

WHAT COLOR IS THE SKY ON YOUR PLANET? A REVIEW OF INVESTIGATIONS IN *BEHAVIORAL EPISTEMOLOGY*

Hayes, L. J., & Ghezzi, P. M. (Eds.). (1997). Reno, NV: Context Press.

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Radical behaviorism is a philosophy of mind and therefore an epistemology. That simple truth is known by very few psychologists, let alone by the general public or by philosophers and biologists. For most, introductory textbook psychology is the normal referent and, according to *that* authority, psychology divides into cognitive and behavioral—sometimes phenomenological is added. Anything *good and interesting* is cognitive. That includes all of the “richness” of cognitive psychology itself, as well as the wonderful world of imaginary biology—the cognitive neuroscience boom that has added so very much to our understanding of ourselves. . . as it has.¹ Modern behaviorism lies outside this glittery façade of pretend breakthroughs and great moments in public relations. But modern behaviorism is hard to understand and exists in so many forms and degrees that it is hard to believe that all the authors involved *are* behaviorists.

The contributors to this little volume show how very wide is the range of modern behaviorism. On one end lies the flaky extreme contextualism of Linda Hayes, co-editor of the book, who begins by questioning the sufficiency of science, and unwittingly discovers Bishop Berkeley’s idealism and then, of all people, the “unnatural scientist” Parmenides. From there it is a small step to the “suchness” of Buddhism and the reduction of space and time to mere verbal constructions. Lord love a duck! You’d think that philosophers would have mulled over all of that by *now*. What would a *materialist* monist like Jack Marr think of that?

At the other end of the spectrum lies *science*, anchored in John Staddon’s dish of nematode worms and the “formal representation of data reduced to a minimal number of terms.” Gregory Galbicka’s thinking is not far removed, but he quixotically tries to show that the essence of radical behaviorism, its emphasis of patterns of behavior extended in time, is reducible to momentary/proximal causes. Of course, even B. F. Skinner did that!

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¹ But that was in the 19th century! See the insightful discussion by Glymour (1997).

Between the chilling extremes of Linda Hayes and Galbicka lie some very good and insightful chapters and some very bad and boring ones. The highlights of the book (from our point of view) are Baum's superb chapter on time, Marr's defense of the material monist ontology of Thales, Smith's treatment of consciousness, Guerin's chapter on the influence of language, Staddon's defense of theories, and Leigland's marvelous introductory chapter. Leigland's discussion of methodological and radical behaviorism deserves careful study and it is there that we begin.

Chapters Representing Modern/Radical Behaviorism

Methodological and Radical Behaviorism

There is a continuing conflict in psychology and allied disciplines, not just within behaviorism. It appears in medicine and the biologies and probably through all the sciences and some of the humanities. It is the never-ending continuation of the basic difference between Plato and Aristotle—and since the Enlightenment, science has ironically sided with the mystic *Plato*, rather than with the naturalist Aristotle. Today the Platonists are called cognitivists and methodological behaviorists. The Aristotelians are called radical behaviorists.² Leigland provides the best summary of the two views that we have seen.

Methodological behaviorists are people who are proud to be “objective scientists.” For them subjective experience is unknowable—we can only study public, “intersubjective” things, like overt behaviors. They love the experimental method and explain things at a theoretical level, freely using intervening variables. These are the people who Skinner attacked in 1945; the clearest exemplar was the behaviorist Clark Hull, but virtually all psychologists, scientists, and lay persons endorse this view. Their thinking is that of the 18th century and, as Leigland notes, their theoretical terms come straight from folk psychology. Explanations for what we do are “inside us,” and they take the form of images, hopes, dreams, memories, longings, processing stages, and myriad other terms that appear on TV and in newspapers. Thinking, perception, attention, and other faculties are assumed to be “real” and legitimate, owing to common consent over the past several hundred years.

This is psychology as S-R connection and cognition—most people don't dream that there is any other kind. Adherents can say they are following the steps of Galileo and Newton and they can publish, get grants, and stay in academics. And there are only a few drawbacks.

For one, we have to settle for an illusory world, since objective reality lies beyond Plato's veil, “apart from human functions, constructions, and behavior” (Leigland, p. 17). Yet, we now realize that “facts, reality, and objectivity” are largely the product of language, history, and cultural context. Consider the absurdity of the statement that “we don't know the world as it *really* is,” according

² Some are called phenomenologists, but that is not a widely recognized fact.

to the scientist/methodological behaviorist/cognitive psychologist. They never seem to wonder what “real reality” could possibly be.

