

The Causes of Behavior

B. F. SKINNER

B. F. Skinner (1904-1990) was an American psychologist who spent his career at Harvard University. He was a leading proponent of behaviorism, which had a significant influence on philosophy. Skinner's books include *Science and Human Behavior*, *Walden Two*, and *Beyond Freedom and Dignity*.

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Why do people behave as they do? It was probably first a practical question: How could a person anticipate and hence prepare for what another person would do? Later it would become practical in another sense: How could another person be induced to behave in a given way? Eventually it became a matter of understanding and explaining behavior. It could always be reduced to a question about causes.

We tend to say, often rashly, that if one thing follows another, it was probably caused by it--following the ancient principle of *post hoc, ergo propter hoc* (after this, therefore because of this). Of many examples to be found in the explanation of human behavior, one is especially important here. The person with whom we are most familiar is ourself; many of the things we observe just before we behave occur within our body, and it is easy to take them as the causes of our behavior. If we are asked why we have spoken sharply to a friend, we may reply, "Because I felt angry." It is true that we felt angry before, or as, we spoke, and so we take our anger to be the cause of our remark. Asked why we are not eating our dinner, we may say, "Because I do not feel hungry." We often feel hungry when we eat and hence conclude that we eat because we feel hungry. Asked why we are going swimming, we may reply, "Because I feel like swimming." We seem to be saying, "When I have felt like this before, I have behaved in such and such a way." Feelings Occur at just the right time to serve as causes of behavior, and they have been cited as such for centuries. We assume that other people feel as we feel when they behave as we behave.

But where are these feelings and states of mind? Of what stuff are they made? The traditional answer is that they are located in a world of nonphysical dimensions called the mind and that they are mental. But another question then arises: How can a mental event cause or be caused by a physical one? If we want to predict what a person will do, how can we discover the mental causes of his behavior, and how can we produce the feelings and states of mind which will induce him to behave in a given way? Suppose, for example, that we want to get a child to eat a nutritious but not very palatable food. We simply make sure that no other food is available, and eventually he eats. It appears that in depriving him of food (a physical event) we have made him feel hungry (a mental event), and that because he has felt hungry, he has eaten the nutritious food (a physical event). But how did the physical act of deprivation lead to the feeling of hunger, and how did the feeling move the muscles involved in ingestion? There are many other puzzling questions of this sort. What is to be done about them?

METHODOLOGICAL BEHAVIORISM

The mentalistic problem can be avoided by going directly to the prior physical causes while bypassing intermediate feelings or states of mind. The quickest way to do this is to confine oneself to what an early behaviorist, Max Meyer, called the "psychology of the other one": consider only those facts which can be objectively observed in the behavior of one person in its relation to his prior environmental history. If all linkages are lawful, nothing is lost by neglecting a supposed nonphysical link. Thus, if we know that a child has not eaten for a long time, and if we know that he therefore feels hungry and that because he feels hungry he then eats, then we know that if he has not eaten for a long time, he will eat. And if by making other food inaccessible, we make him feel hungry, and if because he feels hungry he then eats a special food, then it must follow that by making other food inaccessible, we induce him to eat the special food... .

With respect to its own goals, methodological behaviorism was successful. It disposed of many of the problems raised by mentalism and freed itself to work on its own projects without philosophical digressions. By directing attention to genetic and environmental antecedents, it offset an unwarranted concentration on an inner life. It freed us to study the behavior of lower species, where introspection (then regarded as exclusively human) was not feasible, and to explore similarities and differences between man and other species. Some concepts previously associated with private events were formulated in other ways.

But problems remained. Most methodological behaviorists granted the existence of mental events while ruling them out of consideration. Did they really mean to say that they did not matter, that the middle stage in that three-stage sequence of physical-mental-physical contributed nothing--in other words, that feelings and states of mind were merely epiphenomena? It was not the first time that anyone had said so. The view that a purely physical world could be self-sufficient had been suggested centuries before, in the doctrine of psychophysical parallelism, which held that there were two worlds--one of mind and one of matter--and that neither had any effect on the other. Freud's demonstration of the unconscious, in which an awareness of feelings or states of mind seemed unnecessary, pointed in the same direction.

