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Sketch

WHAT DO MENTAL TERMS MEAN?

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Psychologists and philosophers have long been interested in two questions: (a) What do mental terms mean? and (b) what role do mental terms play in explanations of behavior? In the current sketch I review how mediational neobehaviorism, cognitive psychology, and the radical behaviorism of B. F. Skinner address these questions. In so doing, I seek to clarify the meaning of mental terms, as well as their role in explanations of behavior.

Key words: neobehaviorism, cognitive psychology, mentalism, radical behaviorism, folk psychology, dispositions, explanation

What do mental terms mean, and what role do they play in explanations of behavior? The answers often depend on the theoretical orientation of the person being asked. In the current sketch I first review how mediational neobehaviorism addresses these questions and then how cognitive psychology addresses questions related to mental terms, including how cognitive psychology conceives of the way behaviorism addresses the questions. Finally, I contrast how the radical behaviorism of B. F. Skinner addresses the questions with how neobehaviorism and cognitive psychology address them. In so doing, I seek to clarify the meaning of mental terms and their role in explanations of behavior.

How Mediational Neobehaviorism Addresses Questions About Mental Terms

The dominant form of behaviorism is mediational stimulus–organism–response (S–O–R) neobehaviorism. As a prelude to reviewing how neobehaviorism addresses questions about mental terms, the following is a summary of the background and features of this form, taken from Moore (in press-a).

The distinctive feature of mediational neobehaviorism is the insertion of inferred mediating organismic variables between stimulus and response in theoretical explanations of behavior. The mediators are thought to be necessary to account for the nominal spontaneity and variability of behavior. According to the notion of mediation, environmental stimuli are viewed as activating some unobservable, inferred inner act, state, mechanism, process, structure, or entity that mediates the relation between S and R and in

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a meaningful sense causes R. The mediator is regarded as the proper target for psychological theorizing because the organism is not in direct contact with stimuli in the environment, rather only with the mediator.

Given a distinction between observational and theoretical terms in science, the inferred mediating organismic variables are regarded as theoretical terms. An operational definition that refers to observables establishes agreement on their meaning. The particular type of theoretical term is a hypothetical construct, rather than an intervening variable. A hypothetical construct admits meaning beyond the observables that operationally define it. These inferred mediating organismic variables comfortably accommodate the surplus meaning inherent in mental concepts, and indeed may even have been conceived to do so.

For a neobehaviorist, then, a mental term is rendered as a mediating organismic theoretical term and as a hypothetical construct. In scientific venues, a neobehaviorist would remain silent on its ultimate ontology and not commit to whether it referred to something that was literally mental or cognitive. Rather, a neobehaviorist would say it is enough to point to publicly observable measures of the construct. However, in other venues the neobehaviorist might well agree that the mental really exists, even though the mental cannot be talked about directly in science because it is not publicly observable.

A referential or symbolic theory of verbal behavior underlies the neobehaviorist approach. Words, terms, or concepts are taken to refer to something in another dimension, such as in the mind of the theorist. Agreement about the meaning of a word, term, or concept is established by taking the publicly observable data of the operational definition as the acceptable surrogate or proxy for the genuine referent in another dimension, allowing the neobehaviorist to remain silent about that genuine referent for purposes of doing science.

How Cognitive Psychology Addresses Questions About Mental Terms

Moore (in press-b) recently described some of the background and features of cognitive psychology. As a prelude to reviewing how cognitive psychology addresses questions about mental terms, the following is a summary of that background and those features. To be sure, cognitive psychology is not monolithic—different forms have somewhat different features. The following summary emphasizes background and features associated with information-processing forms.

In brief, information-processing forms of cognitive psychology are based on assumptions derived from communication theory, cybernetics, electrical engineering, mathematics and computer technology, psycholinguistics, and the verbal learning tradition, as well as earlier forms of psychology. The focal assumption of these forms of cognitive psychology is mentalism: the appeal to unobservables (e.g., inferred acts, states, mechanisms, processes, structures, or entities in the "mind") from another dimension (e.g., mental, cognitive) as causally effective antecedents in explanations of behavior. The explanatory appeal to unobservables is held to be necessary because behavior in the observable dimension is not related in any obvious one-to-one way to environmental stimuli in the observable dimension. Therefore, behavioral output must be causally related to something other than the direct input

from environmental stimuli. This other something to which behavioral output is causally related, and in terms of which an explanation of behavior is appropriately sought, is the mind and its structures that are held to underlie behavior. Readers may note that this concern in much of cognitive psychology is similar to the earlier concern in mediational neobehaviorism with how to accommodate the nominal spontaneity and variability of behavior while retaining a commitment to an S–R framework. In many forms of cognitive psychology, the concern about the ostensible lack of relation between behavior and environmental stimuli is typically expressed under such headings as "poverty of the stimulus" or "stimulus underdetermination." With particular regard to psycholinguistics, many cognitivists point to (a) the rapidity of linguistic development in children and (b) the novelty of children's utterances as evidence against empirical or environmental accounts that might be offered in behaviorism. In light of such arguments, many cognitive psychologists hold that reinforcement plays little if any role in the acquisition of natural language skills in typically developing children. Rather, they argue that natural language can be understood as a child possessing and applying various grammatical and syntactical rules that are innate. In a word, mentalists are concerned with competence, rather than with performance and the analysis of environmental factors that attend any specific instance of behavior.

