

Suing for Peace in the War Against Mentalism

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Abstract The antimentalists' war against mentalism has not vanquished it. To examine why, we focus on two theses—mind as causal and internal—and three standard attacks against mentalism as defined by both theses: 1) mentalism implies dualism; 2) mind is unobservable, which hinders its scientific study; and 3) mentalism is impractical. These salients fail because: 1) if the mind is causal and internal, it must be material; 2) the observable/unobservable distinction is too problematic, with antimentalists equivocal about where to draw that line, with some even embracing publicly unobservable behavior as causally relevant; and 3) mentalism has not been demonstrated to be less practical than antimentalism. For the war on mentalism to succeed, stronger attacks must be devised, both scientific and philosophical. We contemplate some possibilities, while expressing doubts as to the wisdom of continuing the war. Peace may be better than war, and the resulting intellectual commerce may be good for both sides.

Keywords Mentalism · Mental inner causation · Antimentalism · Behavior analysis · Behaviorism · Dualism · Observability · Pragmatism

An academic discipline is a group of scholars who has agreed not to ask certain embarrassing questions about key assumptions.
(Cohen, 1989; cited in Taubes, 2008, p. 229)

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Mentalism and its more specific version, cognitivism (for brevity, we will call both “mentalism,” because the labels are often used interchangeably, although some may bridle at that lumping), remain the chief divide between behavior analysis and the rest of psychology, especially cognitive psychology, behavior analysis’s main competitor in psychological research. This article is about assaults on this divide from various quarters, especially different forms of behaviorism (radical, molar, teleological, interbehavioral, contextual, pragmatic, radical-monistic, behaviorological, etc.). Our intended audience therefore consists of behavior analysts (experimental and applied) and others who reject mentalism for one or more of the reasons we will examine, regardless of their particular philosophical inclinations on other issues. Such inclinations vary, but the core intersection against mentalism makes the present article relevant to all.

It is tempting to call our audience “behaviorists” for brevity, but the label is imprecise, as there are many different forms of behaviorism. Some of the problems we raise afflict a particular form of behaviorism (radical behaviorism), but other problems also arise from other forms of behaviorism. Certain forms of behaviorism, like S-O-R neobehaviorism, are mentalistic (see, e.g., Amsel, 1989), and eliminative materialists (e.g., Churchland, 1981; Stich, 1996) are not behaviorists but reject mentalism. More important, we do not seek to challenge any form of behaviorism as such, only a particular stance that otherwise different behaviorisms share, namely, the rejection of mentalism. We call this rejection “antimentalism” for short, and our audience “antimentalists.” We exclude eliminative materialists, because they reject mentalism for reasons other than the ones we will examine. Finally, we recognize that many behaviorists are nonmentalists, because they prefer to work within a behavioral framework without taking a position against mentalism.

To antimentalists, mentalism is the culprit for what is and has been wrong with psychology—its Big Bad Wolf. Unlike the fabulous creature, mentalism is real, alive, and well. But like the Wolf, and much to the antimentalists’ vexation, mentalism is also Big in Psychology—which psychologists from William James to George Miller identified as the “Science of Mental Life.” Antimentalists also deplore it as Bad (“mischievous and deceptive”; Moore, 2007, p. 122), a lurking predator that victimizes most dwellers in this land. Antimentalists have therefore felt compelled to wage “war” on it (see Uttal, 2000¹).

The antimentalists’ war on mentalism has two modes, defensive and offensive. The defensive mode concerns antimentalists’ (especially radical behaviorists’) replies to criticisms from mentalism. These replies have repeatedly noted that the criticisms misrepresent the positions that were attacked (e.g., Baum, 2017; Chiesa, 1994; Moore, 2008; Skinner, 1974; Todd & Morris, 1983). The replies are largely solid and we applaud them, agreeing that the attacks from mentalism on antimentalism are ineffective.

The offensive mode concerns the antimentalists’ attacks against mentalism. Have these attacks reduced the prevalence of mentalism in academic psychology? (Folk psychology is a different matter we leave for another time.) This question motivates the present article, and a negative answer seems correct. Mentalism still dominates academic psychology, despite the antimentalists’ attacks. Antimentalists will agree with

¹ Uttal suggests that no side of the “war between mentalism and behaviorism” can ever claim victory because both are deeply mistaken in their attacks and defenses on one key issue: the scientific tractability of the mind, which the author sees as an epistemological issue. The scientific tractability of the mind will be part of our analysis later on, but in a different direction.

this diagnosis, but be perplexed by it, because they believe their attacks to be decisive. Thus, antimentalists explain such dominance in ways other than the strength of their attacks (e.g., entrenched counterproductive cultural practices and predispositions, especially from religion and spiritualism; e.g., Kantor, 1981, pp. 114–116; Moore, 1975, p. 132; Skinner, 1969, pp. 223–226; Uttal, 2000, pp. 23ff).

This article offers a different account: The antimentalists' attacks against mentalism have failed because they have not proven mentalism wrong. They leave it unscathed. Some attacks backfire. The main problem, we believe, is that the attacks have been short on specifics. Antimentalists have underestimated what it takes to defeat mentalism. Most make a caricature of mentalism on a slate that they then easily wipe clean but, looking up, are surprised to see that the real object stands unimpaired. Their attacks also mystify their intended targets, who do not see themselves in the caricature. When the specifics are laid out, we hope that you will see that standard attacks that antimentalists have launched against mentalism are too problematic to sustain. Where the attacks do appear to be effective, in giving a sense of solidarity and purpose to their troops, they may do their greatest harm—becoming friendly fire on their own ranks. We know this seems like heresy, but please hear us out.

As reassurance, we do *not* seek to champion mentalism, or diminish any form of behaviorism in any way. One may question certain of a culture's practices without repudiating it. Critical examination of attacks against mentalism is a first step in repairing or replacing them with stronger attacks, assuming that attacking is a good thing. Perhaps it is not: putting others down might not be the best way to rise up. Dispensing with antimentalistic rhetoric may well be the higher ground. Peace is often better than war. Moreover, stronger attacks might not be possible, in which case, antimentalism may well be a lost cause and peace would be the only alternative. Read our arguments and decide for yourself.

We shall focus on three interrelated attacks on mentalism in turn: 1) mentalism is dualistic (or implies, or is allied with, dualism); 2) the mind² is publicly unobservable, which presumably hinders its scientific study; and 3) mentalism is flawed or even useless from a pragmatist perspective. There are other attacks (see Uttal, 2000, pp. 64–108), but the ones we have chosen are the most prominent. We seek to convince you that all of them miss the mark. Much of what we will say is interpretive of others' assertions, but we considered them as charitably as we could. If we misinterpreted, we welcome corrections with open minds.

Mentalism

We first summarize how mentalists and antimentalists conceive mentalism, a label widely used to name the attacked position of interest here. Many sympathizers of this

² Antimentalists might worry that this noun forces viewing mind as “substance” (technical philosophical lingo for “thing”) and therefore takes us too close to substance dualism. Substance dualists do use the noun in that way, but many others, like us, use it only as a convenient shorthand to refer to “minding” as a process consisting of (perhaps causally connected) states and events. In most current ontologies of mind, the noun is used in this way. This is similar to the observation that the rotation (or “rotating”) of a wheel is not the same as the wheel (a thing), but a process of the wheel. Descartes used the analogy to weight—it is not a thing added to a body, but rather a property of the body. We use “mind” as a harmless reification of “minding,” just as behavior analysts use “behavior” as a harmless reification of “behaving.”

position, which include philosophers and cognitive psychologists, also use the label to name their position (e.g., Bandura, 1999, p. 156; Dennett, 1978, pp. 54–70; Fodor, 1968; Fiske & Taylor, 2017, pp. 17–18; Fumerton, 2011, p. 188; Kihlstrom, 1999, p. 424; Paivio, 1990, pp. 3–4; Searle, 1992, p. 54; Sperry, 1980; Valentine, 1992, p. 50; Wundt, 1897, pp. 310–328). We therefore shall call them “mentalists” for short, although some might dislike the label. Many detractors of this position also use the label “mentalism” to name the position they reject (e.g., Baum, 2017; Chiesa, 1994; Kantor, 1933; Moore, 1999, p. 48; Moore, 2008, p. 316; Moore, 2015, pp. 15–18; Fisher, Groff, & Roane, 2011, pp. 3–5; Skinner, 1953, pp. 27–31; Skinner, 1963, 1974; Staddon, 2001; Vargas, 2013, p. 28; see also Bunge & Ardila, 1987, pp. 89–115; Uttal, 2000, 2004).

