

# CAUSAL DEPTH, THEORETICAL APPROPRIATENESS, AND INDIVIDUALISM IN PSYCHOLOGY\*

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Individualists claim that wide explanations in psychology are problematic. I argue that wide psychological explanations sometimes have greater explanatory power than individualistic explanations. The aspects of explanatory power I focus on are *causal depth* and *theoretical appropriateness*. Reflection on the depth and appropriateness of other wide explanations of behavior, such as evolutionary explanations, clarifies why wide psychological explanations sometimes have more causal depth and theoretical appropriateness than narrow psychological explanations. I also argue for the rejection of eliminative materialism.

**1. Introduction.** Individualism claims that psychological states supervene on the intrinsic, physical states of the individual. It has been argued to be a constraint on taxonomy in psychology which rules out certain explanations as unsuitable for a properly scientific psychology (Fodor 1987, 1991; see Wilson 1992 for discussion), or which expresses a truth about computational psychology (Egan 1992, Segal 1989). While the debate over individualism has sometimes attended to empirical research in psychology, it has not focused explicitly on the criteria we use in evaluating causal explanations. This paper introduces two related aspects to explanatory power, *causal depth* and *theoretical appropriateness*. We do and should, *ceteris paribus*, prefer causal explanations that exhibit these explanatory virtues. But nonindividualistic psychological explanations of behavior are sometimes causally deeper and more theoretically appropriate than their individualistic rivals. Therefore, in at least some cases, we should reject individualistic explanations in favor of wide explanations of behavior because of the latter's greater explanatory power.

This sketches the chief argument in this paper, whose primary conclu-

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sion is that individualism is not a constraint on psychological taxonomy which shows that certain types of explanation or particular research programs are unscientific. Some of the details of this argument also provide reasons for rejecting neuroscientific explanations in favor of intentional explanations of behavior; the argument is thus also secondarily directed at eliminative materialism, particularly versions that concentrate on our commonsense conception of mental phenomena as intentional (P. M. Churchland 1981, P. S. Churchland 1986, Ramsey et al. 1991). Both individualism and eliminativism ascribe a primacy to intrinsic, physical properties in scientific explanation; this leads to a view of what a properly scientific psychology must be like that focuses on the issue of how such a psychology is to be integrated with the developing neurosciences and computer science. If the argument of this paper is correct, then we can understand why this view and focus should be rejected.

The argument is developed in four stages. First, I provide an account of the explanatory virtues of causal depth and theoretical appropriateness (sec. 2). Second, I examine a class of wide explanations of behavior that clearly possess the above explanatory virtues (sec. 3). While these are not psychological but *evolutionary* explanations of behavior, their depth and appropriateness is due to their wide, functional nature. Third, I sketch the argument as applied to the case of psychology (sec. 4), and, fourth, defend its premises (secs. 5–6). Finally, I draw more general conclusions and point to some of the difficulties that this argument poses for individualists (sec. 7).

**2. Explanatory Power: Causal Depth and Theoretical Appropriateness.** Both whole theories and particular explanations can vary in their explanatory power. Two aspects to explanatory power are causal depth and theoretical appropriateness. I focus on the case of explanations rather than theories.

Consider, first, the notion of causal depth. The idea that an explanation must have causal depth, and that better explanations are those that identify or specify causally deeper factors than their rivals, is the idea that causes should be *resilient* across slight counterfactual changes. In circumstances slightly different from the actual circumstances, the causes that an explanation with causal depth identifies still exist, and the explanation remains true. In the language of possible worlds, a causally deep explanation holds not only in the actual world but in nearby possible worlds. *Counterfactually rigorous* explanations thus have a degree of necessity; the notion of causal depth indicates the necessity of good explanations. We can think of causal depth as a *vertical* dimension to explanatory power: It is a relation between a given explanation and the phenomena explained.

For an explanation to have causal depth, it has to possess an *implicitly*

*general scope*. A causally deep explanation will apply not just to the particular phenomenon being explained but to phenomena that are of the same *type* or *kind*. Minimally, such explanations must range over kinds rather than particulars: An explanation should be true of a type of entity, process, event, and so on, if it really explains *why* an entity or phenomenon came about or did what it did. Explanations that have a more extensive scope within the domain being explained are causally deeper explanations.

Even if the implicitly general scope of an explanation is part of what it is for that explanation to have causal depth, note that it cannot be the whole of it. After all, one can gain generality simply by decreasing the amount of information one provides in one's *explanans*, or by formulating predicates that by stipulation apply to many entities. Yet these ways of making an explanation more general would not give one a causally deeper explanation.

According to R. Miller (1987, 98–104), in explaining the Nazi rise to power in Germany in the early 1930s, an explanation appealing to the role of individual decisions and actions would have less causal depth than one appealing to the functional interests of big business and government, even though both types of explanation, let us suppose, accurately identify the actual causal processes that brought about the rise of the Nazis. Given the economic and social conditions in Germany in the early 1930s, the Nazis would have risen to power even had, say, Hindenburg not invited Hitler to become chancellor. Explanations that cite only the decisions and actions of individuals as the causal factors responsible fail to capture the *sine qua non* of that phenomenon; such explanations lack causal depth.

