

Mentalism as a Radical Behaviorist Views It — Part 2

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Part 1 of this review suggested that mentalism consists in explanations of behavior in terms of causal mental states and processes. These causal mental states and processes are inferred to reside in an unobservable dimension beyond that in which behavior occurs, and to function differently from environmental events, variables, and relations. One of those functions is inferred to be mediation, in which environmental events trigger a mediating state or process, which in turn triggers a response. For mentalism, an explanation should properly focus on specifying the causal role of the mediator, rather than talking about observable relations. Part 1 further suggested that mentalism is actually as integral to mediational neobehaviorism as it is to cognitive psychology, even though each claims to differ from the other. Part 2 continues the review of mentalism by addressing the relations among mentalism, operationism, and the meaning of scientific verbal behavior, especially when the verbal behavior involves private behavioral events. The review then considers some sources of mentalism, along with examples of how mentalism is supported in philosophy. Finally, the review summarizes the radical behaviorist opposition to mentalism. Overall, the review concludes that radical behaviorism differs from both cognitive psychology and mediational neobehaviorism, which radical behaviorism regards as comparably mentalistic.

Keywords: mediational neobehaviorism, mentalism, radical behaviorism

Part 1 of this review suggested that mentalism is an orientation to the explanation of behavior. According to this orientation, researchers and theorists should explain behavior by appealing to the causal capacities and architecture of states and processes in the mental dimension. The mental dimension is inferred to be an underlying, unobservable dimension beyond the dimension in which behavior occurs. The causal phenomena in this dimension are inferred to function differently from environmental events, variables, and relations, such as by actively mediating if not initiating our experience with the world at large.

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For mentalism, explanations in any form of behaviorism are inadequate because they are concerned with performance, and are expressed in terms of observable relations between behavior and environmental circumstances. Mentalists argue that behavior is far too rich and flexible for such behavioral accounts to constitute a meaningful explanation of behavior. Something beyond observable relations is needed.

Part 2 of the review continues to examine mentalism and addresses such questions as: (a) What are the relations among mentalism, operationism, and the meaning of scientific verbal behavior, especially when the verbal behavior involves private behavioral events? (b) How is mentalism supported in philosophy? (c) What are some sources of mentalism? (d) Why do radical behaviorists oppose mentalism?

Mentalism, Operationism, and the Meaning of Scientific Verbal Behavior

Radical behaviorism argues that much of the controversy between radical behaviorism, on the one hand, and both mentalism and neobehaviorism, on the other hand, turns on a symbolic, referential conception of verbal behavior. According to this conception, the meaning of any term is established by identifying the entity that is being symbolically represented and to which the term is assumed to refer. Radical behaviorism argues that both mentalism and neobehaviorism accept a symbolic, referential conception. In contrast, radical behaviorism rejects this conception as mischievous and deceptive, notwithstanding claims that operationism insulates the symbolic, referential conception of verbal behavior against any explanatory liabilities.

A symbolic, referential conception is longstanding in traditional psychology and philosophy. For example, Stevens (1939), an early advocate of a particular view of operationism in psychology, fully subscribed to this symbolic, referential conception of verbal behavior:

A sign has semantical significance when an organism will react to it as it would to the object which the sign supplants. The psychologist works out the laws under which different stimuli evoke equivalent reactions. Signs, as stimuli, can be combined and utilized extensively in the control and direction of behavior, both individual and social. The entire activity of the scientist as a sign-using organism constitutes, therefore, a type of behavior for which behavioristics seeks the laws. (p. 250)

A further example is Benjamin (1955):

What, then, gives such an operation cognitive significance? The answer is simple and clear-cut. The event which is produced by the operation must *refer* to that which was involved in its creation in that unique way which is characteristic of all *symbols*. Symbols are a special kind of *sign*. A sign is defined as that which has the property of referring to, or indicating, something else; this "meaning relationship" is probably unique and indefinable. (p. 97)

With respect to the modern era, radical behaviorism argues that both mentalism and neobehaviorism take psychological terms to symbolically represent or refer to mediators in a nonbehavioral dimension. For mentalism, the mediators are unselfconsciously asserted to be states and processes in a mental dimension. For neobehaviorism, at first glance the mediating organismic variables may not appear to reside in a mental dimension. However, closer analysis indicates the mediators are almost always surrogates or proxies for mental if not explicitly dualistic causes — Skinner called these and other such variables “explanatory fictions.” Regardless of debates about ontology, neobehaviorism remains mentalistic because of the way it conceives of the explanatory behavior of observing scientists on the basis of the foregoing symbolic, referential conception of verbal behavior. For example, a common locution is that once these mediators have been named, it is only “as if” they actually exist, according to an instrumentalist orientation to theorizing in science. The disingenuous assumption is that the scientist need take no position on their actual existence — it is enough to point to their role in promoting an explanation. The problem with this assumption is that in order to correctly explain behavior, researchers and theorists are assumed to construct these theoretical terms in their minds, and then couple the terms with aspects of experimental design and the hypothetico-deductive method. This position constitutes an “epistemological dualism.” Common indicators include appeals to constructs, models, theories, hypotheses, inferred structures and processes, again where psychological terms are assumed to symbolically represent mental phenomena that cause explanatory behavior on the part of the researcher or theorist to be correct. Thus, given their commitment to a symbolic, referential conception of verbal behavior, researchers and theorists are mentalistic about themselves, when they explain their own behavior of explaining, regardless of any attempts at instrumentalist justification.

Some Historical Context

A brief summary of the approach of the mediational neobehaviorist E.C. Tolman establishes some additional historical context for the present analysis. By the 1920s many psychologists had come to express the concepts in psychological theories and explanations in terms of observable stimuli and responses. One reason psychologists did so was to avoid the ambiguity and vagueness of appeals to mental processes supposedly revealed through introspection. Two relatively early examples are Meyer (1921) and Singer (1924). However, as was becoming apparent by the 1930s, many psychologists believed a vocabulary restricted to observable stimuli and responses had difficulty explaining the flexibility, richness, and apparent spontaneity of some forms of behavior.

Tolman was one of those who argued that behavior was not easily explained in a vocabulary that was restricted to observable stimuli and responses. Tolman

had traveled to Europe in 1912 and 1923. In 1931, Moritz Schlick, the leader of the Vienna Circle, went to University of California–Berkeley, Tolman’s university, as a visiting professor. Tolman then spent a sabbatical year in Vienna in 1933–1934. Presumably as a result of these contacts, Tolman became well acquainted with logical positivist thinking. Central in that thinking was how to respectably include terms ostensibly referring to unobservables in scientific theories and explanations. This thinking was attractive to Tolman in light of his desire to go beyond observable stimuli and responses. Tolman’s approach was to introduce what he called “intervening variables” into his theorizing. These variables were theoretical terms referring to unobservables that intervened and mediated the relation between observable stimuli and responses. [Readers should note that Tolman introduced his set of terms a decade before MacCorquodale and Meehl (1948) proposed a formal definition of theoretical terms using a related set of terms. Consequently, readers should not take the similarity of terms to indicate that Tolman’s approach in the 1930s was identical to that of MacCorquodale and Meehl (1948).] A series of passages from Tolman (1951) indicate this approach:

These demands, differentiations and hypotheses are all demonstrated and defined by objective experiments They are, in short but logical constructs. They are not relivings of immediate experience. Psychology like physics deserts immediate experience and leaves it for the philosopher, the poet, or the proponent of common sense. (p. 114)

The particular . . . predictions in which psychology is interested concerns the to-be-expected behavior of organisms — the behavior to be expected from other organisms, and the behavior to be expected from ourselves. And in these predictions, mental processes, whether they be those of another or of ourselves, will figure only in the guise of objectively definable intervening variables. Or (to borrow a phrase from William James) the sole “cash value” of mental processes lies, I shall assert, in this their character as a set of intermediating functional processes which interconnect between the initiating causes of behavior, on the one hand, and the final resulting behavior itself, on the other. (pp. 116–117)

