

Behavior, Adaptation, and Intentionality: Comments on Rychlak, Leahey, and Jenkins

Stephen Hibbard

University of Tennessee

Target articles are evaluated in light of the consideration of intentionality. It is argued that behaviorism lost its hegemony in psychology, not precisely because it eschewed investigation of mental phenomena, but rather because it failed to give an adequate account of adaptation. Behaviorism, along with other orientations, views the explanation of adaptation as a central concern of psychology, but a full account of adaptation cannot be given without appeal to a construct which behaviorism could not assimilate. This is the construct of intentionality. Intentionality is necessary to give an adequate account of adaptation.

We have three excellent contributions to this symposium on the construct "behavior" from eminent commentators who are intimately familiar with the subtle nuances of psychology's history and theoretical bases. Two of the contributions, Jenkins' and Rychlak's, are by psychologists whose professional identities matured during (and apparently largely in spite of) the period of behaviorism's hegemony in psychology. The third is from a younger psychologist, Thomas Leahey, who nonetheless has earned a reputation as a foremost historian and theoretician of psychology. Hence, it seems appropriate to cast my commentary within an initial sketch that summarizes the major aspects of the behaviorist program during the period of behaviorism's hegemony in psychology.

Without too much oversimplification, there seem to be two chief components of the behaviorist program.¹ The first of these is a body of findings that

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¹There are many different "behaviorisms." The characterizations of behaviorism herein have general applicability.

we might call the laws or principles of behaviorism. These constitute the major portion of learning theory. I have in mind here the entire set of principles governing learning that have been elucidated since the period of Pavlov and Thorndike and that govern classical conditioning and contemporary behavior analysis. These phenomena are contained in most learning textbooks, and include the Law of Effect, the concepts of habituation, irradiation, autoshaping, and so on, just to mention a few of these principles randomly. These are the principles in terms of which the explanatory units of behaviorism are related.

It is important to the major point I shall make in this commentary that these principles are principles of adaptation. Behaviorist learning theory is a theory of adaptation. However, it is only one such theory of adaptation. The broadest common denominator to all psychological theories, let me just state dogmatically, is that they are all about adaptation. If one were to distill from either of the Freuds, Watson, Skinner, Selye, J.R. Anderson, or contemporary connectionist theorists what they were up to, the least common denominator would be how organisms (or more general systems) adapt.

The other major aspect of behaviorism was to insist on the point on the basis of which psychology promised to distinguish itself from philosophy, that psychology be an empirically grounded discipline and that its domain of study be one which was publicly adjudicable. This was an effort to simultaneously distinguish psychology from philosophy on both ontological and epistemological grounds, i.e., both with respect to the question of the "being" of its subject matter and the methodological justification of its knowledge claims. In regard to the "being" of its subject matter, psychology was not to be about either the nature or the existence of minds and souls; nor was the justification of its knowledge claims to stem either from the intuitions of authority or from first person, private, introspection. Thus, the second major aspect of the behaviorist program was the determination of the subject matter of psychology: "behavior" was to be the proper explanatory unit. But, as Jenkins (1993) asked, "What counts as 'behavior?'"

For a long time, something's being a mental entity was sufficient to exclude it from the canonical domain, and even more recently, psychology has defined behavior as something publicly observable (Atkinson, Atkinson, and Hilgard, 1983). In his later years, however, Skinner (1974) for one became willing to allow that "seeing Venice with eyes closed," mental imagery, could count. And whether or not behaviorism is willing to allow mental events in the door, it is clear that cognitive scientists allow mental events to count as behavior. Thus, Searle (1990) describes "understanding sentences" and "intuitions of grammaticality" as instances of "what we are referring to by the use of the short-hand term 'behavior'" (p. 593).