Radical behaviorism has a different source. Rather than Plato and (much later) the Enlightenment, it began with Aristotle and was revived by Bacon, Mach, Loeb, and popularized by Dewey, Peirce, James, and other pragmatists (Peirce, 1877/1962). According to this view, the subject matter of psychology is solely *behavior* and that includes “any observable functional actions or activities of the organism or person, including those available to a single observer.”³ Explanation does not refer to intervening variables or to hypothetical mechanisms within the organism. We explain by relating historical, contextual variables to behavior. Note that “behavior” includes any private psychological activity imaginable, as long as it can be construed as activity.

Unlike the “experimental design” method of methodological behaviorism, radical behaviorism employs “functional analyses,” at least ideally, seeking the environmental and historical contingencies that explain the occurrence of various behaviors. The strategy relies on extending the scope of basic principles to more complex cases and the use of “increasingly abstract descriptive systems.”⁴ Leigland notes that behavior analysis has been applied to a broad range of applied areas: clinical psychology, education, verbal behavior, and the origin of cultural practices. He could have added applications to law and to advertising. And he notes that critics are puzzled and infuriated by this widespread application! Why should that be?

It is because the *actual* clinical applications and the educational ones that are familiar to most critics fit their preconception that behaviorism is merely the carrot and stick caricature of methodological behaviorism. And, sadly, they are correct! One scans the applied literature for some inkling of appreciation of advances in understanding that have arisen in basic research. One hopes that practitioners realize, as Leigland points out, that reinforcement and the other terms of behavior analysis have only descriptive meaning, that personal history, heredity, and context determine everything, and that ordinary language does not necessarily refer to important phenomena. But one looks in vain, as applications seem wholly restricted to principles at least 50 years old. Practitioners are way, way behind the times. These so-called “behaviorists,” as well as their critics, would learn a lot about modern behaviorism if they became familiar with the molar behaviorism that has developed since the 1960s. A good place to start is Baum’s chapter, “The Problem with Time.”

William Baum is a major exponent of the molar behavioral approach, as is Howard Rachlin,⁵ and others, though they constitute a minority even among radical behaviorists. They are very concerned with *time*. Time is a problem for us for the same reason that action at a distance was a problem for Newton—people like causes and effects to be discrete things, like thunder and lightning, which

³ p. 20

⁴ p. 20

⁵ Rachlin, H. (1994). *Behavior and mind*. New York: Oxford University Press.

occur contiguously. Molar behaviorism is modern radical behaviorism and it relies on patterns in time, so it seems counterintuitive, just as modern physics does.

But conventional “intuitive” accounts are not sufficient. For example “good manners” describes a pattern of behavior that began in childhood for most of us—it requires extension in time.⁶ Yet, we often say that early reinforcement of good manners in childhood leaves patterns stored in the brain and that those control our current “mannered” behavior! The same foolish simplicity of thinking forced Freud to describe intrapsychic mechanisms to bridge the gap between early trauma and adult psychopathology (Gay, 1989).

Baum likes to compare populations of behaviors with patterns of types studied in evolutionary biology. This practice is tedious and unfruitful, in our view, but Baum uses it to communicate that both fields deal with selection pressures, mutations, and environments and that neither behavior analysis nor evolutionary biology predicts *precisely*. Only the pattern of phenotypes or of behaviors over time tells the story—a still picture is uninformative.

The physicist-turned philosopher Erwin Schrödinger provided Baum with another instance of temporal patterning. This time the issue is the infinite number of simultaneous causal sequences chugging along in a deterministic world, running in parallel and often crossing, so that seeming “chance” occurrences change lives. We missed the train, so we took the plane and met Bill Gates and hit it off and. . . so on. This “tapestry pattern” renders the tracing of causal chains impossible and forces a look at the molar picture. Yes, well, whatever.

A more inspiring case is that of Benjamin Lee Whorf, the insurance adjuster-turned linguist who showed that the Standard Normal European notions of space and time are not as “given” as Newton and Kant thought. One conspicuous example lies in the language of the Hopi, which has no reference to time, implicit or explicit, and the verbs of which have no tenses. They use no mass nouns, like “water,” or “mountains,” and they do not distinguish objects from images of them. It sounds like epistemological monism to us! We have never seen a better rendition of Whorf’s work and the epistemology and ontology of the Hopi than Baum provides here.

