3 A NEUROPHILOSOPHICAL APPROACH

A Neurophilosophical Approach of the Psychological Process of Chronic Pain

Magali Fernández-Salazar,[1] *Paris IV, Sorbonne University*

1. INTRODUCTION

The only way to tackle the unresolved problem of chronic pain is to study it from different perspectives, that is, a multidisciplinary approach. It seems to me that as philosophers, we cannot talk about pain if we do not take into account other disciplines, (e.g. physiology, neurobiology, cognitive sciences, and psychology) because pain is not only a sensation, nor a perception, but both. The perception of pain by an individual is highly complex and individualised, and it depends on a variety of external and internal influences. The somatosensory cortex is concerned with the appreciation of pain and its quality, location, type and intensity. But, in addition to neural influences, which transmit and modulate sensory input, the perception of pain is affected by psychological and cultural responses.

In this work, I envisage exploring the nature of pain as a typical state of consciousness, while taking account of its physiological and phenomenological aspects, in order to start a discussion regarding the body-mind problem.

The current definition of pain is not complete because it is impossible to identify the nature of pain beyond affirming that it concerns a disagreeable feeling due to a corporal lesion. Some physiologists regard

1 Magali Fernández-Salazar is a PhD. philosophy student at *Sorbonne University*. She is also a visiting PhD. student at the *University of Cambridge*. Her current research area is focused in the emotional dimension of phantom limb pain.

pain as a sensation, in which, it is not necessary to take consciousness into account to define the physiological mechanisms. Some philosophers regard it as an intentional mental state without taking into account its neurophysiological aspects to understand its mechanisms in the brain and its relationship with the mind. In addition, some psychologist regard pain from its emotional aspect and somatisation. These approaches are incomplete because of the complex nature of pain, in which, other important aspects are also implicated (e.g. culture). Pain constitutes a legitimate sensation, and a perception too, in the sense where the painful sensation is necessarily integral as a representation. This is to say, consciousness of a bodily lesion is subjected to several levels of comprehension.

Pain, like all other perceptions, can result in illusions, hallucinations (such as a phantom limb), cognitive influences (such as the analgesia of the soldier, or the athlete), and of pathologic elements in which the stimulus is disassociated from representation. The pain of a phantom limb indicates that the brain generates the experience of pain, and that we do not need a lesion to perceive pain, nor a body to feel a body.

With these bases, pain would be the subjective representation of a corporal injury, which includes:

(1) The sensitive element (quale of a painful feeling).

(2) The affective (the aversive emotions which provoke pain).

(3) The volitional (disposing action).

(4) The cognitive (the recognition of the injury, identification and explanation of the perceived feeling).

(5) The behavioral (the movements, the lamentations).

(6) The cultural (the modulation of the painful experience caused by the social and cultural apprenticeship, as well as the influence of personal beliefs).[2]

These elements join together to integrate a complex representation of pain in which each reveals itself as physical and mental.

I shall argue that we cannot consider pain as a determined physiological state (the activation of fiber C conducting the painful information), as it is necessary to explain the quality of the pain, and its phenomenological aspect in respect to the neurobiological mechanisms.[3] Thus, in this document, I propose to study pain as a psychophysical and cognitive mechanism with neurobiological bases, as a subjective, and qualitative experience. In this way, the given neurophysiological

2 All of the above are explained in (Díaz, 2007).

3 These neurobiological mechanisms enable us to identify pain in our organism.

and phenomenological should correlate to constitute a psychophysical process. One should be capable to integrate these two perspectives of pain: the objective and the subjective. This approach would consider the psychophysical, and neurophilosophical.

2. MORE THAN THE PERCEPTION OF A SENSATION

Pain is defined by the International Association for the Study of Pain (IASP) as "an emotionally disagreeable sensory experience associated with a damaged tissue past, or potential, or described in terms of such damage" (Pain, 1986: 250). But, even if this definition takes into account the fact that the patient can accept he has no lesion, it seems to me that the definition is insufficient. The "disagreeable feeling" is too vague of an expression to clarify matters. However, this definition is at least consequential, and important, in the sense that it considers pain as something subjective. This is to say, above all, as a state of consciousness, and not just as a sensory modality.

Moreover, this definition considers the experience of pain as implying diverse associations between the sensory and the affective states, which is profoundly aversive. In this sense, pain would not uniquely be a sensation, but also an affective reaction. In other words, pain would not only be a sensation translated into a repulsive emotion, but would, in addition, be a cognitive experience. Nevertheless, this definition, as it stands, destroys the belief some neuroscientists maintain where pain is a noxious sensation exclusively generated by neuronal mechanisms in the brain. The subjectivity of pain does not only depend on internal mechanisms, but also on external sources which could not simply be deduced by a brain without contact with its environment. The emotional dimension participates in the genesis of pain. The culture of the individual, his beliefs, his motivations, and even his economy are implicated in the perception of his pain.

