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SCIENCE AND HUMAN BEHAVIOR, *DUALISM, AND CONCEPTUAL MODIFICATION*

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Skinner's *Science and Human Behavior* is in part an attempt to solve psychology's problem with mind-body dualism by revising our everyday mentalistic conceptual scheme. In the case of *descriptive mentalism* (the use of mentalistic terms to describe behavior), Skinner offers behavioral "translations." In contrast, Skinner rejects *explanatory mentalism* (the use of mental concepts to explain behavior) and suggests how to replace it with a behaviorist explanatory framework. For *experiential mentalism,* Skinner presents a theory of verbal behavior that integrates the use of mentalistic language in first-person reports of phenomenal experience into a scientific framework.

Key words: Science and Human Behavior, behaviorism, dualism, mind-body, philosophy, mentalism, explanation, Skinner

Science and Human Behavior, Skinner's (1953) masterpiece, is the reason I am a psychologist. As an undergraduate philosophy major at Columbia in 1962, I was fascinated by the ancient metaphysical thesis that our universe consists of two qualitatively different substances, the mental and the physical. Curious to learn what psychologists had to say about this, I registered for an introductory course in psychology. To my surprise, I found that psychology at Columbia in those days was synonymous with Skinnerian behaviorism, and the introductory course, designed by Fred Keller, was really an introduction to operant conditioning. The major course readings were Keller and Schoenfeld's (1950) *Principles of Psychology* and Skinner's *Science and Human Behavior.*

DUALISM

I soon realized that *Science and Human Behavior* was an ingenious proposed solution to the problems of dualism and the mind-body nexus, and much of my subsequent career has been devoted to examining this solution. Although *Science and Human Behavior* was not intended to be a philosophical tract, any attempt to establish psychology as a science, behaviorist or otherwise, must come to terms with dualism and the mind-body relationship. Dualism undermines the unity of science according to which the sciences differ from one another only in complexity and level of observation but share an ontology, an assumption of lawfulness, and a set of methods. If psychology admits consciousness as a second kind of substance, it differs qualitatively from the other sciences in its content. If consciousness and behavior interact, psychology also differs in its principles of causality. More seriously, if consciousness and, in particular, the will, are not subject to deterministic principles, then psychology cannot establish causal laws. Finally, if consciousness constitutes a private phenomenal world, then its study requires special methods such as introspection, and thus psychology's methods and cannons of objectivity are radically different from those of the other sciences.

Historically, structuralism, modern psychology's first attempt at a resolution to the problem of dualism, compromised on the unity of science. Consciousness was adopted as its subject matter, and introspection was accepted as the method of study. Causal laws were to be discovered by careful application of the methods of introspection. To be sure, many sophisticated structuralists argued that the compromises were more apparent than real. For example, some argued that all sciences must begin with conscious experience and therefore structural psychology's use of introspection is neither unique nor subjective. Nevertheless, structuralism failed as a scientific paradigm, and behaviorism, founded by John Watson, was a direct effect and cause of this failure. For Watson, scientific psychology, like all the natural sciences, studied material bodies in motion as its subject matter, adopted the same objective methods of observation

When page numbers appear without a year, the reference is to *Science and Human Behavior.*

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and measurement, and assumed deterministic causal lawfulness.

Conceptual Clash

Watson's rejection of dualism met stiff opposition. His proposal flies in the face of common sense, contradicting the conceptual scheme through which we understand our world, for our language is drenched in mentalism. First there is *descriptive mentalism* used to describe organisms: ''He is angry,'' ''He is expecting a visitor,'' ''He imagined the scene,'' ''He felt a sharp pain.'' Second is *explanatory mentalism* used to explain observed actions: ''He hit him because he was angry,'' ''He arrived early because he thought it was Friday,'' ''He jumped because he felt a sharp pain,'' ''He was awakened by a dream.'' Third is *experiential mentalism* in which we directly experience phenomenal occurrences and then report them in the first person: ''I am feeling a sharp pain,'' ''I am imagining the scene,'' ''I am angry.''

One approach to the dualistic contradiction is simply to ignore it. Behaviorists might have built their science of behavior piece by piece, until it achieved theoretical, explanatory, and applied success. Ultimately, an effective science of behavior would replace our everyday dualistic conceptual scheme, just as the other natural sciences replaced the animistic scheme preceding them. Nevertheless, few major behaviorists adopted this strategy. Most devoted great efforts speculating how the dualistic conceptual scheme might be replaced by a behaviorist one, often suggesting how descriptive, explanatory, and experiential mentalism could be ''translated'' into the proposed behaviorist conceptual scheme (Zuriff, 1985, Section III). Behaviorists could not hope to recruit followers without at least some indication that their proposed science was not obviously doomed to failure without recourse to consciousness.