In A. Garfinkel's (1981, chap. 2) terminology, an explanation that lacks causal depth is *hyperconcrete*. Garfinkel argues that for explanatory purposes it is often more illuminating to ignore the details that microstructural explanations provide in order to draw out regularities in the phenomena being explained. This point is fairly intuitive when considering explanations in the social sciences in which the object of explanation is often a process or phenomenon that is *merely instantiated* in the actions of particular individuals. Merely instantiating explanations cite only the properties, states, and entities that happen to instantiate some process where those particular realizers are not essential to the process being explained (see Jackson and Pettit 1990, Wilson 1993).

Let us turn now to *theoretical appropriateness*. An explanation is theoretically appropriate when it provides a natural (e.g., nondisjunctive) account of a phenomenon at a level of explanation matching the level at which that phenomenon is characterized. Consider some intuitive cases of theoretical *inappropriateness*. Appealing to a complex change in the quantum state of every subatomic particle in a person's body is not the

basis for a theoretically appropriate explanation of why a person subsequently makes one decision rather than another even though such an appeal may accurately identify the causal antecedents of that person's decision. Explaining why the proportion of women in, say, graduate programs in philosophy remains extremely small requires explanations drawn from history, sociology, and gender studies, rather than decision theory, even though we might suppose that decision-theoretic explanations are sufficient.

Take Putnam's ([1973] 1981) well-known example of the explanation of why a square peg goes through a slightly larger square hole, but not through a round hole with a diameter equal to the square hole's width. It is more appropriate to explain this fact in terms of rigidity, size and geometry than in terms of the microphysical properties of the objects involved. Both types of explanation may make the same predictions about what will happen when you try to put the square peg through the round hole, and the microphysical explanation will almost certainly provide you with a more accurate specification of *precisely* what will happen. Nevertheless, the geometric explanation is more theoretically appropriate in this case (see Garfinkel 1981, 59–61). If we think of causal depth as a vertical dimension to explanatory power, then theoretical appropriateness is a *horizontal* dimension: It concerns the relationship not between explanation and phenomena, but between *explanans* and *explanandum* within the structure of an explanation.

Although Garfinkel and Putnam are primarily concerned with a weakness in reductionist explanations in the social sciences, causal depth and theoretical appropriateness are features that *any* type of explanation might possess or fail to possess: The application of these concepts is in principle orthogonal to issues concerning reductionism. A difference in theoretical appropriateness can make one explanation better, in a given context, than another, but nothing here suggests that in certain contexts microstructural explanations could not be more theoretically appropriate than their macrostructural counterparts; the same is true more generally of "lower-level" and "higher-level" explanations. One can understand the two faces of inappropriateness in terms of an analogy. Corresponding to the two ways in which an image produced by a lens can distort how an object really is, that is, by being either too acute or too obtuse, explanations can suffer from either a certain sort of theoretical myopia—a criticism directed primarily at microexplanations—*or* by obscuring features that are shared at some lower level of description; this latter vice would be one that certain *macrostructural* explanations possess. The same point holds for causal depth: Many of our causally deepest explanations *are* microphysical explanations.

Like simplicity, precision, and degree of unifying promise as applied

to both general theories and particular explanations, causal depth and theoretical appropriateness are pragmatic and context-sensitive constraints on explanation whose content in particular cases is to be determined by the details of those cases.

They provide *defeasible* criteria for evaluating causal explanations. An explanation that has less causal depth than another might actually be the better explanation, all things considered; likewise, for theoretical appropriateness. These criteria may pull in different directions in particular cases, and an overall comparison of two or more competing theories will sometimes involve judgements about the relative importance of each of these criteria.

Furthermore, criteria such as causal depth and theoretical appropriateness *tend to* be possessed by our best explanations for particular phenomena. That is, even though they are distinct, they tend to cluster in or be coinstantiated by the very same explanations. For example, take the explanation of the Nazi rise to power in terms of the functional interests of big business, which is causally deeper than an explanation in terms of individual decisions and actions. The functional explanation is also more theoretically appropriate than the narrative explanation in that the causal factors it describes better match the macrosocial phenomenon being explained than do those mentioned in the narrative explanation (see also Putnam's example). Were one interested in understanding why the Nazis rose to power *through Hitler's actions*, then the *narrative* explanation would be more theoretically appropriate; but for such an *explanandum*, the functional explanation would also lack the causal depth of the narrative explanation. Precisely *why* our preferred explanations tend to possess features that cluster is a question whose answer requires a stance on broader issues in the philosophy of science; it is a question I will not attempt to answer here.

**3. Evolutionary Explanations of Behavior.** Although the distinction between narrow and wide explanations of behavior derives from the distinction between narrow and wide construals of mental states, and so applies in the first instance to *psychological* explanations of behavior, the distinction also applies to other types of explanations of cognitive behavior. An explanation of behavior is narrow just if it individuates or taxonomizes the causes of behavior by reference only to properties that supervene on the intrinsic, physical states of the individual whose behavior is being explained; it is wide otherwise. By definition, wide explanations of behavior violate individualism.

A large class of biological explanations for cognitive behavior are evolutionary in that they explain the existence and perhaps prevalence of a given type of behavior by reference to its evolution by natural selection.

Behaviors can be properly thought of as *phenotypes* that animals, including human beings, possess, and, as such, can be the object of evolution by natural selection. Evolutionary explanations exist for a broad range of animal behaviors, including the fleeing behavior of gazelles, the “digging” and “entering” behaviors of certain species of solitary wasps, the cooperative mimicry behavior of cicadas, the hygienic behavior of honeybees, brood parasitism in cuckoos, and kin preference in monkeys (Dawkins 1982, 1986, 1989).

