

Commentary on Howard Rachlin (1995). *Self-control: Beyond commitment*. *BBS* 18:109–159.

Abstract of the original article: Self-control, so important in the theory and practice of psychology, has usually been understood introspectively. This target article adopts a behavioral view of the self (as an abstract class of behavioral actions) and of self-control (as an abstract behavioral pattern dominating a particular act) according to which the development of self-control is a molar/molecular conflict in the development of behavioral patterns. This subsumes the more typical view of self-control as a now/later conflict in which an act of self-control is a choice of a larger but later reinforcer over a smaller but sooner reinforcer. If at some future time the smaller-sooner reinforcer will be more valuable than the larger-later reinforcer, self-control may be achieved through a commitment to the larger-later reinforcer prior to that point. According to some, there is a progressive internalization of commitment in the development of self-control. This presents theoretical and empirical problems. In two experiments – one with pigeons choosing between smaller-sooner and larger-later reinforcers, the other with adult humans choosing between short-term particular and long-term abstract reinforcers – temporal patterning of choices increased self-control.

Intention isn't indivisible

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Abstract: An intertemporal bargaining model of commitment does not entail the interaction of parts within the person as Rachlin claims, and is needed to explain properties of “ordinary” self-control that his molar generalization model does not predict.

Howard Rachlin has often helped clear away the dangling concepts of self control that have elevated so many *ad hoc* descriptions into theories; but in his quest for parsimony, his recent target article (1995) has proposed doing away with the notion of intertemporal bargaining within the person, a hypothesis of genuine explanatory and heuristic value.

He acknowledges the underlying problem of inconstant preferences, predicted by the hyperbolic discount curves of Herrnstein's matching law (1961) and reported with increasing precision in human subjects (Green et al. 1994; Stevenson 1986) as well as animals. He also recognizes that people are motivated to adopt external committing devices like Antabuse to forestall their own future changes of preference. He correctly observes that “most ordinary instances of self-control seem to occur without any extrinsic commitment at all” (p. 112). However, he does not accept an intertemporal bargaining model of such instances, which would create commitment in the form of a motivational stake (Ainslie 1975; 1992), because (1) long range rewards differ from short range ones in not usually being discrete, “punctate” events, and (2) intertemporal bargaining is a form of internal commitment, which seems to imply the interaction of internal part-organisms. Rather, he ascribes the “ordinary” kind of self-control to generalization alone – from the “molecular” view of single “acts” to the “molar” view of “patterns.” We answer that the perception of choices in patterns is not a sufficient explanation of internal self-control (commonly called *willpower*), and that Rachlin's objections to an intertemporal bargaining mechanism are easily dealt with.

Willpower has long been reported to involve the perception of choices in patterns, so that, as the Victorian psychologist Sully said, “impulse as isolated prompting for this or that particular enjoyment becomes transformed into comprehensive aim” (1884, p. 631). However, people's readiness to erode their willpower by distinguishing individual cases from the relevant pattern has been known at least as long (e.g., William James's list of an alcoholic's excuses to have a drink, 1890, p. 565). The molar perception hypothesis alone does not explain this erosion, or the many questions raised by its occurrence. To name a few:

(1) Why is self-control asymmetrical, so that “every gain on the wrong side undoes the effect of many conquests on the right?” (Bain 1859/1886, p. 440) – Marlatt's well-studied “abstinence violation effect” (e.g., Marlatt & Gordon 1980).

(2) Once someone has learned a molar perception, why does he have a persisting tendency to backslide, that is, to resort again to choosing between individual acts.

(3) Given such a tendency to backslide, what determines whether it will prevail, that is, whether the person will see his choices with a molecular scope or a molar one?

(4) Why is even clear insight into molar patterns often insufficient to motivate the relevant behavior, so that the person acts against his better judgment?

(5) Why do people take the trouble to set up what they regard as self-rewards and self-punishments (“I'll give myself a movie if I clean my apartment”), when these supposedly cannot have a basis in realistic cost-accounting?

(6) Why, as Rachlin notes (p. 155), do some conspicuous times like New Year's Day seem to be the occasions of more efforts at behavior change than others?

