

## **MIND AS AN EXPERIMENTAL OBJECT: ON THE BEHAVIORISM OF EDGAR A. SINGER JR.**

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**ABSTRACT:** Edgar A. Singer Jr. is largely forgotten. Yet in the early twentieth century he was one of the most persistent proponents for a theory of “mind as behavior.” This essay explores Singer’s theory of mind as a form of experimentally-definable behavior. This interpretation of mind is derived from Singer’s “philosophy of experiment,” which delimits the forms of questions that can have meaningful answers. Valid questions, according to Singer’s theory, must appeal to phenomena that are public in some sense and which have verifiable effects on our “mechanical images” of nature (which is not to say that such phenomena are themselves solely mechanical). From this perspective, Singer is able to give behavioral criteria for attributing “mind” to organisms and for such “mental faculties” as purpose, sensation, consciousness, and thought. It might be wondered how Singer’s experimental concept of mind compares with B. F. Skinner’s better-known concept of private events. Although there are difficulties involved in the interpretation of each, it would seem that Singer and Skinner are largely in agreement, although they emphasize different factors in the behavioral interpretation of mind.

*Keywords:* consciousness; experimentalism; private events; purpose; radical behaviorism; sensation

### **Introduction**

Is subjective experience (to choose a conveniently broad term) absolutely non-objective? Or is there some sense in which the subjective is also objective? One powerful tendency in philosophy has been to answer “yes” to the first question. Consider, for example, Fichte:

Sweet or sour, red or yellow: what these are supposed to be is something that is purely and simply indescribable; instead, it can only be felt. Nor is this anything that can be communicated to others through any description; instead, if another person is ever to become acquainted with my sensation, he must relate this object to his own feeling. All one can say is that *there is in me the sensation of bitter or sour*, etc., and nothing more. —And yet, assuming that the other person relates this object to his feeling, how do you also know that what arises within him is an acquaintance with *your* sensation? How do you know that he senses in the same way as you? How do you know, for example, that sugar makes precisely the same impression upon his taste that it makes upon yours? To be sure, you call what ensues within you when you eat sugar “sweet,” and he, along with all your fellow citizens, also call it “sweet” along with you. But this is no more than an agreement concerning the word. For how do you know that what you call “sweet” is precisely the same for him as it is for you?

This is a question that must remain eternally unanswerable, for this is a matter that lies within the domain of what is purely subjective and is in no way objective. (2021, p. 367)

There is, in short, no possibility of our subjective experience becoming objectively knowable. The sensations of one person are entirely inaccessible to another.

This individualistic view of experience has retained an attraction through the years. To take a more recent example, according to the neuroscientist Walter J. Freeman,

The dynamics [of the brain] isolates the meaning in each brain from all others, endowing each person with ultimate privacy, and loneliness as well, which creates the challenge of creating companionship with others through communication. I call this condition “epistemological solipsism,” to conform with the philosophical term for a school of thought that holds that all knowledge and experience is constructed by and within individuals. (1999, p. 9)

There have, of course, long been countercurrents to this view. It is possible to argue that our experience and knowledge are—far from being private—socially constructed and publicly observable. This is just what the philosopher Edgar A. Singer Jr. argued at the beginning of the twentieth century.

Singer, though now obscure, is important for several reasons. He was a fellow-traveler of the pragmatists;<sup>1</sup> an influence on a variety of important psychologists and philosophers, including the behaviorist Edwin Ray Guthrie and the systems theorists C. West Churchman and Russell Ackoff; and the coiner of the phrase, in 1910, “mind is behavior.” It is this last notion that is important to us here. For it was Singer’s contention that mind, insofar as it could be an object of knowledge at all, was behavior. Elaborating on the meaning of this statement and its implications for understanding so-called mental or private events will occupy the remainder of this article.

First, I will need to outline Singer’s “philosophy of experiment”—how and why objects can only be known experimentally. Following this we will look at how, according to Singer, we know about others’ minds and about our own. And finally, I’ll consider Singer’s behavior-based experimentalism in relation to B. F. Skinner’s better-known radical behaviorism. Is the concept of “private events” in radical behaviorism compatible with or contradicted by Singer’s radical experimentalism?

### **Singer’s Experimentalism**

Singer gave a helpful summary of his own outlook in 1914: “life and mind must be defined in terms of behavior, whether expected or observed.” The reason is

that to assert the existence or non-existence of any thing is meaningless unless we can verify the assertion, but experience is the only means of verifying assertions, and *behavior* the only

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<sup>1</sup> Singer never identified as a pragmatist (or as a behaviorist for that matter), but he was an assistant to William James at the start of his career and an admirer-cum-critic of both James and John Dewey.

aspect of the beings we call living or conscious which is matter [for] experience. Hence in our empirical reasons for calling one thing alive, another not, one thing conscious, another unconscious, must lie the meaning of life and mind. (1914, p. 645; italics added)

Life and mind must be defined in terms of behavior because behavior is all that can be observed of objects that are potentially alive and mindful.<sup>2</sup>

But what does it mean to observe or experience behavior? The meaning of experience is, for Singer, to be found in the meaning of experiment (cf. Smith, 1928). He holds, as he says, “an experimentalist interpretation of experience” (1929, p. 561). As he put it in 1917, “to define a thing in an empirical or pragmatist way is so to define it as to leave no doubt what experiments would inform us whether anything corresponding to our definition existed or no” (1917, p. 337). In other words, what we mean by mind is “what [we] would *do* to find out whether a being had a mind or not” (1917, p. 338; italics added). This recalls, of course, the pragmatic maxims of C. S. Peirce (1878) and William James (1898). And it similarly recalls (or rather anticipates) the operationism of P. W. Bridgman (1927) that would influence Skinner and other behaviorists.