The Hopi Weltanschauung is incomprehensible to us if we cling to our dualism of subject and object and insist on the independence of time and space. But with effort we can get a feeling for it. For example, instead of a world of objects in space lying in a “stream” of time, we may view experience as “a coherent pattern of events that becomes clearer as we gain experience with it” (p. 54). Strange as it may seem, that was pretty much the view of Saint Augustine, writing in the 4th and 5th Century. Baum wants to go beyond efficient causes, beyond the conception of time as a succession of moments. Nothing occurs at any *moment*, any more than instantaneous velocity describes the motion of any actual object.

This is also an Aristotelian view, which has been ably promoted by Rachlin (e.g., 1994) and which is clearly presented in Aristotle’s *Nicomachean Ethics*.

⁶ This view originated in Aristotle’s *Nicomachean Ethics*, as Rachlin (1994) showed.

According to this view, extended patterns of behavior account for so-called mental things. Thus, “intelligence” is a pattern of intelligent activity, just as “love” is defined as a pattern of acts. Internal states recede in importance because they are in constant flux and are momentary things—not relevant to molar patterns, though they are part of them. We have trouble talking about such patterns, because we want immediate (efficient) causes. So we resort to metaphors that stuff efficient causes inside us. To say that our seeing is caused by an *image* or that aggressive acts are caused by *aggressive cognitions* or *emotions* is like saying that electrons flow through conductors and are pushed by an “electromotive force.” We might say also that water flows because of the immediate cause of fluidity.

The confusion wrought by attributing causality to “names” that signify nothing is part of the subject of Noel Smith’s chapter on consciousness. Smith discusses modern philosophers and “consciousness”—a nightmarish thought! Imagine having to read Dennett, Jaynes, and all the rest, dealing with something that exists only as a *word*!

Dennett wants consciousness as the core of the mind, internal states and channels and something distributed to different parts of the brain. . . .a controller of things. Smith notes that its manner of control is left unspecified. Julian Jaynes famously proposed that consciousness appeared only 4,000 years ago with the dawning of messages flowing between the two hemispheres, originally as the voices of gods. The ancient Egyptians and Babylonians missed out, evidently.

Other “consciousness theorists” include Natsoulas, Pribram,⁷ Humphrey, Farthington, and Chalmers. After considering their various opinions on the subject, one must conclude, as does Smith, “. . .consciousness is nothing more than a tangle of verbal inconsistencies.”

Smith is the sharp knife in the drawer and takes a historical look at the word, telling us that it achieved currency only in the 16thC. It represented the culmination of a long road—the conversion of the real physical universe into an abstraction—the triumph of constructs over events. This was largely due to the “verbal constructs of various cults including Christianity” (p. 151). Later the “interpretative center” of our being became the brain and the idea of *one* organ “housing” consciousness became commonplace. Then we identified psychic events as brain activity and assumed that consciousness accompanies this process. We arrived at a set of “constructs without a referent.” And we lost the physical world, if not the whole universe.

We can trace the denial of physical reality in Western civilization to Pythagoras, who in the 6th century BC posited an ideal reality beyond the senses. This view of the experienced world as a rubbishy illusion was adopted by Plato and was thus transmitted across the centuries to us, the heirs of a bizarre fabrication. Reality was unsatisfactory, so humankind created a better one, but its reality lies only in words. Smith writes (p. 151),

These verbalisms eventually eclipsed all interest in science and helped bring on the dark ages. When science finally re-emerged in the late middle ages, it was

⁷ Who seems too good to be in this bunch.

heavily laden with physical and nonphysical distinctions and the assumption of the reality of verbal constructs.

There *was* a minority view, however, and that was Aristotle's, of course, passed on to the Arabs and then to Thomas Aquinas in the 13th century. It has been promoted in the 20th century by J.R. Kantor, B.F. Skinner, and Howard Rachlin, among others. That story is beyond the scope of this review. But one author in this volume inadvertently reprised St. Thomas' treatment of epistemology, that is, the question of the superiority of reason and "will." While we ordinarily think of knowledge as a conscious verbal entity, much knowledge comes from intuition, or "unanalyzed contingencies."

In fact, Steven Hayes resurrected David Hume *and* Thomas Aquinas when he discussed nonverbal knowledge—not to mention John B. Watson, who agreed that "we know more than we can say." For Hume and (especially) Aquinas, nonverbal knowing involved the will, not reason, and informed us of the Truth of certain things, though reason could not justify the belief. For Aquinas that was knowledge of God's existence, though God surpasses our understanding, and for Hume it was assurance of a world outside ourselves, though it was transcendental.

