

HOW TO SEPARATE CONCEPTUAL ISSUES FROM EMPIRICAL ONES IN THE STUDY OF CONSCIOUSNESS¹

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Abstract. Modern consciousness studies are in a healthy state, with many progressive empirical programmes in cognitive science, neuroscience and related sciences, using relatively conventional third-person research methods. However not all the problems of consciousness can be resolved in this way. These problems may be grouped into problems that require empirical advance, those that require theoretical advance, and those that require a re-examination of some of our pre-theoretical assumptions. I give examples of these, and focus on two problems—what consciousness *is*, and what consciousness *does*—that require all three. In this, careful attention to conscious phenomenology and finding an appropriate way to relate first-person evidence to third-person evidence appears to be central to progress. But we may also need to re-examine what we take to be “natural facts” about the world, and how we can know them. The same appears to be true for a trans-cultural understanding of consciousness that combines classical Indian phenomenological methods with the third-person methods of Western science.

Key words: consciousness, mind, brain, cognitive science, neuroscience, hard problem, easy problem, first-person, third-person, phenomenology, Indian philosophy, dualism, materialism, reductionism, reflexive monism, causation, causal problem, natural fact

What are the problems of consciousness?

Traditionally, the puzzles surrounding consciousness have been known as the "mind-body" problem. However, it is now clear that "mind" is not quite the same thing as "consciousness", and that the aspect of body most closely involved with consciousness is the brain. It is also clear that there is not one consciousness-brain problem, but many.

As a first approximation, these can be divided into five groups, each focused on a few, central questions:

Problem 1. What and where is consciousness?

Problem 2. How are we to understand the *causal relationships* between consciousness and matter and, in particular, the causal relationships between consciousness and the brain?

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Problem 3. What is the *function* of consciousness? How, for example, does it relate to human information processing?

Problem 4. What *forms of matter* are associated with consciousness—in particular, what are the neural substrates of consciousness in the human brain?

Problem 5. What are the appropriate ways to *examine* consciousness, to discover its nature? Which features can we examine with first-person methods, which features require third-person methods, and how do first- and third-person findings relate to each other?

According to Chalmers (1995) the problems of consciousness may be divided into the “easy” problems and the “hard” problem. “Easy” problems are ones that can be researched by conventional third-person methods of the kind used in cognitive science, for example investigations of the information processing that accompanies subjective experience. The “hard” problem is posed by subjective experience itself. As he notes:

“It is undeniable that some organisms are subjects of experience. But the question of how it is that these systems are subjects of experience is perplexing. Why is it that when our cognitive systems engage in visual and auditory information-processing, we have visual or auditory experience: the quality of deep blue, the sensation of middle C? How can we explain why there is something it is like to entertain a mental image, or to experience an emotion? It is widely agreed that experience arises from a physical basis, but we have no good explanation of why and how it so arises. Why should physical processing give rise to a rich inner life at all? It seems objectively unreasonable that it should, and yet it does. If any problem qualifies as *the* problem of consciousness, it is this one.” (Chalmers, 1995, p201)

Following the strenuous efforts in the late 20th Century to demonstrate subjective experience to be nothing more than a state or function of the brain (see review in Velmans, 2000 chapters 3, 4 and 5), Chalmers’ “easy” versus “hard” problem distinction provided a useful reminder that a purely third-person functional analysis of human information processing cannot reveal what it is like to have a subjective experience or explain why it arises (see also Velmans, 1991a). However, this division of the problems of consciousness into “easy” and “hard” ones was, in turn, an oversimplification. As Chalmers himself accepted, even so-called “easy” (empirically researchable) problems can in practice be very difficult to solve. It may also be that the “hard” problem only seems unusually hard because we have been thinking about it in the wrong way. If so, changing some of our unexamined assumptions might be all we need to make the problem “easy.”