(7) Why do efforts at strengthening one's intentions often lead not to long range rationality but compulsiveness and other major pathologies, even when the efforts are successful? (detailed in Ainslie, in press). Indeed, how can there be such a thing as overcontrol?

Rachlin does not take notice of most of these problems, but does assert that “restructuring behavior into a pattern” is sufficient for a person to defend a molar behavior pattern from opportunities for the individual acts that are alternative to its component acts, even though, evaluated as acts, the alternatives are better motivated. He recognizes a need to explain the extra motivation required for defending molar patterns but says that this motivation comes from patterns' intrinsic resistance to interruption. This explanation is undocumented and wholly inadequate. While such resistance may sometimes be apparent, as in listening to symphonies, it is conspicuously absent in patterns of self-control like sobriety and diets: an occasion to break the pattern of “healthy breakfasts” by substituting bacon and eggs for the prescribed cereal is far from aversive to most people, and is declined only through a process that is experienced as effortful. Rachlin seems to be reviving the old belief that habits have innate “force,” which long ago failed of experimental verification (Dember & Fowler 1958).

Ainslie has argued elsewhere (1975; 1992) that the perception of long range patterns is necessary, but not sufficient, for the kind of self-control that has the properties listed above – that these properties arise from a process of recursive self-testing much like the one in social groups that causes sudden movements in stock markets. Strikingly, Rachlin illustrates his concept of molar pattern-perception with similar social examples (a soldier as part of a rout, a citizen as part of a pattern of littering, p. 153). But mutual perception is fundamental to the mechanism that governs such patterns; why is it not equally necessary to individual consistency, when it is the person at successive times, rather than separate people, who must test and be tested? Rachlin says this is mere analogy, but he suggests no other mechanism that might protect molar patterns from those molecular behaviors which in a social context are called free riding.

Granted, some intrapsychic means of commitment are possible without noticing how one choice bodes for subsequent ones (Ainslie 1992, pp. 133–142): guarding one's attention from lures, which might be sufficient for the relatively weak momentum effects seen in animals, and building or inhibiting an emotional

climate, which we suspect in Mischel's children (Mischel et al. 1989). Still, the kind of willpower that is strong enough to overcome alcoholism and resist torture must focus extensive reward on the order of whole molar patterns, on each choice that is subject to a strong undiscounted urge. The perception of individual acts not just as part of a pattern, but as precedents predicting the survival of the pattern, is the only mechanism we know of that predicts such a concentration of reward. Common experience has shown overwhelmingly that molar insight does not elevate people to a new, impulse-free plane, but stays in continual competition with rationales ("rationalizations") for impulses. There is nothing in Rachlin's mechanism of molar generalization *per se* that would prevent a person from gerrymandering molar patterns to exclude the present case, in other words to resolve upon sobriety-in-general-but-not-tonight.

Intertemporal bargaining is a hypothesis about the microscopic details of this competition. We must thus confront Rachlin's disallowance of limited-warfare bargaining situations among individuals as models for the relationships of a person's successive motivational states. His objection that most demonstrations of these models use "punctate" rewards, those that do not extend over time, is simple to meet. Single points can easily be calculated to summarize a continuous rewarding effect like a week of sleeping well or a year's good health, and conversely, series of point rewards can be integrated into aggregates; these transformations cause some differences in the description of reward at relatively short delays, but this does not change the qualitative predictions of hyperbolic discount curves (Ainslie 1992, pp. 147–162 and appendix 3). Recent evidence suggests that human subjects tend to recall extended emotional episodes by representative moments anyway (Varey & Kahneman 1992), but the argument does not rely on this phenomenon.

Rachlin also sweeps aside modeling with successive motivational states in his condemnation of internal commitment. Presumably these states are not "whole organisms," and thus violate the behaviorist convention against theorizing about parts of a person. But a temporal part is very different from a spatial part. We might indeed argue that scientists' actual data give us only single temporal parts of our subjects, and it is our construction of a temporally integrated organism out of these parts that is the questionable theoretical leap. It is a leap we make about ourselves as second nature, so we tend to insist upon it in our subjects; but this, as Rachlin would (or should) say, is introspectionism.

