

Introduction to the Self-Conscious Mind

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Consciousness and the brain

The prevalent view in neuroscience is that the brain produces consciousness. We are conscious because the electrical activity in our brain's neurons works in a complex way and consciousness somehow “emerges” from that complex neural activity. The difficulty with this view is that it doesn't really explain our interior, subjective *experience* of consciousness, as pointed out by David Chalmers (1995), which is the really “hard problem” of consciousness.

In our research, we use the approach of *phenomenology* to study a problem and we use a particular approach called Goethean phenomenology (Zajonc, 1999) which carefully examines the phenomenon from all available aspects to develop a theory. In Goethean phenomenology, the phenomena *are* the theory.

In our work, we looked at two sets of phenomena, one from the field of the near-death experience (NDE), which has been studied now for over 30 years and is a recognized and well-documented phenomenon (Moody, 1975; Greyson, 2000). The NDE phenomena come from reports of people who have been near death and have experienced their consciousness separated from their body. From these indications, consciousness appears at times to be able to separate from the body and operate independently of the brain.

The other set of phenomena comes from neuroscience. We reasoned that the independent conscious mind during the NDE must also work in our ordinary consciousness. In other words, our consciousness must come from a mind that works *within the brain* in ordinary life. If this is true, then there must be a number of neurological phenomena that would suggest that there is some autonomous “agency” that works with the neural electrical activity to produce our experience of consciousness. Indeed, we found several neurological phenomena that suggest that some non-neural, non-electrical agency works in consciousness. This agency we reason is the same conscious mind that appears during the NDE.

Our main conclusion is that the *self-conscious mind* is an entity in and of itself, that ordinarily unites with the brain and body to produce our everyday consciousness. The self-conscious mind (SCM) appears to us as the “field of consciousness” where our self-awareness is located. Under extraordinary circumstances, such as a near-death experience, the SCM can separate from the body and can operate for a time independently of the brain.

While it is united with the brain, the SCM interfaces with the brain's neural structures through some form of mutual induction. When I perceive something, the electrical impulses in the brain induce the consciousness of the object perceived in the SCM. When I decide to move, the SCM induces neural electrical activity that organizes the movement and then causes the movement to occur in the proper muscles. The SCM is autonomous but is dependent on the brain for its function. If the brain's electrical activity ceases, we become unconscious. Even my own thoughts, feelings and decisions must first be reflected in the brain's electrical activity before I can become conscious of them.

The near-death experience and the independent self-conscious mind

The evidence for the existence of the self-conscious mind comes from two sources: the near-death experience and from various neurological phenomena. In a near-death experience (NDE), the patient's self-conscious awareness shifts from being within the body to outside the body. The patient feels herself hovering several feet above her physical body, watching the efforts to revive her. The NDE typically begins with the transition outside of the body, followed by experiences of the immediate physical surroundings including seeing one's own body, then further experiences such as a dark tunnel and a light, and ends with a return to the body. While outside the body, the patient

still has all of the ordinary conscious faculties such as perception, thought, volition, memory, feelings and self-awareness.

The NDE provides evidence that the mind can operate independently of the brain. The NDE frequently includes an out-of-body experience (OBE) where the experiencer has *veridical* (accurate, real) perceptions of the immediate surroundings, even though the NDEr is completely unconscious. In some cases such as cardiac arrest, the NDE OBE can occur during periods when the brain has stopped operating completely (that is, a flatline EEG in both the cortex and brain stem). The veridical perceptions frequently could not have been made except from a position outside of the body, such as with the experiencer looking down from near the ceiling.

The experiences during the out-of-body component of the NDE show that the NDEr's consciousness operates with the same cognitive faculties of perception, thought, will, memory, and feelings as were present while in the body, but many faculties are enhanced, having greater acuity and agility. The NDEr's "body" appears to be non-material, having the ability to pass through objects. There is a continuity of the NDEr's memory and the sense of self, which continue from being in the body, to out of the body, and then back to the body. During the NDE OBE, the NDEr feels she is the same person as before, but is now freed of the constraints and limitations of the body. The return to the body brings back all of the characteristics of the body: weight, fatigue, physical pain and any pre-existing disabilities.

The NDE OBE is thus a coherent, self-consistent experience. During the NDE OBE, the individual appears to be a complete human being, the *same* human being who was present prior to the NDE, except for the physical body, which implies a separation *in fact* of consciousness from the physical body.

