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Consciousness Research and Buddhism

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Introduction

In the following presentation, I would like to talk about consciousness and its connections with Buddhism. First I will briefly introduce the theoretical and practical aspects of consciousness research, starting with theories of mind in both Western philosophy and Buddhist traditions. Then I will describe a recently emerged interdisciplinary research field: cognitive neuroscience. Within this field, the importance of studying altered states of consciousness – such as dreaming, hypnosis, meditation, and hallucinations – will be particularly emphasized. Furthermore, I will talk about meditation and its practical research that has been carried out by Western scientists using Buddhist meditators as their subjects.

1. Consciousness research

Human consciousness is one of the ultimate mysteries that have always been fascinated mankind. We have been asking questions from ourselves, such as "What is the nature of the Universe?" and "How did everything appear from nothing?" For sure, these questions are not easy to answer — if possible at all. But things get even more complicated when we apply self-reflection: "Why is the Universe happening to ‘me’?"

"Who am ‘I’, experiencing all these phenomena around ‘me’?" Indeed, the central topics in consciousness research are concerned with the questions of subjective experience, personal perspective, and phenomenality. Obviously, consciousness has a lot to do with mental functions, such as perceiving things and thinking about things, as well as with the complex physical organ that enables these functions: the brain. Thus, consciousness can be studied from a large variety of disciples, including philosophy, psychology, neurosciences, and cognitive sciences. None of these fields alone can provide full answers on the big questions of consciousness research, but all are needed for a multidisciplinary collaboration.

So what are the most challenging questions in consciousness research? First of all, we need to know the necessary and sufficient processes that are underlying consciousness. These can be revealed by a systematic charting of the neural correlates of the phenomenal experience. However, we also need to find out about the ‘explanatory correlates’ of consciousness, i.e., how phenomenal experiences can exist in the first place? The integration process of different sensory contents into one, seamlessly integrated conscious content is also of scientific interest. Furthermore, the tasks of measuring contents and states of consciousness are also challenging. From a clinical aspect, various disorders of consciousness, such as depersonalization disorder, are also to be charted. There are also ongoing philosophical debates about the possible functions of consciousness — or if consciousness has a function at all?

2. Theories of mind in Western philosophy

In earlier Western philosophy, the notion of consciousness was traditionally addressed by referring to the metaphysical idea of having a ‘soul’. From the 17th century on, natural sciences have been increasingly improved in describing and explaining the physical world and the human body. In the lack of detailed anatomical knowledge, the soul concept was difficult to fit into the actual worldview. The conceptual difference between the mortal body and the immortal soul led to theories that assumed two basic domains: one physical and one mental. The most widespread

such theory, ‘Cartesian dualism’, was named after the French philosopher René Descartes (the author of the well-known phrase “I think therefore I am”). Even though he shaped mainstream Western thinking for the following centuries, Descartes was not able to explain precisely how these two assumed domains would interact with each other. He hypothesized the mind-body interaction to happen in the pineal gland, which he described as the “seat of the soul” inside the human brain. Thus, it is not surprising that the other leading Western ontology became a monist theory, ‘biological reductionism’, which assumes that all phenomena are materially based. Materialism as a philosophy has been incorporated into political ideologies, and it had a great societal influence in the last 200 years.

In the turn of the 20th century, the then-newly emerging disciple of psychology was meant to address issues of the mental domain: the ‘psyche’. At this time, promising experimental and theoretical underpinnings were made by early pioneers of psychology, such as Wilhelm Wundt in Germany, and William James in the USA. However, after just a decade or two, mainstream psychology turned into other directions: toward psychoanalysis and behaviorism. Consciousness as a study topic resurfaced practically only in the 1990’s, in convergence with neurophilosophy, cognitive neuroscience, and humanistic psychology.

3. Theories of mind in Buddhist traditions

In comparing Western and Buddhist theories, there is an inherent difficulty in finding the equivalent concepts of ‘soul’, ‘mind’, or ‘consciousness’. Obviously, the problem is partly due to different languages, but basically it is the underlying concept of the world and human beings that creates such differences. Major world religions, such as Christianity, Judaism, Hinduism, and Islam, all believe in the concept of an immortal spirit or soul. On the contrary, Buddhism teaches the idea of ‘no-self’, i.e., the ‘self’ is only an illusory construct. The idea of ‘no-self’ can be also called a ‘bundle theory’, as it states that there is no such thing as a fixed ‘self’ part inside us, but only a bunch of sensations that create an illusion of a permanent ‘self’. This is quite different from the

Western idea of the 'Ego', which is applied in psychotherapy to promote 'self-reflecting' processes, 'auto'-biographical memories, and 'personal' feelings. Contrary to this, Buddhism offers an alternative solution for the processing of suffering and attachment by simply dismissing the idea of a 'self', thus elegantly rendering those problems void.

Concerning ontological theories, Buddhism has so many peculiar approaches that it cannot be clearly categorized. Monist endeavors, such as the *Yogācāra* school, stated that everything is "mind-only". However, Asanga's model divided consciousness into a sense organ as the subject-part (*darsana-bhāga*) and sense data as the object-part (*nimitta-bhāga*). Expanding these two parts, Dignāga introduced self-consciousness as the third part, onto which Dharmapāla and Hsüan-tsang added a fourth part: consciousness that reflects on self-consciousness. To make thing further complicated, early Buddhist sutras listed six types of consciousness: eye-consciousness, ear-consciousness, nose-consciousness, tongue-consciousness, body-consciousness, and mind-organ (*manas*). To these six, the *vijñānavādin* philosophers added two more types of consciousness: mind-consciousness (*mano-vijñāna*), and store-consciousness (*ālaya-vijñāna*).