Singer gave a fuller account of his “philosophy of experiment” in 1930. It is worthwhile to summarize this as it will further clarify what he means by knowledge and experiment.

Singer (1930) takes as the paradigmatic question of fact, “Is there an X?” The postulates of experimentalism are intended to show whether any particular instantiation of that question is meaningful or meaningless. I will list the five postulates before briefly pointing out certain of their implications:

1. Any question answerable without appeal to experience is no question of fact. (p. 150)
2. A question of fact not answerable by experience is meaningless. (p. 151)
3. A question of fact not answerable by experiment is not answerable by experience. (p. 153)
4. No given observation can exclude the permissibility of at least one mechanical image of a natural system observed. (p. 161)
5. No given observation which leaves permissible more than one mechanical image can preclude the possibility of a further observation which shall exclude as non-permissible at least one of these images. (p.162)

The positive results of this system will be shown in the following sections. Here I will point out some negative consequences, that is, questions which are revealed to be meaningless.

Postulates 1–3 exclude:

1. Questions whose answers are to be obtained *independent* of experience, such as “Is there a God?” as answered by Descartes, Spinoza, or Leibniz.

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<sup>2</sup> Most of Singer’s early essays are collected, in slightly revised form, in the volume *Mind as Behavior* (Singer, 1924a). In this article, however, I generally cite the original publications.

2. Questions of facts that can be experienced by *no one*, such as “Is there substance?” as answered by Locke.
3. Questions of facts that can be experienced by only *one* person, such as “Is there a sensation?” as answered by introspectionists.

Historically, these were exclusions made, respectively, by Locke, Hume, and the behaviorists (1930, pp. 159–60) (though Singer himself had argued for postulate 3 as early as 1898, and it is at least implied in Peirce’s early writings).

But public observability or experienceability is not enough. Observations must be systematized and such a system of observations is traditionally called a *mechanical image* (a manifold of space-time coordinates).<sup>3</sup> This is where the fourth and fifth postulates come in. For Singer, science is the progressive construction, refinement, and exclusion of mechanical images of nature. Postulates four and five say that observations must fit into at least one mechanical image, and that where an observation is compatible with more than one image, the possibility must be held open that further observations will exclude one or more of these images.

Based on postulates four and five, Singer gives two criteria which together indicate that a question of fact (“Is there an X?”) is unanswerable: (1) X is consistent with one but (2) not inconsistent with more than one mechanical image of the system in which it appears (1930, p. 162). In other words, an X, to be taken as “real,” must have some measurable effect in terms of space, time, and mass. This effect will make X compatible with some, but not all, models of nature. Singer’s criteria would seem to preclude such things as disembodied souls (see 1930, pp. 164–65) and conceptions of consciousness that entail the conceivability of philosophical zombies. The criteria would make at least certain statements by the interactionists, parallelists, and epiphenomenalists meaningless.<sup>4</sup>

An important part of Singer’s theorizing derived from some set of postulates such as these (again, these particular postulates did not see publication until 1930, though something like them undergirded Singer’s work since the turn of the twentieth century). The result is the aforementioned “experimentalist interpretation of experience” (1929, p. 561). It is to this experimentalist interpretation that I will now turn. What manner of experiment will allow us to observe the subjective experience of another?

### **Knowing the Mind of Another**

Here is Singer’s elaboration on the theme of “mind as behavior”:

Mind is not something inferred from behavior, it is behavior. Or, more accurately, our belief in mind is an expectation of probable behavior based on an observation of actual behavior, a

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<sup>3</sup> A full discussion of mechanical images is beyond the scope of this article. See Singer (1904, 1925b, 1959).

<sup>4</sup> Three of the major theories of mind during Singer’s lifetime were interactionism (e.g., McDougall, 1911), parallelism (e.g., Fullerton, 1904), and epiphenomenalism (a.k.a. automatism, e.g., Huxley, 1874, 1886). It is worth mentioning that Singer had been a student of the parallelist Fullerton.

belief to be confirmed or refuted by more observation, as any other belief in a fact is to be tried out. (1911, p. 183)<sup>5</sup>

To say that an organism has a mind is to make a prediction that it will act in a certain way should certain situations arise (or should certain experiments be performed). Mind, for Singer, is a very general term referring to “differences in the conduct of life” (1917, p. 339). To talk of differences between minds is to refer to the fact that organisms can accomplish their purposes in a greater or lesser number of circumstances, to the fact that organisms pursue a greater or lesser number of purposes, and to the fact that organisms discriminate among greater or fewer degrees of intensity and quality of stimuli.