The term in ordinary use is hardly confined to the denotation of externally observable entities, and as Leahey (1993) traces (see also Catania [1984]), originally and still most basically connotes morality and manners: it means "deportment." However, the secondary definitions in most dictionaries, including the *OED*, connote the actions or functioning of a system: "the manner in which a thing acts under specified conditions or circumstances, or in relation to other things." Thus, we may sensibly wonder how the economy will behave if the Federal Reserve Board raises interest rates. Similarly, Anderson (1990) says "trying to explain the overall behavior of the machine by studying the behavior of its components . . ." (p. 11). "Behavior" in this usage is a functional concept, and is neutral as regards mentalism or materialism. For example, "How does a heritability model of depression behave if we attempt to fit gender differences," "How does the rat behave when we change the schedule," and "How does the superego behave when we introduce the new intervention," all seem to be perfectly sensible uses of the term "behave" meaning "function" or "act."

Hence, there are these two basic senses of "behave" in ordinary, pre-psychological language: the sense of right conduct, manners, comportment, etc., and the sense of functioning or activity. Behaviorists never confined themselves to the first sense of this term, as Leahey's (1993) paper demonstrates. Behaviorists originally wanted to confine the subject matter of psychology only to publicly observable events of the second kind, but they eventually came around to the view that even private activities and functions could be included, so long as they could be accounted for by behaviorist principles, i.e., by that set of laws and concepts which we have said comprise the first aspect of the behaviorist program.

In many respects, especially when behaviorism was primarily a stimulus-response psychology, it could be considered mechanistic, as Rychlak (1993) suggests. Moreover, psychodynamic mental concepts can likewise be cast in this mechanistic way, for instance, "the mechanisms of defense," as Rychlak notes, and Westen (1986) recently detailed. This same mechanistic quality largely obtains likewise for information processing models that are supposed to be analogues of hypothetical mental entities or brain processes. Talk about the automaticization of processes, or about entities such as sensory stores, memory buffers, retrieval therefrom and storage therein, capacitance and bottleneck theories of attention, activation networks — all of these are likewise mechanistic, and invite us to speak of the behavior of networks, and so on.

In this sense, and just to the extent that psychology still concerns itself with mechanistic models, we have not escaped the behaviorist heritage. Indeed, it might be said that the cognitive revolution has proceeded and continues to proceed along this course. One developmental line is that of

loosening methodological constrictions of the type talked about by Jenkins. Another line is the "mentalese" line, the extent to which mental entities have been allowed in the door. Yes, methodology is far less constricted, and yes, both this and the canonization of the mental reflect the professional and socio-cultural shifts charted by both Jenkins (1993) and Leahey (1993). But I want to suggest that there is something even more central to psychology in the demise of behaviorism's hegemony.

I have flagged the contention that all orientations in psychology are organized around the idea of adaptation, and that adaptation is the underlying construct of that aspect of the behaviorist program which comprises the laws and principles of learning. I want now to propose the idea that behaviorism lost its hegemony not so much because of a resistance to mental entities, but because a full and coherent explanation of adaptation² could not be given without appeal to a construct that behaviorism could not assimilate or accommodate itself to. This is the construct of intentionality. It is intentionality and the construct of an intentional agent — and not the mere domain of the mental — with which behaviorism could not deal. Adaptation is the central focus of psychology. But behaviorism fell short here because adaptation cannot be adequately treated without a full account of intentionality.

Several approaches have been taken to characterizing the notion of intentionality in recent years, but I will here mention only two of them, that of Dennett (1981) and that of Searle (1984, 1990). Dennett's view is the more conservative,³ but in my opinion, it fails to distinguish intentionality sharply enough from behaviorist approaches. Dennett approaches intentionality in terms of an attempt to explain and predict behavior from an outside observer's position. There are three different "stances" one might take in such an attempt, the design stance, the physical stance, and the intentional stance. The design stance is a functional stance. Predictions about behavior can proceed if we have knowledge of the functions of the organism or system in which a design is instantiated. Failures in function are accounted for in terms of design failures or malfunctions. Another stance, which need not concern us here, is the physical stance. We can make predictions and explain failures by reference to such things as summation, neurotransmitters, silicon crystalline structure, metal fatigue or stroke. A third method of explanation involves the intentional stance. When we take this stance, we predict behavior on the assumption that the system possesses certain information and is

²Rachlin (1992) has advanced a position he calls teleological behaviorism. I cannot fully argue the position here, but to the extent that I understand his view, it seems to be either a strong intentionalist view, or a form of teleology which actually commits the same animistic mistakes as did Aristotle's teleology.