Consider a request for an evolutionary explanation of a particular cognitive behavior, say, the fleeing behavior of gazelles when they detect the presence of a predator. Why do gazelles flee from lions? Some of these explanations cite the *selection pressures* which caused that behavior to have been developed over evolutionary time; they refer to how the phenotypes of the current genetic and biochemical causes of the behavior were selected. Selection pressures include the relative abundance of competing species, predators, and prey; the presence of particular environmental toxins; and the existing physical condition of members of the species. Explanations citing the pressures of selection causally responsible for the existence of a given behavior are wide, not narrow, since selection pressures do not supervene on the intrinsic, physical properties of individuals. (The question of whether some selection pressures *do* supervene is irrelevant here; the point is that *at least* plenty of selection pressures do not.)

Selection pressures are *causally deep* determinants of at least some behaviors. For example, had gazelles not been faced with the selection pressures imposed by predators, the species would not have developed that behavior. Selection pressures must operate causally through a variety of local causal factors (e.g., the transmission of genes and their complexes), for, as in the psychological case, there is no evolutionary “action at a distance”. Yet we have no reason to suppose that the best causal, evolutionary explanations of behavioral patterns ought, ultimately, only to make reference to these causal factors as these would be typed by an individualist. Many disciplines and subdisciplines in the biological sciences are not concerned with identifying local causes or causal powers, and even disciplines concerned with identifying the local causes of behavior do not necessarily individuate those causes narrowly. While it is reasonable to expect macroevolutionary explanations of behaviors to be complemented by various microevolutionary explanations, there is nothing wrong with offering explanations for behavior that are macroevolutionary. My main point, however, is not just that wide evolutionary explanations of behavior are perfectly acceptable within the evolutionary sciences. Rather, wide explanations may actually be or be part of the

deepest causal explanations that we can have for particular behaviors *because* of their width.

Wide evolutionary explanations may also be more *theoretically appropriate* than narrow explanations of the same phenomena. This is primarily because in many evolutionary sciences the interest is in explaining behavior described with relative coarseness. Behavior is considered as *fleeing*, or as an organism's *camouflaging* itself, or as *imitating* members of the opposite sex (or another species). Precisely how an organism engages in behavior that falls under one of these descriptions will vary greatly, even within a given species. For behavior described so coarsely, even if narrow explanations in some sense accounted for the behavior so described, wide explanations would be more theoretically appropriate. To return to the lens metaphor in section 2, because evolutionary explanations cast in terms of selection pressures sharpen our focus on behavior described in this coarse way, they are to be preferred to narrow explanations.

One might wonder *why* wide evolutionary explanations of behaviors have, in some cases, depth and appropriateness. This issue deserves more consideration than I can give here, but one reason derives from a point about the nature of selection. Species are often faced with problems that require behavioral adaptation in order to be solved. Selection pressures often *force* a solution to a particular survival problem in the following sense: Had the actual, local causal factors by means of which that problem is actually solved not been available, the problem would have been solved in some other way. In complex organisms, one would expect a multiplicity of ways in which a survival problem can be solved from which the actual solution is "chosen" or developed. Since certain behaviors, like phenotypes more generally, sometimes solve particular survival problems, we should expect this to also be true of behavior. We might call this the *implementational plasticity* of behavior. Given that some behavior is, in this sense, implementationally plastic, wide explanations will often have more causal depth than their narrow competitors. Also, since one cannot adequately characterize the *explanandum* in terms of the merely instantiating physical movements in which such behaviors are manifested, more theoretically appropriate explanations will feature *explanantia* that are wide. Given implementational plasticity, explanations cast in terms of wide causal roles have a causal depth and theoretical appropriateness that explanations cast in terms of actual, local causal factors lack.

Individualists might find this discussion consistent with their views of taxonomy and explanation *in psychology*. I will call *concessive individualism* the position that rejects individualism about evolutionary explanations while endorsing individualism in psychology. One reason for thinking concessive individualism to be a coherent, defensible position turns on the a posteriori character of causal depth and theoretical appro-

priateness. I have suggested general features of evolution which imply that deep and appropriate evolutionary explanations for behavior will often be wide. But if my argument depends on features of the practice of *evolutionary* explanation, one should expect the depth and appropriateness of wide evolutionary explanations to have no real significance for *psychological* explanation.

This train of thought is one with which I have considerable sympathy. But concessive individualism is difficult to maintain; it is a view which, I argue in section 7, is not defensible.

**4. A Statement of the Argument Against Individualism.** Suppose both narrow and wide descriptions of neurological states are parts of *prima facie* satisfactory but distinct psychological theories. The narrow descriptions could be either syntactic or “narrowly contentful”, and they may or may not correspond in some systematic way to the wide descriptions. Call the theory embodying the narrow descriptions *N* and the theory embodying the wide descriptions *W*. If *N* describes mental states in such a way that the states it specifies vary significantly across individuals, while *W* describes states that are more widely shared by individuals under various conditions, then, *ceteris paribus*, *W* will refer to deeper causal factors than *N* and so will constitute the basis for a deeper explanation of cognitive behavior than does *N*. Theory *N* will have neither the implicitly general scope nor the counterfactual rigor of *W*, its causally deep rival. If *W* introduces descriptions of the causal factors responsible for behavior that better match the level at which that behavior is to be described than those that *N* introduces, then *W* will be more theoretically appropriate than *N*.