What does "knowing" mean? It is not merely verbal, since a lot of direct experience produces "knowing" that is never verbalized, you know? And *who* knows? Is it the verbal self, or the physical organism, or the object of verbal behavior ("I know"), or just part of (James') stream? Skinner (1974, p. 30) wrote of responding to one's own responses—we "see that we see," and Hayes adds that ". . . one can be conscious of everything except one's own consciousness." We don't think so—maybe in principle, but conscious of everything? "Deep thought, dude," is a comment that fits the tone of Hayes' musings.

Hayes proposes to solve the problem of Truth with a two-by-four applied to the head, perhaps to communicate the "nonverbal" nature of knowledge gained in that way. The same effect occurs when one absent-mindedly sticks one's hand into a bowl of molten lead.

The fact is that "I" distinguish truth as did St. Thomas Aquinas when he considered the ranking of reason and will. Aristotle favored reason, and Thomas was an Aristotelian, but he argued that Truth is often known only by will—we *feel* it, so to speak, but we cannot say why. That is, real knowledge is always nonverbal. Another author, Bernard Guerin, offered interesting views on this subject.

Guerin considers "how things get done," beginning with the assumption that reality consists of three parts: *things*, *people*, and *intervening activities*. "Well, yes, I guess," you think, though that seems a crude categorization. But Guerin feels it sufficient, and he is miffed because our understanding of HTGD has been crippled by dualisms, as Smith pointed out, so that:

- people are separated from the external world, including their own bodies . . .
- people are separated from the language they use . . .
- words are separated from things.

Some who have escaped this crippling include Roger Bacon,⁸ Claude Bernard, John Dewey, and B. F. Skinner, all of whom believed that we shouldn't just *talk* about things—knowledge is action. Talking leads to the awful absurdities of social constructionism, to Jacques Derrida and others who act as though reality actually *is* nothing but words.

So, what are knowledge, truth, and reality? In a sense, it *is* verbal, and it appears as social control—only in speech can we find contradiction, causality, tautology, and error, as well as time, space, and probability. There can't be contradictory *things*; but there can be a cat *and* no cat—that is, contradictory verbal statements.

Skinner's (1957) *Verbal Behavior* receives obligatory mention, of course, but we all know that he was hazy and equivocal on the epistemological and ontological role of language. Guerin rightly noted that Skinner paid lip service to the powerful role of verbal context, as he did in *About Behaviorism* in 1974. But he always slipped back to the dualisms of subject and object and leaned on the objective world that he tacitly assumed to exist. Don't look for truth in Skinner's writings!

So, for pity's sake, what is Real and what is Unreal? Guerin borrows a page from William James (1890) and the 19th century pragmatic definition of reality—a good idea, since it is the best handle on reality we have. There is no *real* world outside human concerns, and maybe there is nothing outside *my* human concerns! This, the pragmatic ontology, is the only rationally acceptable one, but no one really (*really*) believes it. Guerin writes that “truth is what gets done,” a clumsy way of putting the old pragmatic axiom: truth is conceptual; it is a tool; the usefulness of a belief is the criterion for truth. So faith, or belief, refers to a readiness to act. If we don't *act* on our belief when the occasion arises, it is not much of a belief.

Psychology *is* activity, from the behaviorist viewpoint, and beliefs are readinesses to act. True beliefs are expressed in words (water will put out this fire) that describe actions that perform work that we want done. False beliefs (gasoline will put out this fire) refer to actions that have unwanted results. The pragmatic/radical behavioral ontology does not require “a notion of truth” (p. 229). *What is called truth is always a matter of “words” and no more.* Remember: contradictions, errors, truth, and falsity do not exist in the reality of “things”—they exist only in *words*. A reader who doubts the truth of that statement or who wonders “whether it is true” misses the point and can be reasoned with no longer. Perhaps Linda Hayes could counsel that reader or Steve Hayes could apply his “two-by-four to the temple.”

Through all of this cutting-edge deep thinking, we must bear in mind that the same arguments were made not only by Peirce and James a century and a quarter ago, but also by Hume in the 18th century and by Protagoras in the 4th century BC. Sadly, the authors thus far discussed seem unaware that these people ever lived. And they are not in concert with the next group of authors, Marr, Galbicka,

⁸ But what of Francis Bacon? True, Roger, a 13th century Franciscan, fits the bill too, but Francis is more familiar to most readers. Guerin probably meant to refer to Sir Francis, not poor Roger.

and Staddon, who represent the “behaviorism as conventional science” contributors to the volume.