But what is mentalism? Reading those experts, one quickly comes to see that no definite answer is possible, because “mentalism,” “mind,” and “mental” are fuzzy concepts. At one extreme, one could consider a mentalist any person who attributes a mediating causal role to thinking, feeling, or wanting; this would comprise most participants in this discussion, including B. F. Skinner (see, e.g., Schnaitter, 1978; Zuriff, 1979). Along this dimension are the garden-variety cognitive psychologists who invoke models of processes (e.g., memory systems, attentional shifts, executive control), some of whom talk of functional organization in terms of structure (e.g., long-term memory). Near the other extreme is the typical layperson who invokes ad hoc internal stories to explain external facts. At the far extreme are individuals who treat such stories as initiating causes, unconnected with any prior events. These are not determinists, and they include few scientists.

Many cognitive psychologists do not concern themselves with extending the causal chain to the environment, but if pressed they would concede it plays a causal role—after all, they could collect no experimental data unless they mandated it from their subjects, clearly an external cause. Many antimentalist arguments stem from a dislike of epiphenomenalism, the view that mind exists but is causally impotent (even if itself caused by physical events), but this position is uncommon among psychologists (e.g., Pockett, Banks, & Gallagher, 2006; Wegner, 2002) and philosophers (e.g., Davidson, 1970; Jackson, 1982; Lewis, 1988; Quine, 1974), including antimentalists (see below).

This panoply of persuasions hinders identifying a unitary, crisply delimited position to call “mentalism.” There may well be no such thing, in which case talk of “a position,” in the singular, would be inaccurate. The mentalism landscape is not that tidy. Mentalism, like behaviorism, is a *family* of positions that resists attempts to define it strictly in terms of essences, or necessary and sufficient conditions. At best, it only warrants talk of “family resemblances,” to use Wittgenstein’s (1953) inspired metaphor about certain concepts (e.g., language and games) too complex and shifting for such attempts to succeed. The concepts of mind, mental, and mentalism, like those of language and game (and intelligence, life, and perhaps even behavior), are family resemblance concepts. Accordingly, we do not seek to give a strict definition of mentalism here. We use the label only as a convenient shorthand to refer to certain family resemblances of features across an extended family of positions on mentalism, without intending any such features to be strict essential commonalities.

A further complication is that mentalists and antimentalists use the label “mentalism” differently in one key respect: Mentalists insist their position is not dualistic, whereas antimentalists often disagree. Obviously, no *coherent* depiction can capture *both* uses, as they contradict one another. Which is correct? Many if not most mentalists

hold that mind is causal *and* internal: “Mentalism says that mental states are *inner*. They are the *causes* of behavior and therefore are *not identical with* behavior” (Sober, 1983, p. 113). Moore (2003) has given a similar depiction:

In general terms, mentalism may be defined as an approach to the study of behavior which assumes that a mental or "inner" dimension exists that differs from a behavioral dimension. This dimension is ordinarily referred to in terms of its neural, psychic, spiritual, subjective, conceptual, or hypothetical properties. Mentalism further assumes that phenomena in this dimension either directly cause or at least mediate some forms of behavior. (p. 181)

The thesis of mind as causal asserts that mental events can bring about or modulate behavior. The thesis of mind as internal asserts that mental events occur inside some kind of creature (e.g., a person), relative to some boundary (e.g., the skin, the skull). Mentalists combine the two theses into the view of mental inner causation of behavior, which we shall take as key to mentalism. The view presupposes a substantive mental–nonmental distinction, where some events are mental but others are not, even if the latter are causal and internal. To view anything causal, inner, and nonbehavioral as mental surely is too broad. Myriad brain events at the molecular, cellular, or even microcircuit levels (e.g., one neuron activating another), and other biological determinants of behavior (e.g., genetic, hormonal) can play a causal role in behavior, and are internal and nonbehavioral, but no mentalist would view them as mental in any substantive sense that is opposed to nonmental. In mentalism, all mental events are causal and internal, but not vice versa.

Thus, it is possible to hypothesize inner causal explanations without viewing them as mental and, hence, adopting mentalism: not all such hypothesizing in psychology is mentalistic. Antimentalists may dislike it for being hypothetical, but that is a different prejudice than the one against mentality, as we shall argue below. In his neural-network modeling research, the first author postulates inner causal events conceived as neural, absent any substantive mental–nonmental distinction (e.g., Burgos & Donahoe, 2016). In his models of responding controlled by temporally remote events, the second author hypothesizes inner causal events (response traces) without viewing them as mental (e.g., Killeen, 2011).³ Staddon (2001) also hypothesizes explanatory inner causal states but does not view them as mental. Eliminativists do the same, and they clearly are antimentalists. One of the most influential philosophers of the twentieth century, WVO Quine (1974, pp. 24–26) repudiated mentalism, but hypothesized causal internal states. Such hypothesizing is no more mentalistic than postulating a Higgs Field is spiritualistic.

Many antimentalists also consider dualism as another key feature of mentalism. An example is Moore’s (2003) sweeping indictment above, which uncritically lumps neural and spiritualistic dimensions in a single category of things mental. By his criterion, any nonbehavioral dimension is mentalistic, and by (false) generalization spiritualistic. Against this confusion, we will argue in the next section that the view of mental inner causation is incompatible with dualism. Burgos (2015, 2016) has

³ Some antimentalists may still view us as mentalists because we hypothesize processes measured in different dimensions than behavior, or because of other things we have said. Evaluate our work on its own merits, which is fairer than dismissing it by branding us turncoats.

discussed this position at length, and others (e.g., Dennett, 1978, pp. 54–70; Fodor, 1968, Ch. 2; Sober, 1983) have offered similar arguments.

Dualism

Table 1 shows a representative sample of quotations that claim an alliance of mentalism with dualism. These quotations reveal how their authors conceive dualism. All of them identify one feature: the thesis of mind as *immaterial* or *nonphysical*,⁴ and the rest of reality as material or physical.⁵ This use of the term “dualism” echoes standard uses in the philosophy of mind. Only three of the quotations (from Skinner, 1974; Moore, 2008; Baum, 2017) suggest another feature of mentalism: Nonphysical minds cause (and, to this extent, explain) behavior. Only one quotation (Baum’s) is explicit about the sort of dualism it refers to, namely, Cartesian dualism, after René Descartes.⁶ There also are non-Cartesian forms of dualism, but the Cartesian form is the most widely discussed. We will thus assume that all other authors refer to Cartesian dualism when they use the term “dualism” without qualification. We will also use “dualism” as a shorthand for “Cartesian dualism,” unless otherwise indicated.

Some antimentalists treat dualism as a proper subset of mentalism (e.g., Terrace, 1984, p. 569, who speaks of “dualistic mentalism”), or as overlapping mentalism, but such positions are incoherent. What mentalism and dualism have in common is the distaste for both felt by many behaviorists, because both make use of nonbehavioral descriptions of mechanisms. But mentalisms are compatible with science, whereas dualisms are compatible with neither science nor mentalism.

