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Operationism and Ideology: Reply to Kendler

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Operationism and positivism are treated as a form of ideology: Acceptance of operationism and positivism excludes without argument other orientations to psychology. Specifically, it is shown that Realism and Intentionalism are quietly set aside by operationism and Kendler's nominalistic (i.e., positivistic) treatment of meaning. The present paper is therefore an ideological critique of positivism, and the dangers of ideology are demonstrated.

In his rejoinder to my "Myth of Operationsim" (Leahey, 1980) Kendler asks

> Must one when discussing psychological research consider it only within a philosophy of science framework? Cannot one consider the problems of definition and explanation within the context of the activities of the empiricists and theorists? (1981a, p. 334)

Kendler's plea recalls Newton's refusal to feign hypotheses. He therefore falls in with the long line of scientists casting themselves in Newton's image who adopt a tough-minded view of science and just want to get on with "real science" and forget about metaphysical specualtion. But is it possible to do science without philosophy, to have method without metaphysics? Newton thought so, adopting the positivism that scientists have tended to hold since, because he and they believed it banishes metaphysics. Edwin A. Burtt in his *Metaphysics of Modern Science* (1932) showed otherwise:

> To begin with, there is no escape from metaphysics, that is, from the final implications of any proposition or set of propositions. The only way to avoid becoming a metaphysician is to say nothing.
>
> For this reason there is an exceedingly subtle and insidious danger in positivism. If you cannot avoid metaphysics, what kind of metaphysics are you likely to cherish when you sturdily suppose yourself to be free from the abomination? Of course it goes without saying that in this case your metaphysics will be held uncritically because it is unconscious; moreover, it will be passed on to others far more readily than your other notions inasmuch as it will be propagated by insinuation rather than by direct argument. That a serious student of Newton fails to see that his master had a most important metaphysics, is an exceedingly interesting testimony to the pervading influence, throughout modern thought, of the Newtonian first philosophy.
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> Now the history of mind reveals pretty clearly that the thinker who decries metaphysics will actually hold metaphysical notions of three main types. For one thing, he will

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> share the ideas of his age on ultimate questions, so far as such ideas do not run counter to his interests or awaken his criticism. No one has yet appeared in human history, not even the most profoundly critical intellect, in whom no important *idola theatri* can be detected, but the metaphysician will at least be superior to his opponent in this respect, in that he will be constantly on his guard against surreptitious entrance and unquestioned influence of such notions. In the second place, if he be a man engaged in any important inquiry, he must have a method, and he will be under a strong and constant temptation to make a metaphysics out of his method, that is, to suppose the universe ultimately of such a sort that his method must be appropriate and successful . . . . Finally, since human nature demands metaphysics for its full intellectual satisfaction, no great mind can wholly avoid playing with ultimate questions, especially where they are powerfully thrust upon it by considerations arising from its positivistic investigation, or by certain vigorous extra-scientific interests, such as religion. But inasmuch as the positivist mind has failed to school itself in careful metaphysical thinking, its ventures at such points will be apt to appear pitiful, inadequate, or even fantastic. (pp. 227-229)

I believe that Kendler has followed in the steps of Newton. His rejoinder and his *Psychology: A Science in Conflict* accept the dominant positivism of twentieth century psychology without serious consideration of other views, precisely because he thinks his analysis is free of philosophical presuppositions. More specifically, he makes a metaphysics of his method, especially of operationism. After all, he writes (1981a) "intuitive notions can only evolve into viable theoretical conceptions via the employment of some operational definitions." That is, without operationism there can be no progress in science. But we will see that operationism excludes at least two important alternative approaches to psychology, Realism and Intentionalism. In short, Kendler's analysis of psychology is not a neutral matter of clarifying procedures; it is—as all such discussions must be without exception—inextricably entangled with a certain metaphysics, or philosophy of science. Thus, my answer to Kendler's question, quoted at the beginning of this paper, is No. Before turning to the ideological aspect of Kendler's positivism, it is necessary to consider a preliminary issue. Kendler's attempt to save operationism by defending the thesis of immaculate perception.