The causal explanation of behavior for most forms of cognitive psychology consists in postulating unobservable elements of the nonbehavioral dimension that can cause behavior, their operating characteristics, and how they are functionally related to each other. The argument is that other sciences have progressed by appealing to inferred, unobservable factors, so cognitive psychology is simply doing the same thing.

As mentioned earlier, much of cognitive psychology embraces an information-processing orientation. An important metaphor in this orientation is that of the modern computer: The mind is to the brain as a computer program is to the hardware of the computer. In this view, the job of cognitive psychology is to infer the nature and function of the program based on the evidence of observable behavior.

In keeping with the computer metaphor, much of cognitive psychology embraces philosophical functionalism. In this view, mental states are defined functionally rather than according to physical or physiological parameters. Allied with this view for many cognitive psychologists is the thesis of multiple realizability, which asserts that those states can be realized anatomically in multiple ways and are not defined by one and only one set of physical or physiological parameters. Although instances (i.e., tokens) of mental states have physical or physiological properties, classes (i.e., types) of mental states are to be defined by their functional roles, rather than by physical or physiological parameters. Thus, much of cognitive psychology adopts token physicalism but not type physicalism.

This is not to say that physiological data are incidental. To the contrary, cognitive neuroscience is a particularly important branch of much of contemporary cognitive psychology. For example, many researchers and theorists in cognitive neuroscience seek to find activity in central nervous system structures and pathways that can be taken to represent mental or cognitive concepts from folk psychology. A common practice is to examine the blood-oxygen-level-dependent (i.e., BOLD) response as revealed in functional

magnetic resonance imagery (i.e., fMRI). These concepts are then invested with a modular, faculty-like character (Fodor, 1983).

Similarly, the postulation of mental terms and concepts is held to depend heavily on experimental data, rather than simply on introspective reports. Common dependent measures that are taken as the bases to validate inferences about underlying mental states include (a) reaction times; (b) answers on choice problems, memory tasks, or rating scales; and (c) physiological readings (interpreted as tokens).

In sum, for much of cognitive psychology, mental terms and concepts are taken to refer to causally effective antecedents (acts, states, mechanisms, processes, structures, entities) in a nonbehavioral dimension, that is, the mind (mental, cognitive, spiritual, psychic, conceptual, hypothetical, mystical, or transcendental). The meaning of causally effective ranges from initiating to mediating. Nonetheless, the factors above are linked by a common commitment to mechanical, antecedent causation. That is, the cause of behavior is some antecedent act, state, mechanism, process, or so forth that is fully endowed with a one-to-one capacity to account for all the characteristics of the observed behavior. If the characteristics of a given form of behavior differ from those of another, a new and different antecedent factor with a new and different capacity is proposed (Moore, in press-b).

Some forms of mentalism and cognitive psychology are dualistic, but not all. Dualism involves assumptions of a different sort. The forms of mentalism that hold that they are consistent with materialism and deny that they are dualistic do so because they assert that they do not talk about different things. Henceforth in this sketch I will be talking about forms of mentalism and cognitive psychology that deny they are dualistic.

As in mediational neobehaviorism, an assumption that underlies much of cognitive psychology concerns language: Humans are assumed to be the sort of creatures who use words as symbols to refer to or represent other things. In light of this assumption, the arrangement of those symbols according to grammatical and syntactical rules is of fundamental importance.

Cognitive Criticisms of Behaviorism

Moore (in press-b) reviewed some general criticisms that many cognitivists have made of behaviorism and discussed why cognitivists view their approach to mental terms as theoretically and philosophically superior to that of behaviorism. In brief, these criticisms are as follows:

1. To explain behavior, one needs to identify unobservable structures that cause the behavior, not describe observable features of the environment in which the behavior takes place. This requirement follows because behavior is not functionally related in a one-to-one way with environmental stimulation; therefore, it must be related to something else. Many cognitivists argue that because behaviorism stays at the level of describing environmental circumstances, rather than attempting to find out what the something else is, it cannot possibly be adequate.

2. For behaviorism, theoretical concepts are operationally defined in terms of concepts derived from observable behavior. However, behavior is an effect, not a cause. The cause of behavior should properly

be mental states and structures, rather than anything observable and behavioral. Therefore, behaviorism cannot possibly be adequate.

3. For behaviorism, the overall orientation is at best merely observational and descriptive. In contrast, for cognitive psychology, the overall orientation is theoretical and explanatory. Cognitive psychology possesses these characteristics because it is concerned with assessing the capacity of underlying states and structures, rather than with assessing mere performance as in behaviorism.