We do not say that by “dualism” antimentalists mean only “Cartesian dualism.” “Cartesian dualism” is but one of the senses in which they use “dualism,” but it is a focus of their many homilies against dualism; it therefore deserves examination on its own. By “dualism,” some antimentalists also refer to the view, dominant in psychology, that a proper understanding of behavior requires positing an explanatory nonbehavioral level of analysis with its own “dimensions,” laws, and methods, even though that level remains physical. We will discuss some aspects of this other meaning in later sections, but not under the label “dualism.” This label is a colossal misnomer for that other meaning, which causes confusion and, we suspect, seeks guilt by name association. This is a centrally important point: the belief of many cognitive psychologists that, above certain levels of complexity, new vocabularies, models, and dimensions may be necessary to

⁴ We use these two terms and “nonmaterial” interchangeably in Descartes’s sense, to refer to the lack of all spatial dimensions (“length, breadth, and height,” as he often put it). Such things are said to “lack extension” or “be unextended.” This use echoes those in some of the above quotations.

⁵ We also use these two terms equivalently, also following Descartes, to refer to things extended in Euclidean space, in the sense of having all three spatial dimensions. All everyday-life medium-sized entities, as well as most entities scientists study (including human bodies), are material or physical in this sense. It is arguable whether entities such as singularities, quarks, and bosons satisfy this criterion. The criterion is therefore imperfect, like all category boundaries.

⁶ Some have argued that Descartes was not a Cartesian (e.g., Baker & Morris, 1996; Christofidou, 2001, 2016). They argue that Cartesian dualism is a misinterpretation of Descartes’s view by one of his contemporaries (Antoine Arnauld’s so-called “Argument from Doubt”). We will not get into this discussion here. We will speak just of “Cartesian dualism,” a standard label, acknowledging the possibility that it is a misnomer and that Descartes may not have held such position.

Table 1 Several claims that mentalism is conflated with dualism

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- “Mentalistic psychology is therefore dualistic.. . . When you ask the mentalist what is the fundamental difference between psychological actions or states and non-psychological things, his answer reduces itself to the proposition that the former do not exist in space” (Kantor, 1933, p. 17).
- “It is usually held that one does not see the physical world at all, but only a nonphysical copy of it.. . . Sensations, images, and their congeries are characteristically regarded as psychic or mental events, occurring in a special world of “consciousness” where.. . . they occupy no space.. . .” (Skinner, 1953, p. 276).
- “But where are these feelings and states of mind? Of what stuff are they made? The traditional answer is that they are located in a world of nonphysical dimensions called the mind and that they are mental. But another question arises: How can a mental event cause or be caused by a physical one?” (Skinner, 1974, p. 10).
- “A pure mentalism was not long in making its appearance, and it has dominated Western thinking for more than two thousand years. Almost all versions contend that the mind is a nonphysical space in which events obey nonphysical laws” (Skinner, 1974, pp. 31–32).
- “There is an ubiquitous long-term and deep-seated relationship between dualisms and mentalisms” (Uttal, 2000, p. 73).
- “By a dualism, I refer to a worldview that incorporates the idea that there can be two kinds of reality, one natural, material, or physical, and the other immaterial, supernatural.. . . Mentalism and dualism are closely related” (Uttal, 2004, pp. 19–20).
- “Conventional dualism, in which the mind (or some phenomenon from the nonphysical, nonmaterial dimension) is presumed to cause behavior (which is in the physical, material dimension), is probably the most common form of mentalism” (Moore, 2008, p. 316).
- “The radical behaviorists’ objection to mentalism is really an objection to dualism, the idea that two sorts of existence, material and nonmaterial.. . . are necessary to understand behavior fully.. . . The writings of René Descartes (1596–1650) were influential in establishing dualism in psychology” (Baum, 2017, p. 39).
- “For many philosophers, mentalism is allied just as strongly with dualism as it is with internalism. These dualists (e.g., Block, 1981) cannot conceive how consciousness, for instance, can be purely physical” (Rachlin, 2017, p. 6).
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understand, predict and control phenomena (such as complex behavior) does not make them dualists. Spiritual things by their nature cannot interact with or control material things. Although most cognitive psychologists may be correctly thought of as mentalists, they remain materialists as well, as surely as the behaviorists who criticize them. Whether they should or should not seek to explain behavior in emergent terms is another matter (Marr, 1996), one of style and pragmatic utility, which we address later.

In short, the Cartesian-dualism sense of “dualism” has been integral to the antimentalists’ war against mentalism. We treat this sense first and most thoroughly, because other senses do not warrant the label “dualism.” Not all antimentalists accuse mentalism of Cartesian dualism, but those who do have been influential in the field. We now proceed to the central piece of this section, our argument that the view of mental inner causation is both separable from, and incompatible with, the dualistic thesis that mind is nonphysical.

Incompatibility with Causation

The incompatibility between dualism and mental causation is the standard criticism against dualism.⁷ This criticism is not a new: Two contemporaries of Descartes,

⁷ Much hinges on what causation is, but we cannot delve into this vast topic here, as mentalism does not entail any particular view of causation. Nor does any current view of causation propound nonphysical causation.

Princess Elisabeth of Bohemia and Pierre Gassendi, confronted Descartes with it (whose ambiguous response did not convince his critics). Skinner (1950) echoed the objection: “A purely behavioral definition of expectancy has the advantage that the problem of mental observation is avoided and with it the problem of how a mental event can cause a physical one” (p. 194). Skinner (1974) also asked “How can a mental event cause or be caused by a physical one?” (p. 10), as did Baum (2017): “. . . dualism is unacceptable because it introduces mysteries such as ‘How does the inner self or mind influence the behavior of the body?’” (p. 29). These problems and questions concern the same difficulty: The conflation of mental with nonphysical, which we join Princess Elisabeth, Pierre Gassendi, and most philosophers, in rejecting.

Such incompatibility is more apparent in a defense of property dualism (e.g., Chalmers, 1996), a contemporary form of non-Cartesian dualism that is not without adherents. This defense invokes the possibility of zombies, hypothetical creatures assumed to be physical clones of us but who feel nothing (e.g., they display all the physiological and behavioral features of pain without any pain⁸). If zombies existed, certain mental states (sensations and perceptions) would be unnecessary for certain behaviors (if pain behavior occurred without any pain, pain would be causally irrelevant for pain behavior). This defense of property dualism implies epiphenomenalism: the negation of mental causation. Mental causation is not just incompatible with Cartesian dualism (largely a historical curiosity), but also with property dualism and its zombies.

If all this is taken seriously (and we think it should be), the conclusion that dualism is incompatible with causation seems inescapable. This conclusion may be derived from the first law of thermodynamics: “It is not possible to construct a machine that will operate perpetually without consuming energy.” It follows that: “It is not possible to construct a dongle that will communicate information or energy from the nonphysical to the physical.” Such a machine would violate that law. Mental causation therefore commits us to materialism: the mind can be intelligibly said to be causal only if physical. To view the mind as nonphysical, as dualists do, makes mental causation unintelligible. This outcome also derives from an assumption (another form of the Dongle Principle) that philosophers often adopt to immunize themselves from dualism: physical reality is causally closed (physical events can only cause and be caused by physical events). This immunization protects against intellectual wasting on pathological arguments.