But what about other evidence? Is the traditional *post hoc, ergo propter hoc* argument entirely wrong? Are the feelings we experience just before we behave wholly unrelated to our behavior? What about the power of mind over matter in psychosomatic medicine? What about psychophysics and the mathematical relation between the magnitudes of stimuli and sensations? What about the stream of consciousness? What about the intrapsychic processes of psychiatry, in which feelings produce or suppress other feelings and memories evoke or mask other memories? What about the cognitive processes said to explain perception, thinking, the construction of sentences, and artistic creation? Must all this be ignored because it cannot be studied objectively?

RADICAL BEHAVIORISM

The statement that behaviorists deny the existence of feelings, sensations, ideas, and other features of mental life needs a good deal of clarification. Methodological behaviorism and some versions of logical positivism ruled private

events out of bounds because there could be no public agreement about their validity. Introspection could not be accepted as a scientific practice, and the psychology of people like Wilhelm Wundt and Edward B. Titchener was attacked accordingly. Radical behaviorism, however, takes a different line. It does not deny the possibility of self-observation or self-knowledge or its possible usefulness, but it questions the nature of what is felt or observed and hence known. It restores introspection but not what philosophers and introspective psychologists had believed they were "specting," and it raises the question of how much of one's body one can actually observe.

Mentalism kept attention away from the external antecedent events which might have explained behavior, by seeming to supply an alternative explanation. Methodological behaviorism did just the reverse: by dealing exclusively with external antecedent events it turned attention away from self-observation and self-knowledge. Radical behaviorism restores some kind of balance. It does not insist upon truth by agreement and can therefore consider events taking place in the private world within the skin. It does not call these events unobservable, and it does not dismiss them as subjective. It simply questions the nature of the object observed and the reliability of the observations.

The position can be stated as follows: what is felt or introspectively observed is not some nonphysical world of consciousness, mind, or mental life but the observer's own body. This does not mean, as I shall show later, that introspection is a kind of physiological research, nor does it mean (and this is the heart of the argument) that what are felt or introspectively observed are the causes of behavior. An organism behaves as it does because of its current structure, but most of this is out of reach of introspection. At the moment we must content ourselves, as the methodological behaviorist insists, with a person's genetic and environmental histories. What are introspectively observed are certain collateral products of those histories. . . .

Our increasing knowledge of the control exerted by the environment makes it possible to examine the effect of the world within the skin and the nature of self-knowledge. It also makes it possible to interpret a wide range of mentalistic expressions. For example, we can look at those features of behavior which have led people to speak of an act of will, of a sense of purpose, of experience as distinct from reality, of innate or acquired ideas, of memories, meanings, and the personal knowledge of the scientist, and of hundreds of other mentalistic things or events. Some can be "translated into behavior," others discarded as unnecessary or meaningless.

In this way we repair the major damage wrought by mentalism. When what a person does is attributed to what is going on inside him, investigation is brought to an end. Why explain the explanation? For twenty-five hundred years people have been preoccupied with feelings and mental life, but only recently has any interest been shown in a more precise analysis of the role of the environment. Ignorance of that role led in the first place to mental fictions, and it has been perpetuated by the explanatory practices to which they gave rise. . . .