Behaviorism as Traditional “Science”

In a way, Jack Marr had to consider the “foundations of nature” to deal with the hassle over the proper definition of behaviorism—recent verbal battles about that subject clearly dismay him. He lamented that behaviorism spends too much effort trying to define itself and everyone seems to think that behaviorism must be *one* thing. Well, that’s life—psychology *itself* is undefined, except as an academic field and a professional organization (or two, or three. . .). Within psychology, whatever *it* is, lie horrible amalgams: 500 therapeutic approaches as “clinical” psychology, 47,000 models that comprise the hodgepodge that is “cognitive” psychology, and so on. Define “cognitive neuroscience” precisely!

Can behaviorism be defined in such a way as to be coherent and separate from other approaches? We don’t think so—the authors in this volume testify to that. But we propose that there are two characteristics that must be essential to behaviorism/behavior analysis. First, behaviorism must not allow actual representations of an outer reality that are placed inside the organism—that is the very definition of cognitive psychology! Second, *behaviorists must be monists*; there can be no metaphysical distinction between mind and body (mental and physical, organic and inorganic). Behaviorists cannot be dualists.⁹ This brings us to Marr’s encounter with Mayr; that’s Ernst Mayr the biologist and evolutionary theorist.

Marr referred to Mayr’s attempt to sharply differentiate biology from physics and chemistry, presumably in order to show its special status, much as the Church and humanists insist on a special status for humans! In a nutshell, Mayr argues that physics (think of high school physics) is deterministic, mechanistic, reductionistic, and requires proximal causes. Biology, as Mayr envisions it, is probabilistic, emergent, selectionistic, and deals with historical causes. These differences separate physics and the physical world from biology and the world of living things, at least for Mayr. Biological entities are far more complex and “iffy,” while physics remains stiff and certain, as it was in your high school textbook! What an absurd argument for a senseless dualism! It’s incompatible with any version of behaviorism and Marr gives it the cabash by showing that everyday physical phenomena, like bouncing a ping pong ball on a table, are as complex and “iffy” as any biological system. Dynamical systems theory considers many phenomena that illustrate this point.

On the border between cognitive science and behaviorism lies “dynamical systems theory,” and it is called “dynamical,” not “dynamic.” It is different from the information processing theories of the 1970s and from the connectionist models of the 1980s. Unlike cognitive theory, it does not assume that representations of the world are inside the organism and, like radical behaviorism,

⁹ Behaviorists should also be epistemological monists, disposing of the distinction between subject and object, knower and known. But that is asking a lot.

dynamical systems theory traces the history of environment/organism interactions, seeking mathematical descriptions of the changes in the state of the system over time.¹⁰ Jack Marr describes this approach in making an ontological argument in favor of material monism—though he doesn't cite Thales, the utterer of the first scientific statement,¹¹ and first to argue for such monism.

Dynamical systems theory encompasses many fields, ranging (in a kind of descending order) from physics, to evolutionary biology, to economics. Examples of applications include bending beams, animal coloration, and stock market prices. Marr, through examples in inorganic systems, shows that extreme complexity of behavior is not only characteristic of *biological* systems, as Mayr held. Animate *or* inanimate phenomena can show agonizingly complex behavior. Differences between physical and biological phenomena are quantitative, not qualitative.

Pendulum motion is simple, but leave the high school textbook and give the swinging bob a tap occasionally and motion becomes complex indeed, though simple Newtonian mechanics still operate. Consider the motion of a beam on a bridge with traffic passing over it, or try to understand the behavior of a planet orbiting a two-star system—there is seemingly unpredictable, complex behavior—yet, simple principles are still operative. The same applies to water freezing on the outside of a window, hurricanes and tornadoes, shapes of trees, pigeon behavior, and the behavior of people. All of the complexity, “emergence,” and unpredictability one could want occurs in both physical and biological systems—there are no qualitative differences.

Herman Helmholtz made the same point in his research as a medical student in Berlin. He provided the first quantitative proof for the principle of conservation of energy, by showing that physical/chemical principles were sufficient to understand the processes occurring in muscular contraction. There was no “vital force” that was added to physical structure. Behaviorists can't endure vital force either and they can't separate the biological from the physical. That does not mean that physical reductionism is admissible; it means that whatever vital forces, spirits, or essences we attribute to ourselves we must also attribute to inanimate objects.¹²

These dynamic¹³ models are actually close to what Skinner must have meant when he referred to mathematical formulations of environment/behavior relations. Beer's (2000) paper can serve as a straightforward introduction that shows the reader exactly how such models are unlike the symbolic information processors and connectionist models that we have endured for so long and with so little effect.

