

Kuttner and Rosenblum Failed to “Objectify” Consciousness

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Kuttner and Rosenblum’s (2006) presentation of the “only objective evidence for consciousness” is criticized for (1) not adequately defining consciousness (moreover, it is argued that the authors should have referred to the mental processes which they brought into question as *working memory*), (2) not providing at the outset an explanation of the philosophical–theoretical interpretation of quantum theory that would lead to a direct rationale for their “impossible” (their characterization) quantum experiments, and (3) suggesting that data from their impossible experiments could be treated as non-theoretical “facts.” It is concluded that Kuttner and Rosenblum fail to objectify consciousness.

Key words: consciousness, Copenhagen interpretation, working memory

To set the tone for this commentary on Kuttner and Rosenblum’s (2006) “The Only Objective Evidence for Consciousness,” I begin by pointing out the rather difficult time these authors had with the idea of “consciousness” at the outset. In the second paragraph of the article the authors attempt to frame the type of “consciousness” they are aiming to “objectify” (namely, consciousness closely related to first- and second-person “awareness,” or “subjective experience”). In doing so, they contrast their view with Francis Crick’s (1994) “astonishing hypothesis.” Using the Crick quote presented below the authors inform us that Crick *denies* the existence of their type of first- and second-person “consciousness.” Kuttner and Rosenblum state: “Crick identifies electrochemical activity as being all there is to our objec-

tive experience” (p. 44). What Crick really said (Kuttner and Rosenblum also provide the bulk of this quote) is this:

The Astonishing Hypothesis is that “You,” your joys and sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules. (p. 3)

The problem with Kuttner and Rosenblum’s use of this quote is — as any serious student of psychology would be expected to determine — that (1) it does *not* say there is no consciousness beyond neural correlates — it simply says that such conscious activities are the *product* of (they are the behavior of) their neural correlates, and (2) Crick clearly was not talking about consciousness at all, but the *soul!* Crick even indicates in the subtitle of his book that he is talking about the soul. To follow-up on the difficulty the authors show in regard to (1) above, only a few pages later Crick suggests that one of the reasons his astonishing hypothesis seems so strange to people is the obvious everyday nature of *consciousness*, within which, he says, “We have, for example, a vivid internal picture of the external world” (p. 9). Such vivid internal pictures are, of course, part of first-person consciousness. So, Kuttner and Rosenblum’s use of Crick’s astonishing hypothesis to illustrate the idea that he felt that *consciousness* (and not the soul) is *only* its neural correlates is a rather surprising misinterpretation of the literature used to support their definition of consciousness! This seems an unforgivable blunder, but the authors have a larger one in store for the reader, which I will get to in the next section.

I am quite sure that Kuttner and Rosenblum did not intend to use quantum-theoretical experiments to provide “the only objective evidence for the *soul!*” So why do they select the Crick quote as a basis to make part of their purpose to “contest Crick’s claim?” There’s only one explanation, namely, inadequate background development. The confusion between the soul and consciousness indicates either a misreading of Crick, or a weak understanding of consciousness itself. The reader is left to decide which it is. If the authors had read just a little more of Crick, they would have easily recognized the inappropriateness of his quote to their topic.

But There Is a Bigger Problem With “Consciousness”

Kuttner and Rosenblum apparently did not stop to ask themselves what psychological process or mental entity is really at play in their quantum experiments. My point here is that what they were actually talking about by their own definition — namely, in their first paragraph they said, “the term [con-

sciousness] is best defined by its use in the experiments we describe” — is not consciousness at all, but *working memory*. That is, when one looks at the mental entity in the experiments they describe, what one sees is decision making made by working memory processes, and not consciousness. If Kuttner and Rosenblum have proved the objective existence of anything (which, as I explain below, I don't think they have), they have proved the existence of working memory. But of course we already knew of the existence of working memory. They had to use it to write their article, and the reader used it to read it.