³Conservative as opposed to radical, not as opposed to liberal. Dennett's view is more liberal than Searle's in the sense that more entities are intentional for Dennett than for Searle.

pursuing certain goals in a sensible fashion. Dennett's "intentional stance" is a sort of "as if" intentionality: when we take the intentional stance, we act as if some system has beliefs, desires, the capacity to infer, and so on.

Without going into great detail, we can see immediately that explanations from the design stance are essentially mechanistic explanations, while explanations from an intentional stance assume that the intentional agent is acting in a goal directed manner. These explanations include Rychlak's (1993) teleological explanations. I want to suggest that intentional explanations of this sort have come to predominate in cognitive and psychoanalytic psychology, and it is primarily the ascendance of this intentional stance that most definitively has marked the dethronement of behaviorism in psychology. Here are some instances of intentionality in Dennett's sense in contemporary psychology.

A. Reliance on the learning–performance distinction. This distinction first surfaced in the work of Tolman, although Tolman probably did not see its full implications for intentionality (the notion that his experiments implied that rats in mazes developed "beliefs" about maze corridors) because he thought that intentionality entailed consciousness. Dennett argues forcefully against this. I would add to the example of Tolman all of Bandura's work regarding learning through modeling. Intentionality, the acquisition of beliefs and inference rules is virtually explicit in social learning theory.

B. We should also include here a whole host of experiments that suggest that stimuli in both classical and instrumental learning paradigms have information value. These experiments suggest that such stimuli signal information to an intentional agent who then responds accordingly, and they provide a plausible basis for the claim that both classical and operant conditioning paradigms can be explained in terms of the information value of the stimuli. Again, intentionality enhances adaptation. I would also include here the whole theory of affordances explicated by J.J. Gibson (1979), though surely his followers (and perhaps Gibson himself) might object to calling him an intentionalist.

C. Recent trends in the literature on categorization suggest that categorization is a process that is theory dependent (Medin, 1989) or depends on underlying knowledge structures (Lakoff, 1987). Categorization decisions viewed in this way unequivocally entail that categorizers have systems of belief about the world in terms of which they make such categorization decisions. To talk about categorization in this way is explicitly to invoke the intentional stance.

D. As Rychlak (1993) has explicated Freud, the elucidation of ego defenses in an intentional fashion gains in comprehensibility over more mechanistic views. It is difficult to see how what we might call psychoanalytic semeiotics—the whole symbol systems of both the Freudian and Jungian uncon-

sciouses — could be given anything less than a very cumbersome account from what Dennett calls the design stance, as opposed to the intentional stance. (Freud's *Interpretation of Dreams* in some of its more mechanistic passages, nonetheless, often does adapt the design stance.) All of Freudian theory, depending as it does on the concept of "wish" and "desire," is thoroughly intentional, and his psychology as a theory of adaptation is the more comprehensible because of its reliance on intentional explanation. Some aspects of the dispute between defenders of "classical" AI architectures (see, e.g., Fodor and Pylyshyn, 1988; Johnson-Laird, Herrmann, and Chaffin, 1984) and those of connectionist architectures (see, e.g., Smolensky, 1988) may be seen in a similar way. The former's objection to the adequacy of the latter's accounts of cognitive processes — that connectionism does not account for symbol manipulation — is in essence the argument that connectionist explanations are confined to the mechanistic, design level, while classical AI accounts assume the intentional stance.⁴