For example, in contrast to consciousness, we usually take the existence of matter for granted, and we assume that physics does not present similarly “hard” problems. But there are many. Why, for example, should electricity flowing down a wire be accompanied by a magnetic field around the wire, why should photons sometimes behave as waves and at other times as particles, and why there should be any matter in the universe at all? We simply assume these to be natural facts that we can observe in the world. We can try to explain them by incorporating them into some body of theory, but we do not agonize over their *existence*. It might equally be a natural and irreducible fact about the world that certain forms of brain functioning are accompanied by certain

forms of first-person experience. That would require us to change a few of our pre-theoretical assumptions about the nature of matter and its relationship to consciousness, and we would still have to investigate the principles that govern the consciousness-brain relationship in great detail. But the fact that given conscious states accompany certain forms of brain functioning would then be “hard” to understand in the same sense as many facts in physics.

Given this, it seems more useful to sort the problems of consciousness into those that require empirical advance, those that require theoretical advance, and those that require a re-examination of some of our pre-theoretical assumptions². If, for example, the problem is "What are the neural substrates of consciousness?", or, "What forms of information processing are most closely associated with consciousness?", then conventional cognitive and neuropsychological techniques look as if they are likely to yield useful results. There are many questions of this empirical kind and, consequently, the new "science of consciousness" is already very large (see the extensive reviews and readings in Velmans & Schneider, 2006).

Examples of empirical questions and investigations within neuropsychology include :

- The search for the neural causes and correlates of major changes in normal, global conscious states such as deep sleep, rapid eye movement dreaming, and the awake state.
- The search for added neural conditions that support variations in conscious experience within normal, global states, such as visual, auditory and other sensory experiences, experiences of cognitive functioning (the phonemic and other imagery accompanying thinking, metacognition, etc), and affective experience.
- The search for neural conditions that support altered states of consciousness in psychopathology and in non-pathological altered states, such as the hypnotic state, some drug-induced states, meditation, and mystical states.

Examples of empirical questions and investigations within cognitive psychology include:

- Examination of the timing of conscious experience. When in the course of human information processing (for example in input analysis) does a conscious experience arise?
- The determination of functional conditions that suffice to make a stimulus conscious. For example, does material that enters consciousness first have to be selected, attended to and entered into working memory or a “global workspace”?
- The investigation of functional differences between preconscious, unconscious, and conscious processing (e.g. in studies of non-attended versus attended material).

² Some problems require a combination of these approaches.

Given that we can get an empirical handle on such investigations, it is sometimes assumed in the consciousness studies literature that these problems are *entirely* empirical—and even that *all* the problems of consciousness will eventually be resolved in this way.

But it is easy to show that this is not so. One might think for example that Problem 1, the nature and location of consciousness, should be easy to resolve, as we all have access to and information about our own consciousness. However both its nature and location are much disputed in the literature—and the same may be said about the enduring puzzles and disputes surrounding the causal relationships between consciousness and the brain (Problem 2). Although empirical progress can be made with many questions (of the kind listed above) without first settling such disputes, we cannot in the end ignore them, for the simple reason that pre-theoretical assumptions, theories, and empirical problems interconnect. How, for example, could one arrive at an agreed understanding of the neural correlates of consciousness without an agreed understanding of what consciousness is—and without an understanding of how consciousness *could* have causal effects on matter, how can one determine its function in the workings of the brain?

Problems of definition

According to Thomas Nagel (1974) consciousness is "what it is like to be something." Without it, after all, it would not be like anything to exist. While it is generally accepted in modern philosophy of mind that this does capture something of the essence of the term, no universally agreed "core meaning" exists. This is odd, as we each have "psychological data" about what it is like to *be conscious* or to *have consciousness* to serve as the basis for an agreed definition.