This discourse on the replacement of the everyday dualistic conceptual scheme with the promised behaviorist one is at once both philosophical and scientific. It is the former because the business of philosophy is to analyze meanings, interpret concepts, and explore the logical geography of conceptual schemes. It is the latter because for the behaviorist, a ''conceptual scheme'' refers ultimately to classes of verbal behavior, and verbal behavior—how it is acquired, maintained, and modified—is subject matter for a science of behavior. Note that this ''translation'' of ''conceptual scheme'' to ''classes of verbal behavior'' is itself part of the discourse.

Science and Human Behavior can be viewed as many things, not all of them intended by the author, and this multiplicity is a sign of a great book. I wish to discuss the work as an impressive attempt to revise our everyday conceptual scheme, or to put it another way, as Skinner's verbal behavior modifying the reader's verbal behavior. Specifically, I shall examine his treatments of the descriptive, explanatory, and phenomenal mentalism of everyday speech. My theses are two: (a) Skinner's approach to everyday mentalistic language is heterogeneous; that is, he treats mentalistic verbal behavior in a variety of ways ranging from wholesale conceptual scheme replacement to a more modest conceptual revision, and (b) Skinner's treatments of mentalistic language are persuasive not only because his interpretations are so ingenious but also because he already had the beginnings of a successful science of behavior on which to base those interpretations.

Historical Context

At the time *Science and Human Behavior* appeared, behaviorism was flourishing in both philosophy and psychology. Philosophical behaviorism assumed many forms, the most prominent of which was the logical behaviorism of the logical positivists (Carnap, 1932–1933). According to their verificationism, the meaning of a sentence is determined by the public conditions for empirically testing the truth of that sentence. Any proposition that cannot be observationally verified is meaningless. Therefore, the meaning of mental concepts is given by other concepts, especially behavioral ones, referring to observables that are the conditions of application and verification. Thus meaning cannot include the contents of introspected consciousness, and dualism disappears from scientific language.

Verificationism found its way into psychology via the operationism of the physicist Bridgman (1927). According to operationism, the meaning of a concept, and a mental concept in particular, is to be found in the operations used to measure or detect the presence of that concept. This approach was

adopted in psychology most prominently by Stevens (1935), who studied sensations but defined them operationally, thereby avoiding any suggestions of dualism.

Another form of philosophical behaviorism was the analytic behaviorism of Wittgenstein (1953) and Ryle (1949). Through painstaking philosophical analysis of traditional mental concepts, analytic behaviorists tried to demonstrate that dualistic interpretations of mental language are founded on logical errors. Instead, they argued, everyday mental concepts refer to aspects of behavior rather than to private consciousness. The behavior is said to be the ''criterion'' for the application of the mental concept; that is, noninductive evidence for the mental concept and justification for its application.

Neither logical behaviorism, operationism, nor analytic behaviorism was acceptable to Skinner. Logical behaviorism and operationism simply legislated private consciousness out of science. In contrast, Skinner (p. 258) believed that the incorporation of private events into a natural science was one of the most important achievements of his behaviorism. Analytic behaviorism, on the other hand, although it pruned language of its dualistic connotations, left language as it was.[1] This did little to advance a science of behavior, and it left intact the language of agency and freedom Skinner viewed as detrimental to behaviorism's contribution to human social progress.

More congenial to Skinner was a long line of behaviorist psychologists, originating with Watson, who offered behaviorist interpretations of mental language (see Zuriff, 1985). Two contemporaries of Skinner are worthy of note. Clark Hull (1930) approached mental concepts experimentally. First, he selected aspects of animal behavior thought to display mentalistic features. He then formulated an explanation of that behavior within his experimentally derived behavioral theory. Having demonstrated that the behavior could be explained without appeal to any mental concepts, he thereby eliminated the dualism. This strategy, although powerful, is severely limited. It operates slowly, one concept at a time, and only for those features of behavior strictly deducible from the theory. Skinner's (1950) distaste for Hullian hypothetical-deductive theorizing precluded his following the Hullian strategy.