Incompatibility with Internalism

The incompatibility between internalism and dualism is equally clear, if not more so, but has been far less discussed: How can an unextended mind be internal if internality requires spatiality? To make this crisp:

⁸ Obviously, this makes sense if pain is different from pain behavior, as all ontologies of mind propose, except for a mind-behavior identity theory according to which “[p]ain is pain overt behavior” (Rachlin, 2014, p. 56). In this theory, there cannot be pain without pain behavior. Therefore, there cannot be zombies, because if they exhibit pain behavior, pace Rachlin, they experience pain. We are not defending the possibility of zombies here. We only mention it to illustrate how causation is incompatible with a contemporary defense of property dualism that calls up the undead as arguments. The impossibility of zombies, as implied by a mind-behavior identity, does not invalidate our pedagogical use of them here. Causation also implies their impossibility, again supporting our point. A mind-behavior identity theory (denying feelings absent overt feeling behavior), then, is not the only way to kill zombies. Embracing mental causation is another.

- Internality, in the standard ordinary, scientific, and philosophical use of the term, is a spatial relation between extended (3D) objects.⁹
- In dualism, immaterial minds are essentially unextended (i.e., by their essential nature they have no spatial dimensions).
- Only extended (3D) objects can be meaningfully said to be internal, inside, or inner in that sense of the term. Without spatial dimensions, immaterial minds cannot therefore be meaningfully said to be internal to anything that is extended (like a body).
- Hence, if the mind is internal, it must be extended and, therefore, material.
- By the same token, a mind situated partly outside the skin, as the extended-mind theory propounds (Clark & Chalmers, 1998; Dror & Harnad, 2008; Rockwell, 2005), must also be physical.

Internalism, then, like causation, contradicts the view that the mind is immaterial, and it is not obvious how to avoid the contradiction. Viewing the mind as both nonphysical and internal violates all standard senses of what it is and means to be nonphysical and internal. On all such senses, internality implies spatial extension, which goes against the dualistic (and idealistic) idea of a nonphysical mind. The thesis of mind as internal therefore implies that mind has spatiality and is therefore material.

Thus, nonphysicality provides no ontological support for the antimentalists' claim that mental entities are "fictions" in that they "do not exist at all" (Moore, 2008, p. 332). This libel could work against a dualist or idealist, but not against mentalists who are materialists, embracing the theses of mental inner causation. Some antimentalists might claim that the mind, as internal and physical as it may be, does not cause behavior and, hence, is explanatorily irrelevant. It is unclear what argument antimentalists could offer to support this claim. The official view among antimentalists, especially radical behaviorists, is the Machian view of causal relations as functional relations between observations. The view was also popular among logical positivists (e.g., Schlick, 1932/1949, p. 524: "... science does not speak of causes and effects, but of functional relations"—this is essentially Skinner's position). Its main motivation was to restrict cause-effect relations to observable regularities, and therefore exorcize anything unobservable (hidden powers and connections) from them. This view of causation relies on the observable/unobservable distinction, which we next will argue to be too problematic to support any epistemology.

In Sum

The theses of mind as causal and internal, which mentalists and antimentalists view as key to mentalism, are incompatible with the thesis of mind as nonphysical. Mental inner causation is inconsistent with dualism. The two logically repel one another. Cartesian dualism, as a combination of the two, is thus incoherent, which suffices to

⁹ This use also applies to "inside" and "inner." Often, these terms are interchangeable with "in" (e.g., "My mind is in my head"). We are not concerned with other uses of "in" (e.g., ones that describe a state of the organism: "I am in love," "I am in good health") that are not interchangeable with the standard one we adopt here, legitimate though they might be. Such other uses of "in" are not at work in assertions that the mind is internal or inner to, or inside, the body.

dismiss it summarily, without any further discussion beyond its incoherence. An immaterial mind cannot be intelligibly said to be causal or internal.¹⁰

Part of the reason for the common confusion of mentalism with dualism is that many people believe in divine intervention, ghosts, and voodoo, and assert that these have to do with the mind; they believe in mind over matter. This is dualistic, but of course it is unscientific, and does not characterize the statements or working habits of cognitive, developmental, or neuroscientific psychology. It is possible to conduct scientific research under a mentalistic framework (as did George Miller, Ulrich Neisser, Daniel Kahneman, and cognitive psychologists in general) without being dualistic. Lumping those scientists with the superstitious public is more than grossly unfair; it is a libel.

Unobservability

The main outcome of the previous section is that mental entities as conceived in mentalism (i.e., causal and internal) can only be physical, because only physical entities can have those properties. Hence, mentalism opposes dualism. Antimentalists therefore need search for other redoubts from which to attack mentalism. One redoubt is the claim that the mind is unobservable. According to antimentalists (e.g., Uttal, 2000), such unobservability hinders the scientific study of the mind and its causal status in behavior, as observability is held to be essential to science.¹¹ This is an epistemological, rather than metaphysical, objection, and scientists are somewhat more comfortable fighting battles on epistemological grounds. Like the dualism attack, however, the unobservability attack is unsupportable: it is ineffective against both theses of mentalism. Being unobservable does not imply that the mind is not causal or internal or nonphysical or inexistent. Whether or not seeing is believing, not seeing is weak grounds for not believing. If the mind is argued to be unobservable because it is internal, this only grants internalism about the mind and supports its material nature.

Unobservability is a weak reason to deny physicality and existence. Scientists often treat as causal many processes in nature that are not directly observable (gravitational and electromagnetic forces, chemical bonding, rhodopsin bleaching by light, protein synthesis, action potentials, neurotransmitter release, etc.). Some antimentalists argue in the other direction: mind is “unobservable because nonphysical” (Baum & Heath, 1992, p. 1313), but we have already refuted the dualism attack against mentalism.

The attack on mentalism may be waged on the epistemological grounds that unobservability makes a scientific study of it impossible (e.g., Uttal, 2000; Watson, 1913). The mind should therefore be excluded from scientific parlance as irrelevant or misleading. It matters not whether or not the mind exists or is material. Such metaphysical discussions are perennially moot, hence impractical (see Leigland, 2016; Marr, 2016; Moore, 2011, p. 133). This epistemological argument would be a strong attack against mentalism, one that sidesteps our ontological conclusion in the first section, were it not for two threats that undermine the argument on its own terms: 1) the protean

¹⁰ Nor can ordinary mentalistic language be dualistic either, as Ryle (1949) famously argued. This argument allows antimentalists to indulge in ordinary mentalistic talk without committing to mentalism.

¹¹ To be fair to Uttal, he never denied the existence of the mind; just its accessibility to scientific treatment. See (Killeen, 2017) for an appreciation of his work and life.

nature of observability, and 2) the ambivalence about how defining observability is of antimentalism in particular, and science in general.

The Protean Nature of Observability

What does it mean to be observable? Mentalists and antimentalists alike rarely ask this key question. Perhaps they take the observable/unobservable distinction for granted as unproblematic. Its history in the philosophy of science, however, tells a different, thornier story. The distinction was central to the logical positivists' view of scientific theories, but they made it in too intuitive, informal in a way that contrasted sharply with their emphasis on formal rigor elsewhere (see Suppe, 1977, pp. 45–46). They were overconfident that the distinction was reasonably valid and clear, even useful. They blinked.

Such overconfidence was eventually proved misplaced. In a seminal paper, Maxwell (1962) argued that the distinction cannot be made in a nonarbitrary valid way, ontologically or epistemologically (see also Putnam, 1962). The problem is that there is an *observational spectrum*: seeing with the naked eye through differently powered telescopes, binoculars, glasses, a vacuum, air, magnifying glasses, and differently powered microscopes. Where is the limit between the observable and the unobservable and why? Any answer will be arbitrary, or so Maxwell argued. Cardinal Bellarmine objected to Galileo's description of the surface of the moon because it was through a telescope (one flawed by spherical aberration), not direct. Maxwell further argued that observability is not an intrinsic property of any entity, but rather an extrinsic property that depends on human perceptual capacities, and often, especially in science, on their technological amplification, and human training in using the technology.