This uncertainty about how to define consciousness is partly brought about by the way global theories about consciousness (or even about the nature of the universe) have intruded into definitions. In the classical Indian tradition, e.g. in the Upanishads, consciousness is thought to be, in essence, transcendental, for example as Ātman (sometimes identified with Brāhman)—a pure, subject-object-less consciousness that underlies and provides the ground of being of both Man and Nature (Saksena 1965). In the classical Western tradition, "substance dualists" such as Plato and Descartes bifurcated the universe, believing it to consist of two fundamental kinds of stuff, material stuff and the stuff of consciousness (a substance associated with soul or spirit). Following the success of the brain sciences and related sciences, 20th Century theories of mind in the West became increasingly materialistic, assuming physical "stuff" to be basic and consciousness in some way "supervenient" or dependent on the existence of physical forms. For example, "property dualists" such as Sperry and Libet took consciousness to be a special kind of property that is itself non-physical, but which emerges from physical systems such as the brain once they attain a certain level of complexity. Taking materialism to its logical conclusion, "reductionists" such as Crick (1994) and Dennett (1991) argued consciousness to be nothing more than a state or function of the brain. Within cognitive psychology, there were many similar reductive proposals which identified consciousness with some aspect of human information processing, for example with working memory, focal attention, a central executive, or a "global workspace".

I do not have space to examine the arguments for and against these and many other proposals here (but see Velmans, 2000, chapters 2 to 5). Suffice it to say that these differing claims about consciousness often start more from some pre-existing *theory* about the nature of the mind or world than from the *everyday phenomenology of consciousness itself*. In the modern literature, for example, Dennett provides a prominent example of the triumph of materialist theory over phenomenological evidence when he tries to deny the very existence of phenomenal qualities (as normally understood). He makes this perfectly clear when he writes:

"Philosophers have adopted various names for the things in the beholder (or properties of the beholder) that have been supposed to provide a safe home for the colors and the rest of the properties that have been banished from the external world by the triumphs of physics: raw feels, phenomenal qualities, intrinsic properties of conscious experiences, the qualitative content of mental states, and, of course, qualia, the term I use. There are subtle differences in how these terms have been defined, but I am going to ride roughshod over them. *I deny that there are any such properties. But I agree wholeheartedly that there seem to be.*" (Dennett, 1991, p372 - my italics)

Dennett arrives at this view by presupposing that while information obtained from a third-person perspective is "scientific" and reliable, first-person information has no credence at all. Indian philosophy assumes the opposite to be true. There are, of course, also many Western views that take conscious phenomenology seriously—and I have given a detailed critique of Dennett's position that I do not have space to repeat here (see Velmans, 2000, chapter 5, 2001, 2007). It should be evident however that such oppositions neatly exemplify a situation where pretheoretical assumptions (in this case about the nature of the world and how we can know it) motivate the argument.

There can be no point of convergence and certainly no consensus between researchers who take the existence of conscious phenomenology to be both self-evident and important, with those who give no credence to that phenomenology at all. Classical Indian investigations of consciousness for example have been *primarily* phenomenological. Note however that their conclusions about the nature of consciousness arise largely from altered conscious states consequent on prolonged periods of meditation, and this can be another, potential source of confusion in East-West discussions focused on the nature of *everyday* conscious phenomenology. The pure, contentless consciousness said to be experienced in such states is, in various writings, thought to underly all of Nature, which makes this a claim about what in the West is sometimes referred to as "the ground of being" or, in Kantian terms, "the thing in itself," rather than a claim about the forms of "phenomenal consciousness," that are more usually investigated in modern consciousness studies.

In short, to make progress towards some global understanding of consciousness, we may first have to take a step backwards, and re-examine our different points of departure and the presuppositions that support them. Empirical investigations on their own won't always do.

To what does the term "consciousness" refer?

To investigate any phenomenon, one first has to “point to” or pick out the phenomenon that one wishes to investigate sufficiently well for independent investigators to be confident that they are investigating the same thing. For many researchers, the phenomenology of everyday conscious experience (often referred to as “phenomenal consciousness”) provides a natural place to start.

In some writings "consciousness" is synonymous with "mind." However, given the extensive evidence for nonconscious mental processing this definition of consciousness is too broad. In Western psychology, "mind" typically refers to psychological states and processes that may or may not be "conscious".