Rachlin is not alone in regarding the process of volition as irreducible to smaller steps. A prominent philosopher of mind has recently advanced the same view (Bratman 1987). This is not a view based on evidence, however, but on a disregard of the empirical complexity of this topic. If molar intention is atomic, then its success or failure over time must be determined within its black box; and the questions we have asked above, for which Ainslie has proposed recursive intertemporal bargaining mechanisms, must remain unanswerable. Behaviorism, of all disciplines, has no reason to discourage inquiry in this fashion. Conflict among successive motivational states is a deduction from the matching law, and Rachlin himself accepts it in the case of physical commitment (e.g., Ulysses tying himself to the mast). Why not follow out its implications?

Psychology without brains

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Abstract: Rachlin's "teleological behaviorism" is a dubious melange. Of Aristotle's four basic "causes" – formal, efficient, material, and final – the scientists and philosophers of the modern era expelled the last, or teleology, from science. Adaptationist evolutionary biologists now some-

times sanction talk of the function or purpose of organisms' structures and behavioral repertoires as a first step because they believe evolution through natural selection makes natural organisms look *as if* they are purposively designed. But, as Aristotle himself insisted, humans are as much artificial as natural and so teleology is much less appropriate. To the degree that Rachlin's view makes sense it seems to amount to Daniel Dennett's intentional stance or the folk psychology talk of our everyday narrations of ourselves and others.

One is startled when Rachlin (1995) distinguishes his "teleological behaviorism" from "physiological and cognitive (or 'intentional') stances," (particularly when he cites Dennett for the latter) in that Rachlin's teleological behaviorism mostly amounts to just Dennett's intentional stance (oddly focused on artificially boxed behavior). Rachlin seems to be aware of this because elsewhere, as support for what he sees as Aristotle's wise identification of "mental terms with molar actions of whole organisms," he quotes Dennett's (1978, p. 154) description of his intentional stance exemplars, Ryle and Wittgenstein, as showing

that there are questions that arise purely at the personal level, and that one misconceives the question if one offers sub-personal (i.e., cognitive) hypotheses or theories as answers. Typically readers who do not understand, or accept, these difficult claims see them as evading or missing the point, and complain that neither Ryle nor Wittgenstein has any positive psychological theory to offer at all. That is true: the personal level "theory" of persons is not a psychological theory. (Rachlin 1992, p. 1375)

But Ryle and Wittgenstein also claim, notably and reasonably, that the "molar actions of whole organisms" are best (and perhaps only) understood within the vocabulary and conceptual apparatus of ordinary language ("folk psychology" as we call it today); in addition, they vehemently insist that this realm was not characterizable in a systematic way or usefully subject to scientific examination. Wittgenstein's famous metaphor of the tangled byways of the "old city" and the systematically laid out scientific suburbs makes this point vividly. He also maintained that this vocabulary is wholly inapplicable to nonhuman animals. Noam Chomsky (1995) has reiterated these claims, though from a very different perspective.

Given the extraordinary range of his *biological* inquiries, Aristotle (1941), in the *Metaphysics*, unsurprisingly credits himself with the discrimination of teleological from material, formal, and efficient causation (since these are all answers to the questions *why?* it is often suggested that *explanation* is a better term than *cause*). Organisms teem with goal-oriented behavior, and their parts with functions. In *Physics II, 8*, Aristotle concludes his brief refutation of a crude version of evolution by natural selection by insisting that "therefore action for an end is present in things which come to be and are by nature." He had begun by asking

Why should not nature work, not for the sake of something, nor because it is better so, but just as the sky rains, not in order to make the corn grow, but of necessity? What is drawn up must cool, and what has been cooled must become water and descend, the result of this being that the corn grows . . . Why then should it not be the same with the parts in nature, e.g., that our teeth should come up *of necessity* – the front teeth sharp, fitted for tearing, the molars broad and useful for grinding down the food – since they did not arise for this end, but it was merely a coincident result; and so with other parts in which we suppose that there is purpose? Wherever then all the parts came about just what they would have been if they had come to be for an end, such things survived, being organized in a fitting way. (Aristotle, *Physics II, 8*)