To these general criticisms may now be added some more specific criticisms. The background to these more specific criticisms is as follows. A prominent feature of many ostensibly "behavioral" orientations in philosophy and psychology is called *philosophical behaviorism*. Philosophical behaviorism is sometimes related to the analytic philosophy associated with Gilbert Ryle (e.g., 1949) and Ludwig Wittgenstein (e.g., 1953/1973), although the precise nature of the relations among philosophical behaviorism, analytic philosophy, Ryle, and Wittgenstein is often subject to interpretation. In any event, for philosophical behaviorism, mental terms are related to *dispositions*. A disposition is ordinarily defined as a measurably high probability of engaging in some form of publicly observable behavior in some specified circumstance. According to a dispositional view, to say that an individual is in pain means that we can observe that the individual has a high probability—a disposition—to moan and groan in some circumstance. To say that an individual intends to do X means that we can observe that the individual has a high probability—a disposition—to actually do X in some circumstance. At issue is whether for philosophical behaviorism such matters as being in pain are defined exhaustively to mean engaging in publicly observable behavior and nothing more. Many cognitive psychologists hold that for philosophical behaviorism the definition of mental terms is in fact exhaustive and that they mean nothing beyond publicly observable behavior (see, e.g., Fodor, 1968, pp. 51, 55). This position is tantamount to type physicalism. Therefore, many cognitive psychologists charge that philosophical behaviorism in effect subscribes to both token and type physicalism, which is in error.

In a similar vein, many cognitive psychologists assume neobehaviorism exhaustively defines its mediating organismic theoretical concepts, of which mental concepts are examples, by relating them without remainder to observables (Moore, in press-b). This assumption follows in large measure because of a further assumption that neobehaviorism is so closely linked to both logical positivism and operationism as to be virtually isomorphic with them. A conspicuous early example of these assumptions was the cognitive philosopher Fodor (1968), who commented critically in the following passages on what he saw as the manifest explanatory liabilities of a behaviorism based on logical empiricism and operationism:

> I think many philosophers secretly harbor the view that there is something deeply (i.e., conceptually) wrong with psychology, but that a philosopher with a little training in the techniques of linguistic analysis and a free afternoon could straighten it out. . . . [P]sychological metatheory has remained seriously underdeveloped. With a few important exceptions, its history during the second quarter of this century has been an attempt to work out a variety of behaviorism that would satisfy the constraints imposed

> on psychological explanation by an acceptance and application of empiricist (and particularly operationalist) views of general scientific method. . . . [P]hilosophers of science . . . have realized that these doctrines are by no means indispensable to characterizations of scientific explanation and confirmation and that philosophical accounts that exploit them may in fact seriously distort the realities of scientific practice. Yet it is precisely upon these views that much of the implicit and explicit metatheory of American experimental psychology appears to rest. (pp. vi, xi–xv)

According to cognitive psychology, then, neobehaviorism, logical positivism, operationism, and philosophical behaviorism are all cut from the same cloth. They all subscribe to both token and type physicalism, and all are entirely inadequate. To use dispositions as an example, several lines of reasoning are commonly cited to illustrate the specifics of the inadequacies.

First, according to cognitive psychology, if we embrace a dispositional view, we equate observational criteria for the use of a mental term with what the term essentially is or refers to. For cognitive psychology, if we say that a mental term means a disposition, and if we then say that a disposition means observable behavior, we have equated a mental term with behavior. For cognitive psychology, a mental term refers to a mental state. The problem is that a mental state is something internal and unobservable, whereas behavior is external and observable. As a result, cognitive psychology argues that a dispositional view does not acceptably distinguish between (a) what entity the term designates or stands for and (b) an observed form of behavior.

Second, and following from the first, according to cognitive psychology, if we embrace a dispositional view, we reduce first-person sentences to third-person sentences. A common joke about this state of affairs concerns two lovers after a tryst. One says to the other, "Your orgasm was fantastic! How was mine? Oh, from your description mine must have been fantastic, too!" According to this criticism, it does not make sense to say that we gather observational evidence about our own behavior, just as we would about another's, and then infer on the basis of that evidence whether it is legitimate to say we had experienced a certain emotion, just as we would about another. We can be in direct and immediate contact with our emotions, so presumably we do not go through any process involving observation and inference.

Third, suppose there were a race of Spartans who experienced pain but did not engage in publicly observable, pain-related behavior (e.g., Putnam, 1980). In this case an internal state would be conspicuously dissociated from a disposition toward publicly observable behavior, in obvious contrast to exhaustive definitions.

Fourth, suppose we say that the meaning of "Jones believes it is going to rain" is that "Jones has a disposition to take an umbrella from the front hall closet before he leaves his house." According to cognitive psychology, we then need to ask, Why take an umbrella? We further need to say that Jones believes an umbrella will keep him dry. We still further need to say that Jones believes he has an umbrella in the front hall closet, rather than in the back hall closet. The upshot is that we eventually need to identify some cause of the behavior. According to cognitive psychology, if we stay at the level of simply describing the probability of engaging in certain forms of publicly observable behavior, we only create an endless series of questions.

