

Understanding consciousness in psychology



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There is no one true definition of consciousness, however the consensus of neuropsychologists and philosophers alike is that consciousness is an awareness of our mental states; experiences, sensations and feelings. The study of consciousness is described as “ the most important problem in the biological sciences” (Searle, 2005) and over the last fifteen years research and interest has grown, evident by more than 15, 000 scientific articles on the topic of consciousness being published.

Consciousness can be considered to be both subjective and objective. Scientists and philosophers alike have been researching in the hope to find an objective definition and understanding of consciousness; based on observable phenomena such as neuronal activity. However, consciousness is also subjective as conscious or mental experiences are said to be personal, individual phenomenon.

Pinker (1997) broke down the consciousness into three subjective matters, the first being sentience, which refers to experiences that take place within the mind and can be modified by individual bias, this includes raw feelings and the reporting of experiences in first person tense.

The second of matter is the access of information, the ability to describe the content of the mental experience without the ability to report how the content was accumulated by the nervous system. The third subject was self-knowledge, which is having accurate information about the self.

There are two classical perspectives of consciousness, dualism and materialism. Dualism holds the viewpoint that the physical phenomena of the brain and mental phenomena are two separate units. There are three

forms of dualism, the pure form, popular dualism and property dualism. The three forms all share the opinion that conscious experience is beyond the scope of physical science. This is termed Epiphenomenalism; there are no causal effects on the brain from mental phenomena that has derived from various brain activities.

Materialism is the contrary of dualism, materialism states that the mind and the body are both physical mediums and that consciousness is derived from physical properties. Science has proved that there are specific parts of the brain that play specific roles in mental processing and studies of individuals with lesions in particular areas show there this damage to a region can cause a person's emotional state to change.

There are many forms of materialism but the most recognised are philosophical behaviourism materialism, which emphasises a person's capabilities and dispositions because they can be measured, unlike the inner experiences, mental imagery and thoughts they may not be shared with others. Reductive materialism states that there are physical states or processes in the brain that are identical to mental states, however it is difficult to decipher mental processes to specific locations in the brain. (Gazzaniga, 2002: 656)

There are many domain specific specialised systems in the brain that interact in unique ways to produce sensations of conscious experience. People are aware of auditory, visual, tactile and olfactory sensations, particularly those that we pay attention to, however, we are unaware of the majority of mental process that take place and contribute to conscious

experience as we perceive it; we are not aware of the brain processes that precede mental phenomena.

There are many theories trying to explain consciousness and in most of these scientists are investigate neurological processes in the brain to figure out which of the many neurological processes cause consciousness. Two particular scientists that have attempted to do just that are Christof Koch, a cognitive and behavioural biologist and Susan Greenfield, a pharmacologist. They both agree that the actions of neurons are the key to consciousness but we are far from understanding exactly how. The aim of Koch and Greenfield's (2006) research was to find the neuronal correlates of consciousness (NCC), that is the brain activity that matches up with specific conscious experience.

Koch's (2006) theory states that " for each conscious experience, a unique set of neurons in particular brain regions fires in a specific manner". There are unique NCCs for each conscious experience, for example there would be separate neuronal actions for a sensation (feeling), recognising a person in a crowd or recognising an object that is unique to that specific conscious experience. A change in the NCC alters or eliminates the associated representation of the experience being perceived.

Koch (2006) believes that pyramidal neurons, long-range projection neurons, that link the back and the front of the cortex form coalitions and fire in a unique way. Different coalitions give rise to different behavioural representations of different stimuli from the senses. For instance when a person sees someone they may know in a crowd, a combination of neurons

fire together for a fraction of a second. The signal reaches the anterior of the cortex, where executive functions such as planning and perception are processed, from the posterior of the cortex, where visual stimuli is first processed. If another persons calls out a name a different combination of neurons would fire together in the auditory cortex. Two-way communication between the front and the back of the cortex is created by the coalition of the pyramidal neurons and this is what could cause focus consciousness on a particular stimuli.

What is not known is whether all the pyramidal neurons in the cerebral cortex are involved in NCC at any one time or whether it is a select few and if so which set constitute which conscious perception.

Susan Greenfield's (2006) theory states that "consciousness is generated by a quantitative increase in holistic functioning of the brain." There is not a specific region in the brain or a specific set of neurons that account for conscious; rather it is an assembly of neurons that contributes to consciousness. "For each conscious experience, neurons across the brain synchronise into coordinated assemblies then disband." The size of the assembly is related to the level of consciousness, for example during sleep the assembly will be relatively small due to the limited external stimuli not engaging neurons and would increase as one wakes up perhaps in response to the loud sound of an alarm clock. Theses 'assemblies' of neurons seem to occupy the right space and timescale for experiences of consciousness. Greenfield (2006) favours this theory as it accounts for everyday phenomena such as wakefulness from sleep and dreams; action of anaesthetics and the existence of self-consciousness.

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Not all researchers in this field believe that there is a distinct system in the brain that produces consciousness or the conscious sense of a coherent self. Rather it is the computational operations of the association cortices; the prefrontal association areas, dorsolateral prefrontal association cortex and the parietal association cortex which is the most densely interconnected region of the association cortex, that consciousness is an outcome of (Kandel et al, 2000). Association areas in the cerebral cortex, are thought to be involved in higher processing of information in the brain that is neither motor nor sensory, they take in information and react to generate an appropriate response to the stimuli presented. Individuals with lesions in the association cortices exhibit a loss, restriction or selective awareness of the self and the world around them. (Jackson,)

Patients whose primary visual areas in the cerebral cortex are damaged have no conscious experience of any visual stimuli as far as they are aware i. e. they are completely blind. If a spot of light was shone to various locations of their visual field they would not respond to it and be unaware of the light. However, when told there a spot of light was being presented to them and asked to point in the direction that the light was coming from they would point in the correct direction but state that they had no awareness of the light. This phenomenon has been termed 'Blindsight' and was studied in detail using patient DB by Weiskrantz (1986). Patient DB was also able to identify and localize other objects that were presented to him in the blindspot of the retina. Like other patients, DB insisted that he could not see the object or the light, yet the guesses of the localization of objects were

significantly correct. It is thought that perhaps blindsight occurs using other visual pathways without conscious awareness of the stimuli.

