

## **Evolutionary Psychology and the Taxonomy, Diagnosis, and Treatment of Mental Disorders**

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In their essay, “Darwin in the Madhouse,”<sup>1</sup> Dominic Murphy and Stephen Stich make a case for taking the perspective of evolutionary psychology in order to improve the taxonomy, diagnosis, and treatment of mental disorders as currently laid out in the *Diagnostic and Statistical Manual*, or DSM.<sup>2</sup> Murphy and Stich are primarily interested in the effect the perspective of evolutionary psychology might have on the reclassification of the taxonomy mental disorders, but they also speculate about the effects taking such a perspective might also have on diagnosis and treatment. Their conjecture on taxonomy is that it would result in the elimination of some disorders, the addition of others, and generally produce a fairly dramatic reshuffling of disorders overall, for reasons I will lay out as I make my case. They argue as well that shifts in diagnostic criteria would follow, with adjustments to therapeutic interventions as well. Although they have little to say about the former and only some vague speculations about the latter, they do float some hypotheses with which I will take issue.

Let me stress at the outset that I take no issue with the general position of the authors that the DSM, even in light of the revised DSM-V, is in need of continued efforts to improve both the classification of disorders and the diagnostic and treatment guidelines that go along with them. Nor am I opposed to an evolutionary account of mind in principle, as some such naturalistic account is bound to be correct. I am deeply suspicious, however, about the ability of the perspective of evolutionary psychology to improve on the existing state of affairs with respect to the diagnosis and treatment of mental disorders. In fact, my view is that taking such an approach could just as easily make the existing situation, for both clinicians and patients, worse. In sum, my position is that evolutionary psychology still faces such serious roadblocks to becoming a workable theoretical and practical paradigm that encouraging its use in the reclassification, diagnosis, and treatment of mental disorders is not only theoretically unwise, but also therapeutically dangerous.

In this paper I describe some of the highlights of Murphy and Stich’s account, with a special focus on several types of depressive disorders. I then turn to one particular weakness for the evolutionary psychologist’s approach, involving the fundamental notion of the so-called Environment of Evolutionary Adaptedness or EEA. This is just one of a number of foundational concepts in evolutionary psychology that is, in my view, deeply flawed, and I will show how such flaws can

substantially impact our understanding of the evolution of human psychology including the mental disorders plaguing it.

Murphy and Stich begin with the standard evolutionary psychology model of mind, outlined in even broader and more wooly terms than it sometimes is: the human mind is a collection of an unspecified number (sometimes conjectured to be in the hundreds or even thousands<sup>3</sup>) of dedicated cognitive mechanisms, often referred to as *modules*. Not much is said in “Darwin in the Madhouse” about what makes these mechanisms *modular* (it is often insisted by evolutionary psychologists that they should definitely *not* be understood as meeting the characteristics of modularity in the classic sense outlined by Fodor<sup>4</sup>) except that modules are domain-specific. From the perspective of evolutionary psychology, this means that they were designed by evolution by natural selection to cope with a specific adaptive problem, or sometimes a related set of problems, faced by our hominid ancestors. As a consequence of their domain specificity, these modules are thus to some degree informationally-encapsulated. There seems also to be an assumption of relative automaticity, which is presumably part of what produces, on the authors’ account, suffering on the part of the patient: patients cannot exercise direct control over modular function, or malfunction as the case may be, and therein lies a, if not *the*, painful rub.

It is assumed by evolutionary psychologists that each of these modules was designed by evolution by natural selection in what is referred to as the Environment of Evolutionary Adaptedness (or EEA). The EEA is sometimes specified geographically, roughly, as the African Savannah. Other times it is specified temporally, as the Pleistocene Era (roughly 2.5 million to 11,000 years ago.) At times both are invoked, as in “the African Savannah during the Pleistocene Era.” I will have more to say about these assumptions in what follows, but for now let’s see where the authors think this general perspective takes us when it comes to the taxonomy, diagnosis, and treatment of mental disorders.

Murphy and Stich argue that if this model of the human mind is right, we ought to find two very different sorts of mental disorders, each of which has its own sub-categories.<sup>5</sup> On the one hand, we ought to find those disorders that are due to problems internal to the person, while on the other hand we should find some disorders that are not due to any internal malfunction, but rather to a mismatch between the EEA and the current environment. In other words, the first category is due to modular malfunctions of some kind, while the second category is due to the fact that what was an adaptive response in the EEA may no longer be adaptive in the current environment.