We call the independent operation of the mind the *independent* self-conscious mind. We reason that if the mind can operate independently of the brain during an NDE, it also operates *autonomously*, as a self-conscious entity, during ordinary consciousness. With a detailed picture of the NDE OBE, we can identify and distinguish the attributes and faculties of the self-conscious mind from those of the brain.

Neurological evidence of the self-conscious mind

Different neurological phenomena also suggest that an "agency" other than neural electrical activity works to produce consciousness. These phenomena include electrical brain stimulation, subjective backward referral of sensory awareness (also called "antedating") and large-scale neural synchrony:

- *Electrical brain stimulation*: When the cerebral cortex is stimulated with electrical pulses in different locations, the patient can experience perceptions, feelings, fragments of memories and uncoordinated muscle movements. In all cases, the experiences under electrical stimulation feel like they are unreal, involuntary and artificially imposed from outside. In some cases, electrical stimulation *inhibits* the functioning of ordinary conscious processes such as speech and muscle movement. Thus, electrical brain activity by itself is not sufficient to produce actual perceptions awareness or intentional movements that feel like they are "ours". Other factors must be involved in our ordinary consciousness so that our experiences feel to us to be at our initiation or the result of our inner activity. Some agency *in addition to* electrical activity must be involved that brings about our actual consciousness, whereby our intentions are effective in bringing about movement, perception and speech.
- *Subjective backward referral of sensory experiences*: When the skin is stimulated with an electrical pulse, an initial nerve impulse, called an evoked potential (EP), appears in the brain at the place in the cortex that is associated with that part of the body. The EP is followed by additional electrical activity which is more spread out in the brain neurons. Benjamin Libet (2004) showed that there needs to be at least a half-second of electrical brain activity before we can become aware of the skin stimulus. If the skin stimulus is too weak, the electrical activity lasts less than 500 msec and we do not become aware of the stimulus. When we do become aware of the stimulus, we automatically adjust our subjective sense of the timing of the stimulus back to the time of the initial EP impulse in our brain. This is called "antedating" of the stimulus timing. Furthermore, we associate the sensation correctly with the part of the body that was stimulated, even though

the electrical activity in that specific part of the brain has long ceased. Since there is no electrical activity, there is no neural mechanism that can mediate the subjective backward spatial and temporal referral of the sensations. Some agency *other than electrical activity* must “hold together” both the time and location of the sensation while the sensation comes to awareness over the period of 500 msec.

- *Large-scale neural synchrony*: At any given time, assemblies of neurons in different areas of the cortex exhibit electrical activity at a particular frequency. When two regions exhibit the same frequency and phase for a period of time, they are said to be synchronized. In other words, for a short period of time, the two regions oscillate electrically in phase with one another. When the two regions are widely distant in the cortex, more than 2 cm, this is called *large-scale* phase-locked neural synchrony. Francisco Varela and colleagues (Varela, Lachaux, Rodriguez, and Martinerie 2001) described how particular mental states can result in large-scale neural synchrony. Particular internal mental states, such as recognizing an image or deciding to move, give rise to synchronized neural activity across widely separated cortical regions. Some agency connected with these volitional mental states must interface in some way with the electrical activity of the brain to bring about the synchronization. This synchronizing agency can't itself be electrical activity because applying any sort of electrical brain stimulation would disrupt the synchronization, which would cause widespread disruptions to consciousness. But electrical stimulation of the brain appears to cause no such disruption of neural synchrony.

In each of these cases, consciousness arises but there appears to be some agency other than neural electrical activity which brings it about. We propose that this agency is the same self-conscious mind that can separate from the body during an NDE.

The idea of the autonomous self-conscious mind (SCM) can be used successfully to re-interpret various additional neurological phenomena, for example, the phenomenon of the *delayed awareness of willed action* (Libet, 2004). In this experiment, the subject is asked to move his wrist at a time of his choosing and to note the time of his decision on a special timer. Prior to any movement, the subject's preparation to move is shown in an electrical “readiness potential” (RP) that appears in the brain. About 550 msec after the RP starts, the actual movement is measured in the hand muscles. The subject also reports the time of his actual decision. We would expect that first the subject decides to move, then the readiness potential begins, in order to prepare for the movement, then the actual muscle movement occurs. Paradoxically, the RP appears to start about 350 msec *before* the subject's awareness of his decision to move, giving the impression that the brain “decides” and prepares the movement *before* the person actually decides to move.