Tolman (1932) suggested yet another view of mentalistic language. He maintained that mental concepts are to be identified with intervening variables; that is, relationships among stimuli and responses (Zuriff, 1985, chapters 4 and 8). Although Skinner expressed some sympathy with this approach, it was not really harmonious with his own style of theorizing. In contrast to Tolman's theory, replete with numerous and complex intervening variables, Skinner's lean theorizing tended to shed intervening variables, and the few he adopted (e.g., reflex reserve, drive, emotion) were eventually deemphasized or eliminated.

Descriptive Mentalism

For the behaviorist, the problem of descriptive mentalism is how to preserve the valid observations of everyday language without accepting the implied mentalism. Skinner's solution is illustrated in a number of curious examples throughout the book, including the following (with italics added):

> Although such terms as . . . ''intent'' appear to refer to properties of behavior, they usually *conceal references* to independent variables (p. 36). . . . Purpose is not a property of the behavior itself; it is a way of *referring* to controlling variables (p. 88). . . . expressions involving goals and purposes are *abbreviations* (p. 90). . . . Moods and dispositions *represent* a kind of second order probability . . . (p. 169)

In all these instances and many others, Skinner interprets the mentalistic language as ''referring to,'' ''representing,'' ''reducible to,'' ''translated as,'' or ''implying'' physical variables rather than the implied mental states. What is the nature of these interpretations?

One way of understanding them is that Skinner is offering the correct meaning of the verbal behavior. But how does Skinner justify his version of the ''correct'' meaning? Is he not begging the question of dualism? Furthermore, how can speakers come to intend Skinner's suggested meanings when

[1] It is not clear how familiar Skinner was with the work of analytic behaviorism. I once convinced him to attend a lecture by Gilbert Ryle, who was then visiting Harvard, by persuading him that Ryle's work was related to his own, but he lost interest and walked out in the middle of the lecture.

most have no idea of what a controlling variable is? To be sure, a lack of knowledge does not always decide meaning as when scientists tell us that when we speak of the temperature of an object we are referring to the kinetic energy of its molecules, even though we may know nothing of molecules. Nevertheless, this interpretation of Skinner's treatment of descriptive mentalism is unsatisfactory because the notions of ''reference'' and ''meaning'' are murky, and Skinner (1957) has criticized them for their mentalistic connotations.

A more promising approach is to make use of Skinner's (1945, 1957) own conception of meaning. In its simplest terms, this theory suggests that the meaning of a verbal response is the set of variables controlling it. This definition does not precisely correspond to the traditional one, but it does shed light on Skinner's treatment of descriptive mentalism. When Jones says ''Smith is looking for his glasses,'' to understand the meaning of Jones's verbal response, we have to look for the variables controlling it. Among the important controlling variables are some of the same variables that also control Smith's behavior. For example, a history of reinforcement for wearing his glasses controls Smith's behavior of looking for his glasses, and that same history of reinforcement may also control Jones's verbal response in describing Smith's behavior. Note that in Smith's case, history functions as a reinforcement variable, and in Jones's case, it serves a discriminative function. In Skinner's theory of meaning, it is inconsequential that Jones cannot articulate which variables are controlling his verbal response. The important point is that none of the variables controlling the verbal response is mentalistic, and hence the meaning of the verbal response can be understood in purely behavioral terms without reference to consciousness.

Although this analysis of meaning appears to solve the problem posed by descriptive mentalism, it conceals one major flaw. According to Skinner, the meaning of a verbal response consists of all the variables controlling it. Thus the meaning of Jones's verbal response is not confined to the discriminative stimuli representing Smith's reinforcement history but also includes a class of intraverbal responses and stimuli (Skinner, 1957). That is, Jones emits the response also under the control of other verbal responses, and these verbal responses may include talk about mental explanatory fictions having no translations acceptable to the behaviorist (see below). Thus, for example, Jones may emit the verbal response ''Smith is angry'' not only under the control of observable stimuli eliciting Smith's angry behavior but also under the control of the verbal stimulus ''What private events occurring in Smith's consciousness caused him to bang the table?''