Aristotle rejects such a view because he so clearly sees that nature is arranged in a teleological hierarchy, arching up, as Rachlin felicitously puts it, from particulars such as "swinging hammer" through "providing shelter for his family" to "being a good husband and father," arriving finally at "being a good person." For Aristotle these hierarchies of course apply to humans as well, for we are biological organisms and we are social and rational by nature. Taking up the teleological/intentional stance toward biological organisms not only helps us cleave nature at her joints (at least as a "propaedeutic to study of how internal mechanisms

work”), it also seems native to human cognition (*autism* seems the result of specific damage to the relevant brain mechanisms).

However, the reason that teleological characterizations are so successful in drawing our attention to features of organisms and their behavior is *not*, as Aristotle believed, because the creator designed them to be fruitful and multiply, nor as he seems also to have believed, because mother nature’s ends *pull* them toward themselves. Rather, to use some recent metaphors, the blind watchmaker has long winnowed and shaped up the *survival mechanisms* of the *selfish genes* in such a way that the teleological/intentional stance gets its explanatory and descriptive purchase. At times Rachlin writes as if his persons have behavioral patterns growing on them and the teleologies of these patterns somehow *pull* the organism, screaming and kicking, into its larger future. When Rachlin writes of behavioral “patterns proceeding” and of habits having “a life of their own,” I keep getting this picture of the poor organism being sucked along by these ever growing external behavioral arcs. There’s almost a suggestion of hitchhiking on them when Rachlin writes that “we keep ourselves behaving well through expansion of our behavioral units to more and more abstract patterns” (he cannot of course say that we *pick* or *will* the larger perspective because that implies inner causality, whether cognitive or neurological mechanism or dualist lightning bolts, and that is Rachlin’s *bête noire*). Though it has some heuristic value in biology, modern science rejects teleology because it is noncausal (Branch 1995 and Hughes & Churchland 1995).

There is a curious discontinuity between the hierarchical, ever-growing behavioral patterns of Rachlin’s teleological stance (from hammering to being a good person) and the deliberately impoverished uniformities of his laboratory environments as if, to play a favorite game of Rachlin’s against him, we could imagine that complicated natural environments were simply the mechanical sum of ever so many simple laboratory environments. Ethologists make a point of studying the behavior of individual organisms within the vast pattern of the particular species’ *umwelt*. This approach may be successful because they can demarcate the relevant *umwelt*, or Rachlinian large teleological pattern, narrowly in terms of what is relevant to the organism’s nutritional, predator-avoidance, reproductive, and nurtural routines (these will differ greatly from species to species, which is one problem with attempts to generalize about behavioral patterns panspecifically, especially through study of behavioral in unnatural and radically simplified laboratory conditions – nature did not design pigeons for button-pushing in spartan boxes, and that pigeons sometimes succeed in such tasks is *coincidental* rather than *teleological*). As Aristotle put it, when we study natural organisms, efficient, formal, and teleological explanations converge: the efficient cause of the organism is its parents, the final cause (telos) is the production of offspring, and the formal cause is the structure of the organism that suits it for both of these roles (beavers are nature’s way of making more beavers). But they do not typically converge so for artificial things; houses are built by house-builders (who are coincidentally biologically human) for sheltering human beings, and houses do not reproduce themselves. Aristotle’s primary example of a thing which is both natural and artificial is the human being. He strews his texts with *quas* in making this point: an individual who is by nature a human and by education a physician is a father *qua* man but not *qua* doctor, while he cures illness *qua* doctor, not *qua* man. Similarly, Aristotle held that our molars are for grinding and our incisors for tearing, while the rain does *not* fall in order to make the corn grow. The *umwelts*, the quasi-teleological hierarchies of behavioral patterns in which we humans are embedded, are vast and structured around many artificialities that often tug orthogonally to each other and to human nature. (While Rachlin has “being a good person” atop his house of cards, Aristotle put “being a good Athenian Greek” on top of his, for he held the personal/ethical must give way to the political).