This paradox can be explained by assuming that there is a delay between making the decision within the SCM and that decision coming to our awareness, much the same as the delay that occurs in tactile sensations coming to awareness. Indeed, if the delay in awareness of the *endogenous* (internal) mental activity (deciding to “act now”) is the same 500 msec as the delay in tactile sensations, then the paradox is removed: the decision to move is made some 150 msec prior to the brain's first response. Libet's paradox is now replaced by another paradox: we subconsciously decide to move before we are aware of the decision. This is not as difficult a contradiction, because we always decide to act out of a conscious context. When the SCM is united with the brain, all conscious awareness, including awareness of our own decisions and thoughts, must come through neural electrical activity before it reaches consciousness.

In our research, we have also examined several additional neurological phenomena and how they relate to the SCM. These phenomena are all different cases of reduced or altered neural function, namely, split-brain patients, hemispherectomy patients, hydrocephalus patients, decorticate patients, and patients with phantom limb phenomena.

From the phenomena of the NDE and various neurological phenomena, we conclude that the self-conscious mind is an entity that is whole and complete in itself. When the SCM separates from the body in the NDE OBE, it recovers sensory functions such as sight, which may have been impaired, and it is no longer constrained by physical disabilities. But when united with the body, the autonomous SCM must operate *through* the physical brain for us to be conscious and to have cognitive function. When the brain is dysfunctional or damaged in some way, the

operation of the SCM is impaired and difficulties with cognitive functions result. Nevertheless, while in the body, the SCM appears to be able to overcome significant neural damage by transference of function to other brain regions. The appropriate perspective in these cases is not the *plasticity of neural function*, but rather the *adaptability of the SCM* to relearn cognitive functions, in the face of reduced or altered neural function.

The idea of a non-material self-conscious mind which interacts with the brain has been proposed before, most notably by Karl Popper and John Eccles (1977). Likewise, our view of the self-conscious mind has similarities with Benjamin Libet's *conscious mental field* (2004). The main difference between these views and ours is that the former hold that the mind arises from the operation of the brain, whereas our view is that the mind is an autonomous entity that unites with the brain and body.

Mind-brain interactions

The strongest objection to our view is that there is no reasonable explanation how the non-material mind can interact with the brain. The interaction must therefore be inaccessible to scientific study. In response, we contend that the interactions of the SCM with the brain and body can be studied scientifically through their associated phenomena. For example, evidence from electrical brain stimulation shows that *brain-to-mind induction* of conscious experience very likely results from neural electrical activity where in some way "we" have been involved. Similarly, evidence from large-scale neural synchrony shows that our conscious mental activities induce electrical neuronal effects through *mind-to-brain induction* over widely distant points in the brain. The phenomena indicate that the induction operates from one aspect of reality (physical brain functions) to another aspect of reality (mind) and vice versa.

Still the question remains: how does the non-material mind interact with the physical brain? In particular, how can the non-material mind interact with the physical brain when it doesn't seemingly interact with other physical things while out of the body (e.g., passing through physical objects)? It is reasonable to propose that the two kinds of mind-brain induction, mind-to-brain and brain-to-mind, are equivalent, perhaps symmetrical or complementary to one another, similar to the way that electric and magnetic fields are mutually inductive. And we would expect such mind-brain induction processes to be perfectly "tuned" for efficient interactions.

In order to develop a theory of consciousness and experience from the phenomena, we propose considering the problem from two aspects: how does the self-conscious mind, when *united* with the body, interact with physical brain processes to give rise to experience, and how does the self-conscious mind, when *independent* of the body, interact with physical processes (and other mind processes) to give rise to experience. Thus, there are two classes of phenomena to be studied:

- *Neural correlates of conscious experience*: In these phenomena, electrical brain activity interacts with the self-conscious mind in a certain way to give rise to a specific subjective experience. Exactly how the mind-brain interface works can be studied via neural correlates of consciousness, and the physiological and electromagnetic aspects of mind-brain induction can probably be found and described in detail. The existence and properties of the non-material SCM can be inferred *indirectly* from the interaction of the mind with the brain and body.
- *NDEr experiences during a veridical NDE OBE*: In these phenomena, the NDEr reports experiences related to the mind when it operates independently of the body. A detailed study of the NDE OBE can reveal the nature of the interaction of the out-of-body mind with physical phenomena such as light, sound, heat and physical surfaces. The NDEr can report the shape and structure of the mind's "body", the relationship of thought and volition, the nature of memory in the out-of-body state, and so on.