Thus, it is exceedingly difficult to articulate a sufficiently clear, precise, valid, nonarbitrary and generally agreed-upon sense in which behavior is observable and mind unobservable. Even if such a sense were possible (a big "if"), it is not obvious how useful it would be. As likely as not, it could be too complicated and difficult to use, making the whole endeavor self-defeating. These difficulties are exacerbated by two related but equally problematic distinctions some antimentalists make in their unobservability attack against mentalism: between in-principle and in-practice; and between private and public.

In Principle and in Practice According to this distinction, all behavior is observable "in principle" (e.g., Donahoe, 1996, p. 71; Hayes & Fryling, 2009, p. 49; Moore, 2011, p. 133; Rachlin, 2014, p. 182), and much of it "in practice," whereas the mind is unobservable "in principle" and, a fortiori, "in practice." But just what is that "principle"? These antimentalists offer no hint, and possible interpretations of its meaning spell trouble for their appeal to this distinction.

The ordinary sense of "in principle" refers to "a general idea or plan, without details yet established." This is unhelpful. Without details, what it means to say that the mind is "unobservable" and behavior "observable" remains opaque. As soon as details emerge, there is no "in principle" anymore, in that sense of the expression, but rather proposals for how to make the distinction. Some details that must be nailed down in those proposals lead back to the issues concerning the protean nature of observability, as further discussed below.

Perceiving Directly with the Naked Senses If “in principle” means “given the right observation conditions,” exactly what are these conditions and why do they apply to behavior and not the mind? Perhaps these antimentalists intend to focus on just one extreme of Maxwell’s (1962) spectrum, to claim that some behavior can be perceived directly, with the naked senses (e.g., typically, seen with, or visible to, the naked eye), as it were, whereas the mind cannot, at least by others. Mentalists agree with this claim and so do we but wonder what the issue is. Taking the antimentalists’ argument to its next step one finds the footing unsteady.

Focusing on that extreme is as arbitrary as focusing on any other part of the spectrum, unless, as per Cardinal Bellarmine’s stance of Galileo, perceiving with the naked senses is supposed to be inherently better than not. It would be difficult to make a valid general case for this supposition. Many times, perception with the naked eyes is better, but many other times it is not even possible, especially in natural science. Myriad entities scientists study (quarks, electrons, atoms, molecules, black holes, cells, etc.) cannot be directly perceived with the naked senses. Yet, scientists do not repudiate such entities as being any less deserving of scientific study, let alone inexistent because nonphysical. Why can mentalists not follow suit? What makes their posited entities any less deserving of scientific study than electrons?

With the conviction that there is more to reality than meets the naked eye, many scientists have made special efforts to detect posited entities through evermore precise and reliable observation apparatuses (e.g., radio telescopes, electron microscopes). More Nobel prizes have been awarded for the development of such tools than for the discoveries made with them (Greenwald, 2012). As scientists retreat from immediate experience, they must take special steps to calibrate their instruments, validate their observations, and converge on consensus. All this complicates the scientific process, but it has paid off sufficiently often to make up for it. Why should mentalistic science be different?

The Mind’s Eye Mentalists agree that only the creature that has mental states can perceive them directly, albeit not in the same way it perceives external objects. In traditional formulations, such direct “perception” occurs through a special inner “sense” often called metaphorically “the mind’s eye.” These formulations are often accompanied by the assertion that a creature has a “privileged” or “first-person access” to its own mind, which is inaccessible to any third party. Thus, the mind is publicly observable only indirectly: others can only “infer” the mental states of any other creature, from its behavior (whether from its actions or its introspective reports).

Mentalists grant all this but insist that none of it implies the impossibility of a science of the mind, any more than the inference of electrons from white streaks in a bubble chamber precludes a science of electrons. The hypothetical character of the mind per se is too weak a reason to repudiate the possibility a science of the mind, let alone the mind’s physicality. Much if not most in natural science deals with hypothetical entities: If other scientists had followed the antimentalists’ observation standards, which repudiate all things hypothetical, there would be no quantum physics, chemistry, or molecular or cellular biology. Fortunately, they have not, nor should mentalists. The antimentalists’ problem here seems clear: their observation standards are unreasonably demanding, so much so that even antimentalists have difficulty meeting their own standards.

Mentalists also claim there already are instruments that allow for the public observation of mental events, states, and processes in practice. Brain imaging techniques (e.g., PET and fMRI), widely used in cognitive neuroscience, allow for the public observation of brain processes that mentalists construe as mental (e.g., Poldrack, Halchenko, & Hanson, 2009). The techniques, of course, are problematic (Uttal, 2011) and in their infancy, but they suggest that the public observation of brain states and processes underlying (or, in the mind–brain identity theory, constituting) mental states, as mentalists conceive them, might not be as unfeasible as antimentalists claim.

Antimentalists might reply, once again, that such observations are “indirect”—if observations at all. They are measurements of spike frequencies and blood-oxygen-level dependent responses, not of talking to oneself or thinking of a white bear. But this is true of many if not most scientific observations outside of cognitive neuroscience—we do not directly see electrons in a bubble chamber, but only their disruption of the mist; we do not directly see magnetic fields when we check our compass, but only the movement of a needle. We do not directly see people when we watch TV, but rather changing pinpoints of light. Behavior analysts routinely observe behavior indirectly through its effects on counters, cumulative records, and celeration charts. Why are these indirect observations more legitimate than the mentalists’ claimed observations of mental states indirectly through their behavioral (or imaging) effects? No answer gives a consistent strategy to the antimentalists.

Private Versus Public Another problematic distinction some antimentalists make, especially radical behaviorists, that weakens their unobservability attack against mentalism is between private and public observability. “Radical behaviorists do not necessarily object to talk that appeals to phenomena that are not publicly observable. . . [I]n some instances, radical behaviorists appeal to private events, and those events, by definition, are not publicly observable” (Moore, 2008, p. 332; for other examples see Zuriff, 1979; cf. Baum, 2011). However, this assertion applies equally to the mind as mentalists conceive it: mind is “private” because internal and, hence, no more or less publicly unobservable than the “private events” some radical behaviorists propound.

If some private events are covert and function as discriminative stimuli, the proposal gets close to inner causation. Furthermore, are such events, when propounded from a third-person perspective, not inferred and hypothetical (Zuriff, 1979, p. 8)? In what sense could they not be? Covert private stimuli, responses, and patterns of behavior seem to be little more than clones of the mentalists’ posited mental events. Antimentalists who propound private events seem to have a double standard here: they frown upon positing mental entities but not private covert events.

Taking Stock

Thus far, the observability assault raises sufficient questions to undermine its effectiveness. Where to draw the line along Maxwell’s (1962) spectrum? And why draw such lines? What makes direct perception with the naked senses better than indirect observation with instruments? Is past unobserved behavior observable? How? What does it mean that behavior is observable “in principle” whereas the mind is not? How do private events and covert behavior, if internal and causal, differ from the mentalists’

posited mental states? The possible answers we have examined do not provide a cogent argument with any scientific or philosophical significance.

Ambivalence About the Importance of Public Observability

A final problem with the antimentalists' unobservability attack against mentalism is that some of them, especially radical behaviorists, have been ambivalent about the importance of public observability to their stance. This ambivalence relates back to some radical behaviorists' positing of private events. To distance themselves from methodological behaviorism, they (e.g., Chiesa, 1994; Day, 1983; Moore, 2008, pp. 40–42; Skinner, 1974, pp. 13–18) have downplayed the importance of public observability. The lack of such public observability, and the calibration it makes possible, is why the father of methodological behaviorism, Watson (e.g., 1913), cast internal, publicly unobservable events (and introspective reports), out of scientific Eden. Downplaying the importance of public observability allowed radical behaviorists to readmit internal events (viz. "covert behavior" or "private events") back into Eden.

