Relations between three-dimensional, volumetric experiences, and neural processes: Limitations of materialism

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Abstract: Certain features of perception – the quale red, for example, and other qualia – must be regarded as additions to the materialist neurophysiological picture of perception. The perception of three-dimensional volumetric objects can also be seen as qualitative additions to the neurophysiological processes in the brain, possibly without additions to the information content.

In the history of science and philosophy, the world has been regarded as material, mental (idealist philosophy), or dualist (both material and mental). Like many people today, Lehar has chosen the materialist view, and he attempts to avoid dualism by assuming the mind-brain identity position ("consciousness is a physical process taking place in the physical brain" – sect. 2.3, para. 5). Still, he writes that there remains a subjective quality (or *quale*) to the experience of red, for example, which is not in any way identical to any physical variable in the brain. I think this must mean that the experience of qualia *adds* something to the assumed material world and that Lehar therefore does not stay consistently within the materialist frame of reference. Lehar also writes (sect. 2.3) that sense data, or the raw material of conscious experience, are the *only* thing we can know actually exists, and that all else, including the entire physical world, is informed conjecture based on that experience. To me this statement appears as a departure from materialism; it is actually close to the idealist view.

I now suggest that the perceptual experience of three-dimensional, volumetric objects, and of empty space is also something that "subjective conscious experience" adds to the assumed material electrochemical processes in the brain, possibly without changing the information content – a qualitatively different representation. Lehar thinks that the gap between the materialist descriptions of neurophysiology and the phenomenological descriptions of Gestalt features of perception may be due to the present "embryonic" state of neurophysiology, but I regard this as a promissory belief rather than an explanation.

Analogously (and staying within the materialist frame of reference) I believe that a computer can produce a three-dimensional, volumetric figure, namely, if it is connected with a device that can construct that figure. The figure will then be another representation of the information content which is represented inside the computer by electrical processes. Of course, a human person can also construct a three-dimensional figure with his hands or describe it in words and drawings, as Lehar does. In this case, it is the connection with the body, particularly with the muscles and the hands, that enables the brain to make these constructions and descriptions from its information content.

I think that materialism has served science well within a rather large domain, but with studies of cognition such as Lehar's, we move into a domain where materialism reveals significant shortcomings. I find that such shortcomings appear in Lehar's work.

Hence, on his materialist background, Lehar rejects direct (naïve) realism which suggests that we can have experience of objects out in the world directly, as if bypassing the chain of sensory processing. Provided that the materialist background is retained, I agree with this rejection. But if we apply an idealist worldview, our perceptions are of course experienced directly, and based on these perceptions we form concepts, such as the concepts of a "material" object, a "material" world, and perceptual models such as Lehar's Gestalt Bubble model. I see these concepts and models as mental constructs representing features of the perceptual reality, such as quantitative features and three-dimensional Gestalt features. These constructs are of course also experienced directly, and they can be made unambiguous and precise. Here I agree with Lehar, who thinks that perceptual models remain "safely on the *subjective* side of the mind/brain barrier" (emphasis in original) and writes about "objective phenomenology" leading to "perceptual modeling" (sect. 4). It is when we accord "material" concepts a special existence of their own, principally different from the existence of conscious experiences, that is, when we move to materialism, that we run into trouble with direct realism.

Lehar finds troubles with indirect realism as well but eventually accepts this view on the premise that the world we see around us is not the real external world but a miniature virtual-reality replica, an internal data structure within our physical brain. I think this view gives only an incomplete, imprecise conception of the "external world," including our "physical brain." This incompleteness and imprecision are shared with other philosophies assuming indirect realism, such as "hypothetical realism" (Löw 1984; Randrup, submitted; Wuketits 1984), "commonsense realism" (Ruse 1986), and Kant's concept of "the things in themselves" versus "the things for us." According to Kant's philosophy, we actually know nothing about things in themselves, except that they are supposed to exist. I think that this uncertainty or renunciation of knowledge compares unfavorably with the precision of the "material" concepts based directly on perceptual data in the idealist worldview.