Let’s look at what all this means in terms of other minds first. Afterward, I’ll turn to knowledge of one’s own mind.

The categories of mind that Singer focused on in detail are sensation, purpose, and consciousness; he also considered, briefly, thought. Sensation and purpose are apparent throughout the living world; consciousness and thought may be of more limited spread. So how do we know that another organism has sensations, purposes, consciousness, or thoughts?

### *Purpose*

Let’s begin with purpose. Organisms are purposeful beings. How do we know purpose? Singer observes that “the accomplished purpose of an act will always be found among the results of the act” (1914, p. 651). Which among the many consequences of an act is to be counted as the purpose of the act? According to Singer’s analysis, the purpose of the act is the result which the act is “*calculated* to accomplish” (1914, p. 652). In other words, purpose is known statistically and probabilistically. An act does not always produce its “intended” or “desired” result. Rather, we must look to the “average common result” (1914, p. 652) by studying a range of similar organisms performing similar acts. (The purpose of an act performed only once, or performed many times with non-overlapping sets of results, cannot be known.) The “average common result” of a chicken’s laying of an egg is the production of another chicken, though not every egg laid by every chicken produces another chicken.

We can study an organism’s purpose, or its will, by varying “some circumstance of the act’s universe.” The “effect calculated to remain invariant throughout a range of acts variant with circumstances” then expresses the organism’s will (Singer, 1925c, p. 434). Singer imagines meeting a friend out walking and asking where he’s going. That is, in this scenario Singer wants to know about his friend’s purpose. The friend responds that he is going “to the club, for dinner.” Singer suggests, “Why not dine with me at *X*’s?” Suppose the friend accepts. “What,” Singer asks, “would you say of his real purpose? Had it been to dine at the club? or only to dine, let us say, well? The club-dinner was evidently only one of a class of dinners that would serve him equally well” (1925c, p. 434). The friend’s end was, in fact, only a means to a decent dinner.

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<sup>5</sup> The original text reads “consciousness” for “mind,” but Singer later reserved “consciousness” for a special use. His later quotations of himself use “mind” in place of “consciousness,” and I follow this use here.

But Singer would have us continue the experiment: “Please, now, vary in your imagination the sort of place *X*’s might turn out to be. We began by offering our friend a good dinner, as was decent, but now let us run the whole gamut of available provender” (1925c, p. 435). As Singer suggests a greater range of meals of lesser refinement, his friend continues to accept. It turns out that his friend’s real purpose was simply finding something to fill his stomach.

By similar sorts of experiments, we can measure the relative strength and weakness of a person’s will. Suppose instead of offering another possibility for dinner, Singer were to invite his friend to some other activity entirely. If we can discover no common elements between the originally intended act and the act finally agreed to, we are in the presence of a weak will (1925c, pp. 435–36).

This is how the will of an organism may be known with some exactitude, whether that will belongs to oneself or to another. Is the will more than this? Is it, for example, some physiological state of the organism (as Meyer, 1911 might have proposed)? Singer largely avoided speculation about what was going on “inside” the organism—one of the ways in which he foreshadows B. F. Skinner. Part of the reason for this was that Singer was interested in defining terms, as much as possible, across the scale of life. The set of mechanical images that might be said to represent purpose in the structure of an amoeba is surely very different from the set of mechanical images representing purpose in human biology. This gets at the reason why life is not, for Singer, a mechanically-definable term. The class of living beings is a teleologically-defined class: living beings are those which share a common purpose (i.e., self-preservation), not a common mechanism (Singer, 1914, 1925b). This does not mean that living beings are not also mechanical: they are groups of mechanically-defined (time-space-mass) points—what Singer calls *pulses*—classifiable according to the purpose which draws them through the mechanically-defined medium of the environment (1914, p. 650).

It was one of Singer’s later projects to show how the categories of biology were related to those of physics and chemistry (Singer, 1959). Perhaps had he lived long enough he would have said more about how the categories of behavior were related to those of biology.

### *Sensation*

Let’s move on from purpose to sensation. Sensation cannot be easily separated from purpose. Organisms have sensations in order that they may work toward their purposes. How do we know when an organism has a sensation? Again, we must turn to its behavior.

Singer says that an organism has a sensation when it “responds to a stimulus consisting of mechanical changes taking place at or within its contours” (1929, p. 564; also 1917, p. 340). And “response” here is by definition teleological or purposeful. A sensation is a function, Singer tells us, of physical and biological phenomena, but it is not definable in these terms (1929, p. 565). This is because the “meaning” of the stimulus for the organism can only be observed in its average response. A change in temperature in the environment is a mechanical phenomenon which may produce a biological reaction in an organism. We can say that this biological reaction is a stimulus

to a psychological response—a sensation—insofar as we can observe some statistical tendency on the part of the organism to change its behavior (cf. Churchman & Ackoff, 1950, pp. 446–47).