Such readmission is what makes radical behaviorism "radical," but this comes at a price. At the same time that radical behaviorists embrace private events in their canon, they will often repudiate the scientific tractability of the mind for its public unobservability, promoting overt behavior as the proper subject matter of scientific psychology. Remember, "A purely behavioral definition of expectancy has the advantage that the problem of mental observation is avoided" (Skinner, 1950, p. 194). Avoided perhaps, but not solved. Moore (2015) agrees, rejecting mentalism because it "holds that. . . proper explanations must [sic] appeal to underlying, unobservable phenomena from a nonbehavioral, mental domain" (p. 16; for similar views, see Baum, 2011, p. 197; cf., p. 40; Rachlin, 2014, pp. 99, 182). Skinner (1977) also complained that "... the fascination with an imagined inner life has led to a neglect of the observed facts" (p. 10). Moore (2010) endorses this claim: "The problem is that a mental state is something internal and unobservable, whereas behavior is external and observable" (p. 704), and "For behavior analysis, most of the variables with respect to which humans behave are publicly observable" (Moore, 2001, p. 169). This private/public distinction has occasioned strong disagreements among antimentalists (e.g., Baum, 2011), which prevents them from presenting a united front against mentalism.

Thus, there is a tension in how key is public observability to scientific psychology, and how defining it is of the antimentalists' stance. Until they resolve this tension, they cannot in good conscience reject mentalism by claiming that the mind is publicly unobservable and sell behavior as the proper subject matter of scientific psychology because it is publicly observable.

In Sum

Overall, the unobservability attack against mentalism suffers from many problems that undermine its effectiveness. It naively takes the observable/unobservable distinction as unproblematic, when in fact it is too problematic to provide steady conceptual footing for an effective attack. In addition, some antimentalists'—especially radical behaviorists—position on the importance of public observability to their antimentalistic stance has been shift. They promote overt behavior as the subject matter of scientific

psychology because it is publicly observable; dismiss public observability as secondary in order to separate themselves from methodological behaviorists; then, in order to separate themselves from mentalists, reject mental entities because they are publicly unobservable. They are trying to have the cake and eat it too, calories be damned. But they cannot have it both ways, on pain of hypocrisy and a bloated stance. The most effective way to ease this tension is to abandon the observable/unobservable distinction with everything that hinges on it (this also goes for mentalists who rely on the distinction). This does *not* mean permitting ad hoc and circular constructs into our scientific discussions; but the observable/unobservable, private/public distinctions do not serve the scientific goals of parsimony and rigor as well as other standard scientific practices will.

Impracticality

According to the final attack we will examine, mentalism is to be rejected for its impracticality. This has been articulated in a number of ways, the most common one being in terms of some form of philosophical pragmatism (viz., Jamesian, Peircean, Rortyan) that antimentalists champion (see, e.g., Baum, 2017, pp. 22–24; Hayes, 1993; Leigland, 1999; Moxley, 2001, 2002). The various forms of philosophical pragmatism differ in important respects. For brevity, we skip the details and assume that all forms of pragmatism largely share the following core theses: 1) a debate is pointless if none of its positions makes a practical difference; 2) if a position makes a practical difference, the debate is meaningful, and the preferred position is the one with the best practical consequences.

The debate of interest here is mentalism versus antimentalism, so we can immediately put the first thesis aside. The antimentalists' persistent rejection of mentalism implies that, to them, this debate is meaningful from a pragmatic perspective. They must believe that adopting a position in this debate makes an important difference, as do the alarms they raise concerning mentalism. The issue, then, is not that the debate is superfluous. The issue, rather, arises from the second pragmatist thesis, that one position in this debate, antimentalism, has better practical consequences than the other, mentalism. Is this true?

Interference with the Prediction and Control of Behavior

Some antimentalists, especially radical behaviorists, claim that an undesirable practical consequence of mentalism is that it “interferes with effective prediction and control of behavior” (Moore, 2008, p. 334). But what does this mean? One possibility regarding prediction is that mentalistic theories do not make predictions about behavior, whereas antimentalistic theories do, but clearly this is untrue. Mentalistic hypotheses typically entail behavioral predictions, so the former does not preclude, prevent, or hinder the latter in any way.

Perhaps by “interfering with effective prediction” these antimentalists mean “making failed predictions?” Mentalistic theories often make failed predictions, but all scientific theories do, even outside of psychology (e.g., phlogiston and aether theories). Mentalists have also made many successful predictions (see Zentall, 2013, and below).

Nothing in mentalism makes mentalistic theories inherently more prone to failed predictions than purely behavioral theories, as far as we can see. The latter also often make failed predictions. Some animals' responding does not fall on the ideal diagonal predicted by the strict Matching Law (some overmatch, others undermatch, others do neither). Human choice often markedly departs from this "Law" (see Lowe & Horne, 1985). The generalized matching law fails to predict the effects of extreme reinforcement ratios (Davison & Jones, 1995). Similar considerations apply to other kinds of matching (McDowell & Dallery, 1999). Behavioral momentum theory (e.g., Nevin et al., 2017) and the delay reduction theory of conditioned reinforcement (e.g., Shahan, 2017) also make failed (along with successful) predictions.

Virtually every issue of the *Journal of the Experimental Analysis of Behavior* (*JEAB*) provides examples. The informal Law of Effect, although quite successful, it also is regularly broken: animals often do not show an increase in response frequency with operant reinforcement (e.g., Baum, 2012; Shettleworth & Juergensen, 1980). Under some conditions (e.g., prolonged reinforcement), some animals decrease their response frequency, such as cases of schedule-induced or adjunctive behavior (e.g., Breland & Breland, 1961; Falk, 1961; see also Aoyama & McSweeney, 2001; McSweeney, Roll, & Weatherly, 1994; McSweeney & Murphy, 2017).

It is true that behavioral reports may avoid failed predictions by making none at all, merely reporting the effects of manipulations. But then it is the inductive stance of Skinnerians that interferes with successful prediction.

Purely behavioral theories, then, do not appear to guarantee successful predictions any more (or less) than mentalistic theories do. This outcome does not change with some antimentalists', mainly radical behaviorists (e.g., Moore, 2008, p. 334; Skinner, 1984, p. 511), rejection of the hypothetico-deductive method and preference for inductive methods. Debates concerning inductive versus deductive versus retroductive methods are misguided and should end once and for all. Briefly, the main problems are:

- The methods are viewed as opposite, when they are complementary.
- Science is claimed to be defined by one method, but this methodological reductionism is false: scientists often use many methods, which makes methodological pluralism more defensible.¹²
- One method or another is claimed to be inherently better, but this claim cannot be demonstrated noncircularly.
- The hypothetico-deductive method is restricted to unobservable entities and, hence, mentalism, whereas the inductive method to observable entities and, hence, antimentalism; but this restriction relies on the too problematic observable/unobservable distinction. Mentalists often use all methods, as do behaviorists, and their predictions concern observable behavior.

¹² Peirce (1901/1958) anticipated this by noting that scientists regularly cycle through abductive, deductive, and inductive inferences (in that order), viewing the three as equally integral to science. During the first half of the twentieth century, philosophers of science dismissed this methodological pluralism in favor of a methodological reductionism where one side (the Carnapian logical positivists) defended the primacy of the inductive method and the other side (Popperian falsificationists) did the same for the hypothetico-deductive method. Not anymore. After the demise of logical positivism, philosophers of science have leaned towards Peirce's methodological pluralism (not without controversy and further elaboration of Peirce's initial ideas).