E. Virtually the whole area of problem solving since Newell and Simon (1972) — including work on ill-defined problem solving and expertise (e.g., Chi, Glaser, and Farr, 1988), up through Anderson's current applications of his own theories (1993) — assumes the intentional stance. More specifically, Newell and Simon's model of goal states and subgoals is explicitly teleological in the obvious respect that the whole point is to make maneuvers within a problem space which are "for the sake of" reaching the goal. Optimization strategies, such as those discussed by Anderson (1991), are clearly efforts to make this movement more adaptive. In Dennett's use of "intentional," it doesn't get any more intentional than this.

F. Finally, as the title of the new journal *Consciousness and Cognition* heralds, we now have a renewed interest in that construct that is the arch-enemy of behaviorism, consciousness, and its correlate, the unconscious. While it is possible to make out a version of the construct intentionality without invoking consciousness, as Dennett does, the invocation of consciousness most assuredly brings intentionality with it. For a long philosophical tradition ranging into psychology — from Descartes through Brentano through Husserl — consciousness has entailed intentionality, the latter being the fundamental characteristic of the former. Moreover, with the admission

⁴I owe to Keith Noland the observation that there is a respect in which, in Dennett's sense, connectionist systems can surely be described as intentional. In training certain connectionist networks, we speak of them as "settling into" a solution as they adjust their weights. But any self-regulating, feed-back system (including thermostats and internal combustion engine governors and autopilots) is intentional in this sense. I would argue that in all these cases, we are no more licensed to speak of "as if" intentionality than we are of animistic explanations (e.g., earth seeking its "natural place"); the chief weakness of Dennett's treatment is that there is no clear distinction between animism and the "intentional stance." But again, that is a matter we cannot fully treat here.

of consciousness, it is not only the "as-if" version of intentionality to which Dennett subscribes which is admitted. It is Searle's more fundamental one which we shall discuss presently.

These are some examples of the extent to which the notion of intentionality is either implicitly or explicitly invoked in contemporary psychology, and of how this invocation of intentionality has moved us past the behaviorist program. I would argue further that a stronger sense of intentionality than Dennett's "as-if" notion (a) can be found in a number of the instances already listed, or (b) will ultimately prove necessary to give valid and coherent accounts of the phenomena listed under A through F. Searle (1990) provides such an alternative. There are two key elements to his view. The first is that intrinsic intentional states represent the world under a particular aspectual shape. The view stems from Husserl and has Cartesian roots. It amounts simply to the claim that perceptions, sensations, thoughts, desires, wishes, and so on — all intentional objects and processes — appear to a subject from a particular perspective. The second key element is that intentionality, precisely in this sense, has a causal role in the explanation of events in nature. This second element is related to Dennett's weaker claim that we can and often do take the intentional stance to explain nature. Searle's claim is necessarily stronger: we cannot give a coherent account of nature without invoking intentional concepts. Obviously, a large part of the sort of causal explanations Searle has in mind are those in psychology.

We can understand the difference between Dennett's view and Searle's by discussing the three related notions of teleology, adaptation, and intentionality. Teleology is the notion that things are ordered by some rational or intelligent agent toward certain ends, an end being, in the words of Aristotle, as Rychlak (1993) reminds us, "something for the sake of which" means are ordered. The term "adaptation" is wider than this, including intelligent teleology, intentionality in Dennett's sense; indeed, it is on the grounds that adaptation includes intelligent teleology that we have argued that the principle of adaptation as used in the behaviorist program is expanded by allowing in intentional explanatory states. But adaptation also includes evolutionary theories that are not teleological in the former sense. It also allows computational optimization strategies, for example, problem solving where the use of good design optimizes efficiency in chess moves or any other problem solving that moves toward a goal state. In Dennett's sense of "intentional," we can characterize computers that implement such strategies as intentional because we can and do adapt an intentional stance toward them: we act as if they are intentional entities. But in Searle's sense of the term, we cannot call them intentional, since decision rules in a computer program do not present themselves under any aspectual shape, and indeed, it doesn't seem to make sense to speak of them as if they do. We can and do say that our lawn is thirsty or

that the engine is trying to pull a heavy load, just as we say that the computer is optimizing chess strategy. But this is metaphorical or "as-if" intentionality. To give an account of intentionality free from metaphor, we must rely on some other notion. The notion of aspectual shape is one such attempt at thus characterizing intentionality.