It appears, therefore, that Skinner's treatment of descriptive mentalism is not simply to interpret such language in terms of its total behavioral meaning because to do so legitimizes talk about explanatory fictions. Instead, Skinner's interpretation provides a partial meaning that includes only those variables useful to a behavioral science. Thus Jones's ''Smith is angry'' is interpreted in terms of the environmental variables both controlling Smith's behavior and serving as discriminative stimuli for Jones's verbal response, but the interpretation does not include talk about explanatory fictions that may also control Jones's verbal response. This understanding of Skinner's mode of interpretation is supported by passages such as the following: ''If statements [about the intention of an act] are useful for scientific purposes, they must be based upon observable events, and we may confine ourselves to such events exclusively in a functional analysis'' (p. 36).

It thus appears that Skinner's treatment of descriptive mentalism can be understood as a recommendation for a partial conceptual revision, or what philosophers call an ''explication.'' In an explication, a more precise and more useful concept is substituted for a vague but important traditional concept. As an explicator, Skinner interprets many, but not all, mentalistic descriptions by showing that such verbal behavior is primarily (if not totally) under the control of (i.e., the meaning of the verbal behavior is) a set of environmental variables that controls both the verbal behavior as well as the behavior being described, and these variables are useful in a functional analysis. Consequently, Skinner is able to justify many of the concepts embedded in our everyday mentalistic conceptual scheme (e.g., intention, purpose, and meaning) without accepting their dualistic implications. He cautions, however, that this kind

of interpretation may not be possible for all descriptive mentalism (p. 163).

Explanatory Mentalism

In contrast to Skinner's revisionary acceptance of descriptive mentalism, chapter 3, "Why Organisms Behave," is one of the most penetrating, cogent, and comprehensive criticisms of explanatory mentalism in the psychological literature. Much has already been written about it, and I shall add only one observation. Although some of his objections are philosophical (e.g., mentalistic explanations are circular, redundant, ad hoc, contrary to the unity of science), most are pragmatic (e.g., mentalistic explanations are useless for prediction and control, are unobservable, lack measurable dimensions, distract us from observing environmental variables, create a false sense of understanding). Accordingly, Skinner's approach to explanatory mentalism is to recommend the total replacement of the mentalistic conceptual scheme with the behaviorist one. For example: "Instead of saying that a man behaves because of the consequences which are to follow his behavior, we simply say that he behaves because of the consequences which have followed similar behavior in the past" (p. 87). He thus recommends a radical change in our verbal behavior.

Obviously, at the time, Skinner did not have confirmed explanations of complex human behavior to substitute for mentalism. Instead, his strategy was to suggest alternative plausible, but untested, behaviorist explanations for complex behavior based on a behavioral theory derived from simple animal experiments. This strategy, that he variously termed "extrapolation" (p. 39), "reduction" (p. 40), and "interpretation" (1973, pp. 260–261), comprises the bulk of *Science and Human Behavior,* and, indeed, all of Skinner's later writings. In his description of the structure of the book, he writes:

> The plan is obviously an example of extrapolation from the simple to the complex. No principle is used in any part of the book which is not discussed in Section II. The basic relations and processes of this section are derived from data obtained under conditions which most closely approximate those of an exact science. (p. 39)

Skinner's notion of the "extrapolation from the simple to the complex," as revealed in this passage, is essential to understanding the achievements of *Science and Human Behavior* as well as the objections of its critics.

One might suppose that the extrapolation refers to the process of taking the behavioral laws derived from research on hungry rats pressing levers to obtain food pellets in experimental chambers and applying these laws to everyday human action in natural settings. Skinner's notion of extrapolation, however, is much more expansive. For him, the "basic relations and processes" derived from laboratory research and used in his extrapolations are not limited to rats in operant conditioning chambers. Section II, described as the location for the principles to be extrapolated from, already contains many applications of these principles to everyday human action, including verbal behavior, for which they had never been experimentally demonstrated. One simple illustration is that of writer's cramp explained as due to extinction (p. 72). Thus the extrapolation is not from the simple animal laboratory case to the complex human case but is from the simple principles of operant conditioning in the single organism, including humans, to complex cases of interactions among these principles and among organisms. By taking for granted the application of behavioral theory to human action, Skinner's extrapolation is much bolder than those of many earlier behaviorists and much more vulnerable to criticism.

With the problem of human application thus finessed, Skinner was free to indulge in original and creative theorizing as to how explanatory mentalism can be replaced entirely by a behavioral explanatory scheme. In recent years, as well as in his own later writings, the major interest has been in Skinner's interpretations of social phenomena, especially government, education, cultural design, and the issue of social control, as discussed in sections IV, V, and VI. Because my interest is in Skinner's treatment of mentalism, however, I shall focus instead on section III, "The Individual as a Whole," because it directly addresses the mind and because I believe it displays some of Skinner's most original and brilliant interpretations.