Immaculate Perceptions

In his rejoinder, Kendler asserts that "fundamental" to my critique of operationism is the thesis that all observation is theory-laden, and he defends the veridicality of perception both there and in his *Psychology: A Science in Conflict* (1981b). Now I did, in fact, use perceptual relativity to attack operationism, because, if all perception is theory-laden then operationism is in trouble.

However, it does not follow that if the perceptual relativity thesis is false then operationism is thereby vindicated. First, I offered in my original paper other sorts of objections, and will offer more below. Second, we will find in

the next section that Kendler's own analysis of meaning results in exactly the kind of paradigm relativity he hoped to ward off by defending immaculate perceptions. Third, Kendler fails to consider attacks on the observation/theory distinction that do not depend on theory-laden observation, and which I reviewed originally.

Consequently, even if perceptions are veridical this is no help to operationism, since it was the *cognitive consequences* of theory-laden perception that counted against it, and these can be retained while recognizing the immaculate nature of perceptions. Perceptions may not be theory-laden, but their products, beliefs, still are, and the observation-theory distinction that operational definition was invented to bridge is still blurry.

And fourth, even if perceptions themselves are immaculate, the cognitive and epistemological consequences of paradigm relativity can still be defended. Consider perception to be belief-acquisition (Heil, in press). That is, for example, when I look at a piece of photographic printing paper under normal light I acquire the (true) belief that it is white. Of course if I look at it in my dark-room illuminated by a red safety-light it will look red. My perception of the paper as red will be perfectly veridical—the paper *really looks red*—but of course I will not thereby believe it is red, because my knowledge of the safety light tells me the red appearance of the paper is an illusion. On the other hand, a person in the dark-room who knows nothing about safety lights and just thinks the room is dimly lit will have the same veridical perception and will consequently (and mistakenly) believe that the paper is actually red. Similarly, if I open a box of paper under safety light illumination I may assume it is white (even though it looks red) and be surprised to discover later that it is, in fact, pink. So perceptions may be veridical, yet their consequences—beliefs—are relative to what the perceiver knows.

Whatever else science is, surely it is a set of beliefs held by a group of scientists. Therefore, even if *all* perceptions are veridical and *no* perceptions are theory-laden, what beliefs scientists acquire from their perception—that is, what conclusions they draw and what theories they form—will still depend on their other beliefs. And if different schools of scientists have very different sets of beliefs about method, theory, the nature of the world, etc. (i.e., different paradigms), they will acquire different beliefs from their identical, veridical perceptions and will still argue about the data.

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The Major Issue: Realism or Nominalism

What is the ontological status of theoretical terms? For the Realist, theoretical terms refer to real existing entities; therefore, the major component of the meaning of a theoretical term is *denotative*: "electron" refers to a class of physical particles, electrons. For the nominalist—and positivists are nominalists—however, only that which is observable has unproblematic existence, so that only observation terms *refer*, that is, have denotative meaning. Theoretical terms do not refer to anything really existing and therefore derive their meaning from use. Operational meaning is a nominalistic way of formally defining the use of theoretical terms by stipulating the procedures which define any theoretical terms. So one might "operationalize" the meaning of "electron" in terms of the procedures of the Millikan oil drop experiment.

In physics, the issue of realism *vs.* nominalism was thrashed out in the atomism debate at the turn of the century (Holton, 1978; Janik and Toulmin, 1973). Atomists, such as Boltzmann and Mendeleev, argued that atoms (and the sub-atomic particles) were real things; anti-atomists, led by the great positivist physicist Ernst Mach, denied that atoms were real—Mach asked "Have you ever seen one?" (Blackmore, 1972)—and agreed to use them only if they were interpreted nominalistically, as convenient theoretical fictions and *no more*. Eventually the atomists won the day, due especially to Millikan's success in quantizing and measuring the charge on the electron. Millikan said, "He who has seen the experiment [Millikan's oil drop experiment] . . . has in effect SEEN the electron" (Holton, 1978, p. 37).