Such an operational behaviorism . . . asserts that these intervening variables are to be defined wholly operationally — that is, in terms of the actual experimental operations whereby their presences or absences and their relations to the controlling independent variables and to the final dependent variable are determined I have denied that introspective behavior provides any *sui generis* type of information concerning the intervening variables. (p. 129)

The consequently evoked state or process — “intervening variable” — in the animal resulting from this presentation of the given environmental sequence is called a sign-gestalt expectation (p. 136)

A theory, as I shall conceive it, is a set of “intervening variables.” These to-be-inserted intervening variables are “constructs” which we, the theorists, evolve as a useful way of breaking down into more manageable form the original complete . . . function. (pp. 150–151)

Tolman's writing here is illustrative. The actual articles from which the passages above are taken were written during the 1930s. Tolman's intervening variables were the mediating organismic variables in the S-O-R model of mediational neobehaviorism, which many psychologists were beginning to embrace during this time. For Tolman, these intervening variables were aids, or to use Tolman's vocabulary, "sign-gestalts" that caused the psychologist to correctly explain the rat's behavior in running the maze, just as the various features of a maze were sign-gestalts that caused the rat to correctly follow the path that led to food in the goal box. As Smith (1986) noted, Tolman embraced an epistemological dualism, in which organisms responded to mediating representations of the world, rather than to the world directly. Operationism provided the means to avoid being accused of admitting mental concepts directly, in the fashion of classical introspection. Early in the development of his point of view, Tolman adhered to established operational practice, as represented in his statement above that his intervening variables were "defined wholly operationally," that is, exhaustively.

The difficulty for Tolman was that he considered his intervening variables to be entities that actually existed inside the organism, effectively on the independent variable side of things though not publicly observable. The organism was the scientist as well as the rat. If an intervening variable was something that actually existed in the scientist or rat, and not just as a logical construct without existential reality, then other criteria could be applied to its meaning or definition. This view created an inconsistency, as the construct could no longer be said to be exhaustively defined by one particular operation or observation. Along with many others, Tolman eventually came to realize the inconsistency. The result was that Tolman came to revise his stance, in light of the convention that MacCorquodale and Meehl (1948) proposed:

I am now convinced that "intervening variables" to which we attempt to give merely operational meaning by tying them through empirically grounded functions either to stimulus variables, on the one hand, or to response variables, on the other, really can give us no help unless we can also embed them in a model from whose attributed properties we can deduce new relationships to look for. That is, to use Meehl and MacCorquodale's distinction, I would abandon what they call pure "intervening variables" for what they call "hypothetical constructs," and insist that hypothetical constructs be parts of a more general hypothesized model or substrate. (Tolman, 1949, p. 49)

Thus, Tolman assumed that his intervening variables were states, processes, and the like that actually existed inside his rats when they ran the maze, and inside him when he explained their maze running. They functioned as variables that mediated behavior. The dimension of such variables was never resolved, other than Tolman's acknowledgment that although they were "mental," they were nevertheless revealed "objectively" through experimentation rather than through introspection, in keeping with the requirements of good science.

About these matters, Skinner (1989) stated

I had called the conditions of which reflex strength was a function “third variables,” but Tolman called them “intervening.” That may have been the point at which the experimental analysis of behavior parted company from what would become cognitive psychology. (p. 109)

Of course, Tolman wasn't the only theorist to take the mediational approach, as Smith (1986) shows in a comparable analysis of the mediational neobehaviorism of C.L. Hull and K.W. Spence. Indeed, MacCorquodale and Meehl (1948) also critically examined Hull–Spence constructs in an effort to clarify their usage. In a recent discussion of these same matters, Moore (2008, p. 347) suggested some might dismiss a claim that linked mentalism to the mediational neobehaviorism of Tolman and Hull–Spence as preposterous and uninformed. However, the link seems clear. The basis for the link follows from the mentalistic views that (a) words are things that symbolically refer to other things, and (b) to establish the meaning of those words individuals must divine what those other things are, the dimension in which they reside, and their causal properties.

The Meaning of Verbal Behavior in Radical Behaviorism

For radical behaviorism, the entire symbolic, referential view of verbal behavior held in mentalism and mediational neobehaviorism is faulty and causes difficulties. Verbal behavior does not at heart reflect some underlying, symbolic, referential process from a nonbehavioral dimension. Terms are not things that refer to or symbolically represent other things. The meaning of a term is not established by finding its referent. For Skinner (1945),

Attempts to derive a symbolic function from the principle of conditioning . . . have been characterized by a very superficial analysis . . . Modern logic, as a formalization of “real” languages, retains and extends this dualistic theory of meaning and can scarcely be appealed to by the psychologist who recognizes his own responsibility in giving an account of verbal behavior. (pp. 270–271)

Terms are instances of operant behavior, emitted under specific circumstances and having a certain function in the speaker's life. It makes no more sense to say that a term symbolically represents or refers to something else than it does to say that stepping on a car's accelerator at a traffic intersection symbolically represents or refers to a green light. In both cases, the meaning of the behavior is a function of the circumstances in which it is emitted. The meaning of stepping on a car's accelerator is the presence of a green light and being able to proceed through the intersection, given the presence of a green light. In the case of verbal behavior, the meaning of a term from a speaker's point of view is the antecedent circumstances that occasion it. The meaning of a term from a listener's point

of view lies in its discriminative function: How does contact with the term allow the listener to obtain certain consequences? Importantly, the antecedent circumstances for the speaker and discriminative function for the listener are not measures of meaning, where meaning should be construed as some causal entity in a different dimension. Rather, they are what meaning means.

It is perfectly reasonable to seek to establish the meaning of a psychological term, and hence its function in scientific inquiry. However, individuals need not assume that the term symbolically represents or refers to states and processes that literally exist in an extra-behavioral dimension and cause behavior. The mediational orientation in mentalism and neobehaviorism clearly does so assume. Thus, the basis for mentalism is the assumption of another dimension, with its collection of mental states and processes to which psychological terms are supposed to symbolically refer. However, the assumption goes, science needs public agreement, and the mental can't be publicly agreed upon because it is not directly, publicly accessible. Consequently, the mental must be dealt with indirectly and inferentially. For radical behaviorists, the assumption of a mental dimension in such an approach is attributable to a variety of extraneous considerations, rather than legitimate scientific practices. On the radical behaviorist view, verbal behavior may well be functionally related to important antecedent circumstances: (a) whatever scientific operations the researchers have conducted and (b) whatever contacts with data have resulted from such operations. However, readers may recall that Skinner (1945) also suggested the verbal behavior may be functionally related to incidental sources that are cherished for extraneous and irrelevant reasons. One of these sources is the aforementioned assumption of a mental dimension with its causal states and processes. This mentalistic assumption then plays out as a bias toward a general mentalistic if not dualistic explanatory orientation in the culture at large. The point here is that functional analysis and interpretation of the verbal behavior in question will clarify why scientists speak as they do.

Moore (2010) suggested that for radical behaviorism, terms from a nominally psychological or mental vocabulary often reflect several sources of control, either singly or in combination: (a) private behavioral events, (b) physiology, (c) dispositions, (d) behavioral relations, and (e) explanatory fictions. With respect to the first source, some so-called mental talk might be about private behavioral events. Private behavioral events are concerned with the influence of feelings, sensations, and covert operant behavior. The notion of private behavioral events allows radical behaviorists to understand how those events participate in contingencies controlling subsequent operant behavior, whether nonverbal or verbal. More is said about private behavioral events in a following section. With respect to the second source, some so-called mental talk might be about physiology. This talk engages the role of physiological structures and pathways that participate in any form of behavior. However, this talk runs the

risk of confounding causal and explanatory categories. Although an organism's physiology necessarily participates in its behavior, physiological events are not the same type as behavioral events, public or private. On this view, an organism's physiology is a material cause. To portray an organism's physiology as an autonomous, initiating, or efficient cause, as traditional psychology often does, creates a variety of explanatory problems (Moore, 2002). With respect to the third source, some so-called mental talk might be about dispositions, as was noted earlier in the present review. This talk does not reflect anything literally mental. Rather, dispositional talk reflects the probability of behavior engendered by contingencies. Dispositional talk is about effects, instead of causes or intervening variables as traditional psychology often portrays them. With respect to the fourth source, some mental terms may actually reflect behavioral relations. For example, the term attention may be understood as reflecting a controlling relation between behavior and some antecedent circumstance. Similarly, discrimination may be understood as reflecting the fact of different responding to different circumstances, typically brought about by different experiences. Generalization may be understood as reflecting the fact of similar responding to similar circumstances. Such terms need not be understood as referring to mediating mental processes. Finally, with respect to the fifth source, some so-called mental talk is little more than an appeal to fanciful explanatory fictions. This talk, common in traditional psychology, owes its strength to language patterns and the everyday social reinforcement inherent in "folk psychology." The talk surrenders to mentalism, notwithstanding any claims that it is "theoretical."