Skinner (1984) also observed that the science of behavior in its own right “does not call” for hypotheses (p. 511), because behavior and its environmental determinants are “conspicuous” and, hence, do not require the hypothetical entities that mentalists posit when they use this method. Many nonmentalistic sciences deploy the method, however, whether their subjects are conspicuous or not. For example, many phenotypic traits of *Pisum sativum* are directly visible with the naked eye, but this did not stop Brother Mendel from hypothesizing invisible cellular “factors” (now called “genes”) and “forms” (now called “alleles”) to explain his observations theoretically. Nor did it deter Darwin from positing the “gemmules” that we now call genes.

Similar considerations apply to mentalism’s alleged interference with the “control” of behavior. If “control” here means that behavior changes orderly by certain environmental manipulations, nothing in mentalism (or the use of the hypothetico-deductive method) prevents the control of behavior in that sense of “control.” Behavior analysts focus on the technology of control, and they have become quite good at it. Mentalists give priority to theoretical understanding, and so arrange experiments to test their hypotheses. Mindless control may interfere with understanding no less than testing hypotheses interferes with control. Mentalistic understanding could help improve the prediction and control of behavior. The antimentalists’ rejection of mentalism could thus interfere with their cherished goals of prediction and control of behavior.

Distraction from the Environment

A related aspect of the impracticality attack is that mentalism can distract attention from the relevant variables (Lamal, 1993; Moore, 2008, p. 334; Skinner, 1950, 1963, 1977). Such distraction, the rationale goes, obtains because mentalists presumably must either explain the explanatory mental states themselves, or leave them unexplained, a *deus ex machina*. Environmental causes will be known more efficiently by removing the mentalistic middle process and going directly to the environment, or so the rationale concludes.

Unanchored events, whether mental or environmental, leave explanation sequences unfinished, which is regrettable but inevitable: All explanations, whether mentalistic or behavioral, must have “initial conditions” (Wigner, 1979); which conditions to designate as “initial” is somewhat arbitrary. Thus, all explanations, just like all theories, are incomplete, although some are more informative (have more content in their *explanans*) than others. To expect complete explanations is naive and misses the point of explaining (i.e., to select a few certain factors hypothesized as determinants and see how well they explain, assuming everything else is equal).

Nothing in any philosophical model of explanation forces mentalists to further explain their posited mental events, just as nothing forces behavior analysts to further explain the environmental conditions they propose to explain behavior. When the spouse asks, “Why did you go out the front door” one might reply “I heard the postman” or “I wanted to see if we had mail” Both explain the trip, even if only the former takes the causal chain outside the head. Both explanations are informative, if fallible because introspective. A more informative answer combines both: “I heard the postman and wanted to see if we had mail.” Correlative data, “Yes, I heard it too”, further strengthens the explanation. And so it goes.

Many mentalists, in fact, further explain their posited mental events. Mediational (S-O-R) neobehaviorists view external environmental conditions (S) as explanatorily

relevant to organismic internal states (O). They take these states (which antimentalists deem mental) to be causal mediators between S and behavior (R) (see, e.g., Killeen, 2004; Killeen & Jacobs, 2016, for examples too close to home). Positing dispositions, drives, and desires does not necessarily distract from environmental causes.

Overthrown Theories

Yet another impracticality attack against mentalism has been the complaint that “Most [mentalistic] theories are eventually overthrown, and the greater part of the associated research is discarded” (Skinner, 1950, p. 194). The complaint has two parts. One part is that most theories are discarded. Yes, but this is common in all science, not just psychology, and nothing in mentalistic theories implies they are more prone to being overthrown than behavioral theories. The second part is the claim that all the effort, time, and money that went into building the discarded theories is wasted. Not quite: scientific theorizing is a process of successive approximations. Popper (1963) explicitly views it as a “trial and error” process: scientists cannot get it right the first time, but will come closer the second time, and so on.¹³ Failures serve the heuristic purpose of ruling out possible ways to account for the phenomenon of interest. The facts generated in the process remain to be accounted for by successor theories, and that is their challenge.

As Skinner (1972) observed, “A failure is not always a mistake; it may simply be the best one can do under the circumstances. The real mistake is to stop trying” (p. 156). Why should this assertion be inapplicable to mentalistic theorizing? Newtonian mechanics was “overthrown” by relativistic and quantum mechanics, but physics would have been much poorer for 250 years without it. Relativity theory required the foundation of Newtonian mechanics. Overthrown theories are often necessary stages towards better theories. The death of a theory is no more a failure than the death of a person. What matters in both cases is what kind of life they led and what they leave behind. None of it need vanish with their death.

Hull’s (1943) theory is another antimentalists’ example of an overthrown mentalistic theory. It was overthrown, or died of neglect, but a better successor arrived decades later and remains influential today: the Rescorla-Wagner model (Rescorla & Wagner, 1972). The model conceives learning as a change in associations between internal representations of stimuli that affect performance. It thus seems to be mentalistic, but it has led to the discovery of new conditioning phenomena. As Mazur (2016) put it, the model “deserves good grades on this count, because hundreds of experiments have been conducted to test the model’s predictions” (p. 80). It also has its failures, as do behavioral models.

¹³ Popper (1963) said: “A false theory may be as great an achievement as a true one. And many false theories have been more helpful in our search for truth than some less interesting theories which are still accepted. For false theories can be helpful in many ways; they may for example suggest some more or less radical modifications, and they may stimulate criticism” (p. 190). In fact, Popper (1974) never said that a theory should be abandoned as soon as it is falsified: “. . . I have used the terms ‘elimination’, and even ‘rejection’ when discussing ‘refutation.’ But it is clear . . . that these terms mean, when applied to a scientific theory, that it is eliminated as a contender for the truth—that is, refuted, but not necessarily abandoned. . . . I have often pointed out that any such refutation is fallible. . . . I do not conflate even admitted falsity with the need to abandon a theory. . . .” (p. 1009).

Discarded Data Many antimentalists also assert that the data generated through overthrown theories are discarded with them. Hence, the time, effort, and money that went into generating the data is wasted. However, nothing in mentalistic theories implies that data inspired by an “overthrown” theory should be discarded. Few would discard the many data collected to test and improve Newtonian mechanics. On the contrary, new theories are expected to account for those old data (as relativity theory does).

According to Skinner’s rationale, if the behavior-analytic theory of conditioned reinforcement is overthrown (and it may be; e.g., Davison & Baum, 2006; Shahan, 2017) several feet of *JEAB*’s bookshelf will have to follow it to the dustbin. More generally, if primary reinforcement goes as well (Baum, 2012; Critchfield & Miller, 2017; and others wonder in print whether this concept is any longer defensible), dust off more yards of shelving. Such sweeping eradication would be like throwing the baby out with the bathwater. Another example concerns stimulus control effects like generalization and transposition. Much early theorizing about these effects (e.g., Köhler, 1918/1938) has been overthrown, but the same data continue to be cited, not only as phenomena that remain relevant today, but also to theorize about them in novel ways (e.g., Lazareva, 2012; Pearce, 1987; Rescorla, 1976). Such novel theorizing, as mentalistic as it might be, breathes new life into old data.

Data generated through overthrown mentalistic theories are often discarded, but not because they were overthrown. Common reasons are methodological, such as control issues, lack of order, and failure to replicate. These same reasons apply equally to behavioral data generated in ways other than mentalistic theorizing. Many data are forgotten, to be sure, but this is different than being discarded, and mentalism cannot be validly blamed for it any more than antimentalism can. Purely behavioral data are no less unforgettable: Who now remembers Holland’s (1958) demonstration of counting by humans on a fixed-ratio schedule?

What to Do?

We have critically examined three prominent attacks that antimentalists have made against mentalism. The attacks involve: a) dualism; b) unobservability; and c) impracticality. These are arguably the strongest attacks in the antimentalists’ arsenal. We found all of them to miss the mark, with some being self-injurious, because they deprive antimentalists of conceptual liberty while leaving mentalism unscathed and at liberty. Such attacks can be countered with straightforward conceptual resources, as outlined above. The emphasis of some antimentalists, radical behaviorists in particular, on behavior “in its own right” as the proper subject matter of scientific psychology has relied too heavily on their antimentalism. Our critique implies that they need to devise either stronger attacks against mentalism or a justification for their epistemological position without depending so much on antimentalism as its foil. Like the null hypothesis, antimentalism in its present form is a weak foundation for anything, behavior analysis included.