The claims that require defense, then, are that in at least some cases (1) wide specifications of the mental states of individuals identify causal factors in psychology that are more counterfactually rigorous and have greater scope than the corresponding narrow specifications (causal depth), and (2) wide psychological explanations are pitched at a level that better fits the level at which behavior is to be described (theoretical appropriateness). For a parallel argument against eliminativism, replace “wide” with “intentional”, and “narrow” with “neuroscientific”. In sections 5 and 6, I state how modifications of these claims against individualism provide us with arguments against eliminativism, noting points at which the arguments diverge.

If I am correct in thinking that there is little resistance to the corresponding conclusion about evolutionary explanations of behavior, then resistance to the conclusion in the psychological case derives from thinking that the premises of the argument, (1) and (2), are false.



**5. Theoretical Appropriateness in Psychology.** Consider, first, premise (2), my claim about theoretical appropriateness. Individualists claim that behavior should be described *autonomously* (Stich 1983), though they differ on whether this entails that psychology ought to explain behavior described *intentionally*. Autonomous behavioral descriptions provide an individualistic description of behavior: They abstract away from the historical and relational aspects of behavior so that the behavior they describe supervenes on the current, internal, physical state of the individual. The individualist's claim that behavior must be described autonomously can be seen as a recognition of theoretical appropriateness as an aspect of explanatory power. In psychological explanation, the descriptions one gives of mental causes must match the descriptions one gives of the behavioral effects that those causes have: Both must be autonomous.

The individualist agrees, then, that one should prefer the most theoretically appropriate descriptions of mental states, other things being equal. There is, however, a substantive disagreement about which behaviors *are* the most theoretically appropriate. In some cases wide psychological explanations are more theoretically appropriate than narrow explanations of behavior because wide explanations offer descriptions of mental states that more closely fit our conception of how behavior ought to be described for the purpose of psychological explanation. Psychology explains an agent's *actions*, and the individualist cannot provide an adequate conception of the notion of an action; not all characterizations of the behaviors that are the *explananda* are autonomous descriptions of behavior (see Taylor 1964, esp. chaps. 3, and 7, on the behaviorists' conception of an action).

Note that although we can state what autonomous behaviors are in a precise manner, even paradigmatic, uncontroversial examples of autonomous behavior so defined are difficult to provide. In part, this may be due to the disagreement between individualists about whether autonomous descriptions of behavior and mental states are content-free (e.g., syntactic) or content-laden. This dispute put aside, difficulties remain in fixing on clear cases of autonomous behavior. Stich's (1983, 167–170) example of an autonomous behavior, that of a robot "performing a weld" (in contrast to "performing its 1000th weld"), is not autonomous since, while it may abstract away from *some* historical and relational facts, it does not abstract away from all such facts. It is, perhaps, reasonable to expect difficulty in pointing to clear examples of autonomous behavior using our ordinary language, and to think instead that descriptions of autonomous behavior will be constructed *within* developing individualistic psychological theories; after all, both a syntactic and a narrow content psychology must differ in important ways from our commonsense psychology.

Both individualists and nonindividualists should grant that many non-

autonomous behaviors warrant psychological explanation, just as many nonautonomous behaviors warrant *evolutionary* explanation. As the standard twin-Earth case shows, folk psychological descriptions of behavior are often, even typically, nonautonomous. In experimental psychology, particularly cognitive psychology, behavior is most usually treated as a dependent variable whose value is determined by variations in some independent variable, and from which one draws inferences about the underlying mental causes of behavior. Standard types of behavioral paradigms that are incorporated into experimental design in cognitive psychology, such as preferential looking, forced choice, and maze navigation paradigms, involve nonautonomous behaviors. The crucial questions, then, are (a) whether such behaviors are constituted by behaviors that *are* autonomous, and (b) whether these autonomous descriptions of behavior adequately characterize the *explanandum* of psychology.

One reason for a negative answer to (b) is that generalizations in psychology sometimes quantify over behaviors that are constituted by different autonomous behaviors. Consider a vivid example, the phenomenon usually referred to as “latent learning” whereby an animal’s performance on a task such as maze navigation exists for different ways of navigating a maze, such as running it and swimming it. There is a psychological generalization about the *navigation* of a maze, not simply the *running* of it. There is a common psychological explanation of the behavior of, say, running and swimming rats, one which presupposes a level of psychological description according to which they are doing the very same thing; such a level of description is nonautonomous. *Even if* we concede that every nonautonomous behavior requiring a psychological explanation is constituted by autonomous behaviors, psychological generalizations range over the nonautonomous descriptions of behavior; at least some *behavioral* kinds in psychology are nonautonomous. This being so, the most theoretically appropriate *mental* kinds that explain at least some behaviors must also be nonautonomous.

