

17 The Problem of Pain

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When my wife was pregnant, our birthing coach asked the class “What is pain?” I thought I might finally get to display some of my philosophical training, but alas, the correct answer was: “Pain is whatever she says it is.” The coach’s “sufferercentric” definition echoes the one offered by the International Association for the Study of Pain (IASP)—“Pain is always subjective”—as well as the definition of pain offered by the philosopher Saul Kripke in his argument against identity theory—“Pain . . . is picked out by the property of being pain itself, by its immediate phenomenological quality” (1972/1980, p. 152).

These subjective conceptions of pain pose problems for the scientific study of pain, as Price and Aydede point out in the introduction of their chapter. If the essence of pain is its phenomenological quality, then it seems the only way to study it *directly* is through introspection and subjects’ verbal reports on their conscious experience, but this is often considered to be an unverifiable and unreliable method. Conversely, *indirect* information about the objective properties associated with pain experiences seems inadequate to fully explain the essential phenomenological quality of pain. The problem, which generalizes to other conscious experiences, is that any materialist theory that attempts to explain subjective experiences in terms of objective properties seems doomed to leave out the very essence of what it is trying to explain—for example, the *feeling* of pain. And any nonmaterialist theory seems doomed to be unscientific. What I will call the “problem of pain” has us taking a materialist approach to the study of pain while conceiving of pain in a way suggestive of metaphysical dualism.¹

The first step in responding to the problem of pain is to recognize the possibility of *epistemological* dualism. As Price and Aydede explain this idea, certain complex neural processes can be accessed in two fundamentally different ways: first, conscious agents in whom the processes occur can introspect on them, and second, other agents (often with the aid of scientific instruments) can observe the processes as well as their

objective causes (e.g., stimuli) and effects (e.g., behavior).² The two types of access provide two different kinds of information, experiential and physical, about the same process. The authors do not flesh out this theory here, but they are right to point out that if sense cannot be made of the idea that one and the same physical process can be accessed in these two fundamentally different ways, then we seem stuck having to choose between some form of metaphysical dualism (perhaps epiphenomenalism) and some form of reductive materialism that eliminates conscious experiences from our ontology (i.e., our catalog of what is real and can be studied scientifically).

The second step in responding to the problem of pain is to recognize that, though pain experience is essentially subjective, there is no *single* and *simple* pain experience. As the authors discuss, people can distinguish differences between, for instance, experiences of “first pain” and “second pain” and between the intensity and the unpleasantness of pain experiences, and these differences correlate with specific activity in the central nervous system. Indeed, by the time a subject experiences a peripheral noxious stimulus as pain, the experience has become *subject-relative* in that the incoming neural signals have interacted with complex brain activity specific to the subject. This activity includes emotional and cognitive processes, such as the subject’s fears about being in pain and beliefs about the long-term effects of the pain. These subjectrelative processes explain the diversity of introspective reports in response to identical stimuli, which encourages the idea that pain cannot be identified with any objective processes and that introspection is unreliable. On the contrary, however, using introspective methodologies in combination with objective observations is required to understand the complexity of pain experience and to test the reliability of introspective reports (see below).

Most pain researchers have been painfully aware of the complexity of factors involved in the subjective experience of pain and introspective reports about them. In contrast, when philosophers present the problem of pain, they often suggest that pain is a simple experience corresponding to a simple type of peripheral neural process (e.g., the C-fibers “identified” with Kripke’s arguments). Paradoxically, it is only by recognizing the *complexity* of pain experiences that we can begin to imagine a satisfying response to the problem of pain. Any successful theory explaining how neural processes can have experiential properties will have to refer to the range of emotional and cognitive states involved in pain experiences and to the corresponding range of diverse neural states.³

Notice the vague language in the previous sentence regarding the processes and states at issue. The third step in responding to the problem of pain is to recognize how far we are from understanding how to individuate the terms on either side of the

equation—both the subjective states, including emotional and cognitive states, and the corresponding neural processes. This point reminds us of William James's description of the state of psychology in 1892: "We don't even know the terms between which the elementary laws would obtain if we had them" (1892/1961, p. 335). So, while one way to describe the problem of pain is to point out that we have no theory to explain how neural states can *be* conscious states, one response is to point out that we do not yet have a theory about which neural states to pick out or how to individuate the conscious states at issue—including, for instance, how to obtain complete and accurate descriptions of pain experiences. What we do have is a lot of inductive evidence that some such correlations exist and that suggests such a theory is precisely what we should be looking for. What we need, in the meantime, is a methodology to arrive at such a theory.

It should be clear by now that I think Price and Aydede gesture toward each of these three steps in responding to the problem of pain. So, those who prefer scathing critiques may prefer to stop reading this commentary. Instead, I will continue to clarify and to extend some of the authors' most important claims, now turning specifically to their proposed methodology.

