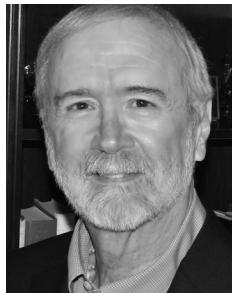


# Consciousness

By William J. House



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Consciousness is one of the most perplexing concepts people have struggled to understand and explain. In this paper, the etymological history of the word *consciousness* will be examined, along with some prominent experimental facts, a bit of the pertinent neurophysiology, and some important theoretical positions.

*Consciousness* is a word of fairly recent origin that probably stands for several interrelated phenomena. First, *consciousness* is necessarily personal and private. Second, as people write or speak, they are interested in gaining the reader's *attention* so that he or she may follow the author's *thoughts* and *understanding*. From one perspective, the writer is attempting to engage and manipulate the reader's consciousness. From another, the communication is merely linking words that the author hopes others have in common.

For example, teachers try to find words and personal experiences that they believe they have in common with their students. But the question always remains: does the student's mimicking of the instructor's words on essays or identifying the identical phrase from the textbook on a multiple choice exam mean that the teacher and students have connected their consciousness? The same question should be asked of the amazing ability of "Watson,"

the artificial intelligence computer program that won against really smart humans on the television show *Jeopardy*. It applies as well to the stunning observations of gorillas, chimpanzees, and other animals who seem to demonstrate understanding of human language. Do computers, animals, and, yes, fellow humans share conscious *experience*? Or do we merely infer from the actions of others, correctly or not, that they have consciousness just as we do?

But then, what is an individual's consciousness? There are many similarities between one person's actions and the actions of others. People's behavior corresponds with what they have come to think of as *their* "consciousness." They watch television, sit and think, read books and articles, and converse with friends about what they see and ponder. But is it justified for them to infer from the performance of these actions by others that such an actually invisible state as consciousness exists?

Marvin Minsky, one of the founders of modern "artificial intelligence," concluded in an interview:

The word "consciousness" is a clever trick that we use to keep from thinking about how thinking works. We take a lot of different phenomena

and we give them all the same name, and then you think you've got it.

On the other hand, cognitive scientist Donald Hoffman (2014) has argued the radical empiricist view that consciousness and experience are *all* that exists.

Ultimately, consciousness may be merely a “trick” word that describes many different parts of our very complicated mentality and our endlessly fascinating repertoire of behavior. Or, the word may stand for the *complete* reality of what’s happening in our minds and the limits of our grasp of the “universe” in which we believe that we exist.

### Etymology

Our modern word *consciousness* comes from a legal term used by Roman lawyers. The Latin polymath Cicero (106-43 BCE) used the Latin word *conscientia* to mean having shared knowledge, for good or ill, maybe secretly with another person. Later, St. Thomas Aquinas (1225-1274 CE) extended that law-term to mean our shared knowledge with God—certainly not merely an ordinary someone else. This led to the creation of our word *conscience*, the internal understanding of what is good versus evil that is gained from our personal mental connection with the Creator or another inherent moral source.

The evolution of the word “consciousness” and, possibly, the concept itself continued with the work of René Descartes (1596-

1650). The great thinker wrote about our minds’ independence from our bodies. Our minds, according to Descartes, are not physical but are nonetheless able to direct our physical actions. The essence of this “mind-body” interaction is (in Latin) *conscius*, the awareness of our own thought. The philosopher famously used this idea to show how we know of our own existence: “*Cogito ergo sum*” or (a paraphrase) “my *consciousness* proves my existence”. Indeed, maybe, consciousness is the only proof we have of who we are.

## Our modern word consciousness comes from a legal term used by Roman lawyers.

Ignoring this Cartesian puzzle, John Locke (1632-1704) proceeded to coin the new English words “*conscious*” and “*consciousness*” in their modern sense. Locke first used the new word to describe *shared* knowledge, just as the Roman lawyers did. But later in his work, Locke employed the new, more reflective word, to mean *personal* knowledge of one’s own self. He wrote in his *Essay Concerning Human Understanding* (1689), “I shall enquire into the

origin of [...] ideas [...] that a man observes and is conscious of having in his [own] mind.”