The difference between these two positions in accounting for scientific progress is very great. A stubborn nominalist looking back at the history of quantum physics would say that the meaning of the term "electron" has changed since Millikan's time, since its use has changed. There are now other, more widely used procedures for operationally defining "electron" (e.g., bubble chambers) and electrons are attributed properties (e.g., spin) that Millikan knew nothing about. Scientific progress is therefore the progressive refinement and increasing precision of theories and theoretical terms. The Realist, however, tells a very different story. For the Realist the essential, i.e., denotative, meaning of "electron" is unchanged; "electron" refers to electrons, and they remain what they always were. What we have learned to do is detect electrons in better ways and thus have found more out about them. Scientific progress, then, consists of discovering more and more about the real world—not just changing our *talk* about the world.

Kendler (1981a, 1981b) distinguishes four kinds of meaning which add up to a complete nominalist account of meaning as use:

(1) Operational meaning;

(2) Empirical meaning, roughly the fruitfulness of a concept in producing facts and entrenchments in scientific laws;
(3) Intuitive meaning, the totality of how a scientist (or scientists) think about a term, including things such as hunches that do not yet appear in public; and
(4) Theoretical meaning, the totality of the theoretical statements bearing on the terms.

Denotation—meaning by reference—has been omitted. Not considered and rejected, just omitted.

Let us continue to use the controversy over the measurement of the electron, and apply Kendler's analysis of meaning to the concept of "electron" as it existed for Millikan as he performed his classic oil-drop experiments as described by Holton (1978). We can explicate the four Kendlerian meanings of electron as follows:

(1) Operational: the oil-drop procedure itself;
(2) Empirical: not very great at present, as "electron" is a provisional concept;
(3) Intuitive: Millikan's ideas about electrons, including a deep commitment to their reality;
(4) Theoretical: all the contemporaneous theoretical uses of "electron."

An important—and startling—outcome of Kendler's nominalistic analysis is exactly the kind of Kuhnian relativism he wishes to refute. For in the mind of a positivist such as Ehrenhaft, who was also working with an oil-drop procedure, the term "electron" will have different meaning—especially intuitive meaning (he did not think electrons were real)—entailing exactly the kind of miscommunication that exists between advocates of different paradigms. Especially since their procedures—operational meanings—were a bit different, the nominalist would have to conclude that Millikan and Ehrenhaft were talking different languages. Therefore, the nominalist would have to view the Millikan-Ehrenhaft dispute as a classic example of cross-paradigm miscommunication. The Realist, on the other hand, would simply say that Millikan was right and Ehrenhaft wrong, primarily because Millikan's apparatus (though much less sophisticated than Ehrenhaft's) and methodology (he threw out "bad" observations that Ehrenhaft kept) were better designed for quantizing and measuring the electron's charge.

Turning now to psychology, we find Kendler (1981b) praising E.C. Tolman for "trying to be operational" about terms such as "cognitive map," but faulting him for allowing "surplus meaning" to accrue to them. What is this dangerous surplus meaning? For "cognitive map" we can specify Kendler's four kinds of acceptable (nominalist) meaning:

(1) Operational: Tolman's various cognitive map (e.g., Tolman, 1948) experimental set-ups;

(2) Empirical: The data and laws generated by Tolman's research;
(3) Intuitive: Tolman's inner thinking about cognitive map's;
(4) Theoretical: The sum of Tolman's theoretical statements about cognitive maps.

Again, what is missing from this list is meaning by reference: the Realist claim that cognitive maps are really existing entities that agents consult to guide their behavior in space. Since all meanings by use have been exhausted by Kendler's analysis, the objectionable "surplus meaning" must be Realist meaning by denotation, although it appears Kendler himself is blind to that fact. That this is Kendler's position is underlined by his (1981b) treatment of the familiar realism/instrumentalism issue, where the only possible reality he accords psychological terms is neurophysiological. Similarly, he earlier (1952) specifically rejected psychological Realism (e.g., cognitive maps are real mental entities) as committing the fallacy of reification.

We find, therefore, that operationism (even if supplemented by Kendler's other acceptable kinds of meaning) is not a neutral research tool. Operationism is inextricably linked to a particular epistemological position—positivism—which recognizes only nominalistic treatment of theoretical terms. Adherence by psychologists to operationalist strictures either dictates methodological behaviorism as Bergmann (1954) and Stevens (1939) themselves believed, or forces one to hide one's true epistemology behind a cloud of insincere jargon, perhaps thereby muddling one's own thoughts, as seems to be the case with Tolman (Amundson, in press). Further clarification of this matter will follow consideration of a reasonable and currently quite important concept that cannot, *in principle*, be operationally defined, namely *Intentionality*.