Radical Behaviorism and the First Type of Private Behavioral Event

We may now say more about the radical behaviorist conception of private behavioral events. Radical behaviorists conceive of two types of private behavioral events. In one type, radical behaviorists address the influence of private stimulation from internal conditions or states of the body, such as feelings and sensations. Of interest here are the processes by which this private stimulation occasions a speaker's verbal behavior. This is the traditional type of "verbal report" concerned with "the use of subjective terms." In another type, radical behaviorists address the functional role of private stimulation from an individual's own private verbal or nonverbal behavior. Of interest here are the processes by which this stimulation occasions the behavior that follows. These processes concern the traditional matter of "thinking." With regard to vocabulary, what follows occasionally uses the term overt as synonymous with public and the term covert as synonymous with private.

In typical circumstances, verbal behavior of any type develops when the verbal community differentially reinforces a response contingent on the presence of a discriminative stimulus. The differential reinforcement can range from the

approval inherent in ordinary discourse to actually receiving some tangible consequence, such as asking for and receiving the salt at the dinner table. Important in typically developing verbal behavior is that both speaker and verbal community are in contact with the same discriminative stimulus, so that (a) the verbal community can maintain the appropriate consistency in its reinforcing practices and (b) the discriminative stimulus can then become the appropriate occasion for the speaker's emitting the verbal behavior in question in the future.

However, the situation with verbal reports about private stimulation from internal conditions or states of the body — the various forms of so-called “subjective experiences” — is somewhat different. Here, the verbal community operates with a handicap when it comes to verbal behavior: only the speaker is in contact with this stimulation. How then does the verbal community differentially reinforce talk related to this stimulation, so that discriminative control by private stimulation develops and speakers are able to talk about it in a reasonably consistent fashion? In everyday language the verbal community doesn't know when the appropriate private stimulation is present or absent, so the verbal community doesn't know when to approve such talk. Skinner (1945) called this problem the “problem of privacy.” The verbal community obviously does solve the problem, given that individuals obviously do learn to talk about their aches and pains, or joys and sorrows, in ways that affect listeners.

The answer is that the verbal community can differentially reinforce responses based on public states of affairs. These public states of affairs are accessible to both speaker and verbal community, and are correlated with the private stimulation. Control develops in an original situation based on the public states of affairs, and then transfers to the correlated private stimulation, so that eventually some measure of control comes to reside with the private form. Of course, these processes vary a great deal across speakers. The result is that verbal reports of speakers about their covert world may vary a great deal.

To use pain talk as an example, three cases can be identified. The first is that the verbal community may initially reinforce pain talk when speakers put their hands to the area that is the source of the pain — a public collateral response that is correlated with the pain. The second is that the verbal community may initially reinforce pain talk when some object has visibly struck a speaker, resulting in observable inflammation or tissue damage — a public accompaniment that is correlated with the pain. The third is that if control by private stimulation related to bodily states or conditions has already developed, then that control may generalize from original to new forms of private stimulation, based on the similarity of new stimulation to the original. For example, in this third case, given that speakers have already learned to talk about a pain as sharp when they prick their finger with a pin, speakers are able to talk about a new pain in their stomachs as sharp when it is similar to the original pain. In sum, verbal behavior develops under the discriminative control of public circumstances

and then control transfers to private circumstances. The result is that speakers end up being able to talk under the discriminative control of internal conditions and states that are accessible to only themselves.

What then is the causal role of sensations and feelings? In what sense is it meaningful to say individuals take a pain reliever *because* they feel the pain of a toothache, they eat *because* they feel hungry, or they learn to repeat a response *because* it is followed by the pleasant feeling? For radical behaviorism, what individuals feel are conditions of their bodies that have been themselves caused by other circumstances or events. The condition felt as the pain of a toothache is presumably caused by an infection. The condition felt as hunger is presumably caused by food deprivation. The condition felt as pleasantness is presumably caused by a reinforcer. In such cases, it is those other circumstances or events that cause both the condition felt and any behavior to which they are related. When individuals with a toothache take a pain reliever, they terminate contact with the infection in a carious tooth. Thus, the infection causes both the pain and taking the pain reliever. An even better step would be to take an antibiotic, to terminate the infection in the first place. In any case, individuals ordinarily wouldn't take something that didn't have the consequence of terminating contact with the pain or terminating the infection. When individuals eat, they terminate the condition caused by food deprivation. Food deprivation causes both the feeling called hunger and the behavior called eating. Individuals ordinarily wouldn't eat something that didn't have the consequence of terminating food deprivation and their hunger. When an individual's behavior changes through reinforcement, the reinforcer causes both the pleasant feeling and the strengthening of the response. When Thorndike emphasized the effect of consequences on behavior, he attributed the effect to the feelings the consequences caused, such as satisfaction in the case of what would now be called positive reinforcers, and discomfort or annoyance in the case of what would now be called aversive stimuli. From the present point of view, Thorndike needed to back his analysis up one more step and attribute both (a) the feeling and (b) the behavioral effect to (c) the consequence.

Radical Behaviorism and the Second Type of Private Behavioral Event

At issue for the second type of private behavioral event is how private stimulation from one's own covert verbal or nonverbal operant behavior acquires discriminative control over the behavior that follows. An understanding of this type of private behavioral event begins with the recognition that operant behavior is usually acquired at the overt level. However, through the action of environmental variables and relations, the behavior may then recede to the covert level. Covert operant behavior is executed with the same organs as

overt operant behavior, but reduced in magnitude, perhaps even to incipient or inchoate levels.

The behavior becomes covert through the action of any of several factors (Skinner, 1957). One is that the overt form is punished. A second is that necessary environmental support is absent. A third is convenience or expedience: individuals may simply be able to respond faster covertly rather than overtly. If the overt form of the behavior was a link in a chain of responses that contributed to discriminative control over subsequent behavior, then presumably the covert form will function similarly.

Individuals make contact with their covert behavior through their interoceptive and proprioceptive systems. This private stimulation is also present in the original circumstances, when an individual behaves overtly. Consequently, the private stimulation will gain some measure of discriminative control in those circumstances. Once discriminative control is acquired, the control can occur in new circumstances, on the basis of induction related to coincident properties. Many usages of the term "thinking" reflect situations wherein the stimulation from one instance of behavior — and the behavior need not even be covert — affects subsequent behavior (Skinner, 1953, chapter 16; 1957, chapter 19). These processes vary a great deal across individuals.

For radical behaviorism, when a private behavioral event does contribute functionally to public behavior, some prior experiences are necessary for the private event to do so. Nevertheless, responding with respect to private or covert stimuli is lawful and alike in kind to responding with respect to public or overt stimuli. Private stimuli may be interpreted as simply additional independent variables in the same dimensional system as public stimuli. As Skinner (1974) put it,

Usually, however, the term [thinking] refers to completed behavior which occurs on a scale so small that it cannot be detected by others. Such behavior is called covert. The commonest examples are verbal, because verbal behavior required no environmental support and because, as both speaker and listener, a person can talk to himself effectively; but nonverbal behavior may also be covert. Thus, what a chess player has in mind may be other moves he has made as he has played the game covertly to test the consequences Covert behavior is almost always acquired in overt form and no one has ever shown that the covert form achieves anything which is out of reach of the overt. Covert behavior is also easily observed and by no means unimportant, and it was a mistake for methodological behaviorism and certain versions of logical positivism and structuralism to neglect it simply because it was not "objective." . . . It does not explain overt behavior: it is simply more behavior to be explained.