I see this section as dealing with one fundamental problem, the issue of agency—a topic no psychological science can avoid.

Who is the actor? Who is thinking, feeling, deciding? Can agency be reconciled with determinism? Skinner looks at two aspects of agency posing difficult challenges to a behaviorist interpretation—self-control and thinking. In these chapters, Skinner leads the reader, step by step, to his prestated goal of demonstrating that these two phenomena can be explained without recourse to mentalism, using only the basic principles of section II. His writing here is an exemplar of subtle persuasion and startling originality.

With both phenomena, he makes use of an insight shared by the analytic behaviorists Wittgenstein and Ryle, although not borrowed from them. Whatever activities precede and are responsible for an action, be they private mental activities, an internal dialog, or external preparatory actions, at some point the action simply happens with no further ado merely because of the nature of the organism. To that insight, Skinner adds a bold hypothesis: One can treat oneself as other. Using these two points, Skinner shows that in self-control and thinking, people manipulate variables of which their own behavior is a function so that their behavior is modified in ways we call ''self-control'' or ''problem solving.'' Closing the circle, Skinner finally shows that the behavior of manipulating variables is itself ultimately a function of the variables reviewed in section II.

In these interpretations, Skinner accepts that people do engage in what is termed ''self-control'' and ''thinking,'' but he attempts to change the way we talk about these activities and how we explain them. He examines the behavior people observe when they apply the terms and then proceeds to explain that behavior through his behavioral theory. Thinking and self-control—as well as many other allegedly mental phenomena—are interpreted as forms of behavior. Neither the behaviors described nor the explanations for them resort to mental events or ''explanatory fictions.'' As Skinner says:

> The best way to dispose of any explanatory fiction is to examine the facts upon which it is based. These usually prove to be, or suggest, variables which are acceptable from the point of view of scientific method. (p. 285)

For the philosopher, the advantage to these interpretations is that they eliminate dualism; for Skinner the advantage is that they allow for the prediction, control, and scientific investigation of thinking and self-control.

Concluding section III, Skinner offers a behavioral definition of the self: ''[I]t appears that a self is simply a device for representing a functionally unified system of responses'' (p. 285). Much is packed in this disingenuously ''simple'' definition, but it does summarize Skinner's analysis of thinking and self-control. One profoundly important implication of this interpretation is that the self is not an a priori given. Rather than serving as the starting point for psychology, the self is instead a product of interactions between the organism and the environment. Moreover, Skinner (p. 291) suggests, through social contingencies of punishment, humans may learn to engage in nonpunished behavior to the exclusion of knowing about punished behavior, thereby opening up the possibility for repression and highly defective self-knowledge.

Experiential Mentalism

Our direct introspective conscious experience has always been the strongest evidence for dualism and the greatest challenge to behaviorism (for a review, see Zuriff, 1985, chapt. 11). As noted above, some behaviorists met this challenge by simply declaring that consciousness, because of its inherent privacy, can never be the subject matter for science and must therefore be ignored. Others agreed that consciousness cannot be directly studied, but first-person reports, such as ''I have an image of a dog,'' are verbal behavior and can be studied scientifically. Within this group of behaviorists, some argued that this verbal behavior is a response to physical events internal to the person, and the first-person report therefore can be used to draw inferences about these internal events. Before Skinner, however, no behaviorists had explained in any detail the relation between the first-person reports and the hypothesized internal events.

In chapter 17, ''Private Events in a Natural Science,'' Skinner offers a highly innovative theory of this relationship. His willingness to extend his behaviorist analysis to private internal events is what distinguishes his form of behaviorism as ''radical'' in the sense of thoroughgoing. One of the strengths of this rad-

ical behaviorism is Skinner's creativity in conceptualizing the nature of these private events. For example, he introduces the concept of "operant seeing," interpreted as a discriminative operant response that may account for reports of private images and private visual problem solving.

Given the variety of covert events Skinner is willing to countenance, he must face the problem of how these covert events give rise to first-person reports. In keeping with the logic of the book, this relationship must not be simply assumed but must be derived from the basic behavioral principles. Accordingly, Skinner conceives of first-person reports as discriminative verbal responses with the covert events as the discriminative stimuli. How, then, does the verbal community train the discriminative responses when it lacks access to the discriminative stimuli? Skinner's clever solution is that the verbal community resorts to public accompaniments of the private event or that verbal discriminations acquired with respect to public events may be transferred to private events on the basis of common properties.