For example: Paramecia will be found evenly distributed throughout an evenly-heated trough of water. Raise the temperature at one end of the trough while lowering the temperature at the other, and all the paramecia will collect in the area having the optimal temperature. The changing temperature induces a mechanical change at the surfaces of the organisms—a stimulus—which is responded to teleologically: the organisms move to an area that is presumably better suited to their survival. One can further determine a paramecium’s range of sensibility by raising and cooling the temperature in the trough in various subtle and not-so-subtle ways. We can determine what degree of change will be “just noticed” by the organism and from there infer the *intensity* of its sensation under other conditions (1917, p. 343).<sup>6</sup>

There are related experiments to determine *quality* of sensation (Singer, 1917, pp. 345–46). Does a paramecium, on average, exhibit the same *type* of response to rising temperature as it does to increasing brightness, increasing levels of some chemical, or application of electrical charge? If so, we can say that they all produce the same quality of sensation in the paramecium. If, however, there are observable differences in type of response (again, not just on one occasion, but on many occasions involving many paramecia), then we can attribute different qualities of sensation to the organism. If a paramecium moves away from both an increasing temperature and an increasing level of a certain chemical, we may say that both are causes of a single sensation quality (perhaps translatable as “discomfort”). If it moves toward one and away from the other, different qualities of sensation are apparent. Of course, this is a highly simplified example. Studying quality and intensity of sensation gets increasingly difficult as one gets to the higher animals and to humans, and structural differences in sense organs need to be considered. But the experimental principles involved remain the same.

Singer is quick to emphasize that the knowledge gained by such experiments is statistical. We do not know precisely how any individual paramecium or person will behave in particular circumstances, or even *if* they will. Individual organisms may have lower or higher thresholds for “just noticing” a change in the environment. We cannot know the precise quality and intensity of an individual’s sensation—and, as we shall see later, they cannot even reliably *tell* us (in the case that they are human). But we can experiment on groups of individuals and make statistical inferences about the quality and intensity of sensation an individual is likely to have (Singer, 1917, pp. 344–45). Singer argues that this is the only way to meaningfully answer questions about an individual organism’s sensations:

It is only an old confusion of categories that can make it seem odd that while it is *A*’s mind we are speaking of, it is not by examining *A* alone, but by studying *B*, *C*, and *D*, that the answer to our question about *A* can be obtained—and that not an approximate or makeshift

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<sup>6</sup> In Singer’s discussions of sensation, the influence of Gustav Fechner’s psychophysics is apparent (see Fechner, 1966).

answer; but *the only kind of answer that makes that kind of question meaningful*. (1917, p. 345; italics added)

The question, “What precisely did A feel on occasion X?” is not answerable by A or by anyone else. We can only come to a *probable* answer, within mathematically definable limits, by studying the behaviors of a range of similar organisms in a range of similar circumstances.

In fact, the behavior that defines a mind is not merely *actual* behavior but mostly what Singer calls *virtual behavior*—“the behavior we should have reason to expect if such and such experiments were tried” (1917, p. 344). We are unlikely to ever perform all the experiments required to fully satisfy us as to the nature of some organism’s mind (the nature and range of its purposes, sensations, and so forth). We must infer its purposes and sensations from the data practically at hand regarding it and organisms like it.

There is a further point to make about the study of sensation. It was mentioned above that sensation could be studied as a function of behavioral responses to variations of a stimulus. But there are sensations which, at least under some conditions, are not readily studied in this way: hunger, exhaustion, pain. The stimuli, in these cases, may be hidden within the body. Can we study sensation where the stimulus is “private”? Singer addressed this in his essay “On Pain and Dreams” (1924b). There is, as it turns out, a convenient alternative to studying sensation via variations of a stimulus. This is by making use of variations of a *counter-stimulus*. Loosely-speaking, the intensity of hunger may be measured by the quantity of food eaten, the intensity of exhaustion may be studied by the quantity of subsequent sleep, and the intensity of pain studied by the quantity of anodyne needed to reduce the pain.

Singer’s definition of sensation—as a function of a response “to a stimulus consisting of mechanical changes taking place at or within” an organism’s contours—also helps us distinguish sensation from perception. Singer does not give a detailed account of perception. But, whereas sensation is a function of response to purely mechanical changes, perception would seem to be a function of a response to a teleologically-defined class of mechanical changes. Various types of energy from the environment cause mechanical changes to our sense-receptors; perceptions happen when I respond to *teleologically-defined groupings* of such changes. I can now be said to respond to *objects*. The mechanical stimulations and thus the sensations resulting from the ringing of a bell heard from different locations, or from a building seen from different angles, are quite different. Yet the *function* of the different stimulations may be the same. I *perceive* the different sets of sounds *as* a bell’s ringing; I *perceive* the different sets of forms and colors *as* a building. An organism’s perceptions can evidently be studied in a similar way as its sensations. My perception of the bell’s ringing is to be studied by observing my behavior toward it.