The present argument is this: mental life and the world in which it is lived are inventions. They have been invented on the analogy of external behavior occurring under external contingencies. Thinking is behaving. The mistake is in allocating the behavior to the mind. (pp. 106–107)

Private Behavioral Events vs The Mentalism of Traditional Psychology

There are at least four reasons why the concept of a private behavioral event is not itself mentalistic. First, a private behavioral event is in the same dimension as a public behavioral event, rather than a different dimension as in mentalism. When an event is accessible to others, it is a public event. When it is accessible only to the behaving individual, it is a private event. Nonetheless, the same principles and analytic concepts apply in both public and private cases.

Second, a private behavioral event is executed by the same response systems as public behavior, rather than nonbehavioral mechanisms as in mentalism. However, the behavior in question is reduced in magnitude. Again, the same principles and analytic concepts apply in both public and private cases.

Third, the provenance of a private behavioral event is functionally related to environmental circumstances. That is, the private behavioral event is not an independent contribution of the organism, and depends on the history of the behaving organism.

Fourth, the influence of a private behavioral event on subsequent behavior is functionally related to environmental circumstances — its influence is not inevitable. In other words, just as does its provenance, any influence it exerts depends on the history of the behaving organism. Skinner (1953) described this influence as follows:

The private event is at best no more than a link in a causal chain, and it is usually not even that. We may think before we act in the sense that we may behave covertly before we behave overtly, but our action is not an “expression” of the covert response or a consequence of it. The two are simply attributable to the same variables. (p. 279)

Thus, the influence of a private event is conditional, not necessarily mediational, as in one of the mental states or processes of traditional psychology. In particular, covert behavior does not explain overt behavior. Rather, it is simply more behavior to be explained.

As noted earlier in this review, much of the radical behaviorist approach is interpretive, in the sense that known scientific principles are used to talk about and explain facts, even though no formal experimental analysis has been or perhaps even can be conducted. According to Skinner (1974),

Obviously we cannot predict or control human behavior in daily life with the precision obtained in the laboratory, but we can nevertheless use results from the laboratory to interpret behavior elsewhere [A]ll sciences resort to something much like it [T]he principles of genetics are used to interpret the facts of evolution, as the behavior of substances under high pressures and temperatures are used to interpret geological events in the history of the earth. (pp. 228–229)

Thus, the theory of evolution uses the principles of variation, interaction, and differential replication, which have been studied in the laboratory under controlled conditions, to explain the evolution of species. Similarly, the theory of plate tectonics uses principles governing the behavior of material under high pressure and high temperature, which have been studied in the laboratory under controlled conditions, to explain the formation of surface features of the earth (e.g., Catania and Harnad, 1988, pp. 207–208). So also can we apply the principles of operant behavior and stimulus control to explain the provenance and influence of private behavioral events (Palmer, 2011).

Radical Behaviorism and Dispositions

Historically, one approach to mental terms has been to treat them as dispositions. A disposition is some robustly high conditional probability that when a given set of publicly observable circumstances is implemented regarding some object, some publicly observable event will take place concerning that object. Presumably, the event takes place because of some physical property inherent in the object (e.g., Quine, 1974), but strictly speaking the property need not be specified. For example, to render the meaning of some mental talk in terms of dispositions, as when a person is said to be experiencing “pain,” the meaning of pain may be understood as simply the robust conditional probability that when the person steps on a tack and is said to be in pain, the person will moan and groan. The person does have relevant neural systems, but they need not be specified. Indeed, dispositional analyses of psychological terms are traditionally regarded as at the heart of “philosophical behaviorism,” for example, as represented in Ryle (1949) and Wittgenstein (1953/1973; see also Hocutt, 1985).

For radical behaviorism, the meaning of some ostensibly mental talk is in fact dispositional. Indeed, a dispositional approach works well with verbs and corresponding nouns related to propositional attitudes, such as “to believe” and “belief,” “to intend” and “intention,” and so on. For example, here is a relevant passage from Skinner (1957):

With respect to a particular speaker, the behavior of the listener is also a function of what is called “belief.” We may define this in terms of strength of response. Our belief that there is cheese in the icebox is a function of, or identical with, our tendency to go to the icebox when we are hungry for cheese, other things being equal. Our belief that there is a substantial table in front of us varies with our tendency to reach for it, place things upon it, and so on. If we have just spent some time in a house of mirrors in an amusement park, our belief in this simple fact may be shaken, just as our belief about the cheese may be quickly dispelled by an empty icebox. 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. If we have always been successful when responding with respect to his verbal behavior, our belief will be strong. If a given response is strictly under the control of stimuli with little or no metaphorical extension and no impurity in the tact relation, and if the speaker clearly indicates these conditions . . . , we will react in maximal strength. (pp. 159–160)

What then about such other verbs and corresponding nouns as “to think” and “thoughts”? Zuriff (1985, p. 59) has pointed out that given the traditional interpretation of operationism, all mental concepts are reduced to being dispositional. That is, on a dispositional view, the meaning of “to think about going to the market” is reflected in the probability of actually going to the market. Here is where radical behaviorism differs from the analytic philosophy of Ryle (1949) and Wittgenstein (1953/1973), as well as such other forms of philosophical behaviorism as Hocutt (1985). For radical behaviorism, thinking may be construed as a kind of occurrent activity that affects subsequent behavior through an operant process. In Skinner’s (1957) words,

There is no point at which it is profitable to draw a line distinguishing thinking from acting [on a continuum ranging from overt to covert forms of action] So far as we know, the events at the covert end have no special properties, observe no special laws, and can be credited with no special achievements A better case can be made for identifying thinking with behaving which automatically affects the behavior and is reinforcing because it does so. This can be either covert or overt. (p. 438)

Thus, although many instances of behavior are peripheral and publicly observable, not all are. Some instances of behavior entail activity within the skin and inaccessible to others, perhaps even central. For example, Skinner suggested “that the kind of thinking which seems to be merely covert behavior (‘truncated, unemitted, reduced, impotent behavioral acts’) may be so reduced that there is no muscular involvement to be sensed proprioceptively” (see Catania and Harnad, 1988, p. 331). Like other instances of behavior, these instances owe their occurrence to a particular set of circumstances, previously recounted. Another set of circumstances is responsible for the subsequent effects or functions of the behavior.

Worth repeating is that the functional analysis of verbal behavior, including that of the scientist, clarifies many of the concerns about establishing the meaning of psychological terms. Some psychological terms are indeed occasioned by dispositions to engage in observable behavior, but not all are. Even when a psychological term is dispositional, it is occasioned by aspects of the dependent variable, rather than by aspects of the independent variable. If the primary interest is in a causal account, the environmental circumstances that cause the disposition need to be specified. For operant behavior, those circumstances are specified in terms of contingencies of reinforcement. A disposition is not taken to be a mediating variable in a mental or conceptual dimension that itself causes behavior. Further, a disposition to engage in publicly observable behavior is not taken as evidence that operationally justifies talk of a mental or conceptual cause.

Tokens, Types, and Surplus Meaning

Discussions of meaning often involve several pairs of terms: tokens and types, exhaustive and partial operational definitions, intervening variables and hypothetical constructs, surplus and no surplus meaning. It is useful at this point in our review of mentalism to examine some relations among these pairs, from both a traditional point of view and a radical behaviorist point of view. We start with tokens and types.

Recall that according to contemporary mentalism, both logical positivists and neobehaviorists are committed to type physicalism. That is, mentalists say that for logical positivists and behaviorists, the defining properties of types of mental phenomena can be reduced to the types of their physical properties. Mentalists say a commitment to type physicalism on the part of logical positivists and behaviorists is dead wrong.