Gregory Galbicka warrants only brief mention here, and his chapter has absolutely no relation to the rest of the contributions. He chose to question the molar behavioral interpretation of Morse & Kelleher (1977), promoted also by others, that emphasizes the role of reinforcement schedules *per se*, independent of

¹⁰ See Beer, R. D. (2000).

¹¹ “All things are made of water,” according to Bertrand Russell (1959, p. 16).

¹² As Thales held. This does not make us dead machines, it just lends some life to nonliving things. After all, carbon, nitrogen, oxygen, and other elements are widely distributed in nature—all nature.

¹³ We just can't say “dynamical” again.

what reinforcers are scheduled. This view has important implications for understanding behavior and especially for understanding the effects of drugs. Very few comprehend this work, and there is no point in trying to summarize it here. Galbicka attempts to show that a molecular account can deal with some of the fundamental findings of Morse & Kelleher, and others, but he misses the point of the whole issue in our view. And he cannot account for key data that seem to require a molar interpretation. We'll consider Staddon's more compelling arguments for tradition—his championing of the apparent oxymoron "Theoretical Behaviorism."

John Staddon has long campaigned for the inclusion of *theory* in radical behavioral research, arguing that the concept of "internal state" is necessary, acceptable, and inevitable. "States" allow us to differentiate among cases where the current behaviors of our subjects are indistinguishable but have arisen due to different histories. Staddon argues that different histories supporting similar behaviors may exert their influences when conditions change. However, such efforts cannot be predicted without reference to internal states. Staddon showed that habituation in a dish of nematode worms required the concept of internal state in order to be interpretable. Staddon suggests that "Radically behavioristic readers should not get their knickers in a twist" over this proposal to "explain" data. He urges us to "Just say '*explain*' means 'a formal representation of the data reduced to a minimal number of terms' in a calm voice a few times and the anxious feeling will go away."

What's going on here? Did Staddon forget to wear his knickers? Staddon views his proposal as consonant with the spirit of radical behaviorism, although he wished it changed in *only* one way. He says we need to modify radical behaviorism by incorporating its antithesis—we need *theory*, "the postulating of events taking place somewhere else, at some other level of observation (or none) described in different terms, and measured, if at all, in different dimensions." This is Skinner's definition of "theory," to which Staddon has never subscribed and about which he has stated his opposition many times. Staddon's proposal seems at first sight similar to that of the mediational theorists of decades ago who were superseded by modern behaviorism. But, it differs in important respects that make it more amenable to radical behaviorist thinking.

That is, Staddon does not propose a list of postulates or a series of processing stages derived *in advance* from reasonable assumptions about the way that organisms work. He also does not assume "representations" or other paraphernalia of the cognitivists. His "internal states" are to be *inductively* determined and to signify histories of exposure to contingencies and there should be few as possible. Staddon's one gigantic drawback is that, in order to infer internal states in the way he proposes, data are required that are virtually nonexistent in psychology. He requires clarity of data, and that cannot be found in any table, figure, or verbal description in the psychological literature.

Staddon argues that if internal states are required to explain *even* the simple behavior of nematodes, such theoretical states must be necessary to explain more complex behavior. This is the same argument used by Wolfgang Köhler when he

demonstrated transposition in chickens and argued that this meant that higher organisms must be capable of such higher-level functions. But, unless applications are presented that involve some kind of behavior more interesting than habituation, Staddon's internal states seem not to apply to what everyone calls "psychology." And if learning, choice, avoidance, imitation, discrimination, generalization, schedule-induced behavior, masochism, depth perception, and the other myriad categories of behavior are to be explained in terms of internal states, will their laboratory analogues need to be so simplified as to be unrecognizable? What happens to all of social psychology and personality research?

Psychology is far from ready for "internal states," and there is a role for radical behaviorism—to determine what is it that organisms do on a *gross* level. If that is ever achieved, internal states will be welcome indeed.

Varieties of Behaviorism Where the Sky is a Different Color

For Ghezzi & Lyons, it's all words, words and syntax, and. . . Leiser & O'Donohue and Linda Hayes were all carried away to a planet where the sky is a color most of us never see. They represent the humanist extreme fringe of radical behaviorism.