### *Consciousness*

This view of perception can help us understand Singer’s definition of consciousness: “the perception of a perception” (Singer, 1929, p. 563). Imagine, he instructs, three individuals (for the sake of argument, we’ll take them as three, though they need not be three distinct organisms). Our three individuals are an organism A, an observer B of organism A, and an observer C of observer



B. By measuring the mechanical changes to A and the corresponding teleological responses, B perceives A to have a sensation of a certain quality and intensity. To have a general term, we'll call perception and sensation "mental states." How should observer C label B's mental state? "What," in other words, "shall we call the class of mental states defined by the condition that of such mental states the stimulus be itself a mental state?" (1929, p. 566). (And, to repeat an important point, B is not perceiving something happening within some ethereal mind-stuff; B's perception is a function of observable mechanical changes in the environment affecting and effected by A. C's perception of B's perception is of this same type.) Singer suggests, following certain historical precedent, that C ought to call B's perception of A's sensation *conscious*. (In a historical addendum to his essay on consciousness, Singer notes that, prior to John Locke, *con* combined with *scio* typically referred to knowing something together with another.) This means, indeed, that B might be conscious of states of mind in A of which A is in fact unconscious (1929, p. 566).

### *Thought*

So far, we have dealt with cases involving a readily observable stimulus and response, and cases involving an observable response and a difficult-to-observe stimulus (e.g., a pain with no obvious source). What about cases in which the *response* cannot be readily observed? Regarding a hidden (or "private") response, Singer was once challenged by the psychologist M. F. Washburn in the following manner: "What are you going to do with a being who thinks, but who exhibits no behavior for the very reason that he thinks? What are you going to do with the passive, the utterly passive thinker?" (Singer, 1912b, pp. 207–8). How are we to know (become conscious of) the thoughts of such a thinker? It seems we have three possibilities: we can observe his present behavior, await his future behavior, or observe small "mechanical changes" in his body (1912b, p. 213).

Clearly his present (and rather minimal) overt behavior is not his thought, though it may be a necessary accompaniment of his thought. On the other hand, the thinker's future behavior may give us part of the meaning of his present thought—but only part of it, and that without much certainty. For example, we could appeal to future behavior by "ask[ing] the thinker what he is thinking about." But in that case:

The man who replies is already other than the man who thought. He is in a more advantageous position than I to venture a guess in the same sense that he is better placed than I to see the wall behind my head; but for him as for me it is only a guess. Memory is generally less fallible than divination, but it is fallible enough. Meanwhile if the question as to this thinker's past has a meaning it has also an answer and there is a definable method of arriving at this answer or at least of indefinitely approximating it. An appeal to the thinker to tell us what was his thought can not give us the truth nor open a way by which we may approach the truth. The thought just past is lost in the infinite ocean of the past, the pebble just now dropped into this ocean is no easier of recovery than is the treasure sunk there a thousand years ago. (1912b, pp. 210–11)

Similarly, any future act that appears to be a result of the thinking will only reflect a part of what took place during the thinking. We may, for instance, be able to infer a decision arrived at but not the process of thought leading up to it.

The third option—observation of “the minutest mechanical changes” in the thinker—is more promising, yet fraught with technical difficulties. Within the skin of the thinker are movements of atoms. A straightforward mechanical image of these movements will not give us the thought. Yet there is within the set of mechanical images that might be made of a thinker a teleological grouping of points—a grouping of points measuring a response to a stimulus—that will define his thought. These, Singer says, “are the only events in space and time that place the thought in history” (1924a, p. 48n1). And he continues:

I should begin by looking for such movements of atoms as actually moved too slightly for us to notice it—the organs of expression, the tongue, principally, and the eyes. Or perhaps I should find part of the movements to be of this nature, part of them such as strained the muscles that inhibited such expression. Either would be the first step toward a teleological interpretation of a mechanical event. (1912b, p. 214)

Here Singer indicates his belief that thought is a form of what Watson called “implicit behavior” (Watson, 1913, 1920)—subtle muscular movements and inhibitions not readily observable to the naked eye. This view seems out of favor today, though it has a respectable history stretching back into the nineteenth century (see McGuigan, 1981, p. 30–33). It was fairly widespread during Singer’s early career (for a summary see Max, 1934) and would receive a great deal of experimental support from the efforts of Edmund Jacobson (1930), F. J. McGuigan (1978), and others.

What Singer suggested in his rather compressed and cryptic phrases can be brought out by considering McGuigan’s thought-reading machine (McGuigan, 1978, pp. 443–51). McGuigan proposed that one could experimentally determine the set of muscle movements involved in, say, producing certain words. Since McGuigan had demonstrated (to his own satisfaction, at least) that verbal thought was simply a minimization of overt speech, one could theoretically make a sort of translation dictionary of muscle movements to words. Then, if one placed electrodes over the relevant muscle groups of a human subject and asked the subject questions, one could translate the muscle movements constituting the subject’s thought-response into words. In Singer’s terms, the experimenter here is translating mechanically-defined events (muscle fiber twitches) into teleologically-defined objects (words).

In any case, if thought is to be something that can be scientifically known, we must take some such physicalist theory under consideration. While the bodily nature of thought is not a topic Singer pursued in much detail, it does seem that apparently hidden responses—as in thought—have some chance of experimental definition.