In my opinion, the crucial point in Searle's notion of aspectual shape is that it underscores the necessity for a subjective, first person experience of intentionality in accounting for adaptation. This is not to say that Searle's particular account of intentionality will ultimately prove definitive. It is to say rather that intentionality involves a subjective orientation to what is represented or perceived, whether this be in the explication of the role of proprioceptivity in locomotion (Gibson), or teleological representation in problem solving (Newell and Simon). Hence, the real revolution in psychology is taking place in the gradual and still emerging recognition that an account of intentionality which will free us from mechanism ultimately involves explanations which include first person experience. To say this, however, is not necessarily to lock us into a Cartesian mentalism. Accounts of intentionality from an ecological perspective seem particularly promising in avoiding this pitfall. Having set out this context, let me more directly engage certain themes in the papers of the panel members. I proceed in reverse alphabetical order.

In regard to Joseph Rychlak's (1993) paper, this is not the place to engage particular details of his Logical Learning Theory (LLT). Let me simply say in regard to the theory as a learning theory or theory of cognition that I think it has points of commonality with a number of the theories listed in A to F above, and these points of commonality could use further explication. Especially, LLT invites comparison with contemporary work on categorization.

Viewing the theory more generally as a teleological and intentional one, I hope that the context I have provided suggests that Rychlak's thinking is at the continuing edge of the revolution in psychology. For Rychlak, mentality has always been a foregone conclusion. He has for a long time been committed to the centrality of intentionality and subjectivity in psychological explanation. In this regard, it is not clear to me that his anti-mechanistic arguments are exactly on target in regard to those contemporary behaviorists who are no longer married to stimulus-response psychology (Rachlin, 1992).

Thomas Leahey's (1993) paper describes parallel trends in changes in the meaning of "behavior" and in psychology's methodology in assessing personality typology. The meaning of "behavior" changed from the moral category of deportment to a value neutral, normative conception. A parallel change

from the morally tinged demarcation of "character" to the statistically configured measurement of personality types took place in our understanding of persons. If we embed Leahy's comments into the context we have provided, we may see further such changes emerging.

Carl Rogers suggested that openness to experience was the most fundamental personality trait required for therapeutic change. Interestingly, something like openness to experience has since been demonstrated to be one of the "Big Five" personality factors that seem to explain personality composition from a trait perspective (McCrae and Costa, in press). Openness to experience is probably the trait that most clearly relates to the subjectivity of individuals. It is certainly the dimension extolled by the human potential movement (à la Leary and Alport), and which carries on in current "New Age" spiritual movements. At the same time, we have seen turns in psychoanalysis from interest in the neuroses to the treatment of the self. It is a turn toward the subjectivity of the subject that is most prominent. Similarly, social psychologists have come to see the role of the self as central, while constructionism arising from social psychology has led the movement away from the older positivist-operationist approach toward a more subjectivist interpretation in psychology. I am suggesting that in the 30 years or so since the demise of behaviorist hegemony, we have also seen a concentration on subjectivity within most fields of personality and psychotherapy. The subjectivity entailed by a view of intentionality (particularly like Searle's) has been put at center stage in these fields. Unfortunately, it threatens to overcome all methodological strictures, if it is not adequately constrained.