This is not just a matter of semantics. The following is a contemporary, widely accepted definition of working memory from a leading researcher in the area:

Working memory refers to cognitive processes that retain information in an unusually accessible state, suitable for carrying out any task with a mental component. The task may be language comprehension or production, problem solving, decision making, or other thought. (Cowan, 1999, p. 62)

Decisions (like those made in quantum experiments) are made by working memory, not by “consciousness.” Consciousness, as far as anyone knows, does not make “decisions.” Working memory has been widely studied using brain imaging techniques, and its theoretical components have been localized to several areas of the brain with considerable agreement among investigators (see, e.g., Cabeza and Nyberg, 2000; Chein, Ravizza, and Fiez, 2003). From operational definitions derived from this theory as well as the imaging studies, working memory processes could be duplicated in a computing system, “consciousness” probably could not. So, the whole business of the observer in Kuttner and Rosenblum's definition and experimental scenario applies equally to a human's working memory or to an appropriately programmed computer. *Kuttner and Rosenblum absolutely must tell us why it is consciousness and not working memory that is at existential play in their quantum experiments.* In passing, this criticism/requirement applies to all those who would relate consciousness to quantum theory, not just to Kuttner and Rosenblum.

Why did Kuttner and Rosenblum call what is really *working memory*, “consciousness?” I believe the answer to this question goes back to their initial understanding and distinction among psychological processes they put forth in their introduction. I can only guess from the introductory description of the variable that they purported to be studying that the choice of calling it “consciousness” was due to a lack of familiarity with appropriate psychological concepts.

Getting Consciousness (Actually, Working Memory) Into the Theoretical Backdrop of the Copenhagen Interpretation

Kuttner and Rosenblum attempt to apply the quantum measurement procedure to establish the consciousness of the observer “as an entity beyond its neural correlates” (their abstract). Because Kuttner and Rosenblum’s introduction was so weakly developed, in order to comment in an understandable way I must do for them what they should have done at the outset — I must provide a preparatory introductory background development to the topic of the observer in quantum measurement. There are two tightly interrelated issues that were inadequately developed in the introduction that, I think, sound the death knell for their whole treatise. First, the authors do not adequately describe how the *consciousness* of the observer might have gotten into the operational specifications of the quantum measurement procedure in the first place. This would have allowed the reader to evaluate the logic of their ensuing arguments using the consciousness of the observer as the variable of investigation. This is how experiments are designed. In order to describe the role of the consciousness (actually working memory) of the observer (not in the individual sense, but in the objective sense) in the quantum procedure the *psychological gist* of the Copenhagen interpretation of quantum theory belonged in the introduction to the problem — because the place of the observer in quantum measurement is the basis of the problem. This is how research papers are written. Kuttner and Rosenblum did nothing here. However, Stapp (1997), for example, did an extremely fine job of developing this theoretical line of thought *right up to where Kuttner and Rosenblum could have carried it forward*; not that, because of their “theory-neutral” approach as we will see, they would have been able to take it anywhere. Stapp provided an extensive section on “Experience Within Science” that spells out the kind of analysis and quantum–theoretical discussion of consciousness that would have allowed the authors to have rationally brought the phenomenon(a) of consciousness squarely into their picture.¹

¹It is my view that Stapp, too, should have referred to processes related to the observer as *working memory* rather than as consciousness. Consciousness, per se, is not responsible for the formulation of classical physics through which we must study quantum activity — working memory is. Moreover, working memory is the only known “mental entity” which would formulate the purely abstract conceptions of quantum theory or any other physical theory (see Vandervert, Schimpf, and Liu, in press). It must be remembered that the study of mental entities entails measurement problems that are analogous to those of quantum entities; *both* must be presented within the constraints of the principles of classical physics. Working memory satisfies this criterion. The point here is that consciousness or any other “non-operationalized” mental entity cannot simply be pulled out of the air, so to speak, and then used to explain physical events.

In addition, in that same article, Stapp proposed how consciousness within the quantum–theoretical framework could have been of evolutionary selective value:

In the quantum world, consciousness *can* be causally efficacious, and in the orthodox theory [the Copenhagen interpretation of the von Neumann/Wigner elaboration of the Bohr/Heisenberg formulation] being discussed here consciousness is causally efficacious. Thus, creatures possessing consciousness could in principle have enhanced survival prospects. (1997, p. 189)

I bring up Stapp’s argument on the evolutionary efficaciousness of a quantum–theoretical consciousness because it would have been an excellent type of argument for Kuttner and Rosenblum to have used to help validate their “objective” evidence for consciousness (see footnote 1). They offer no such “externally” validating arguments.