Another shortcoming of materialism in relation to the study of cognition is that it is difficult consistently to avoid dualism, as appears from Lehar's views about qualia mentioned above. And if dualism is admitted, it is hard to see how conscious experiences can be generated by material processes in the brain, as Lehar thinks they are (sect. 2.4). In the alternative idealist view of the world, it is not so hard to see, conversely, how "material" *concepts* are generated by the mind; the history of science shows how such concepts have been created (e.g., quanta, superstrings) or deleted (impetus, phlogiston, the ether) following the advent of new perceptual (observational) experiences. The special material type of *existence* is not a part of the idealist philosophy. (For a more extensive discussion of the mind-matter and mind-brain problems in relation to cognition, see Knight 2001; Randrup 1997; 2002.)

Actually I think that Lehar's study, based on "the primacy of subjective conscious experience" and leading to a model of phenomenal perception, is most readily understood within the idealist worldview, and within this view his troubles with direct and indirect realism, with materialist monism, and with mind-matter relations will be significantly reduced. For more about the idealist worldview proposed here, see Randrup (1997; 2002).

Consciousness as phenomenal ether?

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Abstract: The Gestalt Bubble model of visual consciousness is a courageous attempt to take the first-person perspective as primary in the study of consciousness. I have developed similar ideas as the Virtual Reality Metaphor of consciousness (Revonsuo 1995; 2000). I can, hence, only agree with Lehar about the general shape of a proper research strategy for the study of consciousness. As to the metaphysical basis of the research program, I have, however, several reservations about panexperientialism.

I agree with Lehar on several points but disagree about the ultimate metaphysical nature of consciousness. I shall first describe points of agreement and then proceed to a criticism of panexperientialism. First, any research program on consciousness should start by taking the *explanandum* seriously, constructing a systematic description of it. This is Lehar's "objective phenomenology." In the context of the biological sciences, this is the initial, de-

scriptive stage of inquiry. All branches of biology have begun with the descriptive stage, and the study of consciousness should be no exception.

Second, in the study of consciousness the top-down approach should be of at least as much importance as the bottom-up approach. Once we have a detailed description of the structure, organization, and dynamics of a higher level of organization (in this case, subjective phenomenology), it will impose significant constraints on the possible lower-level (neural) mechanisms that could account for the higher-level features. The lower-level mechanism must be capable of supporting exactly the kind of structure, organization, and dynamics as is found at the higher level of phenomenology; otherwise the proposed mechanism is not a plausible candidate to explain the phenomenon. The bottom-up strategy is important too, but it should be combined with the top-down strategy. Otherwise bottom-up approaches may lead either to the elimination of consciousness (because it is so difficult to see how single-neuron activity could add up to holistic features of consciousness), or to the search for the mere neural *correlates* of consciousness (rather than the directly underlying constitutive mechanisms that explain the phenomenon), because the signals that are collected from the brain usually originate nowhere near the higher levels of organization where consciousness itself resides (Revonsuo 2001).

Third, indirect realism as a theory of perception seems to be the only alternative that can give a plausible explanation of dreams and other hallucinations. Dream experiences show that the brain in rapid eye movement (REM) sleep can bring about a fully convincing simulation of the perceptual world and a simulated self embodied inside this virtual world. Dreams are temporally progressing "being-in-the-world" experiences generated inside the brain. During dreaming, phenomenal consciousness is causally isolated from the stimulus environment, from the concurrent state of the physiological body, and from behavioral output systems. As I have argued in my previous *Behavioral and Brain Sciences* commentaries on Pessoa et al. (1999) and O'Regan & Noë (2001), their theories of visual consciousness cannot account for our vivid visual experiences in dreams.