The Critical Case: Intentionality

The most actively discussed issue in cognitive science is the concept of the *Intentionality* of mental acts (Amundson, in press; Dennett, 1978; Fodor, 1981; Rosenberg, 1980; Searle, 1980). While there is widespread disagreement about the ultimate role Intentionality will play in cognitive science there is general agreement that it cannot be behaviorally, i.e., operationally, defined.

Franz Brentano introduced the concept of Intentionality as a criterion separating the mental from the physical. The idea is that mental acts contain their own objects within them, what Brentano called "intentional inexistence." Take, for example, the assertion, "The King of France is bald." One can falsify it by pointing out that there is no King of France. However, the assertion, "Fred believes the King of France is bald," is independent of the existence of the King of France, and is true if Fred has this belief, and is false if he does not, whether or not there is a King of France (or, if there is, whether or

not he is bald). Similarly, the truth or falsity of the statement, "Sarah is looking for a pin," is independent of whether or not there is a pin in the room with her; as long as her *intent* is to find a pin the statement is true. So the object of mental acts is self-contained and quite independent of the state of the world.

Intentional statements also fail to follow the ordinary logic of propositions. For example, since the Evening Star and the Morning Star are one and the same, the proposition "The Evening Star is fuzzy" entails the proposition "The Morning Star is fuzzy" as a matter of fact about Venus. However, "Harry thinks the Morning Star is fuzzy" does not entail "Harry thinks the Evening Star is fuzzy" or "Harry thinks Venus is fuzzy," since Harry may not have the relevant connecting beliefs.

In Intentionality we have a perfectly clear psychological concept that *cannot* be operationally defined. Since the status of an Intentional state (and virtually all mental states are Intentional) is independent of the state of the world—and may lead to no behavior—I have, for example, beliefs about Vulcans that are unlikely ever to be acted on—the necessary levers of operationalizing are simply missing.

At one point Kendler (1981b, pp. 133-134) grapples with Intentionality but unfortunately gets it mixed up (as many do) with ordinary common sense intention, to which it is related but not at all identical. Kendler suggests that intention can be reduced either to a motivational inferred construct or to neurophysiology. The first option is eliminated by showing the Intentionality of non-motivational states such as "believes" or "thinks." The second possibility is exactly what Brentano wanted to refute: the reduction of the mental to the physical. A thing—even a neuron—cannot believe, think, hope, wish and so on; only a person (Margolis, 1978), or suitable cognitive agent, can do so. That is, no *thing* can have Intentional states; they are ineluctably mental. This conclusion does *not* necessarily support dualism, it only asserts that mental states cannot be usefully and lawfully reduced to brain activity. For example, if I say "I am thinking of Washington, D.C." it is perfectly clear what I mean, but I could be doing many (mental) things: having an image of the Capitol; of the Jefferson memorial; of how the traffic has gotten worse since I used to live there, etc. Each of these would have some (different) neurophysiological basis, but no one of them would underlie "Thinking of Washington." (For discussions of this see Davidson, 1974, who uses it to refute reductionism, and Fodor, 1981, who makes an important distinction between type and token physicalism).

In any event, we see that Intentionality cannot be *operationally* defined. Therefore, strict adherence to operationism excludes without argument any mentalistic psychology, and even confuses discussion of cognitive Intentional behavioral psychologies. For example, Amundson (in press) shows that in

addition to being a Realist, Tolman was an Intentionalist; indeed, Intentionalism was the heart of his purposive behaviorism. But commitment to operationism made Tolman express himself badly and others misunderstand his theory. E.R. Guthrie criticized Tolman's claim that a rat's behavior is "directed towards" food by pointing out that if we have forgotten to put food in the goal box, that rat's explorations will be unaffected. Guthrie is claiming that the behavior cannot be "directed toward" food if none is there, which completely misses the point. As long as the rat *believes* the food is there he will continue to work toward it, the food being Intentionally inexistent in the rat's belief, just as the presence or absence of a pin does not prevent one from truly saying, "Sarah is looking for a pin." Of course if we change this belief (as in "instant extinction" studies—e.g., Seward and Levy, 1949; see Brewer, 1974, for a review of human studies), food will no longer be Intentionally inexistent, and the rat's behavior will change.