As Murphy and Stich argue, when it comes to those problems resulting from internal issues, we should expect to find that they themselves are also of two very different kinds. It should be that we find, on the one hand, problems that are due to modules experiencing internal malfunctions, and, on the other hand, problems due to modules that are themselves functioning properly, but that are

receiving the wrong kind of input (or failing to receive input altogether) from a module “upstream” that feeds into that module. In such cases problems arise in a “garbage-in, garbage-out” fashion.

Speculation about examples of the internal type that involve modules that are themselves malfunctioning that Murphy and Stich cite include autism, which is hypothesized to be caused by a failure within a “theory of mind” module. Another is psychopathy, which is hypothesized to be due to a failure of a “violence-inhibition mechanism.” Finally, they cite dysthymia (an affective disorder characterized by a continued depressed mood over a period of more than two years), which is hypothesized to be due to a failure of a “reciprocal relations” module.<sup>6</sup>

When it comes to examples of disorders speculated to be due not to specific modular failure but rather to a failure of communication between modules, the authors offer Capgras Delusion, in which the patient believes someone close to her has been replaced by a doppelgänger. This is thought by the authors to be due to a failure of the affective-response mechanisms to provide the module responsible for face-recognition with the correct inputs. It is hypothesized that the face-recognition module requires at least two inputs and thus has the structure of an and-gate: it requires both input about the structure of the face (perhaps using a template-matching mechanism) as well as an affective-response input that tells the person whether the face is familiar or not, and how much so. If either of those inputs is missing or defective, malfunctions will result. In the case of propagnosics, facial recognition itself is missing altogether, but in the case of those with Capgras Delusion, the recognition is there but the affective response is missing. To quote the authors, “As a result, these patients have an experience analogous to seeing the identical twin of one’s best beloved. The visual match is there, but not the emotional response.”<sup>7</sup> Here the problem is postulated as a problem with the recognition module, however, it is not thought to be due to a failure of the recognition module itself, but instead to a failure of an “upstream” module (the affective-response module) that inputs to that recognition mechanism.

The other major category of disorders the authors argue that we might see if the evolutionary psychology approach is correct is mental disorders that are due to a mismatch between module and current external environment. Evolutionary psychologists are fond of emphasizing that what was once adaptive in the ancestral environment of adaptedness (EEA) may not be adaptive in the contemporary environment. Thus, we might see any number of disorders for which there is nothing wrong internally—all modular systems are functioning “as nature intended,” so to speak—but instead what was functionally useful in the ancestral environment is now detrimental in the contemporary environment. Murphy and Stich cite as possible examples of disorders of this type phobias such as fears of heights or of crowds, both of which may have been adaptive (or at least not clearly maladaptive) in the ancestral environment but which can be crippling in a modern urban environment.

Here Murphy and Stich also offer the example of postpartum depression, which, on one broadly evolutionary hypothesis (it is not clear what role the specific modular cognitive mechanisms central to the evolutionary psychology approach are supposed to play in this story) is a response to the recognition that maternal resources may not be sufficient for infant-thriving (due to a recognition that external environmental conditions such as harsh winters, famine, etc. do not favor thriving or that social resources may not be forthcoming) and/or to problems internal to the mother and/or child (illness, deformity, etc.). There is some evidence that links PPD to these environmental conditions<sup>8</sup> but it is limited and the nature of the causal connection, if any, remains unclear. In the EEA, Murphy and Stich argue, such problems of scarcity were not typically offset by the technological advances of the contemporary physical environment (in terms of shelter, etc.) as well as the social environment (in terms of state-aid, etc.) Thus, they argue, PPD might have been an appropriate response in EEA but maladaptive in the contemporary environment—at least in that of contemporary developed nations with a strong network of state-run aid. Again, it is important to note that although Murphy and Stich devote a good deal of ink to this topic, and it is one of the few disorders for which they cite evidence linking the condition with the postulated “resource-failures,” they are curiously silent in this case about the modules) supposed to be involved.

Murphy and Stich note that, given their conjectures, it is likely that different sorts of disorders will respond to different sorts of therapeutic techniques, due to their very different causes. Some are caused by faulty modules, while others are caused by environmental mismatch. They speculate that perhaps those due to environmental mismatch will respond better to behavioral modification techniques (e.g., phobia therapy), while those due to faulty modules might respond better to drug therapy, but their discussion of treatment options amounts to little more than speculation. That, in itself, strikes at part of the danger: instead of encouraging research programs to test a given hypothesis and providing some ideas as to how that might be done, they simply float the hypothesis that as an example of “environmental mismatch” a disorder should respond better to cognitive therapy. If such speculations are what are supposed to drive the massive reshuffling of disorders and subsequent treatment plans for the new DSM under the approach of EP, then that bodes ill both for the theoretical approach and for the patients it is intended to serve.