We need to trace the cause of that behavior back to prior beliefs as mental states (Chisholm, 1957).

How Radical Behaviorism Addresses Questions About Mental Terms

The radical behaviorism of B. F. Skinner took an entirely different approach to behavioral science than did mediational neobehaviorism. To begin with, radical behaviorism never followed the neobehaviorist tactic of distinguishing between observational and theoretical terms and then inserting theoretical terms between S and R to represent mediating organismic variables of an uncertain ontology as causally effective antecedents in its explanations. Instead, it embraced the notion of operant behavior. As a result, radical behaviorism is fundamentally opposed to neobehaviorism and continued efforts at antecedent, mechanical causation. Therefore, readers should not take radical behaviorism to be consistent with neobehaviorism simply because many use the term *behaviorism* to describe them both.

As Moore (in press-b) reviewed, radical behaviorism stands opposed to cognitive psychology and the way it invokes mental terms for many of the same reasons that radical behaviorism stands opposed to neobehaviorism. For instance, Moore pointed out that, for neobehaviorism, operational definitions actually only partially define a term, rather than exhaustively. As a result, operational definitions of mediating organismic terms in neobehaviorism only give evidence that justifies use of the terms, not an ostensive brief of their nature. A cognitive criticism that assumes behaviorism exhaustively defines its theoretical mediators is off the mark. Again, to point out that neobehaviorism only partially rather than exhaustively defines its theoretical terms does not mean that neobehaviorism is acceptable, because the partially defined mediating organismic terms in neobehaviorism can be just as mental or cognitive as the entities proposed in cognitive psychology (see Moore, in press-b). In this regard, Leahey (1992, 2004) argued that little actually distinguishes mediational neobehaviorism from cognitive psychology.

Moore (in press-b) further pointed out that, for radical behaviorism, the key problem lies in the view of verbal behavior. Both neobehaviorism and cognitive psychology adopt a referential, symbolic view of verbal behavior, according to which terms refer to or symbolically represent things in another dimension called a "meaning." Radical behaviorism unhesitatingly rejects this entire view and favors instead a thoroughgoing behavioral view. In a thoroughgoing behavioral view, the question of whether an operational definition exhaustively or partially identifies the referent is irrelevant—it does neither because the meaning of verbal behavior is not a matter of reference or symbolic representation in the first place. In any event, we may now further examine the reasons why radical behaviorism stands opposed to cognitive psychology.

Radical behaviorism begins by critically analyzing the assumptions that underlie cognitive psychology.

1. Cognitive psychology assumes two dimensional systems: behavioral and mental. Radical behaviorism deals with only one dimensional system. However, questions about ontology and dimensions are tricky here. Radical behaviorism does not say that there are really two dimensions and two ontologies requiring two sorts of terms (mental

versus behavioral), where one is publicly observable and the other not, and that in order to meet the requirement of a science we must restrict ourselves to the one that is publicly observable (e.g., Skinner, 1945, 1953). Rather, radical behaviorism asserts that there never has been more than one dimension and ontology to begin with. Talk of two dimensions and ontologies is the legacy of spurious factors that are cherished for extraneous and irrelevant reasons. In particular, radical behaviorism attributes mental talk to social–cultural factors, patterns of language use, and inappropriate metaphors. Thus, radical behaviorism rejects mentalism and talk of two dimensions on the basis of the factors and assumptions that give rise to that talk.

2. Much of cognitive psychology assumes that in order for something to count as behavior, it must be publicly observable. For example, it may be assumed to be something like the publicly observable output of a machine. If something is not publicly observable, it cannot count as behavior. Again, radical behaviorism does not grant this assumption. Radical behaviorism does not conceive of behavior in mechanistic terms and therefore questions the reliance on a mechanistic metaphor and antecedent causation. In addition, radical behaviorism accepts forms or aspects of behavior that are not publicly observable. We may call these forms private behavioral events. Their ontology does not differ in principle from public events, except that they are accessible to only one person. One class of private behavioral events occurs when we engage in covert forms of operant behavior. Covert forms involve the same organ systems as overt forms. The covert forms may exist in the current instance at the inchoate or incipient level. Just where these forms lie on a continuum from peripheral to central in the organ system is an empirical question. Covert behavioral events are caused by factors and relations in the environment, just as are public, overt behavioral events. In fact, the covert forms presumably started as overt but then changed to covert as a result of influences from the environment. They may provide a sort of discriminative control, or they may be intermediate steps in a sequence of behavior, as links in a chain. They may avoid punishment that would otherwise be associated with an overt form. They are not necessarily present in every behavioral event. Even when present, they do not achieve anything more than overt events would. The kind of phenomenon conventionally called "thinking" is an example. In any case, these private, covert behavioral events are not part of a different dimensional system. A second class of private behavioral events occurs during the course of our lives, such as when we come in contact with biologically significant forms of stimulation. That stimulation evokes a wide range of responses, including those that constitute our internal bodily conditions. When we feel anxious or depressed, sad or happy, fatigued or energized, hungry or thirsty, we are feeling or sensing bodily conditions or the action of bodily structures. More will be said about this second class later in this sketch.