So we learn, again, that operationism is *not* a neutral tool, but presupposes a particular approach to psychology, ruling out Intentionality as well as Realism. While perhaps Intentionalism (Dennett, 1978; Rosenberg, 1980) and Realism (Anderson, 1978) will turn out to be non-viable approaches to scientific psychology, it nevertheless remains true that any decision to abandon them should be made either empirically or on the basis of open argument, but not by presupposing one approach—positivism and operationsim—as the only way to do psychology.

Operationism as Ideology

We should consider whether operationism—and the positivism of which it is a part—constitutes an ideology in the sense of the Frankfurt School. The Frankfurt School of critical thought is little known among English speaking psychologists, but deserves to be listened to, because despite their sometimes irritatingly smug presentations (e.g., Sampson, 1981) their message is a valuable one. Combining insights from both Freud and Marx, the Frankfurt School sees people, including scientists, as acting in a world constructed with a set of largely unconscious presuppositions; that is, an ideology. As explicated by Geuss (1981), who provides a succinct and critical view of the Frankfurt School, an ideology is a set of beliefs used to legitimate political power that promotes a "false consciousness," the most important part of which is the acceptance by people as natural and objective what is, in fact, a social construction. People holding an ideology in this sense find themselves unnecessarily limited and constrained by a supposedly objective reality that is in truth subjective.

While he did not use Frankfurt jargon, this is essentially Burtt's criticism of positivism. By proclaiming itself the only possible analysis of science it quietly

sets aside other positions which tend to be forgotten. As the single position is established and sinks into the background it becomes so familiar that it becomes ideology. Everyone assumes positivism—no longer named because there is no other *ism* competing with it—is the only way to do science, and its strictures exert an even greater hold on its followers precisely because they are no longer followers, but unreflective captives. What they believe is pragmatic, hard-headed methodological analysis; whatever challenges others may bring are dismissed as irrelevant metaphysics.

I can perhaps do no better to illustrate the ideological function of operationism/positivism than to offer myself as an example. Obviously I am no friend of either operationism or positivism, but so steeped was I in that tradition by my training as a psychologist that I accepted Kendler's four kinds of meaning as an exhaustive treatment of the problem. I was prepared to criticize him rather weakly (as in my preliminary reply) only for readmitting surplus meaning to psychology as "intuitive meaning." It was not until a philosopher, Ron Amundson, sent me a preprint of his "E.C. Tolman and the intervening variable: A study in the epistemological history of psychology" that I saw the Realist alternative to positivism's nominalism, pulling together some of my earlier variegated criticisms.

If positivism is ideology, then what I have offered here (and without knowing it, in "Myth of Operationism") is critique. Ideological critique is constructed on an analogy with psychotherapy: to make conscious what has become unconscious, to see as subjective what we falsely believed to be objective and unalterable, and to reflect in the full light of reason on what we should do.

So I close my reply as Kendler closed his rejoinder. Kendler speculated that the real reason people reject operationism was their fear that operational analysis would make them change their minds. But I may say that fear of critique—of metaphysics, of philosophy of science—is counter-therapeutic resistance, a fear of illuminating the fundamental, and hidden, assumptions upon which we have built our professional lives. But if there is no escape from metaphysics, then critique is the healthful intrusion of reason into the unlit foundations of our thought. I return to the man who clapped to ward off elephants. For him it was an objective, verified fact—there were no elephants near by. The job of the therapist, of the philosopher, is to convince the patient, the scientific community, otherwise. We must not live unexamined lives.

Reference Note

1. Smith, L. Tolman, Hull, and Skinner: Imported methodology or indigenous epistemology? Paper presented at the annual meeting of CHEIRON, Newport, Rhode Island, June 1982. An abstract of his doctoral dissertation, University of New Hampshire, 1982.

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