An affirmative answer to (a) does not suffice to show the theoretical appropriateness of narrow descriptions of mental states. The reading of (a) about which both individualists and nonindividualists can agree is that every wide behavior is constituted in part by a narrow behavior. Yet this reading of (a) tells us nothing about behavioral kinds *in psychology*. Recall from section 3 the point that the behaviors of an organism explained by the evolutionary sciences were often described coarsely (as *fleeing*, or as *camouflaging* itself) without regard to the particular movements in which the behavior is instantiated. This is not to say that there is no narrow description of these behaviors, only that, given the explanatory practice in these sciences as they have actually developed, explanations in terms of selection pressures are more theoretically appropriate for be-

havior described so coarsely. I suggest an analogous conclusion about *psychological* explanations of behavior; the explanatory interests of psychology require wide taxonomies of mental states and behavior.<sup>1</sup>

Consider *skills*. Skills often *involve* an individual's acting in the world; having a skill involves bodily know-how that is constitutively related to possession of the skill. Even when skills can be decomposed into constituent autonomous behaviors that *are* the *explananda* of a narrow psychological theory, explanatory interests of cognitive psychology transcend such autonomous behaviors. For example, suppose that the skills that compose the ability to play the piano have autonomous descriptions. There remain questions of psychological significance not addressed by the existence of such a decomposition: What is it about certain individuals that allows them to reach a level of expertise in their piano playing? is the development of the skill of piano playing influenced by the development of other skills? is there a critical period during which certain experiences dramatically influence one's capacity to develop the skill? what is the relationship between possession of the skill at a certain level and more general abilities? In attempting to answer such questions, psychologists taxonomize individuals *not* according to what autonomous behaviors they engage in—experts, for example, can be extremely diverse in this respect—but, rather, in accord with the types of *wide* behavior they exhibit. The fact that the skill can be decomposed into its constituent autonomous behaviors is of only secondary interest from at least part of “the” psychological point of view.

These same considerations show why neuroscientific explanations may not be as theoretically appropriate as wide intentional explanations and so point to a problem for eliminativism: Explanatory interests in understanding behavior are described intentionally rather than as a series of bodily movements. Wide intentional explanations are more theoretically appropriate to such an *explanandum*.

**6. Causal Depth in Psychology.** In defending premise (1), I consider the cases of folk psychology and subpersonal, cognitive psychology separately.

*6.1. Causal Depth (1): Folk Psychology.* Philosophers who think that there is an individualistic vindication of the propositional attitudes (e.g., Fodor 1987, 1991) are at least implicitly committed to a revision of folk

<sup>1</sup>Were the set of wide behaviors that require psychological explanation isomorphic to some set of narrow behaviors such that one could factor each member of the former set into a member of the latter, then we might have some type of vindication of individualism. Yet the claim that such an isomorphism exists is controversial and, I think, implausible. Refer to the case of evolutionary biology.

psychology, one cast in terms of narrow content. Let us call this *narrow-folk psychology*, which is the psychology that results from replacing wide content with an appropriate notion of narrow content in folk psychology together with any required adjustments. By construction, folk and narrow-folk psychology are alike in many respects, differing primarily in that the former is wide, the latter narrow. One claim recognized by both anti-individualist defenders of folk psychology and those who propose to defend folk psychology by defending its narrow counterpart is that individuals in the actual world vary in their *physical* constitution. Since individuals *do* share beliefs and desires, folk explanations of behavior must be pitched at a different level of description from those developed in the neurosciences. Likewise, narrow belieflike and desirelike states that are part of narrow-folk psychology must be pitched at a more abstract level of description than neurophysiological levels. What is sometimes referred to as the *chauvinism* of such explanations can be stated in terms of their hyperconcreteness: Such explanations fail to be as counterfactually rigorous as higher-level, *psychological* explanations, such as those that exist within folk psychology and those proposed by revisionists about folk psychology.

Thus narrow descriptions of folk psychological (narrow-folk) mental states, to avoid being chauvinistic and so hyperconcrete, need to be narrow *functional* descriptions, abstracting from the physical details of the state realizations. This is not to imply that narrow-folk psychology is committed to a conceptual role account of narrow content. *Whatever* account of narrow content one favors, narrow content must supervene on the intrinsic, physical properties of the individual, and it is more plausible to view narrow content as having a functional rather than a physical level description. Similarly, ordinary, *wide* folk psychological states have a wide *functional* description, rather than some wide physical description.

Just as neurological descriptions of folk *and* narrow-folk states are chauvinistic and so hyperconcrete, so too are narrow functional descriptions of folk psychological states. As in the case of the argument for functionalism over type-type materialism that claims that the latter is chauvinistic, this claim can be defended by considering an interspecific case.

Consider creatures whose behavior is as sophisticated and as systematic as our own, which is explained by attributing to them *either* folk or narrow-folk psychological states. Both individualists and anti-individualists should agree that it would not impugn either of these attributions to discover that such Martians are composed of physical stuff that is very different from our own cellular, material basis. Furthermore, similar discoveries about the underlying subpersonal, cognitive mechanisms, what is sometimes called the “depth psychology” (here called “subpersonal psychology”) of

such creatures, would also not defeat our *ordinary* folk attributions, particularly if the wide part of the functional roles of their mental states was the same as ours. Ordinary folk psychology is not tied to the subject of what McGinn (1989, 171 ff.) has called *psychotectonics*, the study of how to engineer or build a cognitive system. Folk psychology does not make a substantial claim about the realization or implementation of the states its posits; epistemologically, our folk psychological attributions are relatively insensitive to discoveries about our subpersonal psychology.