Although I therefore largely agree with Lehar as to what the proper approach to the study of consciousness should be, there is one core issue on which we seem to have differing views. His fundamental metaphysical commitment is to panpsychism (or panexperientialism), according to which (a simple form of) consciousness is a fundamental property of physical matter. According to this view there is no *radical* discontinuity between any physical systems as to the possession of consciousness; it is just a matter of degree. Everything is more or less conscious; simple physical systems to a lesser degree, the human brain perhaps to the highest possible degree. This smooth continuum of consciousness across all physical entities is supposed to have the following explanatory strengths: (1) consciousness is a fundamental property of physical matter and therefore need not be explained in terms of (nonconscious) physical matter; (2) there is no radical conscious/nonconscious dichotomy to be found anywhere in the natural order (e.g., in phylogeny or ontogeny).

This approach raises some severe problems. There are clear, well-demonstrated dichotomies between the presence and the absence of the state of consciousness (caused by anesthesia, epileptic seizures, fainting, coma) and between the presence and absence of particular contents of consciousness even though the stimuli are implicitly processed (as in blindsight or neglect). Any theory of consciousness should be able to explain these radical subjective differences between the presence and absence of consciousness. The panexperientialist is, however, forced to say that these are not really cases where the presence and total absence of consciousness in the brain could be strictly contrasted. The contrast is only between *primitive* and *more sophisticated forms* of consciousness. According to the panexperientialist, the primitive form may be something so simple that we would hardly recognize it as consciousness at all. Hence, what we thought was the total absence of experience is actually the presence of a primitive form of experience; we just cannot recognize it as experience.

Unfortunately, this move will not help us to understand the radical contrast between the presence and absence of conscious experience in the above cases. Regarding everything as conscious (to some degree) does not remove the radical conscious/nonconscious contrasts. In fact it leads to a position as difficult as (but the exact opposite to) the eliminativist position defended by Dennett. If we take either the panexperientialist position that phenomenal consciousness is *everywhere* in the world or the eliminative position that it is *nowhere,* we are no closer to explaining the radical empirical differences that we want to understand.

Furthermore, panexperientialism smacks of a misuse of the concept of experience. It is difficult to see why the postulated "primitive form" of consciousness – which we might not even recognize as experience – should be placed in the same category as our vivid phenomenal experiences. There seems to be no clear idea of what "protoconsciousness" could be, whether it exists at all, or how the claims for its existence could be empirically tested or theoretically modeled; and how exactly the primitive form of consciousness relates to our ordinary, vivid, phenomenal consciousness.

Hence, I do not regard panexperientialism as an advisable metaphysical commitment for a research program on consciousness. I would rather postulate that the sphere of subjective experience is a higher level of biological organization in the brain. Phenomenal experience exists only at that level and in those creatures whose brains can realize that level. Otherwise, the physical universe is devoid of phenomenal consciousness. When we totally lose consciousness, as we do during anesthesia, for example, our brain is temporarily incapable of supporting the phenomenal level of organization. The radical difference between the presence and the absence of phenomenal experience is to be described and explained in terms of biological levels of organization in the brain. Physical matter at lower levels of organization perhaps may be said to contain the *potentiality* of being conscious, but only in the weak sense in which all physical matter contains the *potentiality* to be alive. The mere potentiality does not make simple physical systems (say, carbon atoms or diamonds) alive, and it would be a waste of time to study the microphysical structure of diamonds in order to understand the biology of living systems. In a similar vein, I fear that the assumption that all physical systems (diamonds, toothbrushes, bacteria, and so on) are conscious (or "protoconscious") is going to be a useless, untestable hypothesis for the science of consciousness.

Protoconsciousness seems to be comparable to "ether," the invisible form of matter that was once believed to fill all physical space. The idea of a vacuum devoid of physical matter was unimaginable. Perhaps the idea of a "phenomenal vacuum" or the total absence of conscious experience is equally difficult to accept. But although there were genuine empirical phenomena that the ether models tried to account for, there seem to be no phenomena (either nonconscious physical or conscious phenomenal) that the phenomenal ether of panexperientialism accounts for. Furthermore, as far as we know there *are* total phenomenal vacuums, total absences of phenomenal experience, and we should not try to fill them by postulating a phenomenal ether that pervades all physical matter. Instead, our theories of consciousness should explain the definitive differences, both phenomenal and biological, between the total presence and the total absence of consciousness in the brain.

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