In 1714, German thinker Gottfried Leibnitz (1646-1716) published a work called *La Monadologie* in which he created a new French word, *appereception*, by which he meant *personal* consciousness. This philosopher viewed consciousness as the awareness of unity or distinctiveness, and, most importantly, the realization of one’s self. Unlike Descartes, Leibnitz endorsed the *act* of perceiving the world rather than the more passive *thought* about our mutual condition as the central issue of consciousness.

Further, Leibnitz proposed a continuum or scale of our awareness that corresponds with our actions and experience, the “*petite perceptions*” or levels of consciousness. Indeed, Leibnitz wrote that “all things are full of life and consciousness,” and his idea set the stage for the coexistence of *unconsciousness* along with the gradations of awareness. Moreover, according to Leibnitz, consciousness is a *universal* product of creation—perhaps, even, the ultimate goal. (A comparable idea was later developed by Carl Jung [1875-1961]: the “collective unconsciousness.”)

Immanuel Kant (1724-1804) brought the developing concept of consciousness into modern times with his examination of how we humans think and then freely choose what to do in his *Critique of Pure Reason*. First, this philosopher

proposed that our senses provide raw information through “*a priori* categories”—innate ways that we sort out our sensory experiences. Then, these mental compartments are amalgamated into the “unity of consciousness.” All of the sensory information that regularly bombards our separate senses are brought together into a *single* view of who, where, and when we are.

In *Principles of Psychology* (1890), American psychologist William James (1842-1910) moved toward explaining how our moment to moment awareness works using the famous idea of the “stream of consciousness.” Consciousness, for James, is the dynamic process of sensing and remembering the immediate past, thereby creating what he called the “specious present”—a fleeting and dubious moment. What James called “Self-Consciousness” is the core of one’s actively changing knowledge of how one personally relates to the world. To James, our continually developing idea of who we are and of how we relate to the barrage of worldly experience and our always burgeoning memories is the very basis of our consciousness. But how does our individual experience combine to produce the dramatically unique persons that we become?

Sigmund Freud (1856-1939) attempted to apply the First Law of Thermodynamics (conservation of energy) from physics and chemistry to the understanding of consciousness. This law requires that the action of *any* system be accounted for with a constant level of energy. That is, although energy

may appear to change as action occurs, all of the power of the system must be preserved without addition or subtraction of outside force. Freud was one of the first to apply this influential physical law to psychology.

## Consciousness as it may exist outside of our completely personal experience can only be totally and exasperatingly *inferred*.

Freud conceived of the energy of the human mind as powerful drives that are the product of our interaction with the world. Following Charles Darwin’s (1809–1882) theory of natural and sexual selection, Freud argued that our biological energy is directed toward self-preservation and consequent species preservation through procreation—sex. And that is where Freud’s theory enters into the discussion of consciousness.

Greatly influenced by Leibniz’ theory of “*petit perceptions*” or degrees of consciousness, Freud

proposed that human action is caused by drives that we only marginally realize or to which we are totally oblivious. That is, some of the motivational energy of our actions comes from powerful *unconscious* drives. And, indeed, the consciousness of our self (in Freud’s terms, the Ego) is fabricated to serve these basic self- and thus species-serving sensual drives (for Freud, the Id). The definitive account of this idea is in Freud’s *Five Lectures on Psychoanalysis* (1910).

### Some Empirical Facts

The concept of “consciousness” developed along with the words used to describe the ineffable sense of “knowing” that we all seem to share. Unlike the similar enigma, gravity, consciousness as it may exist outside of our completely personal experience can only be totally and exasperatingly *inferred*. However, perhaps a careful examination of the words that we use and the undeniable facts of behavior and neuroscience will lead to understanding our own consciousness and what seems to be our mutual experience.

*The Cocktail Party Phenomenon.* You have surely experienced being in a noisy restaurant or party in which you are trying to heed the words of a friend. Then, from across the room, your own name is spoken and immediately your attention is diverted. What is happening to your consciousness in such a situation? We might think that our consciousness is focused on the immediate conversation, but at another level, we must be

attending to other matters that might be important to us.

British psychologist Colin Cherry (1914–1979) examined and named this fascinating aspect of awareness the “Cocktail Party Phenomenon”. The implications of his findings for understanding consciousness are quite important.

In his experimental method, Cherry had subjects listen to different messages presented to each ear simultaneously. These people were instructed to pay attention to the message in one ear but to ignore the other. Although the subjects appeared unaware of the message in the unattended ear, previously presented “priming words” that were personally significant to the listener were randomly presented to that ear. The subjects showed that they heard these words in spite of their diligent attention to the message in the opposite ear. Their attention to the listening task was easily diverted with personally important information.