In other writings "consciousness" is synonymous with "self-consciousness." As one can be conscious of many things other than oneself (other people, the external world, etc.), this definition is too narrow. Here, self-consciousness is taken to be a special form of *reflexive* consciousness in which the object of consciousness is the self or some aspect of the self.

The term "consciousness" is also commonly used to refer to a state of wakefulness. Being awake or asleep or in some other state such as coma clearly influences what one can be conscious of, but it is not the same as being conscious in the sense of having "phenomenal contents." When sleeping, for example, one can still have visual and auditory experiences in the form of dreams. Conversely, when awake there are many things at any given moment that one does *not* experience. So in a variety of contexts it is necessary to distinguish "consciousness" in the sense of "phenomenal consciousness" from wakefulness and other states of arousal, such as dream sleep, deep sleep, and coma.

“Consciousness" is also sometimes used to mean "knowledge", in the sense that if one is conscious of something one also has knowledge of it. However, at any moment, much knowledge is nonconscious, or implicit (for example, the knowledge gained over a lifetime, stored in long-term memory). So consciousness and knowledge cannot be co-extensive.

The above distinctions are quite widely accepted in the contemporary scientific literature (see, for example, Farthing, 1992; readings in Velmans & Schneider, 2006) although it is unfortunate that various writers, both East and West, adopting different philosophical positions and pre-theoretical assumptions, continue to use the term "consciousness" in very different ways. One might think for example that confining the use of the term “consciousness” to “phenomenal consciousness” (its everyday phenomenology), might be enough to reach at least an initial agreement about what it is that we are investigating. Unfortunately, nothing could be further from the truth—as differing philosophical positions make very different claims even about the *global* nature of conscious phenomenology. Following Descartes, for example, Dualists maintain that conscious experiences are composed of “thinking stuff” (*res cogitans*) that, unlike material stuff (*res extensa*), has no location or extension in space. Materialist Reductionists claim something very different. If consciousness is nothing more than a state or function of the brain then conscious experiences must also have a location and extension in the brain. Reflexive Monism argues against both of these positions on the grounds that both give a false account of our everyday experience. Rather than the phenomenology of our conscious experiences being either “nowhere” or “in the brain” the contents of consciousness include the entire phenomenal world that has phenomenal location and

extension beyond our experienced bodies up to the dome of the sky. Experienced objects and events also have an experienced location and extension within that phenomenal space. Such disputes about the location and extension of conscious phenomenology are not merely “philosophical,” for the reason that they invite different avenues of scientific investigation. Reflexive Monism for example invites an investigation of how preconscious processes within the brain, interacting with the surrounding world, support experiences of objects and events that appear to be outside the brain (“perceptual projection”) and of how visual processing supports an entire, experienced, three-dimensional, phenomenal world.

Again, I do not have space to elaborate on this here (c.f. Velmans, 2000, chapters 6 to 12, 2006). I simply want to stress, once again, that agreeing on a common point of departure is important. Once a given reference for the term “consciousness” is fixed in its *phenomenology*, the investigation of its nature can begin, and this may in time transmute the meaning (or sense) of the term. As Dewey (1910) notes, to grasp the meaning of a thing, an event or situation is to see it in its relations to other things—to note how it operates or functions, what consequences follow from it, what causes it, and what uses it can be put to. Thus, to understand what consciousness is, we need to understand what causally affects it, what its function(s) may be, how it relates to nonconscious processing in the brain, and so on. As our scientific understanding of these matters deepens, our understanding of what consciousness *is* will also deepen. A similar transmutation of meaning (with growth of knowledge) occurs with basic terms in physics such as “energy”, and “time.”

Conceptual problems surrounding the function of consciousness and the causal interaction of consciousness and brain.

Let us turn now to the question of how our presuppositions influence our theories about what consciousness *does* (rather than about what it *is*). Cognitive theories of consciousness often assume it to be some form of information processing. Consequently, cognitive studies of consciousness commonly assume that functional differences between “conscious” and “preconscious” or “unconscious” processing will reveal the function of consciousness (see review in Velmans, 2000, chapter 4; Baars, 2006). However, researchers adopting this approach are seldom clear about the precise *sense* in which the process under investigation can be said to “be conscious.” As noted in Velmans (1991a) a process can be said to be “conscious”

- (a) in the sense that one is conscious *of* the process
- (b) in the sense that the operation of the process is *accompanied* by consciousness (of its *results*) and
- (c) in the sense that consciousness *enters into* or *causally influences* the process.