Are stronger attacks possible? Perhaps, although mounting them will not be easy because mentalism is not a single, monolithic view. Just as it is oversimplifying to speak of “behaviorism” in the singular (Zuriff, 1985; see also O’Donohue & Kitchener, 1999), it is equally sketchy to speak of one “mentalism.” Mentalisms can take various forms,

each with nuances that are not apparent in the general definition. The generic characterization of mentalism we have used here is too broad to allow for a surgical attack.

Antimentalists may contend, for instance, that mind-brain identity theory and functionalism, two dominant forms of mentalism, share features that offend them. Perhaps, but functionalism arose in opposition to the mind-brain identity theory (and behaviorism). Their differences are sufficiently important to require separate (but coordinated) attacks. Attacks on one will not work against, and might even help the other, so attacking each one needs its own well-synchronized strategies. Not an easy task, though, because criticisms of one from proponents of the other already seem to be as strong as they can be. Thus, it will be difficult to think of stronger criticisms from the behavioral perspective that apply to both, without falling back to the kinds of generic, ineffective attacks we have discussed.

Antimentalists might also consider simply getting over it, that is, reallocating time and energy from criticizing other metaphysics to the more creative and demanding endeavor of developing their own metaphysics for things mental. Rachlin's (2014) mind-behavior identity theory provides a recent example in his teleological behavioral rejection of the internal aspect of mentalism. According to it, mental states are behavioral sequences (see also Skinner, 1987, p. 784: "The mind is what the body does. It is what the person does. In other words, it is behavior."). Promising as such a theory might be, it still is light on the details (Dougher, 2016). Functionalism (e.g., Buechner, 2008) and the mind-brain identity theory (e.g., Polger, 2004), have been formulated in far more detail. To compete with these forms of mentalism, a mind-behavior identity theory needs more elaboration than it has thus far received. This is not to diminish the necessary first steps, but rather encourage those with conceptual inclinations to help with the equally necessary further steps.

The Connection to Science

We have dwelt on the philosophical character of the thrust and parry between mentalism and antimentalism; but mentalism is more than a philosophical stance: It also has scientific import. Many of its practitioners believe that it benefits scientific understanding. The kinds of philosophical tactics we have examined here are insufficient to deter these uses of mentalism: Many respected scientists and practitioners will be simply uninterested in them. In any case, there are many instances of great science (and mathematics: Kline, 1980) conducted atop unsteady philosophical foundations.

To be stronger, then, attacks against mentalism would also have to be scientific in character (though preferably well-coordinated with effective philosophical engagement). Understanding the scientific import of both antimentalisms and mentalisms, they can be assessed by how well they explain and predict the evidence, compared to one another in a model-comparison approach. For this is how most scientists think. Mental models may involve extra degrees of freedom in explanation (the mental states as latent variables), and so they must pay their way in better predictions, just as certain model assessment tools (e.g., the Akaike Information Criterion; e.g., Burnham, Anderson, & Huyvaert, 2010) require mathematical models to furnish better predictions as their flexibility increases.

How might antimentalists who are so inclined begin the study of mental processes without being exiled from the behavior analysis community? Start with the founder, B. F. Skinner, who invoked 10 types of inner causes in his writings (Zuriff, 1980). In each

type, “an inner event is hypothesized to play a causal role, acting as a link in a causal chain, albeit an intermediate one” (Zuriff, 1979, p. 2). All 10 are phenomena that are studied elsewhere in psychology under names that would be judged mentalistic, and hence repudiated by the antimentalists—but the name does not change the phenomena or the value of studying them. Skinner brought fresh insights to their study. What more might be accomplished by pursuing them than by attacking them?

Consider, for example, the mentalism of Roger Sperry, a neuropsychologist, summarized in his 1980 commentary “Mind-Brain Interaction: Mentalism, Yes; dualism, No.” Such interaction was explained in terms of the

. . . emergence in nesting brain hierarchies of high order, functionally derived, mental properties that interact by laws and principles different from, and not reducible to those of neurophysiology. Reciprocal upward and downward, interlevel determination of the mental and neural action is accounted for on these terms without violating the principles of scientific explanation and without reducing the qualities of inner experience to those of physiology. Interaction of mind and brain becomes not only conceivable and scientifically tenable, but more plausible in some respects than were the older parallelist and identity views of the materialist position (p. 195).

Sperry took mental phenomena to be explanatory (that I feel hungry might validly, even if incompletely, explain my opening the refrigerator, and need not exclude aspects of the environment as also explanatory), causal (not parallelist), emergent (as the laws of thermodynamics stood to mechanics), embodied (internal), and nonreductive (arising from, but not predictable from, neuronal firing). This is clearly not a behavior analyst speaking, but a Nobel laureate whose metaphysics were relevant to his science. It is a defensible position. We have to do as well.

Does Behavior Analysis Need Antimentalism?

The failed attacks on mentalism we have pointed out do not diminish or limit in any way the strengths and potential of behavior analysis. Nor are those attacks necessary to justify or strengthen behavior analysis in any way. Behavior analysts still must do good work, independent of any contrary positions. Progress in behavior analysis hinges on that work, not on proving mentalism wrong. Behavior analysis, applied and experimental, as well as associations that promote it, are thriving. A technology of behavior emphasizing functional analyses—attention to environmental causes and consequences—works extraordinarily well, and has been influential in inspiring much research, even mentalistic (associationistic) theorizing (e.g., Adams & Dickinson, 1981; Colwill & Rescorla, 1990).

Perhaps, then, behavior analysis does not really need antimentalism to advance or even justify itself: behavior analysis’ merits stand on their own. None of this means that mentalistic theorizing should be blindly trusted. We have acknowledged, as most if not all mentalists would, that mentalistic theories are fallible, but then again, so are purely behavioral ones. Behavior analysis and psychology in general need protection not from mentalism or antimentalism but from extreme, reductive, oversimplifying positions about theory and method, or anything else, for that matter: moderation is key.

It is an injustice to use the tar brush of dualism to besmirch mentalists, just as it is to suggest that theirs is a less effective research strategy than is the behaviorists'. Perhaps it would be better to change our tactics—moving away from an unfortunate implication of the names we have been using: “isms” are, or easily become, ideologies and religions. It might be more accurate to speak of behavioral and cognitive “approaches.” In the future, we shall avoid the use of the dysphemistic suffix “ism” for either: To reduce the number of “isms” by two in the world is a small step for civilization, but a significant one for civility among scientists. A subtle reminder, too, that genuflection is not required in our house.

Behavior analysts need not pump up motivation by fighting against hypothetical enemies. What behavior analysts fight *for*—their positive accomplishments in basic research and applications—provides a stronger, more constructive and fruitful motivation. Behavior analysts are excellent experimentalists, and their research is progressing well, if slowly and with some lacunae. Sperry (1980) concluded by noting one such gap:

Of all the questions one can ask about conscious experience, there is none for which the answer has more profound and far-ranging implications than the question of whether or not consciousness is causal. The alternative answers lead to basically different paradigms for science, philosophy and culture in general. (p. 205)

Neither mentalists nor antimentalists have yet filled this gap. If they find a way to coexist peacefully, maybe even collaborate, they might accomplish more and make strides towards filling the gap: there could be strength in unity, and the best way to know is to try it. Perhaps we are being overoptimistic, but we prefer this potentially more fruitful attitude than the poverty of disunity. What do you think?

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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