To date, we have a few details of the NDE OBE phenomenology. For example, the mind's "body" appears to have an intricate, luminous structure, at least in some NDErs (Moody and Perry, 1988). The NDEr "body" generally appears luminous in some way to the NDEr, that is, giving off light of its own, although that light can't be seen by ordinary people. The NDEr's sight appears to be more complex than normal vision, having at times such qualities as

enhanced clarity and focus, omnidirectional awareness and synesthesia, that is, sensations with more than one sensory quality such as tones and colors (Ring and Cooper, 1999).

While various NDE OBE accounts indicate in general that the NDEr's "body" is non-material and does not interact significantly with objects, interactions with physical substances and energies do appear to occur, and include subtle interactions in different forms. Some NDErs report a slight resistance in passing through objects and the ability to lightly touch the surface of a ceiling. Sight for at least some NDErs is dependent on the actual level of illumination by light. Some NDErs report that they can hear, for example, heart monitors or fluorescent lights, implying an interaction with vibrations in the air. Finally, there are a few accounts of ordinary people feeling subtle interactions with the NDEr, for example, when the NDEr has playfully touched their face.

These accounts suggest that there is a subtle interaction between the NDEr "body" (that is, the SCM) and physical objects, electromagnetic radiation, and vibrations in the air, and that the interactions are subtly perceptible by another person's nervous system. If the SCM can interact in subtle ways with physical objects and air vibrations, and can directly "perceive" light when out of the body, then the SCM likely can interface in some way the electrical activity of the brain, in brain-to-mind induction. Similarly, if the out-of-body SCM can be luminous in some way and its touch can be felt by an in-body person, the SCM may similarly be able to induce electrical brain activity in the nervous system, in mind-to-brain induction.

Mind is a fundamental entity, a new dimension of reality

Another basic objection to the view that the non-material mind interacts with the brain is that such mind-body interactions would violate the laws of physics, in particular the law of conservation of energy. In our approach to phenomenology, the phenomena *are* the theory, and the fundamental phenomena in this case are clear: the veridical OBE component of the NDE suggests that consciousness can operate completely independently of the body, and a number of neural electrical phenomena suggest that a non-material agency induces conscious experiences and self-consciousness while in the body.

If the phenomena of the mind can't be explained by known physical laws, then the mind must be a fundamental entity, a new, non-material dimension of reality, one that involves mental and consciousness phenomena. If there are *non-material* aspects of reality, we would expect that the current laws of material physics need to be extended, in much the same way as they have been in the past. The fact that a non-material mind interacts with electrical brain processes means that there must be some sort of mind "force" which brings about this interaction. The effects of these mind interactions are almost certainly small, because the observed interactions in the brain are physically small, on the order of milliamperes.

Thus, the law of conservation of energy is not, in fact, violated, because there is a new fundamental entity, mind, and a new "force" which describes the nature of its interaction in the world. The law of conservation of physical energy becomes the law of conservation of *energy-mind*. "All" that we have done here is to introduce a new concept which extends our conception of reality: reality includes "mind" which interacts with the physical brain, so mind operates in the same "sphere of interaction" as matter and energy.

General principles of the self-conscious mind

The NDEr's veridical (accurate, real) perceptions during the out-of-body experience demonstrate the existence of the self-conscious mind (SCM), separate from the physical body. In the out-of-body state, the mind is non-material and is completely independent of the body. Ordinarily, though, the SCM is intimately united with the brain and body, and in this united state, the SCM operates *through* the brain. This view is supported by evidence from neurological phenomena which suggest that a non-material agency induces conscious experience and self-conscious awareness. The general principles governing the self-conscious mind include:

1. *Autonomous field of consciousness*: In ordinary consciousness, the SCM is an autonomous "field of consciousness" which is united with the brain and body and is spatially coincident with the physical body. The SCM interfaces with the body through the electrical activity of the brain and nervous system. The SCM

is generally united strongly with the brain and body but can, in some individuals, separate in the NDE and operate for a time independently of the brain and body.