The second issue where Kuttner and Rosenblum fail in their stated mission is the suggestion that their “impossible” (their own characterization) quantum experiments provide *theory-neutral* (their term) and therefore “objective” factual evidence for consciousness. Nothing could be further from the truth! The quantum measurement *procedure* is synonymous with quantum theory and thus applications of the quantum procedure can not *ever* be theory-neutral. *Never!* Once the quantum measurement setup is employed (and observation is made), one is *irrevocably within* the quantum–theoretical structure and, likewise, *simultaneously* (and irrevocably) *within* some theoretical interpretation of the role of the observer in that structure, namely, for Kuttner and Rosenblum, the Copenhagen interpretation. (See, for example, Stapp, 1972, Section II for a simple, straightforward account of the indivisibility of the quantum setup and quantum theory.) This massive oversight renders Kuttner and Rosenblum’s “consciousness parable” of impossible experiments (their own characterization) not only impossible, but pointless. As described above, there are no “theory-neutral quantum facts” (their own characterization) *outside* of the quantum procedure. Kuttner and Rosenblum characterized their “theory-neutral” notion this way:

We will present the empirical facts of the two-slit experiment in a theory-neutral manner. Again, by “theory-neutral” we mean that our description avoids any reference to quantum *theory*. The point of the theory-neutral treatment is to emphasize that the objective evidence for consciousness can arise *directly* from empirically demonstrable facts. The usual treatment, introducing theoretical constructs such as the wave function, can mask this evidence. (2006, p. 47)

Kuttner and Rosenblum overlook the fact that this explanation does not remove the quantum measurement procedure (and the possibility of quantum demonstrations) from quantum theory. Any scientist knows that without

some theoretical starting point, there is nothing to “observe” (Karl Popper). Thus the quantum demonstrations they describe are still interpretable only within quantum theory. It seems incredible that these authors would relate their arguments so strongly with quantum procedure/theory and its psychological meaning for consciousness only to suspend the entire value of the framework to claim theory-neutrality for their quantum demonstration of consciousness. Therefore, Kuttner and Rosenblum not only can not actually produce the theory-neutral “facts” they propose, but their “objective evidence” likewise does not produce a consciousness that is separate from (“beyond,” as they put it) its neural correlates, which is, according to them, the whole point of their article.

It must be added that nothing, in or out of quantum theory, Kuttner and Rosenblum have argued should be (or perhaps even *can* be) interpreted as indicating that consciousness exists “as an entity *beyond* its neural correlates” (their abstract). This would be like saying (maybe the same thing as) the quantum measurement setup exists *beyond* classical physics. For an explanation of why this would be impossible, see the Heisenberg quote at the conclusion of this commentary.

Hopelessly Outside the Paradigm: The Real Reasons Kuttner and Rosenblum Failed to Objectify Consciousness

In their attempt to provide “The Only Objective Evidence for Consciousness,” Kuttner and Rosenblum managed only to confuse the relationship between psychology and physics. While Kuttner and Rosenblum may know their physics, they demonstrated that they did not have the deeper study backgrounds to take on the exposition of great revelations in psychology. It is an extremely difficult task for scholars and scientists from one discipline to capture the conceptual and philosophical nuances of a discipline new to them and thus to make a true contribution. Even Einstein was apologetic, humble, and cautious in his occasional intrusions into the field of psychology, for example, when he proposed a description of the nature of “thinking” in his “Autobiographical Notes” (Einstein, 1949), or when he talked about how “intuition” led to scientific axioms in his famous letter to his good friend, Maurice Solovine (Einstein, 1956).