Contemporary mentalists argue that although token physicalism is a commendable commitment to materialism, type physicalism such as found in early logical positivism and operationism, and as applied in succeeding theoretical positions, goes too far. For example, consider one influential mind–body position: identity theory. According to identity theory, a mental or psychological state was identical to a brain state (e.g., Feigl, 1958; Place, 1956). This position had the apparent virtue of rendering talk about something unobservable — a mental state — in terms of something observable — a physiological state. At issue is whether being in the designated type of mental state is identical with being in the designated type of physiological state and nothing more. In other words, the type of mental state is reducible to the type of physiological state, without remainder, as an instance of type physicalism.

At issue here are whether definitions should be partial or exhaustive, whether surplus meaning is admitted, and whether theoretical terms should be interpreted as hypothetical constructs. Identity theory illustrates how these distinctions apply. Suppose type physicalism is accepted. If so, then types of mental states are exhaustively defined in terms of their types of physical, observable properties and measures. If so, then the meaning of the designated type of mental state is reducible to the designated type of physiological state, without remainder. However, philosophical functionalists do not accept type physicalism or an identity theory based on type physicalism. Functionalists therefore dispute exhaustive definitions with no surplus meaning because the meaning would have to reside without remainder in the physical, observable properties or measures said to define the state. In principle, however, functionalists would have no difficulty with partial definitions and surplus meaning, where the mental state is interpreted as a hypothetical construct, because the meaning is not limited to currently observable physical properties or measures. For example, the theoretical term referring to a mental state may be evidenced

by such common measures as percent correct in a judgment task, reaction time, or active pixels of fMRI, but its meaning is not limited by such an enumeration. Philosophical functionalists take the theoretical term to mean well more than these physical measures, in which case the mental state is interpreted as a hypothetical construct. The physical measures only partially define the mental state. They are evidence of the state, but the state is not exhaustively reducible to only those measures.

As relevant as such discussions appear to be to understanding talk of the mental, the relevance is only superficial. Indeed, from the perspective of the present review, they are all beside the point. Discussions of tokens versus types, exhaustive versus partial operational definitions, intervening variables versus hypothetical constructs, and surplus versus no surplus meaning, all concede the premise that verbal behavior is essentially a symbolic, referential process. They all assume the existence of an independent entity called a meaning, which lies in a nonbehavioral dimension. They all assume questions regarding the meaning of psychological terms can be resolved by dealing with the verbal behavior in mentalistic rather than behavioral terms.

In contrast, radical behaviorism distinguishes between meaning for speakers, in terms of what causes speakers to talk in the way that they do, and meaning for listeners, in terms of what the verbal behavior causes them to do. Radical behaviorism does not embrace the symbolic, referential conception of verbal behavior.

If meaning is to be framed in terms of denotation or connotation, there is similarly no problem. Denotation may be taken to imply some specification of what causes speakers to talk as they do, particularly concerning the class of antecedent conditions that occasions the verbal behavior in question. Connotation may be taken to imply some specification of what verbal behavior causes listeners to do, particularly concerning the class of antecedent circumstances into which the verbal behavior in question enters to occasion a listener's behavior. If speakers say they themselves are in pain (i.e., first-person usage), then they are presumably in contact with their own private stimulation, and some course of events has transpired to establish that talk. Moore (2008) described such a course of events, based on Skinner's (1945) account. If speakers say others are in pain (i.e., third-person usage), such talk may be occasioned by the activity of some neurons as measured by scientific instruments, or by the moaning and groaning of the observed others, more likely the moaning and groaning. If a listener hears a speaker say that another person is in pain, the listener typically responds to the other person in the same way as if the listener had observed the other person's neurological activity or the other person's moaning and groaning. The problem comes if denotation and connotation are taken to impart some logical status to meaning as an independent entity in a mental dimension, apart from any relation to the verbal and nonverbal behavior of speakers and listeners and the circum-

stances that occasion the verbal behavior in question. For radical behaviorists, a logical analysis reverts to the mentalism of a symbolic, referential conception of verbal behavior.

For radical behaviorism, type physicalism may be understood as a concern with the properties that determine class membership for the stimuli that occasion a verbal response. Class membership can be determined by any number of properties, sometimes even in combination, according to the conventional practices of the verbal community. Token physicalism recognizes that instances of the class are always going to have such physical properties as length or weight, although those properties do not necessarily determine class membership. For example, consider the definition of the type of stimulus called a “reinforcer.” Suppose something with sugar in it functions as a reinforcer. The features that determine class membership are functional: something is called a reinforcer because it maintains or increases the probability of the response, given that it is a consequence of the response. The features that determine class membership are not necessarily based on physical properties: something is not called a reinforcer because the instruments of physics detect sugar in it.

Sources of Mentalism

Mentalism consists in verbal behavior. For radical behaviorism, the meaning of verbal behavior is to be found in the sources of control over the verbal behavior in question. This section of the review examines sources of control over verbal behavior called mentalistic, particularly verbal behavior that appeals to fanciful explanatory fictions (Moore, 2001, 2010).

Source 1: Social–Cultural Tradition

The first source of control over mentalistic explanatory fictions is revealed in a critical examination of the history of psychology, or indeed, the history of Western culture. Radical behaviorists argue that mentalism began thousands of years ago, if not in the primitive animism of prehistoric cultures then certainly in the time of classic Greek culture. Mentalism and dualism were then institutionalized through cultural and religious conformity as Western civilization developed. The result is a cultural bias toward internal explanations maintained through social reinforcement.

In a large percent of cases, this cultural bias takes the form of “folk psychology.” Folk psychology is roughly the position of uncritically taking terms and concepts from everyday language and reifying them, so that they may be cited as causes of behavior. For instance, given the cultural bias toward internal explanations, such common terms as belief, desire, and intention are uncritically accepted as phenomena in a mental dimension that veridically reflect an

individual's psychological makeup. Such terms are then uncritically incorporated as mental causes in explanations of behavior. Indeed, Western culture virtually mandates doing so.

In other cases, the supposed mental phenomena are said to be biological, innate, or linked with evolution. An example is the following passage from Pinker (1997):

The mind is what the brain does; specifically, the brain processes information, and thinking is a kind of computation. The mind is organized into modules or mental organs, each with a specialized design that makes it an expert in one area of interaction with the world. The modules' basic logic is specified by our genetic program. The operation was shaped by natural selection to solve the problems of the hunting and gathering life led by our ancestors in most of our evolutionary history. (p. 21)

Explanations that incorporate neuroscience information about purported internal processes have come to be particularly favored in the culture. For example, Weisberg, Keil, Goodstein, Rawson, and Gray (2008) conducted experiments in which they gave subjects neuroscience information in an explanation of a "psychological" phenomenon. Subjects evaluated explanations with even logically irrelevant neuroscience information to be more satisfying than explanations without. Similarly, Beck (2010) reviewed recent data suggesting that people find explanations of psychological phenomena that include brain images, such as found in fMRI, and neuroscience language to be more convincing than explanations that do not refer to the brain.

For radical behaviorists, any problems associated with mentalism are not resolved by linking mentalism with physiology and Pinker's aforementioned honorific slogan that "The mind is what the brain does," or by claiming that physiologically laden language is only "theoretical." For example, citing physiological factors as causes can constitute mentalism, just as much as directly appealing to explicitly mental causes constitutes mentalism. Suppose a particular research project involving fMRI is claimed to elucidate the "neural correlates of cognitive processes." This language conveys a dualism of cognitive processes and physiology, which has historically often taken the form of parallelism. Worth mentioning is Bennett, Wolford, and Miller's (2009) not entirely whimsical report that they detected active fMRI readings in the brain of a dead salmon. To be sure, the authors immediately recognized the readings were artifacts and acknowledged them as such. Nevertheless, the authors suggested the results testify to problems that can arise when explanatory inferences from neuroimaging are unrestrained. Indeed, Natsoulas (1984) expertly analyzed the philosophical position of Gustav Bergmann. Bergmann was a logical positivist and methodological behaviorist of the first order. The common view of these positions is that they only allow talk of publicly observable variables and relations. Yet, Natsoulas (1984) pointed out that Bergmann unselfconsciously and explicitly adopted a

form of psychophysiological parallelism that entailed metaphysical mind–body dualism. The point here is that a position can still be mentalistic even though it appeals to physiological variables.