2. *Interaction even though non-material:* The SCM is non-material and seemingly has little interaction with physical objects. Nevertheless during the NDE OBE, the SCM appears to have subtle interactions with solid objects with a slight feeling of resistance in passing through them, with solid surfaces through “touch”, with light through “visual perception”, and with sound vibrations through “hearing”. The out-of-body SCM apparently can sometimes be felt by ordinary people. Therefore, the possibility of a subtle form of interaction of the SCM with the brain through the nerves is reasonable. We expect such interactions would be very small in magnitude, probably being some form of complementary mutual induction, brain-to-mind and mind-to-brain, which would likely be specifically “tuned” for efficient interaction between the brain and the mind.
3. *Integration and interaction throughout the brain and body:* The interaction of the SCM with the brain appears to be via large-scale, brain-wide interactions. Furthermore, the SCM appears to have a bodily structure that projects throughout the physical body and interacts through the body neurons as well as the cortical neurons. Both external sensations and internal mental states in the SCM are reflected in the electrical activity of the brain and their effects can be seen in various forms of brain imaging such as electroencephalography (EEG) and functional magnetic resonance imaging (fMRI).
4. *Operation through the brain, coming to awareness:* In ordinary consciousness, the SCM operates *through* the brain. All cognitive events, both sensations and internal mental states, are first subliminal and “come to awareness” once there has been sufficient electrical brain activity. The electrical brain activity apparently must include activity in the dominant hemisphere in order to achieve consciousness. Subliminal perceptions can still be inferred even when the stimuli are not sufficient to come to conscious awareness through tests where the subject is forced to guess what was perceived, even when nothing was consciously seen.
5. *Cognitive functions reside in the SCM:* Since the SCM retains full cognitive function when it is separated from the body in the NDE OBE, most cognitive functions reside in the SCM, including perception, volition, feeling, thought, and memory. The brain is the supportive instrument for consciousness. In particular, memories are “stored” in the SCM although the brain mediates the *formation* and *recall* of memories while we are in the body. Memories thus resist destruction even with severe brain damage or disease. Loss of long-term memory, for example in dementia, is probably due to the destruction of brain structures that assist with memory recall, rather than destruction of the memories themselves.
6. *Early childhood development integrates the pre-existing SCM:* From NDEr accounts during infancy, the SCM appears to be already fully developed and complete at the time of birth. Thus, learning during infancy and early childhood is a process of integrating the fully-developed mind with the developing body. The process of integration of the SCM with the brain is facilitated by bodily movements and this process influences the development of brain structures. The process of integration occurs most strongly from birth through at least age 7 or 8.
7. *Adaptation to changes in neural structures:* The SCM can adapt to changes in neural structures such as may occur with disease or trauma, by transference of cognitive function to other cortical structures, such that near normal intellectual and motor functions are possible even with extremely reduced or compromised cortical structures. Successful adaptation is most likely to occur when the changes in cerebral structures have occurred gradually over time. Adaptation appears to be facilitated by bodily movements in conjunction with reacquiring cognitive skill.
8. *The seat of our selfhood:* Since the individual experiences a continuity of the sense of self during the separation of the SCM from the body in the NDE, the SCM is the locus of our self-conscious awareness both within the body and out of the body. The SCM is thus our sense of self or selfhood. Even when an individual has significant physical or cognitive disabilities or impairments, the SCM, and therefore the person per se, remains whole and complete.

This view of the mind and body offers a number of perspectives different from those currently taken by most neuroscience researchers:

- The self-conscious mind is an *entity* in its own right that *interfaces* with the brain, rather than an *effect* that *emerges* from the brain's operation.
- When neurological functions become impaired, the mind exhibits *adaptability* in operating within the brain, rather than the brain exhibits *neural plasticity*.
- The mind is the *person per se*, rather than brain processes *determine the person*.
- Significant brain impairment may *impede* the mind from operating but the mind and the person *remain whole*, rather than brain impairment *diminishes mental function* and thereby *diminishes the person*.
- Memory resides *within the mind* and uses the brain for memory formation and recall, rather than memory is *encoded in the brain*.

In this view, our *sense of self* is the self-conscious mind itself, rather than a conceptual self that emerges from the operation of the brain's neural circuits. To be sure, our *awareness* of our self and of much of the rest of our experience of the world is dependent on the operation of neural circuits while we are in our body. But because the self-conscious mind is fundamentally *independent* of our brain, our sense that our self is in charge of our destiny is, in fact, true.

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