Epistemological dualism is a philosophical theory in need of empirical support. The best methodology for garnering such support—and for challenging both some versions of dualism and eliminative versions of materialism—requires using introspective reports.⁴ The goal is to map out the "phenomenological space" of conscious experience and to map this structure onto the "neurobiological space." The latter mapping, what Price and Aydede call the "vertical phase" of their experiential approach, is a well accepted if nascent method in cognitive psychology and neuroscience. But the idea of mapping the phenomenology of pain (and other conscious experiences), what they call the "horizontal phase" of their approach, is more controversial and underexplored.⁵

The most novel suggestion the authors offer is to encourage pain researchers to become subjects of their own investigations. This idea, as they point out, has been used in some prior pain research. It was also the standard methodology of the introspectionist psychologists. But unlike the introspectionists, Price and Aydede emphasize that the experimenter should *passively* observe their experiences rather than actively attending to particular aspects of it. This helps to avoid introspective reports that interpret experiences in terms of one's theoretical commitments and that unduly elaborate on the experience itself (for instance, some introspectionists obtained twenty-minute reports of two-second experiences). However, I do not think the authors are clear enough about what they think introspection is, and the success of

their methodology may vary depending on what model of introspection it employs (see below).

The authors are also not explicit enough about why their methodology *requires* experimenters to test their ideas on themselves rather than others. Their four-step methodology suggests that hypothesis generation and data interpretation will be facilitated by this approach (and surely it is more practical for researchers to do pilot studies on themselves). But it should also be emphasized that introspection, considered analogously to other types of observation, is a *skill* that can be improved with practice and with knowledge of the basic goals of inquiry. Untrained and uninformed subjects are less likely to attend to the subtle aspects of their experiences, especially the distracting and unpleasant experience of pain. And while one of the problems with the classical introspectionist methodology was that training led to theory-laden reports, in fact untrained subjects are also inclined to offer explanations (biased by their lay theories) about *why* they are experiencing what they are rather than just descriptions of *how* things seem to them.

Experimenters using Price and Aydede's methodology can practice introspecting pains produced by the same stimuli numerous times with the aim of producing consistent and clear descriptions of those experiences that are minimally tainted by theory. They can examine the relationships between different experiences produced by numerous different stimuli.⁶ And they can compare introspective reports, including the vocabulary used, among themselves to test for inter-rater reliability. Unlike the introspectionists, these reports are treated as neither definitive nor final data but rather as preliminary data, which can then be used to generate hypotheses to test on untrained subjects. The experimental stage involves correlating objective data in the form of untrained subjects' verbal reports with objective data about both the stimuli and the resulting neural processes. Indeed, as the authors point out, "the independent variable becomes the experiential dimension to be manipulated as opposed to the external conditions used to produce changes in the experiential dimension" (this volume, p. ••).

An interesting recent example of this is demonstrated in an experiment by Coghill, McHaffie, and Yen (2003). Previous experiments have shown consistent within-subject relationships between brain activity and subjects' pain reports as evoked by different stimuli. This experiment established *between*-subject correlations among different subjects' brain activity and their varying reports of pain intensity in response to the same stimuli. High-sensitivity subjects (who report a high degree of pain on a visual analog scale for pain intensity) showed more activity in anterior cingulate cortex and primary somatosensory cortex than did low-sensitivity subjects (while there were no signifi-

cant differences in thalamic activity). This suggests that the experienced intensity of pain is mediated by cortical areas associated with emotional and cognitive functions.⁷ This experiment provides evidence that subjects' introspective reports are reliable indicators of objectively measured neural activity, as predicted by epistemological dualism. It also demonstrates the second step in responding to the problem of pain discussed above—that the experience of pain (even intensity alone) will be identified with a complex, though consistent, range of neural activity rather than with some simple neural process.

The problem of pain mirrors traditional arguments for dualism. It just doesn't seem like the subjective feeling of pain can be the same thing as electrochemical processes. But the correlations begin to look less contingent and the identity claim less mysterious as researchers uncover more detailed and complex correlations between the phenomenal and the neural. It makes sense that C axons, which fire slowly, correspond to dull, throbbing experiences of second pain, while A axons, which fire more rapidly, correspond to sharp, stinging experiences of first pain. It makes sense that increased activity in anterior cingulate cortex, which is associated with emotions such as fear, increases the experienced intensity of pain. Using better introspective methods in combination with improved tools for measuring brain activity is the best way to move toward an explanation of how epistemological dualism works—or to show that it doesn't.

In fact, Price and Aydede suggest that their methodology works on either physicalist *or* dualist assumptions. They mean that it will work to map the correlations between conscious experiences and brain activity, whether considered as two dimensions of one process (e.g., type identity theory) or as two distinct things or properties connected in lawlike ways (e.g., dualist epiphenomenalism). However, there are some forms of physicalism, such as anomalous monism, that suggest such lawlike correlations will not be found, because there are no psychophysical laws. And there are forms of dualism—namely Cartesian interactionism—that should also predict that such correlations will not be found, because some of the emotions and thoughts affecting the experience of pain occur in an immaterial mind beyond neuroscientific study. That is, first-person reports of pain, if modulated at all by the input of a nonphysical mind, should not be expected to correlate consistently with the same types of neural activity.