As with these all different notions of consciousness in Buddhism, it is important to be noted that in these contexts, theories and practices are virtually inseparable from each other. For example, the practice of meditation had been used as a tool of inner discovery for millennia, and such a deep reflective knowledge surely had a great influence on Buddhist theories of the mind.

4. Cognitive neuroscience

Consciousness seems to be a mystery that many people are interested about seriously. As mentioned before, there are numerous disciplines that aim to study this phenomenon, from which a particularly interesting new multidisciplinary field is cognitive neuroscience. Sometimes also called "the biology of the mind", cognitive neuroscience aims to find out about the mind-brain connection by looking at the neural correlates of mental functions. Albeit somewhat similar to the discipline formerly termed as

neuropsychology, cognitive neuroscience relies heavily on modern research technologies and equipments. Its methods include the measurements of electric and magnetic activities on the surface of the scalp (EEG and MEG), three-dimensional brain imaging methods (MRI and PET), as well as interacting with the neural circuits by magnetic or electric stimulation (TMS and TDCS). These measurements are able to provide information on what is happening in the brain during planned performances of certain mental tasks and functions. At the same time with these objective measurements, phenomenologically oriented consciousness research is also interested about the subjective experiences of the studied participants.

5. Altered states of consciousness

We spend most of our daily life in what we can call a “baseline state of consciousness”. This is the wake, alert, sober state, where we perceive our physical environment quite precisely, pay attention to usual and unusual things, perform our tasks, think rationally, communicate verbally, etc. However, there exist plenty of other modes of functioning, where the characteristics of consciousness may notably change, and may be radically different from the usual ones. Such altered states of consciousness (ASC) may occur, for example, during dreaming, hypnosis, meditation, and various hallucinations. Some of these altered states can start up naturally and spontaneously (e.g., dreaming as part of the sleep-wake cycle), some can be deliberately induced (e.g., by hallucinogenic substances such as LSD), and some can be of pathological origin (e.g., due to high fever).

For consciousness research, the importance of altered states is due to the significant change in the functioning of virtually all subsystems of the mind/brain. Such subsystems are, for example, external and internal perception, memory, emotions, sensing of space and time, subconscious processes, and the sense of self. ASC research can thus gather experience reports during these states, and simultaneously measure the corresponding brain changes. Any suggested models of consciousness should

comprehensively include and coherently explain the mechanisms of the mind/brain not only in the baseline mode of operation, but also during various altered states.

6. Meditation research

Altered states of consciousness are frequently utilized in religious and spiritual practices throughout the world. Praying and chanting, body postures, repeated ritual movements, incense burning, glittering items, mind-altering beverages, and ceremonial dresses are all crucial parts of techniques to transcend everyday reality. Contemplation and meditation have been practiced for millennia in the East, also importantly within Buddhism. In the last decades, certain forms of meditation have been increasingly spreading in Western countries. However, meditation is often popularized and related to secular health purposes, such as relaxation and reducing stress.

Regarding scientific studies, meditation is a fascinating topic, as it represents a clearly distinguishable altered state that can be reliably self-induced on request by advanced practitioners. Moreover, meditation is quite an ideal candidate for research also because it is a temporary and reversible ASC with no unwanted side effects. Fortunately, there are many traditions that seriously practice meditation as part of their daily spiritual lives, which makes it possible to search for the effects of meditation by comparing advanced meditators with non-meditators. Scientific meditation research is basically dividable into two main directions: state research and trait research, which are to be detailed next.

Meditation state research is primarily interested about the actual physical, neural, and mental changes that occur during various meditative states. Physical changes include characteristic decreases in heart rate, blood pressure, and breathing frequency. Neural changes are due to the relaxed state: slowing of brain wave frequencies, and reduced brain metabolism in cortical and subcortical areas. Mental changes are primarily related to attention, enabling either a great amount of control (in concentration meditation), a total release of all stimuli processing (in emptiness meditation), or a conscious attending to stimuli without further associations (in mindfulness meditation).

Findings may contribute to consciousness research by revealing which neural circuits participate in enabling or disabling the subjective experience of the 'self'. It is this underlying 'observer' part of the mind that continuously keeps reflecting and commenting on mental events, but that can be "switched off" in deep meditation.

Meditation trait research is looking at the long-term effects of meditation on the body, brain, and personality. These studies often utilize volunteer participants, having many years or even decades of experience in practicing meditation. Trait research has succeeded in finding significant differences between long-term meditators and non-meditators, for example in the thickness of certain brain cortical areas. In spite that meditation in the West may be quite secular and merely a part of a 'new age' -ish or esoteric lifestyle, it may still direct the public attention toward a greater acceptance of Eastern ideas and practices.

7. Conclusions

In the quest for solving the mystery of consciousness, Buddhist ways of thinking and spiritual practices have a lot to contribute to 21st century Western science and philosophy. The contemporary significance of Buddhism lies in its detailed and comprehensive models that had been developed for millennia with sophisticated mental techniques, such as meditation. It is to be certainly admitted that most of these theoretical models have not been proven or even tested by scientific experiments — for quite understandable reasons. On one hand, there was a lack of sufficient knowledge about advanced Buddhist thinking, overshadowed by the scientific hegemony of Western models. On the other hand, there was a lack of sufficient research methodologies until the very last decades. However, from now on, a global future cooperation between science and Buddhism offers a promising avenue that may shed light on one of the greatest mysteries of mankind: human consciousness.