

Recasting Consciousness- A Generalist View

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Abstract

Consciousness and its relevance are of great importance to all humanity. Starting with a folk definition of consciousness the present paper looks at consciousness from a broader perspective. It takes into account the fact that life is conscious at all levels and treats brain as a conscious unit. The implications of such an approach are discussed with some examples. It is considered that such an approach is useful.

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Introduction

Consciousness is perceived by every human being. For example, pain, pleasure, past thoughts, dreams of future, all are a consequence of consciousness. The natural question is what is the origin of consciousness? Many philosophers and religious leaders pondered over this problem for millennia. Earlier philosophers like Descartes and Locke considered that non-material consciousness is external to brain. Spiritual and religious thinkers particularly in India emphasized the universal nature of consciousness emanating from one divine source. Two recent papers related to consciousness based on Vedanta and Yoga may be cited (1, 2). The main stream of modern philosophers and neuroscientists embrace physicalism and think that consciousness just emanates from the brain (3, 4). The problem of consciousness in recent years has become a frontier problem of neuroscience.

Consciousness has no precise definition though we clearly know it exists. The unique subjective experience of the mind is usually emphasized in the various definitions.

The purpose of this paper is to look at consciousness differently by recasting known information. The paper first starts with a folk definition of consciousness. Then I move on to a broader definition of consciousness based on the simple idea that life is conscious at all levels. In other words, it is all pervasive in the living system. The consequence of this approach is discussed with some examples. It is

argued that the proposed broad approach has several advantages. In essence the paper attempts to broaden the reach of consciousness within the empiricism of science.

Consciousness of mind

This paper is concerned with everyday consciousness and whether we gain in our understanding by looking at it in a broader sense. Let us first start with the definition of consciousness. I would like to define it in folk language as *that which comes to mind leading to unique experience or deliberate activity*. Activity in this definition involves intellectual and or physical activity. An example of unique experience is looking at red colour. Though everyone sees the same red colour the subjective experience is different. For example, one may think of murder mystery while another may think of a red rose. It may be observed here that in neuroscience the perception of red colour is cognizance while the experience is consciousness. In the present definition it is a part of consciousness as cognizance is but a trigger to consciousness. Similarly, an internal or environmental stimulus can lead to conscious deliberation and or action. Suppose a person has to make a choice between alternatives. This need comes to the mind first. Then the mind deliberates with *free will* and decides on a choice. While there is an ongoing debate whether free will exists (5, 6) here we accept free will exists. This choice may or may not lead to physical action as the case may be. For example, suppose a person has to decide on the best numerical method to solve a problem. Based on

his knowledge and some rough work the person decides on the best method. This amounts to intellectual activity. On the other hand driving from point A to B will involve selection of the route coupled with the physical activity of driving. The mental consciousness referred to here, is abbreviated as MC in the rest of the paper. While there is no doubt that 'coming to mind' is an acceptable way of looking at consciousness the word *mind* needs to be carefully defined.

What is mind?

Definition of mind is varied indeed. Many philosophers and spiritual thinkers considered it to be distinct from brain and nonmaterial. For example the words like atman, soul, and mind have all been used to describe it. On the other hand many modern philosophers and neuroscientists consider that mind is an integral part of brain where conscious experience results. It appears the experience that happens is a collection of information from various circuits and there is probably no centralized processing. But what is certain is that there is an entity either internal or external to brain where experience happens. Hence mind in present context is defined as that which is internal or external to brain where experience happens.

Is not the whole Being conscious?

While every biologist knows that life is conscious at all levels it is somehow not brought to bear on consciousness. In particular modern evolutionary biologists like Shapiro (7) have provided evidence that a cell is not involved in just metabolism and reproduction in a routine manner. It reacts to environment

like a mini life by adjusting to it. Thus, a cell is sentient. Tissues form from agglomeration of cells and the behavior of the ensemble cannot be predicted from single cell. The famous statement of Aristotle is relevant here. He stated that the whole is more than the sum of parts. The life processes at all levels are going on consciously from the view point of each system and sub-system. Large amount of activity of brain is involved in controlling these processes. It is justifiable to consider brain as a conscious unit by itself. Repercussions of such an approach are considered next.