## Knowing One's Own Mind

So far I have discussed how we might know the so-called mental states or private events had by another organism. But how do you know the mental states that you yourself have? Surely, these are known in a more direct manner than the way in which you know the mental states of another. It is tempting to draw the conclusion that we have some innate and certain knowledge of our own mental states that others do not have. Many philosophers have, indeed, drawn this conclusion—notably Descartes and much of the tradition that followed from him. This conclusion was, however, denied on logical and behavioral grounds by Peirce (1868) and later Singer (1898) (and then, of course, by the behaviorists; see Hocutt, 1996).

Singer argued, against the Cartesians and early empiricists, that there is nothing “merely given in experience”—at least nothing that is of philosophical or scientific use. The truly immediate “can have no name” because to *know* a phenomenon is to put it into a system of relationships (likenesses and differences) with other phenomena. To be describable, something must become more than what is “merely given” (Singer, 1898).

That the subjective is social is a point Singer insisted on throughout his career. To cite but a few relatively early examples:

When one is young one feels more secure in the secret possession of a unique personal experience than when, after longer contact with life, one has formed the habit of “seeing through” others and has had the shock of being “seen through.” And I am not so sure that the experience of philosophy has been different from that of each individual. Gorgias found that the subjective did not thrive on an *incommunicado* regime, and it is not unnatural that Hegel should insist on the part played by other individuals in forming the nature of the self's most intimate possessions. (1902, p. 77)

It is so far from self-evident that each man's mental state is his own indisputable possession, that no one hesitates to confess at times that his neighbor has read him better than he has read himself, nor at other times to claim that he knows his neighbor's state of mind more truly than the neighbor himself knows it. ... In a word, so long as we are social beings our judgments, even the simplest of them, have social meanings, and each knows himself through others. (1911, p. 180)

I could find no way of getting at the truth about myself—even my innermost self—save by going abroad for it and receiving it as often as not at the hands of my fellows. (1913, p. 144)

This was not a new line of thought, as Singer indicates by his references to Gorgias and Hegel; elsewhere he cites Laurence Sterne (Singer, 1959, p. 71), and similar passages can be found in Goethe and other thinkers. But certainly, philosophical orthodoxy at this time maintained that one knows one's own mind first and best.

So what if, Singer would have us ask, “his own mind is the last thing a man comes to know” (1912a, p. 16)? Rather than beginning “with an immediate fact of consciousness and construct[ing]

a world,” what happens if we “begin with the world and construct an immediate fact of consciousness” (1912a, p. 16)? This, indeed, seems truer to the facts of human development.

Singer suggests that we arrive at the recognition of “immediate facts of consciousness” by observing the people around us and ourselves. For

I regard my own mind as behavior, quite as frankly as I take my fellow’s mind to be nothing else. It is of course a *type* of behavior that is in question, and it is my observation that I act like or unlike others in certain situations which makes me class my experience as of such and such a kind. (1911, p. 184)

Events occur and the people around us react. Extensive experience leads us to realize that different kinds of events lead to different kinds of reactions: “Part of their action I call reaction; I call it their seeing of a color, their hearing of a sound.” Then, “As my experience of other minds grows, my knowledge of my own is enriched: I class myself among those who see and hear.” I also notice that when people talk, part of what they talk about is “descriptive” of the world, and that these descriptions vary with what is seen and heard. And I begin to understand that, “All do not see the same thing or see the same thing in the same way” (1912a, p. 18). He continues:

As I arrive through observation at the notion of descriptive behavior, discover the way in which this varies with the point of view, I quite come to recognize that I see different things at different times, that I and another see different things at the same time. From this I gradually struggle toward an understanding of what is the same in the thing we so differently see, of the “objective” and the “subjective” factors in every description. I come to discover a subjective factor in my account of the very world with which I started. I come to see that the purely objective world and the purely subjective datum of consciousness are two ideals toward which we endlessly strive, modifying our notions of each as we change our understanding of the other. (1912a, p. 19)

And so, having started out from the relatively undifferentiated world of the infant, we come to the notion of subjective experience—of immediate facts of consciousness—as distinct, yet never purely separate, from the objective world “out there.” This is all dependent, as he says, “upon my observation of behavior” (1911, p. 184).

Does this mean that the venerable technique of introspection is without value? This was one charge made against Singer. The philosopher Ralph M. Blake wrote that, in urging “the necessity of a purely objective and behavioristic interpretation of consciousness,” Singer “denies all value to introspective methods of psychology” (Blake, 1925, p. 383). To this, Singer replied that he had no wish to “deny all value” to introspection. Rather, his theory shows that it is one type of evidence to be placed alongside other types of evidence in determining a fact. It is a special type of evidence, perhaps: just as my companion makes a better witness of what is behind my head than I do, the pain in my leg is more readily available to me than to him. But while the goings-on behind my head are “immediately available” to my companion as they are not to me, they are *not* because of that “immediately certain” (Singer, 1925a, pp. 712, 715). Or, to use another analogy, the pen in

my hand is “immediately available” to me in a way it is not to you, but its nature may be far more certain to you than to me (1912a, p. 17). To approach certainty, introspective evidence, like all other evidence, needs to be made accessible “to more than one point of view.” But these points of view can only come from outside the moment of introspection. Which is to say that the *scientific* value of introspective evidence is maintained precisely by making mind an observable, experimental object.