Consider the report "I am, was, or will be hungry." "I am hungry" may be equivalent to "I have hunger pangs," and if the verbal community had some means of observing the contractions of the stomach associated with pangs, it could pin the response to these stimuli alone. It may also be equivalent to "I am eating actively." A person who observes that he is eating voraciously may say, "I

really am hungry," or, in retrospect, "I was hungrier than I thought," dismissing other evidence as unreliable. "I am hungry" may also be equivalent to "It has been a long time since I have had anything to eat," although the expression is most likely to be used in describing future behavior: "If I miss my dinner, I shall be hungry." "I am hungry" may also be equivalent to "I feel like eating" in the sense of "I have felt this way before when I have started to eat." It may be equivalent to "I am covertly engaging in behavior similar to that involved in getting and consuming food" or "I am fantasizing eating" or "I am thinking of things I like to eat" or "I am 'eating to myself.'" To say, "I am hungry," may be to report several or all of these conditions. . . .

PERCEIVING

Perhaps the most difficult problem faced by behaviorism has been the treatment of conscious content. Are we not all familiar with colors, sounds, tastes, and smells which have no counterparts in the physical world? What is their place in a behavioristic account?

In the traditional view a person responds to the world around him in the sense of acting upon it. Etymologically, to experience the world is to test it, and to perceive it is to capture it--to take it in and possess it. For the Greeks, to know was to be intimate with. A person could not, of course, capture and possess the real world, but he could make copies of it, and these were the so-called data--the givens--with which, in lieu of reality, he worked. He could store them in his memory and later retrieve and act upon them more or less as he might have done when they were first given... .

The Copy Theory

Those who believe that we see copies of the world may contend that we never see the world itself, but it is at least equally plausible to say that we never see anything else. The copy theory of perception is most convincing with respect to visual stimuli. They are frequently copied in works of art as well as in optical systems of mirrors and lenses, and hence it is not difficult to imagine some plausible system of storage. It is much less convincing to say that we do not hear the sounds made by an orchestra but rather some inner reproduction. Music has temporal patterns, and only recently have copies been available which might lend themselves to a mental metaphor. The argument is wholly unconvincing in the field of taste and color, where it is not easy to imagine copies distinguishable from the real thing, and it is seldom if ever made in the case of feeling. When we feel the texture of a sheet of paper, we feel the paper, not some internal representation. Possibly we do not need copies of tastes, odors, and feelings, since we are already physically intimate with them, and for presumably the same reason we are said to feel internal states like hunger or anger rather than copies.

The trouble is that the notion of an inner copy makes no progress whatsoever in explaining either sensory control or the psychology or physiology of perception. The basic difficulty was formulated by Theophrastus more than two thousand years ago:

. . . with regard to hearing, it is strange of him [Empedocles] to imagine that he has really explained how creatures hear, when he has ascribed the process to internal sounds and assumed that the ear produces a sound within, like a bell. By means of this internal sound we might hear sounds without, but how should we hear this internal sound itself? The old problem

would still confront us.

Similarly, as a modern authority has pointed out, it is as difficult to explain how we see a picture in the occipital cortex of the brain as to explain how we see the outside world, which it is said to represent. The behavior of seeing is neglected in all such formulations. It can take its proper place only if attention is given to other terms in the contingencies responsible for stimulus control.

Seeing in the Absence of the Thing Seen

When a person recalls something he once saw, or engages in fantasy, or dreams a dream, surely he is not under the control of a current stimulus. Is he not then seeing a copy? Again, we must turn to his environmental history for an answer. After hearing a piece of music several times, a person may hear it when it is not being played, though probably not as richly or as clearly. So far as we know, he is simply doing in the absence of the music some of the things he did in its presence. Similarly, when a person sees a person or place in his imagination, he may simply be doing what he does in the presence of the person or place. Both "reminiscing" and "remembering" once meant "being mindful of again" or "bringing again to mind"--in other words, seeing again as one once saw. . . .

Behaviorism has been accused of "relegating one of the paramount concerns of the earlier psychologists--the study of the image--to a position of not just neglect, but disgrace." I believe, on the contrary, that it offers the only way in which the subject of imaging or imagining can be put in good order.