The narratives of biographers and novelists provide the best, richest, and most overarchingly complex characterizations of hu-

mans embedded in such harmonious and dissonant hierarchical quasi-teleological patterns. Indeed, as Aristotle also warned in writing, in *Poetics*, that dramatic fiction is more universal than history, the novel can paint a clearer, neater, and more revealing, purposive, and instructive picture than the biographer. Real lives are cluttered with telos-less accident, and the muddy and incoherent clash of the so many *quas*, so many perspectives. The biographer can only partly overcome this by leaving out scads of material that does not serve the narration/interpretation; as times and circumstances change, biographies have to be rewritten in the context of later events. Rachlin commends Aristotle for recognizing the epithet *happy* belongs to the whole behavioral structure of a human’s life, rather than to its individual subjective moments; Aristotle went beyond this to recognize that a life thought *happy* could turn out *unhappy* because of events that happened long after the individual dies, which surely suggests that *happy* (so understood) belongs primarily to the vocabulary of the artist and the historian, not the scientist, to the evaluative construal of individual human lives, rather than a biological, physiological, neurophysiological, and psychological examination of the human organism, brain and brain function included.

Author’s Response

The teleological science of self-control

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Abstract: In response to Ainslie & Gault: The value of a temporally extended behavioral pattern depends on relationships inherent in the pattern itself. It is not possible to express that value as the simple sum of the discounted present values of the pattern’s component acts.

In response to Leiber: Teleological behaviorism may be deemed unscientific because it has not yet succeeded to the required degree in predicting and controlling the highly complex patterns of human behavior that comprise our mental lives. However teleological behaviorism is not unscientific because it is teleological or “noncausal;” nor is teleological behaviorism unscientific because it is not reducible to neurophysiology. Nothing in principle bars the development of a teleological science of the mind.

R1. Ainslie & Gault

I conservatively estimate that 75% of the theory of self-control presented in the target article arises from and is in agreement with Ainslie’s (1992) *Picoeconomics*. We are arguing here about the other 25%.

Moreover, I am happy to discover a point of agreement that I had previously thought was a disagreement. Teleological behaviorism claims that self-control (or its lack) is fundamentally a pattern of behavior (a pattern of interaction between the whole organism and the environment). In this regard teleological behaviorism retains Skinner’s (1953) purely psychological focus on the behavior of the whole organism, leaving investigation of internal mechanisms to neuroscientists. For teleological behaviorism the meaning of a self-controlled act lies in its behavioral context over time (the pattern of which the act is a part), not its physiological context at a point in time.

Ainslie's emphasis on bargaining in an "internal marketplace" (1992, p. 47 and elsewhere) would seem to imply that separate agents concurrently present within an organism ("parts within the person") are capable of trading commodities with each other. The **Ainslie & Gault** commentary makes it clear that this was not Ainslie's intent; the bargaining and trading is said to occur between interests at different times in the life of a whole organism. This clarification makes our remaining disagreements much easier to pinpoint.

According to **Ainslie & Gault**, the value of a complex pattern of self-controlled behavior such as social drinking or being honest or supporting your family or just being a good person is nothing but the present sum of discounted values of individual motivational states, each of which is meaningful at an individual point in time; these individual states are the piceconomic bargaining units. Teleological behaviorism, on the other hand, sees the value of complex patterns of behavior as intrinsic to the patterns themselves. For teleological behaviorism the conflict is not of present behavior in the form of an individual act (at T_0) versus each subsequent individual act ($T_1, T_2 \dots T_\infty$) but of relatively brief versus temporally extended patterns of present behavior.

It is not just perception of behavioral patterns but perception of their value that is necessary for self-control. To perceive the value of a behavioral pattern such as sobriety, it is not enough to discriminate between the behavior itself and its absence. You also have to discriminate those environmental patterns, such as success at work and better treatment by others, that depend on the behavioral pattern ("reafferent" stimulation) and those that do not (plain "afferent" stimulation). People (whole people) who consistently make such discriminations are *ipso facto* perceiving the value of their behavior.