What does this mean for the construct "behavior"? I would like to discuss this in the context of some points made by James Jenkins (1993). Jenkins cites Meehl's rendering of three different versions of behaviorism. Roughly, the first is a rather dogmatic ontological behaviorism, the second methodological behaviorism, and the third domain behaviorism, i.e., the position that psychology is the study of behavior. Jenkins believes most psychologists to be methodological behaviorists, but I wonder whether, once we elucidate this construct a bit, Jenkins would still call the position in question "methodological or epistemological behaviorism." The reason I am not a methodological behaviorist is that in my opinion (Hibbard and Henley, in press) even to understand what most of us do in psychology as "methodological behaviorism" is to accord too much of a privileged and artificial status to the construct "behavior" which is a holdover from the days of behaviorism's hegemony.

Jenkins defines methodological behaviorism in reference to the need to validate our inferences about mental events, and our lack of special access to them. Surely, psychology ought to be an empirical discipline and psychologi-

cal problems ought to be amenable to empirical investigation. In principle, psychological questions ought to be testable, given sufficient research resources. (Resources, of course, are never adequate, which probably better explains why we make such "slow progress" than does referring to the ways in which our questions are formulated.) But, if what is meant by "methodological behaviorism" is simply the fact that psychology should commit itself to appropriate empirical constraints, then, by all means, I concur that most academic psychologists are so committed — and rightly so. I simply see no reason to call this "behaviorism," with or without the delimiter.

I likewise concur in the view that private mental events should not enjoy special status, though some such events, e.g., imagery, are worthy of study in their own right. By and large, introspective reports on private states have not done much for psychology. On the other hand, self-report regarding not only how a subject acts, but also how he or she typically feels and thinks is a perfectly good research methodology, whether it is done with pencil and paper tests or is done in interview for purposes of protocol analysis. Of course, one can try to revive the very arbitrary discipline of the behaviorist hegemony (so well outlined by Jenkins, 1993) by describing these methodologies as relying on "verbal behavior"; but to do so is only to accord to the term "behavior" a status that it has not independently justified in psychology. Why not just call such methodologies what they are: self-report and protocol analysis?

Perhaps much of what people think of in psychology as "methodological behaviorism" is a very different thing, namely the validation of a construct through empirical investigation. This occurs in social and personality psychology through variations on the multitrait-multimethod approach. It happens in cognitive psychology through the establishment of dissociations between various cognitive processes that are "inferred," i.e., constructed, on the basis of getting different results from different tasks (e.g., explicit and implicit memory). But again, why call this "methodological behaviorism"? Why not just call it construct validation, which is what it is?

Finally, let me broach another possible reason why we might want to refer to "methodological behaviorism." This is because we are tempted to hold to a sort of neo-Hullian "intervening variables" view of the relationship of mental events to "behavioral" ones. But this view has two basic problems. First, it is thoroughly mechanistic (as suggested by Rychlak, 1993). To the extent that consciousness and the mental have a place in psychology, it is not as efficient or mechanistic cause, but as intentional (Searle, 1984) or final cause. Second, and in this regard I think commentators so diverse as Searle and Rachlin would agree, the neo-Hullian view is too dualistic and does not take the person as the central subject matter in psychology.

I hope that I have not suggested that a well-worked out position on these matters is before us. I have rather tried to describe the trends which seem to me to be important. To summarize, these are that psychology is primarily the

study of the adaptation of organisms. There is no news here. Aristotle described the "psyche" as the principle of "movement" or change of the organism. Behaviorists, perhaps more than any other of the early psychologists, knew that psychology was the study of adaptation. What we continue to learn through the "revolution" against behaviorism is that adaptation cannot be thoroughly explained without understanding intentionality. The old mechanistic explanations are not sufficient, even when they are explanations of mental mechanisms inside of physical systems. I believe, though I have not argued this extensively, that this means we have to give an intentional account of consciousness which includes subjectivity. I see hope for an emerging consensus in commentators seemingly so disparate as Searle, Gibson, Rychlak, and Rachlin.

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