Seeing in the absence of the thing seen is familiar to almost everyone, but the traditional formulation is a metaphor. We tend to act to produce stimuli which are reinforcing when seen. If we have found the city of Venice reinforcing (we refer to one reinforcing effect when we call it beautiful), we may go to Venice in order to be thus reinforced. If we cannot go, we may buy pictures of Venice--realistic pictures in color of its most beautiful aspects, although a black-and-white sketch may be enough. Or we may see Venice by reading about it if we have acquired the capacity to visualize while reading.... With no external support whatsoever, we may simply "see Venice" because we are reinforced when we do so. We say that we daydream about Venice. The mistake is to suppose that because we create physical stimuli which enable us to see Venice more effectively by going to Venice or buying a picture, we must therefore create mental stimuli to be seen in memory. All we need to say is that if we are reinforced for seeing Venice, we are likely to engage in that behavior--that is, the behavior of seeing Venice--even when there is very little in the immediate setting which bears a resemblance to the city. According to one dictionary, fantasy is defined as "the act or function of forming images or representations in direct perception or in memory," but we could say as well that it is the act or function of seeing in direct perception or in memory.

We may also see a thing in its absence, not because we are immediately reinforced when we do so, but because we are then able to engage in behavior which is subsequently reinforced. Thus, we may see Venice in order to tell a friend how to find his way to a particular part of the city. If we were together in the city itself, we might take him along a given route, but we can "take ourselves along the route visually" when we are not there and describe it to him. We can do so more effectively by pointing to a map or a sketch of the

route, but we do not consult a "cognitive map" when we describe what we see in "calling the city to mind." Knowing a city means possessing the behavior of getting about in it; it does not mean possessing a map to be followed in getting about. One may construct such a map from the actual city or by seeing the city when absent from it, but visualizing a route through a city in order to describe it to a friend is seeing as (not what) one sees in going through the city. . . .

Seeing in the absence of the thing seen is most dramatically exemplified in dreaming when asleep. Current stimulation is then minimally in control, and a person's history and resulting states of deprivation and emotion get their chance. Freud emphasized the significance of wishes and fears plausibly inferred from dreaming, but unfortunately he was responsible for emphasizing the distinction between seeing and what is seen. The dreamer engaged in dream work; he staged the dream as a theatrical producer stages a play and then took his place in the audience and watched it. But dreaming is perceptual behavior, and the difference between behavior when asleep and when awake, either in or out of a relevant setting, is simply a difference in the controlling conditions.

Rapid eye movements during sleep seem to confirm this interpretation. When most actively dreaming, people move their eyes about as if they were observing a visual presentation. (The middle-ear muscles also seem to move during dreams involving auditory perception.) It has been argued that eye movement, as well as ear-muscle movement, show that "physiological input" affects dreaming, but such behavior is quite clearly a physiological *output*. We can scarcely suppose that the iconic representations observed in dreaming are under the eyelids or in the outer ear.

There are many ways of getting a person to see when there is nothing to be seen, and they can all be analyzed as the arrangement of contingencies which strengthen perceptual behavior. Certain practices in behavior therapy, in which the patient is asked to imagine various conditions or events, have been criticized as not genuinely behavioral because they make use of images. But there are no images in the sense of private copies, there is perceptual behavior; and the measures taken by the psychotherapist are designed to strengthen it. A change takes place in the patient's behavior if what he sees (hears, feels, and so on) has the same positively or negatively reinforcing effect as if he were seeing the things themselves. It is seldom if ever enough simply to instruct the patient to "have feelings," to ask him to feel sexually excited or nauseated, but he may be shown pornographic or nauseating material or be asked to "visualize as clearly as possible" a sexual or disgusting episode.

That a person may see things when there is nothing to be seen must have been a strong reason why the world of the mind was invented. It was hard enough to imagine how a copy of the current environment could get into the head where it could be "known," but there was at least a world outside which might account for it. But pure images seem to indicate a pure mind stuff. It is only when we ask how either the world or a copy of the world is seen that we lose interest in copies. Seeing does not require a thing seen.