For behavior analysis, the trouble with traditional concepts is that they all too often conform to the categories of a dualistic metaphysics in folk psychology, rather than to the categories of natural science. The traditional approaches identify little that can be manipulated to produce effective action. To be sure, various parts of the brain do become active during various tasks, and this cortical activity may be detected by physiological measuring equipment, such as CAT scans, PET scans, or BOLD responses during fMRI. This activity does not explain behavior. Rather, it is itself part of the total response of the organism that is explained by relating it to other factors (Moore, 2002).

In sum, radical behaviorism argues that today, as a result of a lengthy cultural history, the mentalism that appeals to internal causes is strongly entrenched in various social institutions cherished in the Western world. Religious and judicial practices are but two examples of such institutions, although again these practices may have proved useful in Western culture for a different reason than that they accurately take the human condition into account. The result is that mentalism is the dominant, conventionally accepted viewpoint in virtually all of Western culture, and is taken for granted to accurately reflect the underlying psychological makeup of humans as behaving organisms. According to radical behaviorism, virtually all of contemporary psychology is mentalistic, regardless of whether it is cast as mediational neobehaviorism or cognitive psychology: “As the philosophy of a science of behavior, behaviorism calls for probably the most drastic change ever proposed in our thinking about man. It is almost literally a matter of turning the explanation of behavior inside out” (Skinner, 1974, p. 256).

Source 2: Linguistic Patterns and Practices

A second source of mentalistic explanatory fictions is the inherent nature of language. Adjectives and adverbs are converted to nouns, which are in turn interpreted as an actor’s mental states and processes. The nouns are then invoked as real phenomena that cause the behavior in question. For example, actors might be said to do something intelligently, where observers are describing how efficiently and effectively the actors accomplish some act. Actors might then be said to do something that shows intelligence, where “intelligently” has been linguistically converted from an adverb to a noun. Finally, actors might be said to do something because they have intelligence. Here intelligence has linguistically become converted to a possession that causes the behavior in question. Such terms as “nominalization,” “reification,” and “hypostatization” are commonly used in connection with this practice, although no description has ever actually created or even changed the event, variable, or relation that

actually occasions the description. The problem is that these causes from another dimension are uncritically accepted through the cultural influence of folk psychology. The variables and relations that are responsible in the first place for saying that someone does something intelligently are never examined. Ultimately, the problem lies in the conception of verbal behavior that gives rise to this sort of mistake. The hidden assumption is that if a term is used as a noun, then there must be something, somewhere that the noun symbolically represents or to which the noun refers. Skinner (1974) commented on this practice as follows, with due consideration given to social-cultural tradition at the end of the passage:

Turning from observed behavior to a fanciful inner world continues unabated. Sometimes it is little more than a linguistic practice. We tend to make nouns of adjectives and verbs and must then find a place for the things the nouns are said to represent. We say that a rope is strong, and before long we are speaking of its strength. We call a particular kind of strength tensile, and then explain that the rope is strong because it possesses tensile strength. The mistake is less obvious but more troublesome when matters are more complex. There is no harm in saying that a fluid possesses viscosity, or in measuring and comparing different fluids or the same fluid at different temperatures on some convenient scale. But what does viscosity mean? A sticky stuff prepared to trap birds was once made from viscus, Latin for mistletoe. The term came to mean "having a ropy or glutinous consistency," and viscosity "the state or quality of being ropy or glutinous." The term is useful in referring to a characteristic of a fluid, but it is nevertheless a mistake to say that a fluid flows slowly because it is viscous or possesses a high viscosity. A state or quality inferred from the behavior of a fluid begins to be taken as a cause.

Consider now a behavioral parallel. When a person has been subjected to mildly punishing consequences in walking on a slippery surface, he may walk in a manner we describe as cautious. It is then easy to say that he walks with caution or that he shows caution. There is no harm in this until we begin to say that the walks carefully because of his caution

The extraordinary appeal of inner causes and the accompanying neglect of environmental histories and current setting must be due to more than a linguistic practice. I suggest that it has the appeal of the arcane, the occult, the hermitic, the magical — those mysteries which have held so important a position in the history of human thought. It is the appeal of an apparently inexplicable power, in a world which seems to lie beyond the senses and the reach of reason

There are, of course, reasons why a fluid flows slowly, and a molecular explanation of viscosity is a step forward. There are physiological reasons why a person behaves in a manner we call cautious, and the physiologist, will, we assume, eventually tell us what they are. (pp. 165–166, 169)

Source 3: Inappropriate Metaphors

A third source of mentalistic explanatory fictions, following from the second, is inappropriate metaphors. To be sure, it may well be useful to compare something familiar to something unfamiliar when trying to understand the latter. In so doing, various similarities are noted, however abstract those similarities are. The difficulty is that doing so can sometimes cause problems. An example is

the storage and retrieval metaphor for memory, perhaps as derived from the overall computer metaphor described earlier. To be sure, a reminder can be written down on a piece of paper, put it in one's pocket, and pulled out at a later date. However, if the concern is to understand how a response can be reinstated after the passage of time, at issue is the metaphorical language of saying an actor cognitively creates a mental representation of an event, stores it in some memory location using a certain memory process, then retrieves it at some later date. Radical behaviorism says this approach to memory misrepresents the facts to be accounted for. Consequently, this approach does not provide a useful framework for understanding what the term "memory" means. What needs to be taken into account is who is "remembering" what and under what circumstances. If the computer metaphor of information processing appeals to the software of a computer operating system or program that stores input, the important question is: Who has written the code?

Mentalism in Philosophy

In brief, many cognitively oriented philosophers dispute philosophical behaviorism by arguing that a psychological explanation can't legitimately appeal to factor X to explain behavior, where X is a mental state, if X is then to be defined in behavioral terms — as a disposition. For example, in Part 1 we noted that according to Sober (1983),

[M]ental states are inner. They are the causes of behavior and are therefore not identical with behavior Besides claiming that mental states cause behavior, mentalism goes on to say how these mental states manage to do so. (p. 113)

Thus, the argument is that mental states should not be defined in behavioral terms. At issue is how to do so. The solution is to identify their causal contribution. On these grounds, philosophical functionalism has become the dominant philosophy of mind in contemporary philosophy. Functionalism views itself as just as physical and material as any other orientation, again by recognizing that instances or tokens of mental states are physical and material, but disputing that types of mental states can be defined with reference to their physical properties. Rather, what distinguishes types of mental states is their causal contribution.

In a representative treatment, Fodor (1968) formally distinguishes between explanations in behaviorism and explanations subscribing to the mentalism of cognitive psychology. The basis of Fodor's distinction is whether mental concepts are defined in terms of publicly observable behavior:

To qualify as a behaviorist in the broad sense of that term that I shall employ, one need only believe that the following proposition expresses a necessary truth: For each mental predicate that can be employed in a psychological explanation, there must be at least one

description of [publicly observable] behavior to which it bears a logical connection. I shall henceforth refer to this proposition as P (p. 51)

A mentalist is, then, simply someone who denies 'necessarily P' The distinction between mentalism and behaviorism is both exclusive and exhaustive. (p. 55)

Interestingly, Kitchener (1999, p. 401) specifically identifies as Fodor's (1968) targets such nominally behaviorist positions as Ryle (1949) and Wittgenstein (1953/1973), who are often cast as philosophical behaviorists by virtue of their linking mental terms to publicly observable behavior and dispositions.