To continue the focus on forms of depression, consider Murphy and Stich’s take on dysthymia, or prolonged depressed mood. Dysthymia, unlike PPD, falls, as they see it, under the category of modular failure, on their favored analysis. They favor an analysis in which dysthymia is due to a failure of the hypothesized reciprocal relations module (possibly better known as the postulated “cheater detection module,” thought to be responsible for the well-known differential performance on the Wason Selection Task in so-called “cheater contexts.”<sup>9</sup>) One hypothesis that Murphy and Stich float about dysthymia when thought to be due to modular failure is that it is not in

fact anything about the supposed reciprocal relations module itself that is malfunctioning. Rather they suggest that the subject has failed to internalize the specific reciprocal relations expectations of their particular cultures. This, they speculate, might lead subjects to tend to, as is often observed cases of dysthymia, over-value their own contributions to reciprocal relations while simultaneously undervaluing the contributions of others. This in turn leaves subjects feeling under-appreciated, isolated, and depressed for an extended period. A simple example of how the reciprocal relations expectations of cultures may differ that Murphy and Stich offer is that in one culture it might be of considerable value to offer a hot stock tip while in another culture it might be of significant value to pay a shaman to pray for the recovery of a child with a flu.<sup>10</sup> Here a tension seems to arise in their account: do dysthymia sufferers, under this analysis, have a failure of their reciprocal relations module? Or do they have a more general knowledge-acquisition failure that leads them to fail to internalize the reciprocal relations expectations of their particular cultures? The authors offer no words as to why they see this kind of failure—failure to internalize the expectations of one’s own culture when it comes to reciprocal relations—as resulting from a faulty module upstream rather than as the result of something else altogether.

The “evolutionary” part of evolutionary psychology appears to differ subtly on these two different accounts of depressive disorders as a result. Note that when it comes to PPD, which is supposed to result from a mismatch between old and new environments, it is not at all clear what evolutionary modules are involved. One might speculate that they would invoke some form of “parental investment module,” but Murphy and Stich say nothing about the existence of such a module or evidence for it—a notable absence since they go into some detail about the evidence for the existence of modules postulated in other cases.

Throughout, the authors utilize a “social competition hypothesis” about depression in general: The social competition hypothesis sees our ancestral communities as miniature ecosystems in which individuals strive to find niches where they can excel and make a good living. In modern societies, though, your chance of excelling—of being the best at anything, or indeed anywhere near the best—are remote. If we have inherited a mechanism which is triggered when we believe ourselves to be outcompeted, then that mechanism will fire frequently as we are inundated with information about accomplished people. But, of course, in the modern world it is far more likely that the mechanism will fail to achieve the goal it was selected to attain. If the mechanism is set off by the realization that one is not even close to being the best at anything in the global village of the information age then getting depressed is not likely to be an effective reaction. For it is typically the case that there is no other strategy to adopt -no other niche one could fill—which would do significantly better than the present one in that global competition. Moreover, the mechanism will frequently be set off even though its

owner is actually doing very well in the local environment. You can be the most respected and admired real estate developer in Sioux Falls without being Donald Trump.<sup>11</sup>

It is to be noted that Murphy and Stich do not miss the obvious objection, although they relegate it to a footnote, that on this analysis nearly everyone in a modern society should be depressed because few can reasonably expect to be the best or near the best at anything. And yet most are not depressed. How is that issue resolved? Here is their footnoted response:

One question often asked about the social competition hypothesis is why it does not entail that just about everyone in modern societies should be depressed, since almost all of us are aware that there are lots of people who are better than us in just about anything that we do. Part of the answer, we think, is that different individuals will have different levels of sensitivity to the cues that trigger this sort of depression. ... Another factor that might be relevant is that in some important ways modern societies may not be all that different from ancestral communities. For as Dunbar (this volume) has shown, the social networks that individuals maintain in contemporary societies are similar in size to the social networks of individuals in surviving hunter-gatherer communities.<sup>12</sup>

This quote displays a pair of views that are at odds with the typical evolutionary psychology account. One is that modular function may differ, apparently fairly dramatically, across and within populations. The traditional approach of evolutionary psychology has been to seek universal mechanisms that operate in like ways—pancultural traits that are insensitive to variations in environment. To the extent that purported cognitive modules behave differently depending on varied environmental triggers they lose some of their status as mechanisms adapted through cumulative natural selection and fixed in the human population, resulting in similar traits across a wide variety of ecological and social environments.