To understand why, consider a case involving discoveries about the subpersonal psychology of people from cultures other than one's own. Is there *any* discovery about cross-cultural differences in subpersonal processing mechanisms that could lead us to think that people whose behavior was as sophisticated and as complex as ours *did not have beliefs and desires*? I think not. The contrary view reflects a chauvinistic or perhaps an overly specific view of folk psychology, one which does not appreciate the huge epistemological gap between investigations in subpersonal, cognitive psychology and the commitments of folk psychology. As Dennett puts it:

Suppose, for the sake of drama, that it turns out that the subpersonal cognitive psychology of some people turns out to be dramatically different from that of others. One can imagine the newspaper headlines: "Scientists Prove Most Left-handers Incapable of Belief" or "Startling Discovery—Diabetics Have No Desires." But this is not what we would say, no matter how the science turns out. (1987, 234–235; see also Horgan and Graham 1991)

Would such discoveries about the subpersonal psychology of other beings or other members of our own species defeat our narrow-folk explanations of their behavior? In the following sense they would not: Simply finding *some* difference in the subpersonal psychology that they instantiate need not imply that they are subject to a different narrow-folk psychology. But if we allow that their subpersonal psychology may vary arbitrarily from our own, then the following problem arises. On the conception of narrow-folk psychology according to which narrow-folk psychological states are instantiated as subpersonal states  $s_1 \dots s_n$ , as tokens in the "language of thought", narrow-folk states will not be instantiated in creatures who lack  $s_1 \dots s_n$ . Only folk psychology would apply both to us and to such creatures since we may differ arbitrarily in the subpersonal psychologies we possess.

For narrow-folk psychology to have the causal depth that folk psychology has, it needs to be tied less closely to subpersonal psychology: It needs to posit narrow functional states that are not tokens in the "language of thought", for creatures very much like us in terms of the ex-

tensive and sophisticated behavioral regularities they exhibit need not instantiate such tokens. Yet a more general challenge for the individualist can be posed. Even if we seemed able to explain the behavior of other creatures by applying our narrow-folk psychology to them, we would be mistaken if they varied with respect to *just* the narrow functional structure that fixes narrow content. Such a discovery about their functional distinctness from us would impugn our narrow-folk attributions (but not our *folk* attributions) for the same reason that it would impugn our attributions of particular psychological mechanisms.

The width to folk psychology—precisely what any narrow-folk psychology lacks—gives folk psychology its causal depth. Thus, *any possible* account of narrow-folk psychology will have less causal depth than ordinary folk psychology. The general case made for folk over narrow-folk psychology *may* fail because of details to be completed as part of a narrow-content program in philosophical psychology; yet, that would be a failure in the argument I offer. But this argument introduces a new consideration for those who think that such a program *can be* completed: The explanations of a narrow-folk psychology will need to be at least as causally deep as are those in ordinary folk psychology. Since proponents of narrow-folk psychology typically consider folk psychology itself to have considerable causal depth, this constraint is not trivial. The argument also employs a general strategy against those who wish to defend the causal depth of narrow-folk psychology: show that creatures who lack the narrow functional structures that are to be identified with narrow contents could, nonetheless, share our folk psychological states (see Shoemaker 1981, esp. secs. 4–6).

The corresponding argument against eliminativism, which would defend the claim that some intentional psychological explanations have greater causal depth than any nonintentional explanation, divides into two cases: one against nonintentional, *neuroscientific* explanations; the other against nonintentional, *syntactic* or computational explanations. Since eliminativists, unlike advocates of the narrow-content program, are typically skeptical about the causal depth of folk psychology, the argument here could not appeal solely to folk psychology, but would have to appeal to other types of intentional psychology. I will not develop this argument against eliminativism here.

*6.2. Causal Depth (II): Cognitive Psychology.* Let us now consider explanations in subpersonal, cognitive psychology. Much of contemporary psychology is constituted by explanations offering functional analyses for given capacities. The object of explanation is a cognitive capacity, such as detecting edges, recognizing faces, remembering names, and drawing valid conclusions. In explaining how agents possess such

capacities we break the capacity into simpler, component capacities. The methodology here is *homuncularly functional*. That is, we posit a mechanism (a homunculus) which performs a function that is a necessary part of some larger function we know the cognitive system does perform. The explanatory burden is discharged because each constituent capacity is cognitively simpler than that which it constitutes (Cummins 1983; Lycan 1981; 1987, chap. 4; 1988, chap. 1).

The prevalence (or even ubiquity) of the homuncular strategy of explanation in cognitive psychology seemingly suggests that large parts of psychology must be individualistic. For even when we have wide descriptions of mental states, these can be factored into descriptions of the constituent capacities which are narrow; similar considerations might be adduced in favor of neuroscientific descriptions of constituent capacities. Yet this does not follow; and for at least some psychological capacities, it is false. I take the weaker of these claims first.

Suppose that the functions that some homuncular units perform mediate between individuals and their environments in such a way that the sub-personal mechanisms posited are described in terms of their long-armed, world-involving, and often specialized functions. Describing such mechanisms purely in terms of their narrow functional role would not fully express what such psychological mechanisms *do*. Nonetheless, an individualist who pointed out that wide descriptions of psychological capacities add nothing to the narrow descriptions of their constituent capacities could at least pose the following challenge: Show me *what* such wide descriptions give us in explanatory terms over and above what the constitutive narrow descriptions give us. In principle and in practice, additional causal depth. A wide homuncular psychology may be causally deeper than any narrow homuncular psychology.