In these passages, Fodor (1968) seems to be responding to a view of behaviorism wherein mental terms are exhaustively defined in a physical-thing language, both token and type physicalism are accepted, and surplus meaning is not admitted. For example, elsewhere Fodor acknowledges that one interpretation of "logical connection" is that "theoretical terms in psychological explanations must, in principle, be eliminable in favor of (definable by) terms that designate observables" (p. 51). Worth noting, however, is that the majority of mediational neobehaviorists (as well as any surviving logical empiricists and conventional operationists, for that matter) no longer embrace the exhaustive interpretation of mental terms that Fodor assumes. Rather, they embrace an interpretation wherein mental terms are viewed as hypothetical constructs and are partially rather than exhaustively defined, token but not type physicalism is accepted, and surplus meaning is admitted. Thus, Fodor and others who follow in the same tradition object to a position that is no longer widely held (see also Moore, 2012).

Nevertheless, the cognitive criticisms still miss the point. To adopt the argument of the present review, if a mental state is exhaustively defined in terms of physiological brain state or behavior, then there is a problem with circularity, as correctly and routinely noted in the literature of philosophical functionalism. At the very least, one does not know what circumstances have caused the supposed mental state in the first place. If a mental state is partially defined in terms of physiological brain state or behavior, such that the definition allows surplus meaning, then there is a problem of admitting mentalism, even if not in its dualistic form. Of course, the cognitively oriented philosophers and psychologists don't see this as a problem — they see admitting mentalism, if not dualism, as a virtue and the way to demonstrate the inadequacy of behaviorism. Radical behaviorists see it as a problem in the pragmatic sense because the formulation does not identify what actions of the scientist will bring about a desired end.

Again, the problem ultimately turns on the conception of verbal behavior. With specific regard to a speaker's verbal behavior, mentalists take for granted that words are things that symbolically represent or refer to other things, and to determine the meaning the things that are symbolically represented in lan-

guage need to be identified. Mentalists take for granted that the meaning of words or terms is an independent entity, stored in the brain in some sense, to be retrieved when speakers decide to “use” the word to express themselves. For radical behaviorism, discussions of meaning that follow from this mentalistic conception of verbal behavior are all beside the point.

The majority of mentalists profess a materialist rather than dualist metaphysics. However, in the final analysis the putative materialists say the same things as dualists. If they say the same things, then their explanatory verbal behavior incurs the same liabilities. Descartes explained voluntary behavior by appealing to the immaterial Soul that impinged on the pineal gland, which in turn activated animal spirits in the nervous system and caused muscles to move. How different is a contemporary mentalist appeal to modular and unique Executive Processes, perhaps located in the prefrontal cortex, which supposedly regulate personality expression, decision making, morally correct behavior in social settings, and other forms of so-called higher order cognitive functioning? Radical behaviorists argue not very.

Again, for radical behaviorism, verbal behavior is operant behavior. If researchers and theorists want to identify innate contributions to verbal behavior, they can point to the emergence of operant control over verbal processes, presumably through changes in brain structures, in the evolutionary history of the human species. If researchers and theorists want to identify genetic contributions to verbal behavior, they can acknowledge the role of such genes as *FOXP-2*, which regulate the development of structures that make possible the essential continuity in the sequencing of the minimal units of verbal operants. But this viewpoint is considerably different from a mentalistic viewpoint in traditional psychology that endows mental states and processes with efficient power to cause behavior.

Why Do Radical Behaviorists Oppose Mentalism?

To be sure, it is useful to assess what mental terms mean. If there is no extra-behavioral dimension, then mental terms aren't literally concerned with some state or process in that dimension. Rather, it is useful to assess what if any events, variables, and relations in the behavioral dimension occasion the use of the mental terms, as instances of a speaker's verbal behavior. If behavioral events, variables, and relations do occasion the mental terms, then those events, variables, and relations may be usefully clarified. For Skinner,

We may quarrel with any analysis which appeals to . . . an inner determiner of action, but the facts which have been represented with such devices cannot be ignored. (1953, p. 284)

And again,

No entity or process which has any useful explanatory force is to be rejected on the ground that it is subjective or mental. The data which have made it important must, however, be studied and formulated in effective ways. We may quarrel with any analysis which appeals to . . . an inner determiner of action, but the facts which have been represented with such devices cannot be ignored. (1964, p. 96)

If no behavioral events, variables, and relations occasion the use of the terms, or if they do so only to a very limited extent, then the terms can be safely discarded, as they are exclusively or largely occasioned by incidental factors, cherished for irrelevant and extraneous reasons. This analytic approach is at the heart of what Skinner (1945) meant by the “operational analysis of psychological terms.”

Thus, radical behaviorists oppose mentalism on pragmatic, rather than ontological grounds, notwithstanding expressed concerns about the mental as fictitious and an invention. From Skinner’s (1969) point of view,

The basic issue is not the nature of the stuff of which the world is made or whether it is made of one stuff or two but rather the dimensions of the things studied by psychology and the methods relevant to them The objection is not that these things are mental but that they offer no real explanation and stand in the way of a more effective analysis. (pp. 221–222)

Elsewhere, Skinner put it as follows: “What is wrong with cognitive science is not dualism but the internalization of initiating causes which lie in the environment and should remain there” (see Catania and Harnad, 1988, p. 73). Radical behaviorists argue that a critical examination of mentalism reveals it is based on an entire series of mischievous assumptions about the nature of verbal behavior generally and scientific verbal behavior particularly. In turn, these mischievous assumptions lead to a faulty conception of knowledge and explanation. The result is that people accept ineffective mentalistic answers to questions about the causes of behavior. Day (1969) commented on the characteristics of these supposed mental processes when he stated that “Ontological properties are attributed not only to theory, presumably as distinguished from description, but also to such entities as logical reasoning and extrapolation, possibly taken either as mental processes or as *a priori* forms of knowing” (p. 504). In a similar vein, Skinner (see Catania and Harnad, 1988) stated that

Unlike direct observation and description, the construction of a hypothesis suggests mysterious intellectual activities. Like those who are said to be capable of extrasensory perception, the hypothesis makers seem to display knowledge which they cannot have acquired through ordinary channels. That is not actually the case, but the resulting prestige is real enough, and it has had unfortunate consequences Like those body builders who flex their muscles in setting-up exercises or handstands on the beach, hypothesis makers are

admired even though their hypotheses are useless, just as extrasensory perceivers are admired even though they never make practical predictions of the movements of armies or fluctuation in the stock market The hypothetico-deductive method and the mystery which surrounds it have perhaps been most harmful in misrepresenting the ways in which people think. (p. 102)

Readers may note especially that radical behaviorism does not oppose mentalism because radical behaviorism assumes (a) science should only include phenomena that are publicly observable in its theories and explanations, and (b) mentalism violates this principle by seeking to include — even indirectly — phenomena that are unobservable. Some other forms of psychology do assume that science should only include phenomena that are publicly observable in its theories and explanations. These other forms of psychology assume that it is necessary to “translate” or “reduce” terms from a mental language to a behavioral language, in order to secure agreement and respectably meet the requirements of good science. These other forms further assume that psychology can circumvent a restriction against phenomena that aren’t publicly observable and legitimately appeal to mental causes by interpreting them as mediating “theoretical terms” in the previously discussed S–O–R model. The mediating terms may then be operationally defined, if only partially as hypothetical constructs, by referring to publicly observable behavior in order to gain agreement.

An important feature of these other approaches involves what is meant by such terms as “translate” or “reduce.” Does the use of such terms imply that some state or process does literally exist in another dimension, but science can’t deal with it because it is not publicly observable? Does the use imply that the term from the other dimension must be symbolically represented by publicly observable behavior, so that science can legitimately engage it in its theories and explanations? Radical behaviorists argue against this orientation to doing science. This orientation is called methodological behaviorism, and is extensively discussed elsewhere (Day, 1983; Moore, 2008, chapter 17; 2012).