This is not to say, necessarily, that the points of view that make evidence scientific need be the points of view of different biological individuals. They may, in certain cases, be different points of view of a single individual at different times, from different angles. How this is to be conceived is the topic of Singer’s essay “Man and Fellow-Man” (1913). Singer here is trying to avoid a theory of truth by social agreement. The upshot of his argument, without going into the technical details, is this:

Such is the nature of the self that it can well enough be its own other. ... True, a hundred men can build a house more quickly than one, but if that one happens to be a genius he might—give him time—build a finer house. Just so our dependence upon neighbors for the acquisition of knowledge is a question of speed; give him time and it all depends upon the manner of man he is whether our man without a fellow turn out imbecile or philosopher. (1913, p. 148)

The combined efforts of many individuals no more guarantee objective truth than the isolated efforts of a lone worker guarantee incurable subjectivism. It all depends on the nature of the individuals involved and the procedures employed.

It is possible, then, for introspection to be made scientific, though Singer himself did not offer any specific recommendations. However, another philosopher close to him, Grace Andrus de Laguna, did. Her recommendation is worth reproducing here:

To the all-important problem which is thus raised: how introspection, which is by definition a sort of observation unverifiable by others, can yet possess scientific value, the only solution I know is that offered by behaviorism, *viz.*, that introspection has such a value only in so far as the introspective observations of the subject are treated as *responses*, and not as statements of observed facts. In other words the introspections are data for the psychologist, as the flight of the bee is for the naturalist, digestion is for the physiologist, or the burning of coal for the chemist. This solution is, I believe, theoretically sound, and it accords moreover with the actual procedure of the experimentalist. The real scientific observer in the psychological experiment is not the *O* but the *E* of the experiment. The series of introspections is a series of responses given by the *O* under the conditions of the experiment, and observed and interpreted by the *E*. (1919, p. 299)

There is no inherent reason why *O* and *E* may not be the same person, given appropriate experimental controls and objectives—though admittedly this is not how we tend to envisage scientific practice.

## **Radical Experimentalism and Radical Behaviorism: A Comparison**

At this point there are many paths we could take. Having presented Singer's theory of mind as an experimental object, I could show how the tendrils of this theory connect to the philosophical foundation laid down by C. S. Peirce; how its fruits show pronounced similarities with and subtle differences from those provided by John Dewey and George Herbert Mead; how the theory maintained itself against the dominant Cartesian philosophies of its time; whether it supports a paradigm of molar or molecular behaviorism. But it is perhaps most profitable in the present context to get straight to the dominant behaviorism of the twentieth century, radical behaviorism. And here I find that Singer and B. F. Skinner are largely in agreement, given a certain interpretation of each.

At first blush Singer's experimentalism and Skinner's radical behaviorism seem to be opposed on the question of subjective experience. Singer, after all, talks about mind as a necessarily observable object, while Skinner is known, in part, for ushering a certain concept of privacy into behaviorism.

But Singer and Skinner are not so far apart on this issue, and there are several very striking similarities between them. The potentially confounding issue is Skinner's often misunderstood concept of privacy.<sup>7</sup> Let's begin by trying to sort out what Skinner means by private experience (private stimuli, private responses).

Skinner famously wrote that, "The fact of privacy cannot, of course, be questioned. Each person is in special contact with a small part of the universe enclosed within his own skin" (1963, p. 952). More precisely:

The individual's response to an inflamed tooth, for example, is unlike the response which anyone else can make to that particular tooth, since no one else can establish the same kind of contact with it. Events which take place during emotional excitement or in states of deprivation are often uniquely accessible for the same reason; in this sense our joys, sorrows, loves, and hates are peculiarly our own. With respect to each individual, in other words, a small part of the universe is *private*. (Skinner, 1953, p. 257)

But, Skinner goes on to say,

We need not suppose that events which take place within an organism's skin have special properties for that reason. A private event may be distinguished by its limited accessibility but not, so far as we know, by any special structure or nature. We have no reason to suppose that the stimulating effect of an inflamed tooth is essentially different from that of, say, a hot stove. (1953, pp. 257–58)

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<sup>7</sup> The concept of "private events" in Skinner's radical behaviorism has been much discussed. For a set of recent and wide-ranging perspectives, see Burgos (2009), Hayes & Fryling (2009), Hocutt (2009), Moore (2009), and Palmer (2009).

The key point is that a private event is one of unique or limited accessibility. It is otherwise not distinct from a public event. Earlier I indicated Singer's distinction between *immediate accessibility* and *immediate certainty*: Am I warranted in supposing, he asked, "that I know better than all the world the nature of the pen I am holding because, forsooth, it is mine?" (1912a, p. 26). The answer we are compelled to give is "no."