3. Much of cognitive psychology assumes that verbal behavior differs fundamentally from other forms of behavior. For example, much of cognitive psychology assumes qualitatively different mechanisms

underlie verbal behavior than other forms of behavior. Radical behaviorism does not make this assumption. To be sure, a difference is that verbal behavior has an effect on other persons, who mediate reinforcement for the speaker's verbal behavior; verbal behavior does not have a direct effect on the nonsocial environment. Nevertheless, verbal behavior remains a form of operant behavior, reinforced by its consequences.

4. In keeping with the previous point, much of cognitive psychology assumes that meanings are singular entities that are symbolically communicated in a different dimensional system from the mind of the speaker to the mind of the listener through the use of a term. For the case in point, much of cognitive psychology assumes that mental terms mean or correctly reflect the internal states or processes in a mental dimension that are an intrinsic part of our psychological nature. Radical behaviorism does not grant this assumption about verbal behavior. Again, questions of two dimensions and of one mind communicating to another in the mental dimension are distinctly troublesome in a natural science. For radical behaviorism, meanings are a function of causal conditions in the one dimension (Skinner, 1945, 1957). To ask what speakers mean is to ask what variables and relations in the one dimension cause the speakers to speak in the way they do. To ask if a listener understands what a term means is to ask what the term causes the listener to do in the one dimension.

A Fundamental Question

We are now left with a fundamental question: In light of the foregoing behavioristic analysis, what are people actually talking about when they use mental terms, whether with respect to themselves or others? The previous section describes covert behavior, such as thinking. What about when we describe our pains as sharp or dull? We obviously talk about ourselves and others as having a toothache. How can we secure a causal analysis of such talk?

The famous French philosopher René Descartes (1596–1650) held that we are just supposed to know the features of our own internal lives so perfectly well that we could not possibly be mistaken about them: *Cogito, ergo sum* ("I think, therefore I am"). These intimately known features of our mental lives then cause us to behave in particular ways. This dualistic position is well-established in Western culture, and it is the view upon which much of cognitive psychology is predicated, despite its frequent denial of dualism. According to this view, something transpiring within us (like a mental operation involving the contents of our minds) causes us to do something that is observable from the outside, and we are in privileged contact with that which goes on inside of us. If we adopt the Cartesian dualistic view that we are in privileged contact with events or entities that are inside us, then it follows that when we use mental terms to speak about our sensations, feelings, or thoughts, we must be able to do so because we somehow have a "private language" that we can use to incorrigibly express ourselves and from which our observable behavior follows. Ironically, the logical empiricist philosopher Feigl (1967) also ended up accepting the dualistic doctrine of a private language.

However, the traditional Cartesian view is not without opposition. For example, consider the later work of the European philosopher Ludwig Wittgenstein (1889–1951). For Wittgenstein, the traditional Cartesian view was a mistake: "There is a kind of general disease of thinking which always looks for (and finds) what will be called a mental state from which all our acts spring as from a reservoir" (Wittgenstein, 1965, p. 143). Similarly, Wittgenstein (1953/1973) suggested that it was important for us to "try not to think of understanding as a 'mental process' at all—for *that* is the expression which confuses you. But ask yourself: In what sort of case, in what kind of circumstances, do we say, 'Now I know how to go on'" (para. 154).

With specific regard to language, Wittgenstein held that language is something like a game, played according to a set of rules shared between speaker and listener. Ordinarily, speakers learn to say things about experiences they have in common with listeners according to the shared or conventional set of rules. However, in the case of things going on inside the skin and accessible to only one person, the things spoken about obviously are not shared.

Nevertheless, we just as obviously do speak about our toothaches, or about our sharp or dull pains. The relevant question is how are we able to do so, in light of Wittgenstein's concerns about the impossibility of a private language? Wittgenstein suggested that talk about our own aches and pains is simply a "natural expression" of those internal phenomena. Talk about the aches and pains of others in dispositional terms reflects nothing more than our observations and our conventional practices. The solution that Skinner (1945) proposed was to emphasize that we acquire verbal behavior in a public circumstance. This solution meets Wittgenstein's requirement for a shared experience. After the verbal behavior has been acquired, control over that verbal behavior transfers to private forms of stimulation that were present during the public circumstance. When only the private stimulation is present in the future, it will occasion the response. Thus, internal events are not causal in the traditional sense of an efficient cause. Rather, their causal efficacy is derived from their relation to public events.