It is difficult to show how fundamental phenomena in fields other than one’s own “really work.” Scholars and scientists not “brought up” (so to speak) in the studies of a field of inquiry outside their own are almost never aware of the more subtle, taken-for-granted traditions of thinking and meaning in the newly adopted field. But such disciplinary transitions can certainly be made. As a case in point, the well-known theoretical physicist, Henry Stapp (1972), whom I quoted earlier in this commentary, went to Herculean

lengths to understand and analyze the meaning of William James's pragmatic psychology *before* attempting to apply deep psychology to the interpretation of the measurement of quantum events. Stapp realized that if he (or anyone reading him) was to truly understand the "psychological" meaning of Bohr's and Heisenberg's "Copenhagen interpretation" of quantum mechanical theory, he had better first get far into the thinking of one of the best psychologists and philosophers of psychology. Stapp set the groundwork for the Copenhagen interpretation's unconventional conceptions of reality by describing ontological/epistemological parallels between Niels Bohr's ideas and William James's (1911/1970) pragmatic philosophy. In this groundwork, Stapp first summarized James's conception of what we can know about reality:

The contention that underlies James's whole position is, I believe, that a relationship between an idea and something else can be comprehended only if that something else is also an idea. Ideas are eternally confined to the realm of ideas. They can "know" or "agree" only with other ideas. There is no way for a finite mind to comprehend or explain an agreement between an idea and something that lies outside the realm of experience.

So if we want to know what it means for an idea to agree with reality we must first accept that this reality lies in the realm of experience. (Stapp, 1972, p. 1104)

Stapp then quotes a series of parallel ideas from Bohr. This one is succinct:

In our description of nature the purpose is not to disclose the real essence of phenomena but only to track down as far as possible relations between the multifold aspects of our experience. (1972, p. 1106; see Bohr, 1934, p. 18)

What Stapp is saying through James's and Bohr's conceptions of reality is that science does not (cannot) construct a mental or mathematical model of the actual world "out there," but rather it augments and gives order to our experience. Not even this philosophical conception of reality can be "theory-neutral"; it is foundational to the Copenhagen interpretation of quantum theory. Compare this idea with the connection between the assumptions of classical physics and the observer described in the concluding comment by Heisenberg given below.

Conclusion

Werner Heisenberg, who received the Nobel Prize for his contribution of quantum mechanical theory and, with Niels Bohr, formulated the Copenhagen interpretation, placed the human observer and the quantum measurement procedure in a larger philosophical-theoretical and evolutionary perspective:

[The] suggestion [that it is possible to speak of quantum events outside the concepts and human capacities-related assumptions of classical physics], rests upon a misunderstanding. The concepts of classical physics are just a refinement of the concepts of daily life and are an essential part of the language that forms the basis of all natural science. Our actual situation in science is such that we *do* use the classical concepts for the description of the [quantum] experiments, and it was the problem of quantum theory to find theoretical interpretation of the experiments on this basis. There is no use discussing what could be done if we were other beings than we are. At this point we have to realize, as von Weizsäcker has put it, that "Nature is earlier than man, but man is earlier than natural science." The first part of the sentence justifies classical physics, with its ideal of complete objectivity. The second part tells us why we cannot escape the paradox of quantum theory, namely, the necessity of using the classical concepts. (1958, p. 56)

When we enter the quantum world, the classical concepts, by virtue of being embedded in the human mind/brain, go with us. And we cannot get back out of the quantum world without returning through the world of the theoretical concepts and human capacities-related assumptions of classical physics — no impossible experiments and no theory-neutral "facts" are permitted. On this point, Bohr (1958) was emphatic:

It is imperative to realize that in every account of physical experience one must describe both experimental conditions and observations by the same means of communication as one used in classical physics. In the analysis of single atomic particles . . . the experimental conditions can be varied in many ways, but the point is that in each case we must be able to communicate to others what we have done and what we have learned, and that therefore the function of the measuring instruments must be described with the framework of classical physical ideas. (pp. 88–89)

It is this commentator's conclusion and recommendation that in future theorizing on "consciousness" Kuttner and Rosenblum (a) steer clear of Francis Crick's ideas about the human Soul, (b) operationally differentiate between consciousness and working memory, and (c) refrain from the futility of impossible experiments that are impossibly theory-neutral.

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