Summary and Conclusions

For radical behaviorism, mentalism consists in explaining behavior by attributing its cause to phenomena from a dimension beyond the one in which behavior takes place. Mentalism exists in mediational neobehaviorism as well as in more explicitly cognitive orientations. A representative term for the extra-behavioral dimension is mental — the dimension of “mind.” Representative terms for the causal phenomena are states and processes. These mental phenomena are held to be inside the behaving organism in some sense, as independent contributions of the organism that underlie its behavior. The causal status of these phenomena ranges from initiating to mediating. Initiating causes are common in traditional dualism, whereas mediating causes are common in contemporary neobehaviorism

and cognitive psychology. Claims to materialism ring hollow when supposed materialist explanations invoke causal states and processes that are of the same type as dualistic causes, indicating a common source of control arising from verbal practices, rather than observation. Much of the talk of these phenomena and their causal status has its source in the everyday mentalistic language of Western culture (i.e., folk psychology), rather than the observational and empirical data base ordinarily associated with a natural science. In some instances, an uncritical and mischievous use of physiological concepts can also evidence mentalism. In contrast to mentalism, radical behaviorism is a thoroughgoing behaviorism. Events inside the skin, though not accessible to others, may be interpreted as behavioral in character. These events arise because of certain relations in the environment, and in turn may influence behavior that follows, regardless of whether that behavior is accessible to others. The interactions occur in the one, behavioral dimension.

Importantly, just saying seemingly “mental” words is not by itself mentalistic. First, an approach becomes mentalistic when the terms are assumed to refer to states and processes from a nonbehavioral dimension, and the terms are then cited as causes in an explanation, at the expense of terms from the behavioral dimension. Second, some seemingly “mental” terms may actually have partial relevance to an understanding of behavior. However, the relevance is actually that the terms implicitly take events, variables, and relations from the behavioral dimension into account, rather than that the terms identify literally mental causes. Further analysis is necessary to clarify and refine the nature of the behavioral relevance of this sort of talk.

Ultimately, radical behaviorists argue that distinctions as traditionally conceived between observational and theoretical terms, exhaustive and partial definitions, token and type physicalism, and so on are based principally on a mentalistic, symbolic–referential conception of verbal behavior. More specifically, radical behaviorists argue that such concerns obscure and indeed actively impede the search for important details about the genuinely relevant relations between behavior and environment, they allay curiosity by inducing individuals to accept fanciful “explanatory fictions” as causes, they misrepresent the facts to be accounted for, and they give false assurances about the state of scientific knowledge. Moreover, they lead to the continued reliance on scientific techniques that should be used more judiciously, for example, hypothetico-deductive practices, because they have such great potential to spur wasteful searches for explanatory fictions. Consequently, mentalism interferes with the effective prediction, control, and explanation of behavior.

References

- Beck, D. (2010). The appeal of the brain in the popular press. *Perspectives on Psychological Science*, 5, 762–766.

- Benjamin, A.C. (1955). *Operationism*. Springfield, Illinois: Charles C. Thomas.
- Bennett, C., Wolford, G., and Miller, M. (2009). The principled control of false positives in neuroimaging. *Social Cognitive and Affective Neuroscience*, 4, 417–422.
- Catania, A.C., and Harnad, S. (Eds.). (1988). *The selection of behavior: The operant behaviorism of B. F. Skinner: Comments and consequences*. Cambridge: Cambridge University Press.
- Day, W.F., Jr. (1969). On certain similarities between the *Philosophical Investigations* of Ludwig Wittgenstein and the operationism of B.F. Skinner. *Journal of the Experimental Analysis of Behavior*, 12, 489–506.
- Day, W.F. (1983). On the difference between radical and methodological behaviorism. *Behaviorism*, 11, 89–102.
- Feigl, H. (1958). The 'mental' and the 'physical.' In H. Feigl, M. Scriven, and G. Maxwell (Eds.), *Minnesota studies in the philosophy of science, Volume II: Concepts, theories, and the mind-body problem* (pp. 370–497). Minneapolis: University of Minnesota Press.
- Fodor, J. (1968). *Psychological explanation*. New York: Random House.
- Fodor, J. (1983). *The modularity of mind*. Cambridge, Massachusetts: MIT Press.
- Hocutt, M. (1985). Spartans, strawmen, and symptoms. *Behaviorism*, 13, 87–97.
- Kitchener, R.F. (1999). Logical behaviorism. In W. O'Donohue and W.F. Kitchener (Eds.), *Handbook of behaviorism* (pp. 399–418). San Diego: Academic Press.
- MacCorquodale, K., and Meehl, P. (1948). On a distinction between hypothetical constructs and intervening variables. *Psychological Review*, 55, 95–107.
- Meyer, M. (1921). *The psychology of the Other-one*. Columbia, Missouri: Missouri Book Co.
- Moore, J. (2001). On psychological terms that appeal to the mental. *Behavior and Philosophy*, 29, 167–186.
- Moore, J. (2002). Some thoughts on the relation between behavioral neuroscience and behavior analysis. *Psychological Record*, 52, 261–280.
- Moore, J. (2008). *Conceptual foundations of radical behaviorism*. Cornwall-on-Hudson, New York: Sloan.
- Moore, J. (2010). What do mental terms mean? *Psychological Record*, 60, 699–714.
- Moore, J. (2012). Methodological behaviorism as a radical behaviorist views it. *Behavior and Philosophy*, 39/40, 145–202.
- Natsoulas, T. (1984). Gustav Bergmann's psychophysiological parallelism. *Behaviorism*, 12, 41–69.
- Palmer, D. (2011). Consideration of private events is required in a comprehensive science of behavior. *The Behavior Analyst*, 34, 201–207.
- Pinker, S. (1997). *How the mind works*. New York: Norton.
- Place, U.T. (1956). Is consciousness a brain process? *British Journal of Psychology*, 47, 44–50.
- Quine, W.V.O. (1974). *The roots of reference*. LaSalle, Illinois: Open Court.
- Ryle, G. (1949). *The concept of mind*. London: Hutchinson.
- Singer, E. (1924). *Mind as behavior and studies in empirical idealism*. Columbus, Ohio: Adams.
- Skinner, B.F. (1945). The operational analysis of psychological terms. *Psychological Review*, 52, 270–277, 291–294.
- Skinner, B.F. (1953). *Science and human behavior*. New York: Macmillan.
- Skinner, B.F. (1957). *Verbal behavior*. New York: Appleton–Century–Crofts.
- Skinner, B.F. (1964). Behaviorism at fifty. In T.W. Wann (Ed.), *Behaviorism and phenomenology* (pp. 79–108). Chicago: University of Chicago Press.
- Skinner, B.F. (1969). *Contingencies of reinforcement*. New York: Appleton–Century–Crofts.
- Skinner, B.F. (1974). *About behaviorism*. New York: Knopf.
- Skinner, B.F. (1979). *Shaping of a behaviorist*. New York: Knopf.
- Skinner, B.F. (1989). *Recent issues in the analysis of behavior*. Columbus, Ohio: Merrill.
- Smith, L.D. (1986). *Behaviorism and logical positivism*. Stanford, California: Stanford University Press.
- Sober, E. (1983). Mentalism and behaviorism in comparative psychology. In D.W. Rajecki (Ed.), *Comparing behavior: Studying man studying animals* (pp. 113–142). Hillsdale, New Jersey: Erlbaum.
- Stevens, S.S. (1939). Psychology and the science of science. *Psychological Bulletin*, 36, 221–263.
- Tolman, E.C. (1949). Discussion: Interrelationships between perception and personality: A symposium. *Journal of Personality*, 18, 48–50.
- Tolman, E.C. (1951). *Behavior and psychological man*. Berkeley: University of California Press.
- Weisberg, D., Keil, F., Goodstein, J., Rawson, E., and Gray, J. (2008). The seductive allure of neuroscience explanations. *Journal of Cognitive Neuroscience*, 20, 470–477.

- Wittgenstein, L. (1973). *Philosophical investigations* [Trans. G.E.M. Anscombe, third edition]. Englewood Cliffs, New Jersey. (Original edition published in 1953)
- Zuriff, G.E. (1985). *Behaviorism: A conceptual reconstruction*. New York: Columbia University Press.