

The Qualia Manifesto

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Summary

It is the greatest intellectual challenge for humanity at present to elucidate the first principles behind the fact that there is such a thing as a subjective experience. The hallmark of our subjective experiences is qualia. It is the challenge to find the natural law behind the neural generation of qualia which constitute the percepts in our mind, or to go beyond the metaphor of a "correspondence" between physical and mental processes. This challenge is necessary to go beyond the present paradigm of natural sciences which is based on the so-called objective point of view of description. In order to pin down the origin of qualia, we need to incorporate the subjective point of view in a non-trivial manner.

The clarification of the nature of the way how qualia in our mind are invoked by the physical processes in the brain and how the "subjectivity" structure which supports qualia is originated is an essential step in making compatible the subjective and objective points of view.

The elucidation of the origin of qualia rich subjectivity is important not only as an activity in the natural sciences, but also as a foundation and the ultimate justification of the whole world of the liberal arts. Bridging the gap between the two cultures (C.P.Snow) is made possible only through a clear understanding of the origin of qualia and subjectivity.

Qualia symbolize the essential intellectual challenge for the humanity in the future. The impact of its elucidation will not be limited to the natural sciences. The liberal arts, religion, and the very concept of what a man is will be reassessed from the very foundations.

1 . History of the Mind-Brain Problem

The strong AI position held by Marvin Minsky and others was an attempt to simulate some aspects of human intelligence from an objective point of view. It had little to say about the essential problems of the mind, namely the qualia rich subjectivity.

In an effort to fill the gap left by the objective natural sciences, such movements as the "new science" and the "new age" came into the scene. These activities, however, were not particularly keen on taking seriously the consistency with the objective sciences. Even if we are to find new paradigms in search of the theory of mind, the consistency with the objective sciences should be maintained. These "alternative movements" tended instead to the over-emphasis of the subjective. These activities did not therefore lead to a real breakthrough in the science of the mind. These activities proved to be a stud.

The concept of information due to Claude Shannon is based on a statistical picture, and as he himself declared in his historic paper, has nothing to do with the semantics of information. Despite this, the Shannonian concept of information has been applied to "understand" the information processing in the brain. For example, it is an experimentally accepted fact that there is a correspondence between certain features of external objects and the spatio-temporal firing pattern of a group of neurons in our brain. This selectivity of neural activities is called "response selectivity" and is an important analytical concept in neuropsychology. However, it is wrong to think that the nature of our qualia rich perception can be explained away by the fact that there are activities of neurons in the brain characterized by certain

response selectivities. We should instead start from the "interaction picture" rather than the "statistical picture".

We cannot elucidate the neural correlates of qualia starting from the concept of response selectivity. We should instead start from Mach's principle in perception.

Qualia is deeply related to the semantic aspects of information. The Shannonian concept of information has little to do with qualia.

2. Qualia and Subjectivity

In view of the neurophysiological data, it is reasonable to assume that qualia in our mind are caused by the collection of action potentials on the cellular membrane of the neuron in our brain.

"I" feel the qualia in "my" mind. This "I" and "my" structure (subjectivity) is maintained also by the neural firings in my brain. The problems of qualia and subjectivity are deeply related.

Qualia and subjectivity in general cannot be explained away by a simple extension of physicalism. From the point of view of the objective sciences, it is necessary and sufficient to describe the temporal evolution of a system. However, the principle of correspondence of qualia to physical states should be constructed on top of the conventional type of natural laws that describe the temporal evolution of the system. This particular natural law should be of a different character from the conventional ones.

Even if we obtain an ultimate physical theory of everything, it only gives a complete description of the temporal evolution of a physical system; even then the origin of qualia from physical processes such as brain activities would remain unsolved.

Causality plays an essential role when we consider the way the perceptual space-time structure in which qualia are embedded arises from the space-time structure of the neural firing in the brain. In particular, in the Principle of Interaction Simultaneity plays an essential role in the origin of the subjective time.

The "subjectivity" that we discuss here has relatively little to do with the "subjectivity" in the context of the theory of measurement in quantum mechanics. It is our view that the introduction of the concept of subjectivity in quantum mechanics did a tremendous disservice. It confused rather than enriched the arguments.

3 . Related Problems

In modern physics, "NOW" has no special meaning in the flow of time. In order to elucidate the origin of our mind, we need to come up with a structure of the time which designates a special meaning to "Now"

The formulation of the relativistic space-time by the formalism of Riemannian geometry (Minkowski 1911) is only an intermediate step.

4 . Methodology and Conjectures

The trivial attempt to assume a seat for subjectivity in the brain (the homunculus solution) is bound to fail. For example, the Crick and Koch model puts the subjectivity seat in the prefrontal cortex. Of course, saying empirically that this seems to be a necessary correlate of subjectivity is O.K. But that does not solve the most difficult part of the problem.

In considering the neural correlates of qualia rich subjective experiences, the invariance under the transformation of neural activity patterns in space and time is going to be essential.

5 . Towards the Fusion of Two Cultures

A solution of the qualia problem is bound to have impact not only for the natural sciences but also for the humanities.

To take the visual art, music, literature seriously is to take qualia seriously. For paintings and music, this sounds like a cliché. Literature is also an art of the qualia, as the semantics is embedded in the intentional qualia.

As the so-called "exact" sciences have been focusing only on the measurable and quantifiable properties of nature, there was no place in the scientific world view for the immensely qualia rich subjective experience which is the ultimate *raison d'être* for the arts. This was the essential reason why there was and continued to be a division between the two cultures à la C.P.Snow.

To analyze the sound wave of a violin through the Fourier analysis has nothing to do with our subjective experience of the violin sound qualia. It is meaningless to say that color is nothing but the wavelength of light when our concern is the subjective experience of color.

The development of the digital information technology perhaps had a beneficial effect on the fusion of the two cultures. The digital coding of provides a useful tool for the storing and manipulation of information, but has nothing to do with the richness of subjective experience. Unless we understand the "qualia coding" by the neural activities, we cannot find scientific foundations for the subjective experience.

In general, it is nonsensical to try to explain away the enigma of qualia from the information theoretic or evolution theory points of view.

6 . On the Coming New Situation

The sense for the future essential entails a sensitivity for the possibility that the next moment can be something completely different from the previously known.

It is no longer meaningful to cling to the systemacity of religion. Religious feelings and values also consist of qualia, which in turn can be treatedly more or less individually. For example, the qualia associated with the stained glass has nothing in essence to do with Christianity. Even though traditional religion employed the appeal of the qualia as an engine to promote their specific causes, there is no reason to obstinately maintain that systemacity now.

Due to the physical limitation of the human brain, there is a limit to the category of qualia that a human being can experience. Only a ridiculously small subset of all possible qualia is accessible to the human being. This makes us take the possibilities of metaphysics more seriously.

7 . Agitation

The concept of qualia is clearly at the heart of the next stage of human intellectual endeavors.

There is no other intellectual challange more important or pressing than qualia.

The revolution can only be brought about by a combination of a rigorous scientific thinking and a trembling sensitivity.

The qualia thinkers of the world, unite!

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