Pain is much more than the perception of a simple sensation. All painful perception has a subjective character that is modulated by the context in which pain intervenes: its meaning, the previous experiences, the culture, even the socio-economic standing of the individual, and his psychological state (anxiety, depression, etc.). But, it does not seem possible to prove a correlation of these elements, nor does it seem possible to bring about an understanding of the process that surrounds the nature of the consciousness of pain. For the time being, we can just try to

bring some ideas, which direct us, gradually, to the scientific discovery of the mechanisms of the consciousness of pain.

The idea would be to seek a theory that could explain the physiological, the cognitive, and the philosophical functions of pain in a unified model.

3. THE PAINFUL CONSCIOUSNESS

Pain is a process in time, in which its different components are linked and mixed in diverse ways, in order to form a whole. This is a complex and distinct representation, which one can call, a painful consciousness. The distinction of the components that would be necessary to make an analysis is not clear because the painful experience is integrated.[4] *A priori*, each of these elements is revealed as physical and mental. As in the case of consciousness, the spatial location of pain can be disconcerting. Irrespective to the type of pain, (acute, chronic, inflammatory, etc.) the subject who normally perceives it, makes reference to the place of the lesion; however, pain is in the brain. This organ fails to be sensitive to injury, which is a strange, and ironic fact.

It is assumed that pain is found in the brain because the painful tracts that leave the nociceptive receptors arrive there, and it appears that it is also in the brain where the feelings, and perceptions, are integrated. Although, we still do not have good evidence, at least not one that is definitive, to indicate how this integration is produced. Furthermore, we still have no evidence to explain in which way the distinctive quality of pain is produced (e.g. its *quale*).

There is always a dichotomy between the phenomenological experience and the scientific evidence: I can perceive a pain in my finger, but in reality, it is in my brain, and not in my finger. In the same way, we could say that one can perceive the outside world, as an exterior, but in reality this world is perceived by our mind. Thus, it is in our brain. "Pain is a representation of a corporal injury in the same way that the visible world is a representation of the space before my eyes, which is constructed in the brain after the transduction by the cones and rods of my retina" (Tye, 1995).

In any case, when one talks about consciousness, whether it be that of pain or the ability to see objects, and all sorts of elements that surround us, it is not easy to make a distinction between objects, mental representations, the *stimuli* which provoke these perceptions, the quality of these experiences, and our social and cultural beliefs. Further, it would seem

4 This is due to the fusion of its components.

that it is exactly in the convergence of all these factors that consciousness emerges.

4. THE *qualia* OF THE PAINFUL EXPERIENCE

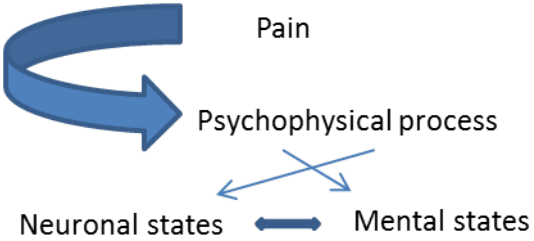
We should analyse the painful experience. What is the "painful" of pain experience? The answer may be the *qualia*.[5] In other words, the qualitative aspects of the painful experience, the brute and primary sensations of the entire state of consciousness (Hansberg, 2003).

To have an experience is to be in a certain state, or to live through something specific. Can we know how the pain of cancer is if we do not have this disease? We could perhaps imagine it, but we will never feel its effects in order to perceive its pain. This, leads us to affirm that in order to talk about *qualia*, we need to believe in mind and subjectivity. It is difficult to know if a new born could have any perception of pain, or if he just feels a pure sensation, because of its lack of experience. To perceive a pain, we have to have been alive. So, if we consider that the new born had an experience of "life", in the womb, in all the extension of the word, and its implications in the mind and the body, then we could affirm that the baby perceives pain. *Qualia* constitute the most intimate and specific aspect of mental capacity. We do not know its physical basis, and that is why the *quale* is so mysterious and challenging.

While the nervous information has similar characteristics in all the cerebral sectors, (for example the schema of electric discharges is analogous to relatively comparable neurons), the modality of feelings and perceptions is phenomenologically distinct. Common examples of this are the redness of an apple, or the concept of liberty, or tooth pains, or the odor of fresh grass. For the time being, it is impossible for us to comprehend how a physiological phenomenon could have a subjective aspect of something so particular and dramatic as pain, in its various aspects of negative quality, punitive, and noxious consciousness.

But, the most difficult problem to be understood, regarding *qualia* is to know if they are purely a representation. That is to say, if the brute feeling already has a term of reference, or if there is something in *qualia* which escapes functional representation. Further, even if for the time being it is difficult to make a proposition which could be proved with psychobiological experiments, we could possibly consider a psychobiology of *qualia*, but not merely a biological one.

5 The plural of *quale*



5. THE CORRELATION BETWEEN NEURAL AND MENTAL STATES

One could propose that consciousness could be an emerging property of cerebral activity, and in this case, one could say that pain could correspond to a neuro-mental state. However, such emergence, which would be a functional property, should be correlated to a physiological process that must be well defined. For the time being, we are incapable of such definition. This leads us directly to the problem of mind-body. We must begin to understand the functioning of this emergent process.