Ghezzi and Lyons approach language from both a psychological and a nonpsychological perspective. The psychological approach views "language from the point of view of the individual as he or she speaks, listens, reads, and writes the everyday language of a culture," while the nonpsychological approach emphasizes "language as the audible or visible products of human activity" (p. 204). Examples of the latter are anthropology, sociology, grammar, anatomy and physiology—that sounds mighty inclusive. Within all these fields, the emphasis of study is on the development, rules, structure, and function of language as it occurs in those fields.

Notice that for Behavioral Epistemology, science is a *verbal* enterprise. So, progress in science, with its advances in understanding and knowledge is actually change in *language*-words and their uses, as Guerin claimed. Yet, the nonpsychological approach is important because structure fits function. When there is a defect in the structure, then the function of that structure will not work properly. It is important to see where these defects lie, and in doing so, find where people have altered their language. As Smith pointed out in Chapter 8, changes in cultural practices and beliefs that accompanied the development of major religions contributed to the disaster that was the creation of the word "consciousness."

The psychological role in language is a fairly new topic, so not much research has been done, as can be seen from this chapter. This approach involves the "relationships between the behavior of the individual and the environment," and adopts the perspective of behavioral psychology. Language is derived from our culture, and our culture influences our behavior. Thus, should culture not be the main focus in looking at language? People are influenced as to what to say and how they interpret meanings, and their culture and those around them influence these people. Amazingly, Whorf is a key figure in promoting this view; he was discussed by Baum (Chapter 3) but was not even cited here!

Leeser and O'Donohue explain that their purpose is to provide a better epistemological foundation for normative accounts of thinking, so that cognitive behavior therapy may operate on a sounder footing, bless their hearts! This is an enterprise that seems as reasonable as teaching fish to ride bicycles, but they note that cognitive behavior therapy relies on identification of irrational beliefs without regard for their formation or the reasons surrounding their formation. They claim that the models of rational belief that cognitive therapists work with are often unclear and that they must identify some *standard* model of proper cognition so that the effects of their therapies can better be assessed.

How on earth do we define "proper cognition," a mighty task, so that cognitive therapy, a comparatively minor item, can be improved? These authors propose to point the way by describing three epistemological justification theories (groan) and show how contextualism is an improvement—no great contest there! Finally they consider whether pragmatics should influence belief-forming practices, a question to which we can guess the answer in advance.

We needn't pore over the descriptions of *reliabilism*, *foundationalism*, and *coherence* theories of justification of belief unless we are ready for some awesome additions to our vocabulary. The first two appear to represent quasi-pragmatic and old-time logical positivist positions, while coherence theories are what their name suggests. All refer to ways to justify beliefs, presumably to clarify what beliefs *should* be held, so that cognitive therapists can teach us what to believe! In the course of this quest, words and expressions that would sicken any clear-thinking reader pop up. For example, "I am being appeared to redly" (p. 175) is more appropriate than "I see an apple." We read about proper "basicality" (p. 176) and of beliefs that should be "problematized" (p. 192).

Contextualism is pretty good looking after considering the first three options, and it turns out to be simple as pie: justification is contextual! Beliefs are subject to change when science reveals new information on human reasoning, and beliefs are better justified when they survive competent critics. That's all there is to it?

Finally, and anticlimatically, Lesser and O'Donohue suggest the need for further research (yawn) in the area of common errors of belief formation. They urge concern with determining criteria for beliefs that should be "problematized." They want to learn how to teach clients to be self-critical and to seek other problem beliefs and how therapists can evaluate quality of criticisms from objector groups. Last, . . . they wonder how to balance the need for belief revision with the need to persevere in a belief until its "verisimilitude" is known. Better they study Taylor & Brown (1988), where the virtues of "improper" self-deceptive cognition are enumerated.

What the reader of the chapter leaves with is the hope that someday the lives and minds of people will rest in hands better than those of cognitive therapists and the conviction that no cognitive therapist will be influenced by this "criteria for rational belief" bushwa!

We reserve Linda Hayes for last. She contributed a thoughtful chapter for readers who want to understand beyond-the-pale behavioral epistemology. It will also appeal to those stoned out of their minds and those who have absolutely no

knowledge of philosophy prior to 1997. The points she makes are individually not *bad*, but taken as a whole, they comprise a creature comparable to that created by Mary Shelley. Her aim, whether she knows it or not, is to show that behavioral epistemology is pragmatic and cannot tolerate an objective world.