The results of this experiment imply that consciousness is not a single, linear process. Rather, it is either multifaceted or it is the result of completely separate components.

*Split Brain, Split Consciousness.* Roger Sperry (1913-1994) won the Nobel Prize in 1981 for creating a surgical technique called a “corpus callosotomy.” This procedure for controlling the very worst epileptic seizures uses the logic of a “fire-break”: the two hemispheres of the brain are surgically separated

so that the out-of-control epileptic neural impulses are limited only to the cerebral hemisphere of their origin. The surgery successfully worked in lessening the impact of the disease, but it also opened a new view of the relationship between the brain and consciousness: consciousness can be *physically* isolated by interrupting the communication between the two cerebral hemispheres of the brain.

## The consciousness that directs our spoken words is separate from the consciousness that compels our actions.

Michael Gazzaniga (b. 1939), a student of Sperry, designed experiments to examine the effects of the “split brain” surgery on the consciousness of these patients. For example, some patients were rapidly presented with visual words, pictures, or real objects so that the image would only register in one or the other brain hemisphere. Then, they were asked to identify the word, image, or object that was presented.

The left hemisphere is the origin of speech, so when the stimulus was presented there, the subject could and would respond orally; when presented to the right hemisphere, there could be no spoken response and, in fact, there was no oral response. However, when asked to point to or grasp the stimulus presented to the mute right hemisphere, the patient succeeded in identification by pointing or touching the presented item.

Thus, the *consciousness* that directs our spoken words is separate from the *consciousness* that compels our actions. Furthermore, consciousness is conclusively a function of the neural activity of our brains.

*Blindsight.* Another example of impaired consciousness resulting from a damaged brain is “blindsight”—the rare ability to respond to visual information without apparent consciousness of what is viewed. It sometimes occurs when there is injury to the primary visual cortex at the back of the brain. This dysfunction has been extensively studied by Lawrence Weiskrantz (b. 1926).

In a clinical observation, for example, a seemingly blind patient was seated in front of a video monitor and asked to describe what was on the screen. After reminding the experimenter that she was blind, the patient was urged to guess. At that point, the subject responded with a remarkably accurate “guess” of the visual image.

Again, as in auditory information, it appears that visual

stimuli also bypass one level of consciousness and can be registered in yet another accessible and describable sort of awareness.

*The Libet Experiment.* In 1983, Benjamin Libet (1916-2007) studied the extremely brief time between the presentation of a stimulus, the conscious decision to act or not, and the eventual physical response itself. These experimental requirements were something like how a baseball batter or tennis player “decides” how and when to react to the extremely rapid event of a quickly flying ball.

While watching a rotating dot on a TV screen, subjects were asked to decide whether or not to act as the dot passed a point of their previous choosing on the screen, to announce their intention, and finally to react by pressing a key. Meantime, the subject’s brain activity (EEG) was recorded from the frontal (thinking) and motor (acting) cortex, and their motor movements were simultaneously monitored and timed. Consistently, the motor action and brain response preceded the conscious thought, all happening within a half second.

Unsurprisingly, explanations for these findings are controversial and have aroused a great deal of productive conversation. Are the Libet findings a verification of the power of *unconsciousness* over conscious action (e.g., James and Freud)? What do the experimental results mean for our ideas of “free will” or the very idea of the *mind* (e.g., Kant and John Locke)?

## Some Notable Contemporary Theories

In recent years, a number of useful theories have been created from empirical findings by many excellent thinkers. Below are four representative and distinguished modern theories of consciousness. While their differences certainly express the complex nature of consciousness, these positions do not compete; rather, they complement each other in portraying the complexity of consciousness. They are each different but valid ways of looking at the many aspects of consciousness. The first two of these theories center on the subjectivity of our consciousness, and the latter pair of theories focus on how consciousness enables cooperation with other people.

# How do all of the parts of our mentality come to produce an apparently unified “conscious” experience?

*Feature Integration Theory: Our Personal View of the World.* How does the incorporation of multi-sensory information and memory come to create a unitary

understanding of the “present” of where and who we are *now*? Today, scientists speak of this issue as the “Binding Problem”: how do all of the parts of our mentality come to produce an apparently unified “conscious” experience? Psychologist Anne Treisman (1935-2018) confronted the “Binding Problem” and won the National Medal of Science in 2013 for her efforts.