In any case, I propose that pain is not only a nervous process, but that it could have a correlation with this process. This is not causality, but a match; reciprocity. This would be:

I avoid the concept of identity and propose one of correlation (with the signs). These two processes could form an independent study, but the result of such studies (of nervous processes) would have to have a significant correlation with the mental states of the individual perceiving pain. This correlation is necessary, as the two aspects, the physiological and the phenomenological, should correspond. There would be neither hard pain, nor a crucial neurological process, without a painful experience.

This formula of correlation opens a door for us to the study of the mechanisms in the consciousness of pain. It could serve to study, not only the aspects of information about pain, but also the sense of the painful quality that should be correlated with the nervous and cognitive aspects of the experience of pain. This would take into account the relation between the qualitative aspect of the mental states of the experience of pain and its neurophysiological aspects.

To arrive at such a stage, it might be necessary to ask which are the specific neurotransmitters involved in the 'painful' process. In other

words, we would need to identify which are the brain areas implicated in this process, the specific structures, their mechanisms, and interactions. One should also find significant correlations with qualitative aspects of the 'painful' experience because we are concerned with the qualitative aspects of the nervous process.

This suggested proposal would be a first step towards the comprehension of the complex processes in the brain. We are not yet able to find a solution to the central problem of the consciousness of pain, but at least, we can find a way to develop a theory of pain by taking into account all the disciplines involved.[6] In any case, it would appear to be undisputable that the psychophysical correlations are preliminary in explaining the qualitative aspects of consciousness, while taking into account the *qualia* of pain as one of the phenomenological aspects in relation to those neurobiological aspects which comply.

BIBLIOGRAPHY

[1] Aydede, Murat. 2001. "Naturalism, introspection and direct realism about pain", in *Consciousness emotion*. 2:29-73.

[2] Craig, A. D. 2003. "Pain mechanisms: labeled lines versus convergence in central processing", in *Annual review Neurosciences*. 26:1-30.

[3] Dennett, Daniel. 1990. "Quining Qualia", in *Mind and Cognition*. Lycan, W. ed. Oxford Blackwells: Oxford. p. 519-548.

[4] Dennett, Daniel. 2008. *De beaux rêves. Obstacles philosophiques á une science de la conscience*. First Edition. de l'éclat Press: Paris.

[5] Díaz, Jose Luis. 2008. *La conciencia viviente*. FCE, Mexico.

[6] Drestske, Fred. 1995. *Naturalizing the Mind*. MIT Press: Cambridge, MA.

[7] Fodor. Jerry. 1990. *A Theory of Content and Other Essays*. Bradford Books/MIT Press: Cambridge, MA.

[8] Folz E.,L., White, L.E. 1962. "Pain relief by frontal cingulotomie". *Journal of Neurosurgery*. 19, 89-100.

[9] Hansberg, Olbeth. 2003. *La naturaleza de la experiencia*. Instituto de Investigaciones Filosóficas. UNAM: Mexico.

[10] Lycan, William. 1996. *Consciousness and Experience*. MIT Press: Cambridge, MA.

6 As opposed to work with them separately, in the same area.

[11] Nagel Thomas. 1974. *What Is It Like to Be a Bat?* Philosophical Review 83: p. 435- 450.

[12] Putnam, Hilary. 1997. "The Nature of Mental States", in *Art, Mind and Religion*, University of Pittsburgh Press: Pittsburgh.

[13] Ramachandran, Vilayanur. 1998. *Fantasmas en el cerebro* First Edition. Debate Press: Barcelona.

[14] Ramachandran, Vilayanur., Diane Rogers-Ramachandran, and Stewart, M. 1992. "Perceptual correlates of massive cortical reorganization", in *Science Journal*, 258 (5085): pp. 1159-60.

[15] Reisberg, Daniel. 1997. *Cognition, exploring the science of the mind*. W.W., Northon and Co: NY, USA.

[16] Sabato, Alessandro. 2010. *Dolore basi molecolari*, CIC. Edizioni Internazionali, Roma.

[17] Smart, J.J.C. 1959. "Sensations and Brain Processes", in *Philosophical Review*. 68, reprinted in John Heil: *Philosophy of Mind: a Guide and Anthology*. Oxford University Press: Oxford. p. 116-127, 1959.

[18] Torebjork, H. E., and LaMotte, R., and Robinson, C. J. 1984. "Peripheral neural correlates of magnitude of cutaneous pain and hyperalgesia: simultaneous recordings in humans of sensory judgments of pain and evoked responses in nociceptors with C-fibers", in *The American Physiological Society*.

[19] Tye, Michael. 1995. "A representationalist theory of pains and their phenomenal character", in *Philosophical Perspectives, 9*. MIT Press: Cambridge, MA.

[20] Woolf, Clifford. 1994. "The pathophysiology of chronic pain–increased sensitivity to low threshold A-beta-fibre inputs", in *Current opinion in neurobiology, Elsevier*.