This empirical theory has deep philosophical implications because it turns traditional Western epistemology on its head. For Descartes, one begins with the certain knowledge of oneself and only later acquires uncertain knowledge of the external world, whereas for Skinner, the epistemological progression is reversed. It is only through a process of social discrimination training that we come to know the contents of our internal worlds.

Thus much of the contents of experiential consciousness, the pains, sensations, images, and feelings, is explained as internal physical events functioning as discriminative stimuli for the verbal behavior we observe as first-person reports. To be sure, such reports are unreliable because of the defective discriminative contingencies and repression (see above) and are not scientific observations, but Skinner does not require that people stop using such first-person reports. He recommends only that people cease talking about private events as if they were nonphysical and that psychologists not accept first-person reports as the basis for a science.

Although Skinner thus neatly finds a role for private events in a natural science, the philosopher in me still wants to ask quietly, "When a physical event occurs inside me and I emit the discriminative verbal response, 'I have a pain,' is this behavioral complex accompanied by a nonphysical phenomenal experience?"

Conclusions

Science and Human Behavior can be seen as an heroic attempt to modify our everyday dualistic conceptual scheme to make a science of human behavior plausible. With regard to descriptive mentalism, Skinner is content to leave intact much of everyday discourse by using his theory of meaning to extract its factual core and dismissing what is misleading or false. In contrast, he recommends that nearly all of explanatory mentalism be scrapped. In its place, he suggests an entire explanatory scheme by extrapolating from the basic principles of his behavioral science. Nevertheless, even in the case of explanatory mentalism, he often bases his analysis on some factual core meaning of the mentalistic explanation. In the case of experiential mentalism, he also leaves most first-person reports intact, but he recommends an entirely new way of conceiving them. Rather than serving as the basis of all knowledge, they are instead the error-prone product of an unreliable process of social conditioning, and rather than reporting about a nonphysical substance, they are discriminative responses to internal material events.

In differentiating among the various aspects of mentalism, Skinner was not guided by metaphysical considerations. Instead, his criteria for accepting, revising, or rejecting everyday discourse were closely related to the effectiveness of his science. Language that interferes with behavioral science is criticized and discarded; terms that may be somewhat misleading but which may be related to scientific concepts are shorn of mentalistic implications and recommended for revision. At its heart, *Science and Human Behavior* is a scientific enterprise.

I have confined my discussion to Skinner's treatment of dualism, but the book is much more than that. It is nothing less than an attempt to develop an empirical and theoretical framework for all psychology, and, as such, it is not entirely inappropriate that it was chosen as a textbook for Columbia's in-

troduction to psychology. In the half-century since its publication much has been written in support and in opposition. Parts of it have stimulated further research and thought whereas others have been superceded or discarded, even by behaviorists. Nevertheless, in terms of its scope, originality, influence and sheer brilliance, it remains unsurpassed in the literature of 20th-century psychology.

REFERENCES

Bridgman, P. W. (1927). *The logic of modern physics.* New York: Macmillan.

Carnap, R. (1932–1933). Psychology in physical language. *Erkenntnis, 3,* 107–142.

Hull, C. L. (1950). Behavior postulates and corollaries—1949. *Psychological Review, 57,* 173–180.

Keller, F. S., & Schoenfeld, W. N. (1950). *Principles of psychology.* New York: Appleton-Century-Crofts.

Ryle, G. (1949). *The concept of mind.* London: Hutchinson.

Skinner, B. F. (1945). The operational analysis of psychological terms. *Psychological Review, 52,* 270–277.

Skinner, B. F. (1950). Are theories of learning necessary? *Psychological Review, 57,* 193–216.

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. (1973). Answers for my critics. In H. Wheeler (Ed.), *Beyond the punitive society* (pp. 256–266). San Francisco: W. H. Freeman.

Stevens, S. S. (1935). The operational definition of psychological concepts. *Psychological Review, 42,* 517–527.

Tolman, E. C. (1932). *Purposive behavior in animals and men.* New York: Century.

Wittgenstein, L. (1953). *Philosophical investigations.* New York: Macmillan.

Zuriff, G. E. (1985). *Behaviorism: A conceptual reconstruction.* New York: Columbia.

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