Skinner has perhaps never made this point explicitly, but it seems he would agree. The kind of self-knowledge that is expressible, he writes, "is strictly limited by the contingencies which the verbal community can arrange" (1953, p. 261). But Skinner would want to add to Singer's analogy the point that, although my knowledge of the pen I am holding may be limited, *I* can directly use it, while *you* may only observe me using it. Likewise a toothache or other bodily condition constituting a sensation or emotion: *I* can directly feel it, while *you* may only observe my behavior with respect to it. According to both Singer and Skinner, the verbal community teaches an individual to describe her private stimuli. But whereas an individual who responds descriptively to a private stimulus does so "directly," according to Skinner, the community can only respond "inferentially" (1984a, p. 579). I can observe my toothache as directly as I can observe my tooth. The community, however, cannot observe my toothache as it observes my tooth; it observes my tooth directly, but it must *infer* my toothache from accompanying behaviors or observable conditions.

There are difficult conceptual issues here involving the nature of inference and the possibility of direct perception. I think Singer would prefer to say that my toothache is simply more readily available to me than the community. I start responding to my toothache well before the community has a chance to know anything about it. If this is all Skinner means by "directly," then he and Singer are on the same page.

The other major area where they agree is on the social nature of experience. Both Singer and Skinner would deny a Fichtean presumption of "experiences unshared and unshareable" (Singer, 1929, p. 562), of "epistemological solipsism" (Freeman, 1999, p. 9). Against this line of thought, Skinner writes, "Knowledge is subjective in the trivial sense of being the behavior of a subject, but the environment, past or present, which determines the behavior lies outside the behaving person" (1974, p. 144). Sensation and perception are behaviors under the control, ultimately, of external environmental stimuli and thus open to experimental inquiry (Skinner, 1963, p. 955). Moreover, behavior which is descriptive of these stimuli is socially acquired (Singer, 1911, 1912a; Skinner, 1945), and likewise open to investigation from multiple points of view.

We saw above that Singer defined consciousness as "perception of perception" or, indicating the roots *con* and *scio*, as "knowing what another knows" (where "another" may be yourself at a later moment). Skinner follows this exactly, describing consciousness as "seeing that we are seeing" (1963, p. 954) or "reacting [i.e., behaving] to one's own behavior" (1945, p. 277). But Skinner emphasized much more than did Singer that "being conscious ... is a social product" (1945, p. 277): "We learn to see that we are seeing only because a verbal community arranges for

us to do so” (1963, p. 954).<sup>8</sup> It is only because the community asks us about our behavior, because our behavior is important to the community, that we learn to observe it (1974, 219–20). “Consciousness,” he wrote in a late manuscript, “is co-science, knowing with others or with the help of others” (Skinner, n.d.).

But all of this is in the domain of what Skinner (1984a, p. 578) called “interpretation”: the application of scientific principles to the analysis of ordinary life. Singer and Skinner also overlap in how they envision experimental practice. This can be seen in the field of psychophysics. Singer’s experimentalist theory of sensation, discussed above, was based in part on the work of Gustav Fechner (a founder of the field of psychophysics). Singer can be seen as continuing and refining Fechner’s attempt to make psychology a quantified science. Just so Skinner. Skinner was only tangentially involved in psychophysics, being more interested in overt behavior in response to environmental variables. Nevertheless, certain of his early writings have been influential in that field (e.g., Estes & Skinner, 1941), and his techniques for controlling animal behavior have been used by animal psychophysicists (see, e.g., Blough, 1961, p. 114). By observing animals’ behavior in these experiments, we can measure, as Singer would say, the quality and intensity of their sensations.

## Conclusion

Is the subjective irreducibly subjective? One philosophical tradition—generally Cartesian—answers “yes.” Only X, it maintains, can truly know X’s experiences. Another tradition, which we can generally identify as behaviorist, replies “no.” As Max Hocutt put it, just because “only X can *have* X’s experiences” does not mean “that only X can *observe* X’s experiences” (2009, p. 109). Singer provided a method by which we can observe the minds of others and ourselves, and specifically our purposes and sensations. Mind, he proposed, is actual and potential behavior as determinable by experiment. This is all it can *meaningfully* be. It is impossible to know or say anything meaningful about phenomena that are absolutely immediate or private. Being inexpressible and having no impact on behavior, they also have no measurable time, space, or mass dimensions. Such phenomena can have no effect on our mechanical images of nature; they are beyond experience, beyond science.

Finally, I would note that while Singer’s work is now obscure, it has not been without consequence. Edwin Guthrie called Singer’s 1910 address on “Mind as an Observable Object” (published as Singer, 1911) “the most stirring event of my academic life” (1952, p. vii). Grace de Laguna’s own behaviorism was derived from “that which [Singer] was the first to formulate and which he has so brilliantly defended” (1927, p. xii). And Singer’s students such as C. West Churchman and Russell L. Ackoff carried his approach to mind on into later decades (see Churchman & Ackoff, 1947; Churchman & Ackoff, 1950; Ackoff & Emery, 1972). Singer’s half-

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<sup>8</sup> Skinner would later acknowledge that “seeing that we are seeing is an unfortunate expression” (1984b, p. 655). The first “seeing” is not necessarily visual; it is responding, especially verbally, to one’s seeing. I don’t believe Singer’s “perception of perception” has the same problem, since it is appropriate to speak of perceiving the behavior involved in another perception.



century of work on this topic remains a treasure trove for those interested in a behavioral science of mind.

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