Indeed, I think Price and Aydede attempt to be *too* inclusive in their metaphysical claims. Whereas they suggest that their methodology is amenable to various types of dualism and physicalism, they should argue more explicitly that their methodology works only if certain metaphysical theories of mind are true, and conversely, that their

methodology offers a way to put pressure on other metaphysical theories by discovering the correlations that those theories predict should not be found.⁸ If we can use introspective methodologies to improve the horizontal mapping of the structure of our phenomenology and to bring to fruition the vertical mapping between phenomenology and neurobiological processes, then we will have empirical evidence suggesting type identity between the mental and the physical—especially if the vertical mapping also provides information about *why* the phenomenological states have the properties they have (just as in other scientific reductions where the lower-level properties *explain* the properties at the higher levels).

I'll conclude with a question about the authors' view of introspection. Price and Aydede (perhaps wisely) attempt to avoid an analysis of introspection, and they suggest that their methodology is amenable to various conceptions of introspection, such as the higher-order thought (HOT) model as well as the higher-order perception (HOP) model. But their methodology may work differently depending on what introspection is—and if there are different types of introspection, it may depend on what type the experimenters and subjects use.⁹ For instance, does introspecting on a pain involve a distinct process from just consciously experiencing that pain? If the introspection is a distinct process, then we should expect to see different neural activity in subjects who are introspecting on their pain than in those who are simply experiencing pain. If the passively attentive introspection the authors advocate is a different process than the actively attentive introspection used by the introspectionists, then we should expect different neural activity and different reports from subjects who employ these different types of introspection. Perhaps we will be able to examine how the process of introspecting alters the neural activity associated with the pain experience and alters it differently depending on the type of introspection employed. Presumably, the introspective methodology Price and Aydede outline can be adapted to study the nature of introspection itself, though I'll leave it as an exercise for the reader to consider how this might work.

Notes

1. Price and Aydede point out several ways that pain poses different problems (and solutions) than other conscious experiences. The more general problem is posed by several different arguments in the philosophical literature. Kripke's argument against identity theory, roughly, is that pain states are not identical with neural states (e.g., C-fibers firing) because, unlike other cases of discovered identities (e.g., water = H₂O), we have no explanation for the apparent contingency of this purported necessary identity. The essential property of pain states, their phenomenological quality, seems like it could exist without a particular neural state (or any neural state), and

the neural state seems like it could exist without the specific feeling of pain, and we have no explanation for its seeming to be this way. Kripke (1972/1980) sees this as a problem for any type–type identity theory (though not as an argument *for* dualism; see p. 155).

2. See their note 6 for philosophical discussions of epistemological dualism.

3. The complexity and diversity of experiences such as pain may explain why some philosophers have seen token–token identity theory as a more plausible alternative than type–type identity theory. I think the plausibility of type–type identities depends on how liberal we are about the types at issue. We will not discover an identity between the type “pain experience” and any specific type of neural process (e.g., C-fibers firing). But that does not entail that there is no identity between more fine-grained types of pain experience and more fine-grained complexes of neural activity.

4. The authors correctly point out that introspection (sometimes in disguised form) has been used often in experimental psychology since the demise of introspectionism. For further defense of the scientific legitimacy (and necessity) of introspective methodologies, see Goldman 1997; Jack and Shallice 2001; Vermersch 1999; Nahmias 2002; and various articles in the “Trusting the Subject” editions of the *Journal of Consciousness Studies* (2003 and 2004).

5. In addition to the introspective methodologies the authors discuss, other recent approaches include the phenomenological interview (e.g., Pollio, Henley, and Thompson 1997); descriptive experience sampling (e.g., Hulbert and Heavey 2001); and protocol analysis (Ericsson and Simon 1993).

6. Few college sophomores will have had extensive experience with a variety of different pains, but (dedicated!) pain researchers can expose themselves to a range of painful stimuli and examine the relationships between the resulting experiences (though, my wife assures me, unless they experience childbirth, they’ll never understand *real* pain).

7. It would be interesting to test the brain activity of a “stoic subject,” one whose cortical activity suggests she experiences a high degree of pain intensity though she *reports* a low intensity. Presumably, she would show interesting differences from both high- and low-sensitivity subjects in other cortical areas associated with cognition and language.

8. For instance, Price and Aydede claim (note 8) that nothing about their methodology crucially depends on what sort of relation holds between physical and mental states—for example, type identity versus supervenience. However, as they note, supervenience allows that the same type of mental state (e.g., pain states) may be realized in different types of neural states. Depending on the range of neural states at issue, some forms of supervenience may thus make their methodology ineffective. The first-person introspective reports would not pick out any neural kinds to be studied using third-person methods. On the other hand, the success of their methodology and the case studies they discuss provide tentative support for type-identity theory (though it may be unable to rule out dualist epiphenomenalism).

9. See Prinz 2004 for a discussion of the different processes that fall under the category of introspection.

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