As an example, let us now consider a causal account of someone saying, "I have a sharp pain," with particular attention to the word *sharp*. We start by assuming that the speaker is not soliciting attention, malingering, or seeking to escape from a distasteful task. Rather, we will assume that the speaker's emission of the term *pain* is occasioned by the properties of the internal stimulation being experienced. At issue is the process by which the statement comes about. We need to take a historical, developmental approach. For example, suppose that when the speaker was a child, she bumped her leg against the sharp edge of a table. She then began to limp. When a parent saw her limping, the parent then asked such questions as "Where do you have the pain?" and "How did your hurt yourself?" When the child indicated she had bumped her leg against something sharp, either the parent or the child may have used the compound term *sharp pain* in connection with the event. The information is important to the parent, who now knows that it was the table that caused the pain and to move the table to a different location so the child will not get hurt in the future. Significantly, the child then learns to use the term *sharp pain* in conjunction with this whole state of affairs. For example, in later circumstances, she may suffer similar pain as a result of being injured by another sharp object and describe the pain as sharp. She has learned to describe the class of pains caused by sharp objects as sharp

pains on the basis of public features of early events. But the painful private stimulation was also present and acquired some of the discriminative control over the response. The result was that in later situations she responded on the basis of the private stimulation alone. Control of the response had transferred from public to private stimulation. If she was originally injured by a dull object, presumably she would learn to describe the class of pains as dull pains according to an analogous process. Skinner (e.g., 1945, 1953) described several such cases in his writings.

Dispositions

Readers will recall that for much of philosophical behaviorism and mediational neobehaviorism, mental terms are taken to mean nothing but dispositions: a high probability of observing some form of behavior in some situation. Given that many cognitive criticisms of behaviorism are related to the topic of dispositions, we may now turn more specifically to the analysis of dispositional talk.

For radical behaviorists, dispositional talk simply reflects the conventional practices of the verbal community—how the shared experiences and resulting conventional practices lead us to invoke certain terms, including mental terms, in our discourse. Our statements that others are in pain from a toothache meet with approval in our verbal community on occasions when those others have been observed moaning, groaning, and holding their jaws. However, radical behaviorism does not equate pain with publicly observable behavior. We do not then sympathize with others who say they are in pain from a toothache merely because they moan, groan, and hold their jaws. We may say we know what others feel like when they are in pain because they are like us—humans who have similar bodies and similar nervous systems and react in ways that are similar to the ways we would react if we had a toothache.

An important question is what causes the behavior of the persons being observed, of whom we say that they have a disposition to do X or Y? Presumably, moaning, groaning, and holding the jaw are Wittgenstein's natural expressions of pain. For radical behaviorism, as for the later Wittgenstein, dispositional talk is simply descriptive talk; speakers engage in dispositional talk when they describe the frequency or a property of behavior in another. Dispositional talk does not constitute a causal analysis of the observed behavior. Indeed, a problem arises if a disposition is taken as an inner entity in others that causes their observed behavior. Such a move elevates a disposition to a conceptual cause and constitutes mentalism. For radical behaviorism, genuinely causal talk involves analysis of contingencies. Thus, one might reasonably recast the question and ask what contingencies cause persons to engage in behavior that causes others to say they have a disposition to do X or Y. The answer will not be found in another dimensional system. This treatment is far from anything cognitive psychology recognizes about radical behaviorism.

To be sure, radical behaviorism agrees that some talk apparently about private phenomena is dispositional. For example, Skinner (1953) stated that "an angry man, like a hungry man, shows a disposition to act in a certain way" (p. 168). Here, one sense of such terms as *anger* or *hunger* may be regarded as dispositional in character. In another case, Skinner (1957) talked

about belief as follows: "Our belief in what someone tells us is similarly a function of, or identical with, our tendency to act upon the verbal stimuli which he provides" (p. 160). Presumably, the tendency to act is a function of the probability of reinforcement with which those verbal stimuli are correlated.

However, not all talk involving mental terms should be considered merely dispositional. As analyzed previously, an internal condition clearly contributes to the factors that occasion use of the term *pain*. Consider also the term *intention*. As often used, the term implies the notion that behavior is with respect to some object. The action is not just released as part of some mechanical process. For radical behaviorism, to say that an individual's conduct is intentional is to say that it is operant behavior and functionally related to its consequence. In addition, perhaps an individual's own verbal behavior that specifies the relevant contingencies contributes some measure of discriminative control.

Suppose someone says, "I intend to go to the computer store to buy a new laptop." At issue is the use of the term *intend* in the statement. Presumably the speaker's action is directed toward a new laptop computer. In addition, the person's statement reflects discriminative control by various features of the person's environment. Perhaps the person's current laptop is slow or does not have enough memory. Probably the person has read in an advertisement that the computer store sells laptops that are faster or have more memory. Probably the person has engaged in some overt or even covert behavior about comparing prices and features of various models. The stimulus control over the eventual behavior is complex. The person is informing a listener of the contingencies governing the behavior of going to the computer store, the consequence of which is obtaining a new computer, as opposed to, say, going home and taking a nap. The person has learned through interactions with the verbal community to use the term *intention* in these circumstances. The term *intention* does not reflect some internal mental state that is possessed and that causes the behavior of buying a new laptop.