Let me first make the point abstractly in terms of a comparison of a wide homuncular psychological theory *WH* and its closest narrow rival *NH*. (Roughly, *NH* will be *WH* shorn of its wide homuncular functions.) Theory *WH* may be true in more nearby possible worlds than *NH* and so have greater causal depth because *WH* includes reference to stable relational properties that remain instantiated by individuals in the environments in those worlds. Hence *WH* maintains its truth in these worlds while *NH*, lacking such reference, is false. The presupposition is that the constituent capacities (say  $c_1 \dots c_n$ ) of *WH* in nearby possible worlds are different than in the actual world, while the psychological capacities they constitute in the actual world are the same across these possible worlds. Or, since causal depth comes in degrees and many of our deepest theories and explanations are not true in *all* nearby possible worlds,  $c_1 \dots c_n$  are instantiated in less of the nearby possible worlds than are the wide capacities they constitute in the actual world. I claim that this situation is

clearly possible. Its possibility shows that individualism *need not* be a consequence of the reliance of subpersonal cognitive psychology on the homuncular strategy.

The more interesting claim, however, is that this relation *actually* holds between some wide psychological theories and their closest narrow rivals. For example, research in visual cognition suggests that there are special mechanisms for *face recognition*, that is, mechanisms that function to identify either conspecific or familiar faces when oriented in the standard way. Our face recognizers are able to recognize faces in the actual world. While we might discover many facts about how our face recognizers work—for example, how they decompose into their constituent capacities and how they are physically realized—that way of describing part of our cognitive apparatus is wide, not narrow. Devices in other possible worlds that have the same constituent capacities that are not able to recognize faces do not function as face recognizers. Consider the individualist's challenge: What does being a face recognizer add to being the sort of thing that has all of the psychological capacities that constitute being a face recognizer in the actual world? What do we lose if descriptions like "face recognizer" are not included in our cognitive psychology? *Causal depth*. Face recognition is a psychological capacity which it is likely that *we* (or creatures very much like us) instantiate in nearby possible worlds.

One reason is that even if our evolutionary history had differed enough so that the particular cognitive capacities that constitute face recognition in the actual world had been different, we would still instantiate face recognizers: Because face recognition is a modular capacity selected for the advantages it confers, it would prevail even were the way it evolved to differ. To illustrate, consider that there are nearby possible worlds in which our evolutionary history is such that we have face recognizers constituted by capacities different from those we have in the actual world. The converse is not true: We have those constituent capacities only because they constitute face recognizers, and so in nearby possible worlds in which we lack the capacity to recognize faces we do not instantiate these constituent capacities. Hence *only* the wide homuncular theory applies to both the actual and these nearby possible worlds, and so the wide homuncular theory is causally deeper. Although parts of our subpersonal, cognitive psychology *would* differ between the actual world and these nearby possible worlds, namely, the parts that are concerned with explaining how our psychological capacities are realized, these parts are not the whole of psychology.

Cosmides and Tooby (1987) have noted that traditional evolutionary explanations of behavior have largely ignored what they call "the missing link" between evolution and behavior, namely, the psychological mechanisms that lead to certain behaviors rather than others. Additionally, such



a missing link has been considered principally in terms of physiological rather than psychological mechanisms:

Psychological mechanisms can be studied on different descriptive and explanatory levels. Most biologically informed studies of proximate mechanisms have described psychological mechanisms in terms of their physiological underpinnings. . . . But natural selection theory, so far, has made only limited contributions to the investigation of physiology. Just as different kinds of hardware can run the same computer program, different physiological mechanisms can accomplish the same adaptive function. (Ibid., 283)

Cosmides and Tooby seem to suggest that an evolutionary psychology is more likely to be stated at a distinctly psychological rather than a physiological level of description, even though its principal concern is to identify and characterize psychological *mechanisms*. For the very reasons that this *is* likely, so too is an evolutionary psychology likely to be wide rather than narrow: Adaptive functions are wide, not narrow. Prima facie, evolutionary psychology is wide, positing cognitive mechanisms individuated both historically and by reference to the (wide) function that those mechanisms serve in a particular evolutionary context.

Perhaps more important, however, is the following general question that the development of an evolutionary psychology raises: If the causally deepest explanations for some psychological capacities are evolutionary and wide, what reason is there to insist that such explanations are not part of cognitive psychology? The question is not rhetorical, for there may be differences across disciplines that explain behavior with respect to whether they are constrained by individualism. What the question implies, however, is that the line to be drawn is *not* that between psychological explanation and evolutionary explanation, since some psychological explanations *are* evolutionary. Let us restate the question in a way that removes any hint of a squabble about where to draw disciplinary boundaries: What reason is there to think that individualism imposes a constraint on the explanation of an individual's mental capacities and behavior, given that we already have the beginnings of wide explanations for some of these capacities and behaviors that are not individualistic?

**7. Conclusion: Wide Explanation is Explanation Enough.** While section 3 illustrates how the criteria of causal depth and theoretical appropriateness apply to evolutionary explanations of behavior, the existence of both wide and narrow explanations within an evolutionary framework is suggestive for psychology. Even with the development of various branches of genetics during the twentieth century, explanations offered by these disciplines have not replaced and are extremely unlikely to re-

place wide explanations that appeal to selection pressures. Likewise, neither folk psychological nor wide functional explanations are used only because we currently lack knowledge about the internal workings of the mind. Wide explanations may be both causally deep and theoretically appropriate and, like wide evolutionary explanations, have these explanatory virtues *because* of their width.