When a behavioral pattern is broken up into components its value is destroyed. For teleological behaviorism a complex pattern (like social drinking) is valuable in itself as a pattern extended over time; for **Ainslie & Gault** a complex pattern is valuable only as an uneasy bargain between momentary interests. Given the Ainslie & Gault picture it is hard to see how such a bargain might be struck – how a complex pattern like social drinking might emerge out of a desire to drink in the present and abstain in the future. Why should your future interests ever allow you to drink in the present and then not drink when their time came? Such a "bargain" seems like pure altruism on the part of your future self; altruism, a denial of economic interest, has no logical place in any economic explanation – pico or non-pico.

For teleological behaviorism, wider and more complex patterns are generally more valuable than narrower or simpler ones. Social drinking (comprising drinking and abstinence) may be more valuable than teetotaling which may in turn be more valuable than having a drink this moment. The difficulty of self-control lies precisely in the fact that the value of the wider patterns is *not* punctate and is therefore difficult to perceive. Such wider patterns may be initially generated by various means – perhaps by obedience to a verbal rule. But leaving aside outside forces such as parental or legal constraints, patterns are maintained by their own intrinsic value. What keeps the pattern together (to answer one of **Ainslie & Gault's** questions) is the fact that breaking it up destroys its value. However, breaking up a relatively valuable pattern is not necessarily

the first step down a slippery slope. It may be the first step in achieving a still more valuable pattern.

The healthy-breakfast eater who chooses one morning to have ham and eggs, the teetotaler who chooses to have one drink at a party, the workaholic who takes one day off, all may be adding an interesting complexity to their lives; they are not necessarily descending to bad health, drunkenness, or sloth. There is no way for anyone to know whether the new pattern will be more valuable than the old one until it plays out. You've got to break an old habit to begin a new one. That is why such decisions are fraught with anxiety. You could go up or down. Ainslie's often discussed "bright lines" (birthdays, anniversaries, holidays, any special occasion to break a pattern) are discriminative tools in establishing higher valued patterns – like counting and timing one's own behavior in order to gain control over it. Nothing about the use of bright lines contradicts teleological behaviorism or supports Ainslie's piceconomic concept of self-control. Once you are exercising regularly, for example, you can enjoy the benefits of exercise (perceive its value) but one day of exercise in a context of slothfulness is, if anything, painful. And it doesn't matter whether that day comes now, in the near future or the distant future. Unless it occurs as part of a pattern, exercise will *never* be enjoyable. What value does it have that it could possibly bargain with?

A second remaining difference between piceconomics and teleological behaviorism is the absolutist character of the former and the relativistic character of the latter. For teleological behaviorism, an act is an act only relative to a wider pattern; a pattern is a pattern only relative to a narrower act. It is therefore useless to look for ultimate individual units. Even a rat's single immediately reinforced lever press may be conceived as a pattern. Pressing the bar and eating is more valuable than pressing the bar in itself. The value of the bar press is high only in the context of the complete pattern. In the context of the complete pattern, pressing the bar is an act of self-control. Not pressing the bar is impulsive because in isolation from the pattern not pressing is preferred to pressing. Would there be any point in conceiving this situation as a bargain struck in an internal marketplace between the rat's present motive not to exert the energy to press the bar and the current value of its future motive (a fraction of a second later) to eat the food? Perhaps at this point readers can decide for themselves.