Analyses of this sort indicate that radical behaviorism is more than just another form of dispositional analysis. Indeed, blanket criticisms from cognitive psychology that any form of behaviorism, including radical behaviorism simply because it is conventionally called a behaviorism, offers nothing but dispositional analyses are significantly wide of the mark (see Moore, 2008, for additional discussion of dispositions).

Summary and Conclusions

For radical behaviorism, when a speaker uses any term, the meaning of that term is a function of the contingencies controlling its emission. Thus, in contrast to both neobehaviorism and much of cognitive psychology, radical behaviorism adopts a nonreferential and nonsymbolic approach to verbal behavior. This approach means that upon closer analysis, talk about so-called "mental terms" could actually be a function of contingencies pertaining to any of several different things, rather than literally about mental events. After all, mental events do not literally exist, so they cannot be what actually occasions the talk. Four possibilities are (a) private behavioral events, (b) physiological events, (c) dispositions, or (d) explanatory fictions (Moore, in press-c).

For radical behaviorism, analysis of some talk that involves mental terms suggests it is actually occasioned by private, covert behavioral events, rather than by phenomena that are literally mental. This talk reflects the way that covert operants like thinking, as well as sensations and feelings like sharp or dull pains, influence subsequent nonverbal and verbal behavior. These events are critical to understanding behavior in all its complexity, but they have been caused by environmental circumstances. We must turn to those circumstances to fully understand behavior. An important matter is that this talk is concerned with behavioral phenomena in the one dimension. However, these phenomena are not accessible to more than the one person who hosts them.

Analysis of other talk that involves mental terms suggests it is actually occasioned by physiological events, rather than mental phenomena. This talk reflects that physiological events necessarily participate in every behavioral event, public or private. However, for radical behaviorists a physiological event is not the same type of event as a private behavioral event. More particularly, an organism's physiology is a material cause. This sense of causation contrasts with that commonly seen in traditional psychology, which formulates physiological factors as autonomous or initiating causes of behavior. Talk of physiological events during the gaps of a behavioral account is clearly relevant to an understanding of behavior, insofar as that talk increases possibilities for prediction and control and thereby contributes to an enhanced understanding of an organism as a behaving system.

Analysis of still other talk that involves mental terms suggests it is actually not occasioned by either private behavior or physiology. Rather, it is dispositional. That is, it is about the probability of engaging in publicly observable behavior. Importantly, for radical behaviorists dispositional talk is about the *effects* of contingencies. This sense of dispositions contrasts with that of traditional psychology, which often formulates dispositions as initiating or mediating inner causes of behavior, instead of effects.

Finally, analysis of some talk that involves mental terms suggests it is not occasioned by anything that exists in space and time. Rather, the terms in such talk are just "explanatory fictions." This talk merely reflects such things as metaphors, the social–cultural traditions of folk psychology, and socially approved ways of offering an explanation of behavior in terms of supposed causally effective antecedents from a nonbehavioral dimension. Regrettably, traditional psychologists often assume that this talk accurately reflects actual causal events or entities in other, nonbehavioral dimensions. Often the talk is justified as being theoretical. However, for radical behaviorism there are no other dimensions in the sense that traditional psychology envisions. According to radical behaviorism, this talk interferes with an effective understanding of behavior and may be dismissed as mentalism, notwithstanding its theoretical pretensions. Indeed, radical behaviorists regard Western culture as decidedly mentalistic, if not dualistic, largely because it embraces this traditional conception of the nature and causal status of internal events. Because feelings and internal states occur at just the right time (i.e., prior to behavior), a common practice is, first, to name them, second, to accept them as unobservable causes by virtue of having been named, and third, to render them as mental. Even if traditional theorists try to correlate them with actual events inside an individual—and they do not routinely do so—traditional theorists fail to assess the extent to which those events are

in turn functionally related to environmental circumstances. The concept of "autonomous man," already at great strength because of prevailing social–cultural traditions and folk psychology, holds that human behavior is initiated or at least mediated from within.