Why does this matter? It is only sense (c) that is relevant to claims that consciousness has a third-person causal or functional role—and, crucially, one cannot assume a process to be conscious in sense (c) on the grounds that it is conscious in senses (a) or (b). Sense (a) is also very different to sense (b). Sense (a) has to do with what experiences *represent*. Normal conscious states are always *about something*, that is they provide information to those who have them about the external world, body or mind/brain itself. Some mental processes (problem solving, thinking, planning, etc) can be said to be

partially “conscious” (in this sense) in so far as their detailed operations are accessible to introspection. Sense (b) contrasts different *forms* of mental processing. Some forms of mental processing result in conscious experiences, while others do not. For example, analysis of stimuli in attended channels usually results in a conscious experience of those stimuli, but not in non-attended channels.

Theories that attribute a third-person causal role to consciousness solely on the basis of functional contrasts between “conscious” and preconscious or unconscious processes invariably conflate these distinctions. They either take it for granted that if a process is conscious in sense (a) or sense (b) then it must be conscious in sense (c). Or they simply *redefine* consciousness to be a form of processing, such as focal attention, information in a “limited capacity channel,” a “central executive,” a “global workspace” and so on, thereby begging the question about the functional role of conscious *phenomenology* in the economy of the mind.

Further problems with conscious causation

While Dualist theories of consciousness do not make such question-begging assumptions about conscious phenomenology, they have problems with conscious causation that are equally serious. According to Plato and Descartes, the material body *interacts* with the soul. In the acquisition of knowledge, the body influences the soul through the operation of its senses. The soul is the source of consciousness and reason, and through the exercise of will, it manipulates the body. John Eccles (1980), a modern Dualist, defended a similar view—although he replaced the term “soul” with “the self-conscious mind.” But how could such causal interactions between brain and soul or self-conscious mind take place?

Causal Problem 1: The physical world appears causally closed. From an external, third-person perspective one can, in principle, trace the effects of input stimuli on the central nervous system from input to output, without finding any “gaps” in the chain of causation that consciousness might fill. Additionally, if one inspects the brain from the outside, no subjective experience can be observed at work. Nor does one need to appeal to the existence of subjective experience to account for the neural activity that one *can* observe. The same is true if one thinks of the brain in systems-theory terms. Once the processing within a system required to perform a given function is sufficiently well specified in procedural terms, for example in terms of the information processing required, one does not have to add an “inner conscious life” to make the system work.

Causal Problem 2. The Conservation of Energy Principle. If nonmaterial conscious experiences are to influence physical events, physical energy must be created from some nonmaterial source, and the total physical energy of the universe thereby increased. Equally, for physical events to influence conscious ones, energy must be drawn from the physical universe. However, according to the Conservation of Energy Principle energy can neither be created nor destroyed.

Causal Problem 3: One is not conscious of one’s own brain/body processing. So how could there be conscious control of such processing? We normally think of speech production as being under “conscious control.” But in what sense does one have conscious control of the articulatory system? In speech, the tongue may make as

many as 12 adjustments of shape per second that need to be coordinated with other rapid, dynamic changes within the articulatory system. In one minute of discourse as many as 10 to 15 thousand neuromuscular events occur (Lenneberg, 1967). Yet only the results of this activity (the overt speech) normally enters consciousness. According to Eccles, the self-conscious mind controls activities in the motor cortex through the exercise of free will. But how could a consciously experienced wish to do something activate neurons or move muscles? The processes required to activate neurons are not even represented in consciousness! For example, the phenomenology of a "wish" includes no details of where our motor neurons are located, let alone how to activate them. Consequently, if some aspect of the mind does control the momentary activities of neurons, that aspect of the mind must be *nonconscious*—which involves a paradox.