R2. Leiber

Dennett's (1978) intentional stance and teleological behaviorism are alike in that they begin at the same point – with behavioral observation. But they differ profoundly in the sense that they go off in two different directions. For Dennett, the meaning of a mental state such as being in pain resides in its underlying cognitive mechanism and eventually in its underlying physiological mechanism; to put it another way, the defining context of an act is its set of internal efficient causes; behavioral observation eventually leads inside the behaving organism. For Dennett, Aristotle's *quas* are not so many behavioral perspectives but so many internal mechanisms. An actor on a stage may act as if he were in pain *qua* actor and may act in exactly the same way *qua* headache sufferer. For Dennett, the actor is *really* in pain or not or depending on the mechanism (conscious or unconscious) that caused the pain behavior. This is a reasonable view, I believe, but it is not the view of teleological

behaviorism. For teleological behaviorism the meaning of a mental state, its defining context, is the wider pattern of overt behavior in which the narrower pattern is embedded – its final cause; behavioral observation leads not into the behaving organism but out to more and more extended behavioral patterns. The difference between the actor acting as if he were in pain and the actor truly in pain is that in the former case the pain behavior begins when the curtain goes up and ends when the curtain comes down while in the latter case the pain behavior extends both earlier and later in time. To identify Aristotelian, teleological psychology with Dennett's intentional stance is to miss the point of both.

It is another question whether one or the other view of the mind can lead to scientific understanding. Aristotle certainly believed that both perspectives were necessary. However, he felt that the final causes of behavior were more scientific (because more abstract) than efficient causes. **Leiber** evidently believes that neither Dennett's intentional stance nor teleological behaviorism can lead to a science of the mind (perhaps this underlies his failure to distinguish between them). He apparently takes the view, not unusual among philosophers of mind, that psychologists ought to just give up and leave the field to them.

If "folk psychology" is the unanalyzable last word on mental life, as **Leiber** claims, then why does he approvingly cite the authority of Wittgenstein that (contrary to folk psychology) animals have no minds? I suspect that Leiber's real bottom line is not folk psychology at all but his own subjective introspections. It is as difficult to relinquish the notion that our minds are spiritual prisoners inside our bodies, accessible only by privileged introspection, as it is to give up the notion that human beings reside at the center of the universe. But both notions are barriers to scientific understanding. The point of studying "artificially boxed behavior," "deliberately impoverished uniformities," and "unnatural and radically simplified laboratory conditions" is not that anyone believes that "complicated natural environments [are] simply the mechanical sum of ever so many simple laboratory environments." Rather, in these simple environments we can isolate certain motives of the human or nonhuman subject, control the constraints on the subject's choices, and observe the resulting behavior and outcomes. This is not to deny that life is complicated. However, anyone who has observed the behavior of a compulsive gambler, an alcoholic, or a heroin addict can see patterns in their behavior, patterns that they did not themselves choose and may not themselves perceive.

Leiber sets up standards for what constitutes scientific respectability that are impossible to fulfill. It is not only human behavior that is complicated but the behavior of everything in nature. Psychological experiments are pointless according to Leiber because they are "artificial" and "simple." Of course psychological experiments are artificial and simple relative to the real world. So are the vacuums and bubble chambers of physical experiments. Is physics less of a science because it cannot predict the path of a leaf falling from a tree?

As **Leiber** says, there is much to be learned about mental life from novels and biographies. This is because, contrary to Leiber's suggestion, mental life is nothing but just plain life, abstractly perceived. Mental life is not neurophysiology (however valuable neurophysiology may be).

Experiments described in the target article (see also

Rachlin 1995) show that adult humans are better able to behave in accordance with relatively abstract behavior-environment contingencies when choices are made in clusters rather than (as logic might dictate) on a case-by-case basis. This is because, on a case-by-case basis, people tend to fall into prisoner's-dilemma traps; [See also Caporael et al.: "Selfishness Examined" *BBS* 12(4) 1989, and Maynard Smith: "Game Theory and the Evolution of Behaviour" *BBS* 7(1) 1984.] When we find our behavior taking on patterns that we did not choose (including neurotic and depressive patterns as well as those typically thought of as problems of self-control) we might, in the light of the target article's experiments, attempt to restructure our behavior. An alcoholic, for example, might extend his pattern of drinking, never buying (or filling) one glass of liquor at a time but always choosing to buy either four or five at a time or none at all. Overweight individuals should never remove just one Dove bar from the freezer but either six Dove bars or none. No addict should ever permit himself to say, "just this once." This sort of regimen is what the experiments described in the target article suggest. It may or may not work as well as reading Tolstoy. We shall see.

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