Radical behaviorism does not assume the traditional dichotomy of (a) behavior as publicly observable and (b) some factor that causes behavior but is unobservable and by virtue of being unobservable must be from a mental dimension. Although many cognitive positions deny that they invoke dualistic causes, closer analysis indicates that at heart these cognitive positions say all the same things as dualism. How different in principle is (a) mental talk of a cognitive executive function of the prefrontal cortex as compared with (b) outright dualistic talk of the Cartesian soul causing voluntary behavior by agitating animal spirits, with the resulting undulations reflected in the pineal gland? If intellectual processes in humans are to be compared to functional states generated by a computer program, the question remains as to who writes the program. Is it a dualistic entity from another dimension? Regrettably, a great deal of a cognitive orientation seems to be derived from traditional dualistic preconceptions of the culture, as evidenced by the concepts of folk psychology. History indicates that science progresses as it abandons instead of perpetuates these preconceptions. Clearly, medical science progresses as it abandons folk medicine: preconceptions that diseases are caused by spirits, miasmas, and imbalances among "humors." Rather, science progresses when it looks instead to naturalistic explanations in terms of bacteria or viruses. Contemporary cognitive positions may claim evolutionary development in humans as the origin of some of their explanatory concepts, but a reasonable question is whether the claim is made more to escape a charge of dualism than on the basis of a sound naturalistic analysis. Table 1 reviews the important relations from the standpoint of radical behaviorism. For the issues of their dimensions, their origin, whether they are necessary to explanation, and their causal status, the cognitive concepts and mental terms of traditional, mentalistic psychology that incorporate concepts from folk psychology are contrasted with the notion of private behavioral events from Skinner's radical behaviorism.

Table 1
A Comparison of Mental Terms Derived from Folk/Traditional Psychology with the Notion of Private Behavioral Events Derived from Radical Behaviorism (Taken from Moore, 2008)

Issue	Folk/Traditional Psychology	Radical Behaviorism
Dimension	Mental	Behavioral
Necessary part of every behavioral event?	Yes	No
Ontogenic/developmental?	Usually no; if yes, incidental	Yes, critical to understanding
Causal status	Initiating, purposive	Discriminative control

Radical behaviorism assesses any viewpoint on operational, pragmatic grounds. If some cognitive or mediational theory appears to predict the outcome of an experiment, or if some cognitive or mediational intervention appears to yield a benefit in therapy, its apparent validity should not be taken to mean that it has identified an actual cognitive or mediational cause of behavior. There are no such entities; they are not the cause of anything; they

are not the basis for any effectiveness. Rather, the validity of the theory or intervention is derived from the factors and relations that occasion it. An operational analysis of the theory or intervention reveals the factors and relations that occasion it. If a theory or intervention is effective, there are behavioral reasons for its effectiveness, not cognitive reasons, in the sense that it is occasioned by data from behavioral contingencies, despite its nominal cognitive or mediational vocabulary. A clarification and refinement of the extent to which it was so occasioned can then provide a basis for further and presumably even more effective action.

The trouble is that the observation of behavioral contingencies occasions very little in cognitive or mediational theories or interventions. Rather, as reviewed earlier in this sketch, radical behaviorists argue that much mental talk is occasioned largely by social–cultural factors, patterns of language use, and inappropriate metaphors. These sorts of factors interfere with an analysis of contingencies at the phylogenic, ontogenic, or cultural level that actually cause the behavior in question. These sorts of factors induce us to look for things that do not exist and therefore cannot possibly cause behavior. Consequently, they induce us to ignore the things that do exist in space and time and do cause behavior, like contingencies. We thereby limit opportunities to strengthen behavior that enhances our welfare.

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Study Questions

1. According to the article, what is meant by mediational S–O–R neobehaviorism? Do mediational neobehaviorists interpret inferred mediating organismic variables as observational or theoretical terms? As hypothetical constructs or intervening variables? As partially or exhaustively defined? How do mediational neobehaviorists render mental terms according to the distinctions above?
2. Briefly describe the principal features of a cognitive orientation to psychology as outlined in the article.
3. In one sentence, what is the article's definition of mentalism?
4. Briefly describe what is meant by "poverty of the stimulus" arguments against behaviorism, particularly concerning verbal behavior.
5. According to the article, how does cognitive psychology conceive of the explanation of behavior? What is the role of a computer metaphor in such an explanation?
6. Briefly distinguish between token and type physicalism. Which form of physicalism is accepted by cognitive psychologists and which is rejected?
7. Briefly describe the characteristics of philosophical functionalism as the philosophy of mind associated with cognitive psychology.
8. According to the article, what dependent measures are prominent in cognitive psychology?
9. According to the article, what are three cognitive criticisms of behaviorism?
10. Does the article argue that cognitive criticisms of behaviorism are directed more at radical behaviorism or mediational S–O–R neobehaviorism?
11. Briefly describe what is meant by philosophical behaviorism. What is the role of dispositions in philosophical behaviorism? Summarize the four reasons why cognitive psychologists argue philosophical behaviorism based on dispositions is inadequate.
12. Summarize the radical behaviorist analysis of the assumptions underlying a cognitive orientation to psychology. According to the article, how do radical behaviorists conceive of the explanation of behavior?
13. Briefly describe Wittgenstein's argument against a private language.
14. According to radical behaviorism, describe the processes according to which we come to say we are experiencing a "sharp pain." Extend these processes to account for how we come to say we are experiencing a "splitting headache."
15. What is the role of dispositions in radical behaviorism?
16. Summarize the distinctions between folk/traditional psychology and radical behaviorism as outlined in Table 1.