Causal Problem 4: Conscious experiences appear to come too late to causally affect the processes to which they most obviously relate. Speech production, speech perception, and reading are amongst the most complex forms of “conscious” human information processing. Yet, as noted above, in conscious speech production there is a sense in which one is only conscious of what one wants to say *after one has said it!* The same is true of conscious reading. Try silently reading the following sentence: *The forest ranger did not permit us to enter the park without a permit.* Notice that, on its first occurrence in your phonemic imagery or “covert speech”, the word “permit” was (silently) pronounced with the stress on the second syllable (*permit*) while on its second occurrence the stress was on the first syllable (*permit*). But how and when did this allocation of stress patterns take place? Clearly, the syntactic and semantic analysis required to determine the appropriate meanings of the word “permit” must have taken place prior to the allocation of the stress patterns; and this, in turn, must have taken place *prior* to the phonemic images entering awareness. Note too, that while reading, one is not conscious of the analysis and identification of individual words or of any syntactic or semantic analysis being applied to the sentence. Nor is one aware of the processing responsible for the resulting covert speech (with the appropriate stress patterns on the word “permit”). The same may be said of the paragraph you are now reading, or of the entire text of this chapter.

Oddly, a similar sequence of events occurs with conscious verbal thoughts. Once one *has* a conscious verbal thought, in the form of phonemic imagery, the complex cognitive processes required to generate that thought, including the processing required to encode it into phonemic imagery have already operated—and the same is true of conscious feelings (Panksepp, 2006) and volitions (Banks & Pockett, 2006).

How can one make sense of conscious causation?

In the cognitive literature consciousness has been thought by one or another author to enter into every main phase of human information processing, that is in input, storage, transformation, and output. This includes stimulus analysis, selective attention, learning, memory, choosing, thinking, planning, language use, and the control and monitoring of complex overt response (see reviews in Velmans, 1991a, 2000 chapter 4). Viewed from a first-person perspective, it seems intuitively plausible that many of these claims are true. It seems obvious for example that one cannot identify new or complex stimuli without first being conscious of them. Nor can one enter information into long-term memory, making it part of one’s “psychological past,” without it

having been in one's conscious "psychological present." Nor can one transform information through problem solving, thinking or output the results in speech or writing unless one is conscious of that information.

Yet, viewed from a purely third-person perspective it is very difficult to see how *any* of these claims are true. To the best of our knowledge there are no "gaps" in the chain of neurophysiological events which require the intervention of consciousness to make the brain work (the physical world is causally closed). And, as George Miller pointed out in 1962, the same functions appear to be realisable in physical and electrical systems entirely without consciousness. In short, from a third-person perspective epiphenomenalism seems true, while from a first-person perspective it seems false. In Velmans (1991a,b, 1993, 1996) I called this the "causal paradox"—and I suggested that a good theory of how conscious phenomenology relates to brain processing needs to show, not that the view from either the first- or third-person perspective is false, but rather how it can be that both perspectives might yield true insights, for example if they are complementary. Once again, I don't have space to go into the debates surrounding this complex issue here (but see Velmans, 1991a,b, 1993, 1996, 2000, 2002a,b, 2003).

Conclusion

Modern consciousness studies is in a healthy state, with extensive, well established research programmes in the cognitive sciences, neurosciences and related sciences. However we should not lose sight of the fact that deep puzzles remain, and that resolving these may have more to do with the need to re-examine basic assumptions embedded in prevailing philosophical positions than with anything that can be resolved by empirical research. Such a re-examination becomes particularly important when the field becomes trans-cultural, for example in some future blend of Indian philosophy, rooted in first-person meditative investigations, with Western-style third-person empirical research. As with the "causal paradox" discussed above, the challenge for a global theory of consciousness may not be to show that the conclusions drawn from one or the other tradition are false, but rather how the perspectives adopted by both of these traditions might offer useful, complementary insights into the nature of consciousness.

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