Brain as a conscious unit

Brain is considered a conscious unit by itself. Brain control of autonomic nervous system is normally considered an unconscious process. The autonomic processes are very large in number that includes control of heart, lungs, liver, and kidneys along with many others. Autonomic nervous system first receives information about the body and external environment. It then responds by stimulating body processes, usually through the sympathetic division, or inhibiting them, through the parasympathetic division. The major question is whether they should be treated as unconscious processes or considered to be conscious brain processes. The argument here is that the whole operation is conscious from the view point of brain and is defined as internal brain consciousness (IBC) as it involves *active control* of internal organs. In a broad sense all controls involve consciousness. Some examples of IBC include control of body temperature via thalamus, and regulation of blood pressure by the cardiovascular centers in medulla. Sometimes these brain processes may

come into MC. For example, thumping in the heart, or discomfort in breathing are perceived by MC and the person may then act to remedy the problem. These are situations where the existing control processes at IBC level become less effective. MC in such cases may be linked to survival mechanisms.

So far, we have looked at the autonomic brain processes only. Brain is involved in many other processes that include cognition to physical movement. Brain is also repository of memories, knowledge and has a capacity to learn. This consciousness of the brain may be called external brain consciousness (EBC) as opposed to IBC which involves internal organs of the body. In several cases activities may be mainly governed by EBC.

The interaction between EBC and MC- Three examples

One of the major problems in the current debate of consciousness is the idea of the combination of what are called unconscious and conscious processes. Any activity that is executed without mental consciousness is called unconscious. I differ here by calling the unconscious processes that can be linked to the brain as external brain consciousness. Three examples are given here to show the interaction.

Driving

Driving is an interesting example where once driving is well learnt most of the driving processes are executed without coming to mind. This is EBC as defined here. Just as brain consciously controls internal organs it can also, by training, learn and execute many other operations. This has the advantage of freeing the

mind for other activities like say listening to music. The role of MC and EBC can be explained by the driving process itself. Suppose a person started learning to drive. His MC is fully active at this stage because the brain yet needs training. In the normal driving also any sudden danger on the road comes to MC so that consciousness is alerted. So I propose that it is the interface between MC and EBC that is active. From this it is clear that relative role of EMC and MC depends on the situation. In other words, it is contextual. Thus, activities may be governed by EBC, MC or a combination of both.

Free will

Many of us routinely believe we can choose between alternatives consciously and act. This concept ran into difficulty based on the work reported by Libet (5). Without going into details the central idea is that simple voluntary act like flexing a wrist is initiated ahead of the person being conscious. In other words the activity starts in the unconscious before the person is conscious. This prior activity recorded by EEG is called reaction potential (RP). On the other hand a more recent paper (8) conducted Libet type experiments with a difference. They monitored EEG when a decision is made with due deliberation. The deliberate decision involved making a choice regarding payment of charity. They find that when deliberate decision was involved RP was absent supporting the normal concept of free will. Such results can be interpreted in terms of interaction between EBC and MC. Thus, the outcomes are contextual as in the case of driving.

Time factor in MC

It is interesting to know that unless mind is exposed to the stimulus for certain time it does not enter MC. Mental awareness depends on the time of exposure. Subliminal priming is an interesting example of this. A stimulus can become conscious only if mind is exposed for a minimum time called threshold of perception (9). This time may be up to 500 Ms.

The stimulus that is subliminal (less than threshold time) can also influence decision. The reasons for this are not yet clear. But it is possible that this is the result of EBC. Thus, many fast activities like reflex actions, and fast sports are probably carried out by EBC. The difference is that existing literature calls it unconscious activity. Here we are attributing it to the external brain consciousness. I feel that unless there is conscious control of activity, however fast, orderly actions may not be possible. Thus, there is an assumption here that though fast actions emanate from brain stem region the brain itself is conscious of these actions.

The important question is whether EBC effectively acts with time durations as low as 50-100ms. There is no answer to this question. One possibility is that quantum effects operate

in the brain for such quick responses. For example, it has been reported that photosynthesis is a very efficient process because of quantum coherence effects (10). Quantum alignment of neurons leading to least resistance and very fast two-way communications is a possibility. Several papers now argue for quantum biological effects as discussed in (11). Probably quantum processes can be indirectly inferred by comparing energy consumption rates for fast and slow processes.

Conclusions

It is known every cell is conscious. The present article looks at the possibility of treating brain as a conscious unit by itself. This change results in treating many unconscious processes as conscious processes of the brain. Implications of such thinking are discussed and it has been suggested that the brain-mind consciousness may be treated as an interface. The relative importance is contextual and depends on the nature of activity. Also attribution of fast actions to brain consciousness may be relevant. It is hoped that the present approach broadens the study of consciousness that may be experimentally verifiable in future.

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