Treisman theorized that “pre-attentive” processing extracts sensory patterns into “feature maps.” This is accomplished unconsciously; the overlaps or consistencies among these maps then produce “saliency maps” where we come to consider or create our *own* world—our tastes, attitudes, dispositions, and beliefs. Give people apples, and all of their conscious experience and lifetime of memory tell them what they are enjoying *now*. Consciousness, thus, comes about through unconscious cooperation among the senses and memory that produces the consistent sense of who, where, and when a person is.

*Somatic Marker Theory: Personal Emotion as the Basis of Consciousness.* Portuguese-American neuroscientist António Damasio (b. 1944) developed a theory of consciousness focusing on the relationship among our multiple sensory systems, our seemingly integrated bodily responses, and our sense of a unified “self”. This theory proposes that body memory, “somatic markers,” are responsible for the organization of our conscious experience and its very personal nature. Organization

of consciousness is established from “core consciousness” (the perception of the present), “extended consciousness” (the awareness of *now* in the context of the immediate past, or short-term-memory), “autobiographical memory” (our unique self), and our “emotional dispositions” (our attitudes and intuitions). Damasio’s theory, thus, promotes our conscious *selves* according to our lifetime’s experiences of feelings, emotions, memories, and growth.

*Social Consciousness: How We See the Consciousness of Others.* Italian neuroscientist Giacomo Rizzolatti (b. 1937) discovered “mirror neurons” in primates (specifically, the pre-motor cortex of chimpanzees). These neural circuits were seen to be active both *during* a specific action and also, most significantly, *while* observing others acting similarly. These findings would certainly explain our ability to coordinate our activity with other people—performing musical, athletic, social activities, and, possibly most importantly, playing together.

Perhaps more basically, the “mirror” cells of our brains might also be the basis of our ready tendency to impute our own mental states, *consciousness*, in others.

*Theory of Mind: How We Become a Conscious Community.* David Premack coined the term “Theory of Mind” (ToM) for the inductive conclusion that one’s own mental attributes also exist in others (1978). Accordingly, higher organisms come to behave

towards others who exhibit similar behaviors or appearance as if those others have the same mental experiences as themselves. Theoretically, thus, ToM enables cooperation, empathy, and intention.

As every parent knows, children normally see their own feelings in toys, dolls, pets, and each other very early in their lives. Indeed, according to Simon Baron-Cohen (b. 1958), failure or deficient development of ToM is the cause of autism and Asperger syndromes.

### Some Conclusions and Opinions

The intractable problem of understanding and explaining consciousness is that it, or its components, are inherently subjective. No one knows another person’s own consciousness but that person. Whether an individual’s means to understand include observation of other’s behaviors, brain activity, or assessments of spoken words, every person’s consciousness is unrelentingly personal and private.

But then, people’s probing of their *own* consciousness suffers from the very weakness in introspective analysis revealed in early attempts to apply scientific method to psychological questions. That there is a discernible unconscious component of consciousness means that the very consciousness that individuals use in this attempt is anything but objective and not always, if ever, dependable. Without question, the capability of everyone’s own reasoned analysis changes from

moment to moment and sometimes its competence disappears completely.

Exactly how much control do we possess over our conscious decisions to feel, think, and act? Are we truly free to conjure our own thought? And what does personal conscious freedom actually mean?

These ancient questions continue and, plainly, they are crucial matters to pursue. This isn’t a parlor game. These are question of how we fit into the Cosmos and what we must do to progress and, ultimately, understand and... survive.

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*Dr. Laura Wittern*

June 4, 2018: Volunteering Abroad as Soft Power  
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May 9, 2018: The Ongoing Campaign to Eliminate Polio Worldwide  
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June 13, 2018: Drug Addiction:  
Sociological-Biochemical-Personal Accounts  
*Ming Tien*

### **DURHAM-CHAPEL HILL, NC**

May 16, 2018: Durham's Monuments to Artistic Genius: A Proposal  
*Dr. Rick Powell, Professor of Art History, Duke*

### **FREDERICK, MD**

May 21, 2018: Traits of Effective Leaders  
*Betty Molina Morgan, PhD*

### **MONTGOMERY COUNTY, VA**

May 8, 2018: Green Burial and Other Funeral Options  
*Isabel Berney*

### **READING, PA**

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May 9, 2018: The Story of the House  
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June 14, 2018: Summer Social Event