The Hard Problem: As the Radical Behaviorist Views It

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My task may seem to be easiest of all. And it would be if all we were concerned with was Watsonian behaviorism. Behaviorism began with Watson. Yes, there were precursors and early influences, but the term was first used and defined by him. His position was that we should concentrate on observable behavior and its relation to the environment. Further, such an investigation should apply the procedures of the natural sciences and restrict itself to what is observable and measurable. Concepts such as consciousness had no real place in Watson's science of behavior. We can directly study the behaviors which some may hypothesize to be the products of consciousness without recourse to consciousness itself. He suggested that the investigation of mental events would not be particularly fruitful. Given that we are gathered here today to discuss the "Hard Problem" some 98 years later, Watson may have been on to something.

In any event, Watson's approach deals with the Hard Problem [consciousness] by simply suggesting that it is not a problem at all. That is, a concept of consciousness has no standing in a science of behavior and relatedly should have no standing in neuroscience either. Problem solved.

If Watsonian behaviorism had survived to be the primary behaviorist position, I could end here. However, it wasn't long after the publication of Watson's "Psychology as the Behaviorist Views It" in 1913 that other forms of behaviorism began to emerge. Schneider and Morris (1987) compiled a list that included monistic (Weiss, 1919), orthodox (Wieman, 1919), parallelistic (Kantor 1921), pure (Gregory, 1922), ideal (Weiss, 1924), strict (McDougal, 1926), metaphysical (Brightman, 1930), negative (Dotterer, 1933), classical (Heidbreder, 1933), physiological (Pepper, 1934), rigid (Young, 1943), and according to Skinner (1945) the most prominent among these methodological behaviorism.

Similar to Watson's approach methodological behaviorism gave no real standing to private events, the big one, which of course is consciousness. However, it did have a way of dealing with them: the operational definition. That is, instead of talking about a "feeling" of anxiety, for example, one could establish a measurable indicator response. A self-rating of W on the XYZ test indicated how anxious the subject was. It was the observable self-rating that could be investigated. One was then free to speculate on internal mediating variables, whether they be psychological of physiological. One could likewise correlate these with observed physiological events such as heart-rate, perspiration, etc. and, as technology improved, changes in various brain related recordings. The private events were not investigated directly, but were instead operationalized through an ever evolving and refining measurement of indicator responses said to suggest the event. To this day, methodological behaviorism exerts considerable influence in both the psychological and neurosciences.

B. F. Skinner was not a fan of operational definitions or methodological behaviorism and challenged both with what he called "radical behaviorism." In his 1945 paper "The Operational Analysis of Psychological Terms," Skinner took behaviorism in an entirely new direction. He argued against the operationism that characterized much of psychology and its attempt to either ignore or only indirectly account for private events. Instead, Skinner maintained that such events fall squarely in the purview of a natural science of behavior. I know that this probably has come as a shock to some, but contrary to conventional wisdom, emotions, thinking, and yes, even conscious content, were all acceptable subjects for the radical behaviorist.

Nearly two decades later Skinner would provide a detailed treatment of his thinking on the subject of private events. In "Behaviorism at Fifty," a paper first presented at the Rice Symposium on Behaviorism and Phenomenology and published in *Science* in 1963, Skinner laid out his approach to what we are calling the Hard Problem. Early in that paper he made his position clear. Quoting Skinner:

> Behaviorists have from time to time examined the problem of privacy, and some of them have excluded so-called sensations, images, thought processes, and so on, from their deliberations. When they have done so not because such things do not exist but because they are out of reach of their methods the charge is justified that they have neglected the facts of consciousness. The strategy is, however, quite unwise. ...An adequate science of behavior must consider events taking place within the skin of the organism, not as physiological mediators of behavior but as part of behavior itself. (p. 953)

For the radical behaviorist, the organism, its relation to the environment, and how selection, both natural and consequential, establishes and maintains that relation is the primary subject of investigation. It is within that type of relation that Skinner would suggest we seek the answer to our question. Those relations account not only for the behavior we observe, but also for that we do not. In Skinner's framework there is no need for the storage of memories, or cognitive maps, or representations of any kind. Copies of the world made within the skin, either by the brain or mind, are unnecessary, and the search for them will not lead to an account of conscious content. In Skinner's words, "It took man a long time to understand that when he dreamed of a wolf, no wolf was actually there. It has taken him much longer to understand that not even a representation of a wolf is there." But if there are no representations or images in our mind or brain, how can we account for our private experience? How do we account for seeing when what is seen is not present? And perhaps more importantly for this discussion, how is possible that we see that we are seeing?

Skinner's position is straightforward. Though we may trace the visual stimulus into the brain, record neural firing patterns, and postulate the existence of neural representations, at some point we must respond, we must engage in the behavior of seeing. We see what is in the world, there is no need to make a copy of it first. Certain areas of the brain may change as a result of seeing one thing versus another, but there is no need for those changes to be considered a representation that is somehow accessed and "seen" within the brain by some inner eye before "we" actually see an object. Further, there is no need to assume a copy of the world is required to see the object when it is not present. That is, we simply engage in the behavior of seeing under the guidance of stimuli other than the object seen. When we see that we are seeing we are simply seeing that we are making a response. No special condition of consciousness is required to explain conscious content or our private events beyond our own verbal behavior. In Skinner's formulation, conscious awareness likely arises from the verbal contingencies arranged when we are first asked questions about our behavior and about the conditions that lead us to behave one way rather than another.