The somatosensory sensory system has been used to study consciousness. Epilepsy is a neurological disorder characterised by the loss of consciousness and convulsions. The concept of ' Split Brain' was introduced by Roger Sperry (1981) who studied patients that had a certain form of epilepsy that involves abnormal electrical activity in one hemisphere and spreads to the other via the corpus callosum that connects the right and left cerebral hemispheres. The corpus callosum consists of millions of nerve fibres that cross from one hemisphere to the other, connecting association areas with the cerebral cortex. It was found that cutting nerve fibres of the corpus callosum thus disconnecting the two hemispheres helped some epilepsy patients by eradicating the seizures. There was evident brain damage or loss of intelligence; however integration between the two hemispheres was no longer there and the hemispheres operated separately. (Thompson, 2000: 461-464)

Figure 1

Source: <http://sites.google.com/site/ibpsychology/genevieve>

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Figure 2 shows the right and left hemispheres split by the severing of the corpus callosum and their associated functions. The left visual field projects to the right visual cortex and the right visual field projects to the left visual cortex; and this is the same for sensory input from the hands.

In split brain patients the right hemisphere loses its ability of verbal comprehension which is a function of the left hemisphere. Patients presented with an object would recognize the object but were unable to name the object. Similarly the left hemisphere lost some functions that would have been supported by the integration of the right hemisphere.

The study of split brain patients with epilepsy did not give conclusive answers about consciousness, the investigation revealed that the hemispheres respond to stimuli individually thus potentially having different inputs of awareness and consciousness.

Researchers have attempted to understand consciousness by applying a Reductionist approach; by dividing the concepts of consciousness into different components. The three main concepts of consciousness proposed by John Searle (1995) and Thomas Nagel were subjectivity, unity and intentionality.

Subjectivity of consciousness refers to our conscious experiences of the world being individual and unique. A person is much more aware of their own conscious states, ideas, moods, sensations and feelings than those of others. A person appreciates the conscious experiences of others by relating and referring them to their own. The question, are there common conscious

characteristics in different individuals, is posed and one would think so if the individuals are experiencing the same world. The problem with this component is that science is objective

Unity or the unitary nature of consciousness component states that our conscious experiences come to us as a unified whole. All sensory modalities are melded into a single conscious experience; we can see, feel, smell, touch and hear something at the same time. Conscious experiences are whole and continuous. We speak in whole sentences but we do not pay attention to how the sentence was constructed. Intentionality refers to the mental content of a conscious experience or the non-physical meaning of the sensations experienced at any given moment.

When discussing the issue of consciousness, it is important to mention that there are different 'States of Consciousness'. Conscious state is when a person is fully aware and awake.

Persistent vegetative state is when a person is in a coma, which is defined as deep, unarousable unconsciousness and is often prolonged. Vegetative state, this is a coma-like state which is characterised by open eyes and the appearance of wakefulness but they are unaware of their surroundings and are unresponsive. Patients in a vegetative state demonstrate cycles of sleep and wakefulness and there is extensive damage to the cortex but the brainstem is intact. Epileptic loss of consciousness, which is a temporary loss of conscious due to an epileptic seizure and is characterised by diminished awareness and wakefulness. The latter three states of consciousness are actually states of unconsciousness and another state of unconsciousness can

be induced by anaesthetic agents. The states of unconsciousness have common features such as, hypometabolism in parietal regions of the brain; blocked functional connectivity in corticocortical and thalamocortical areas and unresponsiveness to conscious stimuli. (Baars et al, 2003, 26: 674)

Figure 2

Source: Baars et al (2003) TINS 26: 671-675

Figure 2 is a Positron Emission Tomography (PET) scan showing metabolism in the brain during four states of unconsciousness (1) Comatose, (2) Vegetative state, (3) Sleep and (4) general anaesthesia. The images in the first column of the scan shows the right lateral part of the brain, the images in the second column show the left lateral part of the brain and the third column displays a medial view of the left hemisphere. During the four states of unconsciousness there is a decrease in metabolism or blood flow compared with metabolism in resting conscious patients. There are regional differences in the decrease of metabolism in the different states of unconsciousness.

In the persistent vegetative state large areas of the brain have a decrease in activity. (Baars et al, 2003: 26: 674)

We might be able to begin to understand consciousness by exploring the unconscious processes that take place before a conscious experience and how the two states interact. Unconsciousness is defined as a state lacking normal awareness, occurring below the level of conscious thought or without sensation or cognition. Conscious processing involves conjunction which means the concurrence of processes, two things happening at the same time. In this instance it would be identifying the orientation or location of a <https://assignbuster.com/understanding-consciousness-in-psychology/>

stimulus and being aware of the stimulus at the same time. Unconsciousness involves disjunction which is the separation or disconnection of awareness of the stimulus and the features. A person can still exhibit behavioural responses to a stimulus while being unaware of the stimulus. (Gazzaniga, 2002: 660)

The vast amount of research on the topic of consciousness in cognitive science does not supply a precise definition of consciousness. However, research does show that there are possible correlations between neuronal activity and consciousness but the exact processes are yet to be known. We know that our conscious states and awareness drives our behaviours and response but further research into conscious and unconscious states is perhaps needed to be able to answer the question ' what is consciousness?'