My argument presupposes that narrow and wide explanations of behavior compete with one another. However, reflection on the case of evolutionary explanations might give one reason to doubt this assumption. Does one have to choose wide evolutionary explanations over narrow explanations? After all, in actual explanatory practice in the evolutionary and biological sciences there is a sort of *peaceful coexistence* between the two. One should adopt this general view of *psychological* explanation: Both wide and narrow explanations have their place in psychology. Yet this is compatible with thinking that in particular cases wide and narrow psychological explanations are rivals, and that they can be profitably compared and evaluated by the criteria of causal depth and theoretical appropriateness. What “peaceful coexistence” is incompatible with, however, is both (i) the acceptance of individualism as a constraint on psychology, and (ii) neurophilic eliminativism. The evolutionary sciences are inherently pluralistic in their methodology, in their taxonomies, and in the types of explanations they offer. Psychology is (and more generally the cognitive sciences are) and should be at least as taxonomically pluralistic as the evolutionary sciences.

Might there not be something about explanatory practice in the evolutionary and biological sciences, a feature absent in psychology, that allowed *it* to be inherently pluralistic? If there were, then one could maintain what I called concessive individualism, a position difficult to maintain. The difficulty arises in part because evolutionary and purely psychological explanations need to be integrated, though this ideal of integration or unification should not be taken to diminish the differences that exist between current evolutionary and psychological explanations. But there is a more general reason to be skeptical about the possibility and plausibility of concessive individualism. The diversity of types of explanation within the evolutionary sciences is indicative of how diverse psychological explanation is, will continue to be, and ought to be. In the cases of both evolutionary and psychological explanations of behavior, while the individual may constitute a natural boundary for taxonomy and explanation in *some* cases, it does not do so for all cases. No difference is apparent between evolutionary and psychological explanatory practice. I suggest that we take these at face value, for no feature of explanation in the evolutionary sciences seems to allow it to be taxonomically pluralistic while psychology cannot be.

To take just one purported difference between the evolutionary sciences and psychology, one might think that Dretske's (1988, 42–45) distinction between *triggering* and *structuring* causes provides one with the basis for defending concessive individualism. The triggering causes of a process initiate or activate that process; its structuring causes are those events which shaped that process in the first place. (In Dretske's own terms, triggering causes are what cause "the *C* which caused the *M*", while structuring causes are what cause "*C* to cause *M* rather than something else" [1988, 42].) Explanations in terms of selection pressures are most plausibly seen as identifying structuring causes, not triggering causes: They explain why, for example, gazelles flee from lions rather than why a particular gazelle responds in a particular case in that way. Psychological explanations, by contrast, do address this latter explanatory question, and when we are interested in identifying the triggering causes of behavior, our explanations must be individualistic, for such causes are always located inside the individual.<sup>2</sup> This suggestion could be developed in at least two different ways.

First one might think that psychology must be individualistic because it does not specify the structuring causes of behavior. Concessive individualism is defensible because we can understand the taxonomic pluralism of the evolutionary sciences in terms of their concern with specifying both the triggering and the structuring causes of behavior; psychology lacks this concern, and so must be individualistic. Recall that the explanatory interests that drive actual explanatory practice in psychology require taxonomies of behavior that are not individualistic (sec. 5). Such explanatory interests also make it difficult to characterize all of psychology as the search for triggering causes. For example, developmental cognitive psychologists are *primarily* interested in the acquisition and change in an individual's cognitive structure over time, and such an interest involves identifying both the triggering and structuring causes of behavior. Even if we bracket areas of cognitive psychology overlapping with the evolutionary sciences, this defense of concessive individualism involves a view of psychological explanation that makes little sense of some core areas of research in psychology.

Second, one might think that the distinction provides the basis for an account of why certain explanations are individualistic and why others are not and allows one to express an important kernel of truth in individualism: Triggering explanations of behavior must be individualistic. Now, unless one also thinks that psychology identifies *only* the triggering causes of behavior, this view does not allow one to defend concessive

<sup>2</sup>D. Scott-Kakures suggested one version of this view; J. Klagge and S. Shoemaker have, independently, made a similar suggestion (personal communication).

individualism. While reconciling such a restrictive view of psychology with current explanatory practice in psychology is difficult, even adopting such a view of psychology would not allow one to defend concessive individualism since even when we are interested in the triggering causes of behavior we might taxonomize such causes broadly rather than narrowly.

I have done little here to address directly a more radical line of response than concessive individualism: that of someone who agrees that wide psychology and evolutionary biology are on a par but thinks that *both* suffer from related weaknesses. Such a person views my use of the “partners in crime” strategy as identifying partners *in crime*. This dispute can only be resolved by reflection on both the sorts of a posteriori explanatory virtues and constraints articulated here and explanatory practice itself; its resolution we must leave for another time.

Since one can understand *why* wide taxonomies and explanations ought to be adopted in some cases in psychology in terms of the criteria of causal depth and theoretical appropriateness, it is difficult to see what is wrong with wide explanation in psychology. In psychology, as in other causal, explanatory sciences, wide explanation is explanation enough.

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