She begins by noting that one's premises can be applied so as to be self-negating, as per a simple interpretation of Protagoras's denial of real Truth. If you hold that all statements can be falsified, what about that one? Hayes questions the existence of real (objective) reality and proposes that we deal with constructions of varying utility—Charles Peirce called that “Pragmatism” in 1863. Then she eliminates *time*, as did Aurelius Augustine (*a.k.a.* Saint) in the 4th Century.¹⁴ Nothing new, but no reference to these gents.

Then. . .there goes *space*, and objects become a reification of function, almost as Bishop Berkeley argued in the 18th century and John Stuart Mill did in the 19th (Russell, 1959, p. 266). Mill and Helmholtz (via unconscious inference) come in again, when Hayes' sister looks “young and strong and beautiful to me” but “middle aged and worn to a stranger” (p. 132). Quite so, and Mill might have used the same words—he surely wrote the same thing! What might be called immediate “sensations,” experienced by other onlookers, are only a small part of what we “see.” The rest is brought by our history. Or, as Skinner (1974) wrote, we don't respond to a stimulus, we respond to a stimulus and our histories.

Hayes denies the existence of objective time and space, as have many, including Albert Einstein. But without time and space, what is *change*? Is it Buddhist “suchness” so that reality is static and all change is psychic illusion? Linda arrives at the ontology of Parmenides, the ineffable sage of ancient Elea, whose monist materialism was literally “nonsense.” That is, he denied the reality of any sensory experience and Zeno had to invent his famous 40 paradoxes to show that Parmenides was right. Reality is one featureless, changeless, unknowable “it.” He believed that we know it through logic or some rational process, but Hayes seems to lean toward Zen.

Who wants to know *real* truth anyway? Hayes' message appears in pieces through the millennia, and it says that neither we nor any kind of science can know Truth. We cannot understand space and time and neither of them is “real,” whatever that means. She summed it up succinctly when she wrote that “. . .to go beyond science is to step into the silence.” But we knew that. Anyway, science is pragmatism, and Truth is replaced by truth. So Newton's laws of mechanics are still true, but less true than Planck's field theory. Nobody looks for the real, unvarnished, everlasting truth anymore, at least not in science.

What is Behavioral Epistemology?

Epistemology is the study of the origin and nature of knowledge, which is also the study of learning and memory and belief and perception and *everything*. In a way, it is the study of “what is reality?” For some, like Linda Hayes, it is stoned-

¹⁴ Confessions, Book XI, Chapter 14, in Kaufmann, 1961.

out-of-your-skull musings about “suchness” and the limitations of science. And it is focusing on *context* so strongly that one wishes that she had taken Philosophy 110, where we learn that “colors aren’t *really* out there!” It’s awful to learn it in middle age and present the fundamentals of the last two thousand years of philosophy as newly-minted truths. Parmenides was a joke in his own time too, called the “unnatural philosopher” by Plato and by Aristotle.

But the flaky contextualism of the Nevada behaviorists does have some virtue, if we just rein it in, gain some perspective, and realize that it is just Peirce’s pragmatism—a view that was a breakthrough in his day and which beats out any subsequent attempt to define reality! This is presented more congenially by Baum, who adds the crucial element of temporal patterning, so that behavioral epistemology is the study of organism/environment relations extended in time. Whorf’s work is appropriate to illustrate the alternative ways of construing reality that incorporate this non-standard normal European insistence on absolute time and space. Though different at first sight, the systems theory promoted by Marr expresses a similar theme. Whatever principles describe behavior, they apply to both inanimate and animate nature—behavioral epistemology has to be metaphysical monism or it’s not behaviorism.

Smith shows that the creation of the word “consciousness” resulted from cultural institutions that developed over centuries and culminated in the denial of physical reality and the substitution of an abstraction that was treated as reality. This is illustrative of the relation between culture and language that was discussed by Ghezzi and Lyons and the malleable nature of “reality” described by Steven Hayes, and by Guerin.

Leigland eloquently and accurately distinguished methodological and radical behaviorism. Baum represents the molar radical behaviorism that has developed over the past four decades while Galbicka carries on the struggle of the old molecular view, a view that was usually endorsed by Skinner himself. The old molecular view was obliged to refer to internal states to account for behavior that was not obviously controlled by current conditions. So “drives,” “memories,” “S-R connections,” “images,” and many more hypothetical internal states were employed. Behaviorism cannot tolerate reliance on internal mediators and that is the usual definition of “theory.” But Staddon argues that behaviorism must become theoretical and that this has nothing to do with internal mediators as usually construed. However, for Staddon’s strategy to work, behaviorists must lower their expectations and deal with phenomena that are tractable.

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