Skinner's position is not without support within neuroscience and considerably overlaps with the position taken in the recently published, and controversial book "*The Philosophical Foundations of Neuroscience"* by M. R. Bennett and P. M. S. Hacker. What is lacking in their account is a clear understanding of behavioral selection by consequential contingencies. Even so, a radical behaviorist would find that they would be in fundamental agreement with their treatment.

At about the same time Skinner was elucidating his approach, Israel Goldiamond was advocating a similar framework based upon his own experimental work. In 1958 Goldiamond published his classic paper “Indicators of Perception I. Subliminal Perception, Subception, Unconscious Perception: An Analysis in Terms of Psychophysical Indicator Methodology,” in which he provided evidence that differences in perception were more likely a function of the indicators response chosen for study and its relation to the environment than of any special perceptual process. Goldiamond would go on to repeatedly demonstrate that changes in private perceptual variables were not necessary to account for the data obtained in many psychophysical experiments. He and Les Malpass would later demonstrate that Skinner’s assertion that the behavior of seeing in the absence of the thing seen was not only plausible, but could, to a certain extent, be experimentally investigated. Their experiment, published under the title, “Locus of Control in Hypnotic Perception,” is worth considering in light of today’s question. As I wrote elsewhere (Layng, 1995):

> ...hypnotized subjects were instructed to see one set of colors when in fact, chips of different colors were actually presented. For example, they might report seeing a yellow chip when a red chip was in fact shown. The subjects' indicator responses and other verbal reports suggested that they experienced an altered color perception when hypnotized which then caused them to consistently report the color "privately perceived" rather than the actual color presented. The colored chips were placed in an apparatus that allowed for viewing either a chip's color or the after-image of a chip's color. When viewing a color, the subjects behaved in accord with the hypnotic instruction; however, when viewing an after-image the subjects reported after-image colors corresponding to the chips' actual colors, not to the "perceived colors." Subjects were subsequently trained in the operation of the after-image device. Now, the after-image indicator responses corresponded to the training history and matched the appropriate after-images for the hypnotically instructed color set. The subjective reports and indicator responses were apparently governed by the instructions and training history provided the hypnotized subjects, not the reported private perceptions. The issue is not whether the subjects did or did not see, think, or feel certain things, but rather how this study elucidates some of the variables governing the responses said to indicate those private events, and possibly the private events themselves. (p. 251)

Goldiamond would later distinguish between dimensional stimulus control and instructional stimulus control. When consequential contingencies are arranged to bring behavior under the guidance of events in the environment, two types of guidance result. The first is what we respond to, and the second is how we respond to it. Goldiamond showed that though these forms of guidance are often intertwined, they can occur separately. In the case of the experiment cited above, the instructional guidance exerted greater control over the observer's behavior than did the dimensional guidance. The observers not only reported seeing yellow in the presence of red, but saw that they were seeing yellow as evidenced by their responses to experimenter questions. Even so, the instructional control over their seeing did not extend to the color's afterimage. That instructional control over behavior can be established such that dimensional control is not required, that is, what is seen may not be present, provides a parsimonious account of our private seeing, hearing, tasting, smelling, and feeling (in the tactile sense). Dimensional and instructional control can be separated such that what is seen, heard, tasted, smelled, and felt need not be present.

Our emotions, thoughts, dispositions, etc. are similarly addressable within a radical behaviorist framework as part of our relation to the environment. Unfortunately, time prevents a greater exploration of these relations from entering into the behavioral history under discussion. What can be said is that such private events are not to be excluded from a radical behaviorist analysis, though they are not necessarily made of things or entities to be studied, but are a part of who we are in relation to our world. They are, at times, products and perhaps at other times by-products, of natural selection and cannot be separated from the contingencies of which they are likely a function. An understanding of these events is to be found in understanding contingencies of selection. As Israel Goldiamond noted, the sweetness we taste is not in the sugar nor in our tongue nor in our brain, it is in the relation between sugar and our tongue and brain as a function of natural selection. The radical behaviorist position is that the role of neuroscience is to understand how the brain is a function of, and services contingencies of selection, both phylogenetic and ontogenetic. This of course includes our behavior, our thinking, feeling, and yes, our consciousness.

Goldiamond speculated that the search for consciousness was not unlike a search for music in a stereo system that plays vinyl records. Where is the music we hear found in the system? Our imaging technology detects certain changes in the needle when the music is heard. We lesion the needle. What happens? The music ends. All else is as it was so it is quite logical the we conclude the music is stored in the needle. We replace the needle and begin lesioning other parts of the stereo. We find that as we

do so, we find either the music to be unchanged (we snip off a piece of a dial), or degraded to some extent. Are we building a map of where the music is represented? Making matters worse, we remove the air from the room and the music stops. Is the music stored in the air? Finally, we discover that if we change the record, the music changes. We put the record under an electron microscope, but no music is found. The best we can come up with is that the differences in the grooves seem to correspond with the differences in the music heard, but no music is found in our record. Where is the music? For Goldiamond it is found in the relation of the stereo (including the record) to our hearing and is not a “part” of either.

From the perspective of the radical behaviorist, what may be making the question under discussion so difficult for neuroscience is that it may be seeking answers in the wrong place.