And though we normally pick out sensations by their conscious instances, we can pick them out by their effects on other states as well — e.g. their causing beliefs about bodily damage. We need some reason for thinking that consciousness isn’t itself dissociable from sensations.

These questions aside, Hardcastle’s book is a useful, in-depth study of pain, providing informative illustrations of neuroscientific, evolutionary, and clinical perspectives on this important topic. It is crucial reading for anyone interested in how pain fits into cognitive science.

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#### References

- Lewis, David (1972), ‘Psychophysical and theoretical identifications’, *Australasian Journal of Philosophy*, 50 (3: December), pp. 249–58.  
Rosenthal, David M. (1991), ‘The independence of consciousness and sensory quality’, in *Philosophical Issues*, no. 1, ‘Consciousness’ ed. E. Villanueva (Atascadero, CA: Ridgeview Publishing).

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#### Manfred Spitzer

*The Mind Within the Net: Models of Learning, Thinking and Acting*  
Cambridge, MA: MIT Press, 1999, xiv + 359 pp., \$25.84, ISBN 0-262-19406-6 (hbk).

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In the past decade or two, we have learned an enormous amount about the workings of the brain from neural network models. Manfred Spitzer’s book enables the non-specialist reader to explore the range and significance of these discoveries. He begins with the basics of neurophysiology and chemistry, contrasting brains with computers, and thus introduces the crucial concept of parallel distributed processing. Then he explains the mathematical basis of artificial networks which, despite their relative

simplicity, can carry out pattern recognition and learning tasks. From this foundation he proceeds to progressively more complex network models which seem to mirror structural principles embodied in subsystems of the brain. The physiology of interconnections within the brain is also gradually explained, so the book gives us a running comparison-and-contrast between human brains and neural networks. Throughout the exposition, each new concept is illustrated by at least one application to specific brain functions (or dysfunctions). Many of these applications, especially in the final section, are medical.

Manfred Spitzer is a psychiatrist (Professor and Chairman of the Psychiatric Hospital at the University of Ulm, Germany). This invites comparison with other medical practitioners who have written for the general public, such as Oliver Sacks, Peter Kramer and Antonio Damasio. Spitzer deals with a number of mental dysfunctions such as schizophrenia, depression and Alzheimer's disease, but he eschews the anecdotal approach which is prominent in the writings of his better-known peers, preferring instead to focus on principles suggested by neural network models and their implications for diagnosis and treatment. This impersonal approach is likely to keep the book off the best-seller lists — which is a pity, because it captures a vital part of what made the 1990s the 'decade of the brain'.

While Spitzer avoids needless jargon, he also avoids 'dumbing down' his subject. He makes it clear throughout that models are only one component of scientific investigation, useful because they can be tinkered with in ways that living brains cannot, and because they allow us to simplify and isolate certain functions that are fully and inextricably integrated in living brains. The book demonstrates the interplay among models, observation of living brains and patients, and neurophysiology, each of them suggesting new lines of investigation to the others. The most detailed examples of this interplay are Spitzer's reports of his own research into phantom-limb phenomena and language disorders among schizophrenics.

Much of the book deals with language issues, and this is where Spitzer comes closest to being controversial. Neural network models, even fairly simple ones, have succeeded in learning certain features of human languages without

being 'programmed' with any syntactic rules. Spitzer presents this as evidence against the Chomskyan hypothesis that some syntactic 'rules' or structures are innately represented somehow in human brains. One of his claims is that Elman network models allow us to account for the ability of children (and the inability of adults) to spontaneously develop complex creole languages in an environment where they hear only pidgin language. But here Spitzer may be exaggerating the explanatory power of neural networks. Elman networks, by Spitzer's own account, 'extract' structures from their input; whereas children raised by pidgin speakers apparently receive no input from which the syntactic features of a creole could be 'extracted'. Indeed Pinker, in *The Language Instinct* (1994; Spitzer's own source), cites children's ability to create creole languages as the strongest evidence for the very hypothesis that Spitzer denies — that their ability to generate these complex structures and 'rules' must be in some sense innate.

The book is not entirely free of errors on the proofreading level. Probably the most serious is the labelling of a key diagram early in the book (p. 26) which illustrates the crucial concept of synaptic weights. These weight factors can be positive or negative, but the signs are omitted from the weight labels in the diagram, making it difficult to follow the explanation in the text. Generally, though, the diagrams and captions (and the glossary) are very helpful, and the proofreading errors few and minor. The style is admirably lucid — perhaps surprisingly so, considering that Spitzer did his own translation from the original German (*Geist im Netz*), with acknowledged help from the MIT Press editors.

Spitzer calls his final two pages 'User's Manual for Your Brain', which at first glance seems whimsically grandiose. But he clearly believes that a better understanding of the network structure of the brain can be of practical value to anyone. His book does a good job of building such an understanding from the neuronal ground up, and I would freely recommend it to anyone with a serious interest in how the brain works.

Gary Fuhrman

#### Reference

Pinker, Steven (1994), *The Language Instinct* (New York: Harper).