The other way in which this discussion is at odds with the standard account given by evolutionary psychology is that it suggests that modern environments may not be so dissimilar to ancestral ones. It is to this latter issue that I now wish to turn in some detail. This last issue is absolutely crucial to understanding one of the main problems facing evolutionary psychology, which is in their understanding of the relationship between organism and environment, particularly in the context of humans. The mental modules that are at the heart of the evolutionary psychologist's worldview are described as having been designed as cumulative adapted mechanisms designed to solve what are deemed to have been "must-solve" problems in the EEA. However, insofar as the EEA is described ambiguously—sometimes geographically and sometimes temporally—that puts pressure on the claim that our ancestors faced relatively stable problems. If the EEA is described simply temporally, as the

Pleistocene, we are talking about quite a long range of history, running from roughly two million to up until as recently as 11,000 years ago. During that time, human migration became widespread, covering much of the globe, and therefore making the adaptive problems facing one population quite different from those facing another population. Non-migratory Northern coastal fishermen and Southern desert nomads, due to their dramatically different ecological niches and life ways, would have faced dramatically different adaptive problems. The very fact of migration itself makes the foundational notion of a “must-solve” problem less plausible, since migration is one way of avoiding a problem one is not well equipped to solve. Instead of changing itself (in the case of human, adapting a mental module with which to solve the problem, on the evolutionary psychology perspective) an alternative response an organism has to an adaptive problem, is to simply pull up stakes and migrate to a more accommodating environment, changing the nature of the adaptive problems faced as a result. This produces an unstable set of environments facing ancestral humans. It at once relaxes the selective pressures those populations faced, and introduces new ones in place of them, and it puts pressure on evolutionary psychology’s claim that our ancestors faced a stable set of must-solve problems, problems to which the response was cumulatively adapted cognitive mechanisms.

But matters get worse for the approach of the evolutionary psychologist when we turn to the other major way in which an organism might respond to an adaptive problem. Here, rather than change itself, organisms can engage in niche-construction, changing their environments so as to relax the pressure of the so-called “must-solve” adaptive problems. This means that even if we restrict our view to the other way of thinking about the EEA, and talk of the “African Savannah,” we have to recognize that different populations of humans may have engineered their local environments differently, changing the nature of the adaptive problems faced. Evolutionary psychology assumes a forager lifestyle that is stable over the long term, so that “must-solve problems” are uniform and relatively continuous, giving genetic selection the time needed to accumulate mutations to construct the many complex cognitive mechanisms postulated as the make-up of the human mind. When it comes to psychology, much human psychology is based in our social systems, and in that regard humans are especially talented niche-constructors. As a result, different populations of humans living on the African Savannah, even if they have developed similar technologies for engineering the external physical environment, may have very different social structures in place and face very different adaptive problems as a result.

This last point is particularly important for our discussion of depression since throughout Murphy and Stich take a social competition analysis of depression as a likely candidate. Depression, in general, on their favored analysis, is a response to perceived failure to compete socially. But social competition will take very different forms in differently-arranged social systems. Some human populations are more strictly hierarchical while others are more egalitarian. Of those that are

hierarchical, some are be patrilineal and others matrilineal. Just think about how Murphy and Stich wanted to analyze Post-Partum Depression from an evolutionary point of view: their analysis was based in the idea that the mother recognizes that her offspring is unlikely to thrive and withdraws support as a result. Sometimes that recognition was of a defect with the mother herself, or of some defect or deformity of the offspring, but more interesting to the authors—when the hypotheses of evolutionary psychology really kick in—were the cases where the mother simply perceived that social support was not likely to be forthcoming. But the strategies (and thus the purported evolved mechanisms, which again, were suspiciously absent from this part of Murphy and Stich’s discussion) for recognizing when social support is available are liable to differ substantially if one lives in a highly-stratified, hierarchical, patriarchal society than if one lives in a more egalitarian, matriarchal society. Thus, the stable environment needed for the development of those evolved cognitive mechanisms appears to be lacking.

The upshot of all of this is that the perspective of evolutionary psychology depends on the human environment having been relatively stable for relatively long periods, so as to provide the pressure of the many “must-solve” that faced all of our ancestors and thus resulted in our having evolved stone-age minds in a modern world.<sup>13</sup> But this perspective is misguided, and misunderstands the nature of human evolution at a fundamental level. It fails to take into account both the extent of human migration during the purported period of adaptive response, as well as the extreme extent to which humans, including ancestral ones, have engaged in niche-construction to change the nature of the selective pressure their particular populations faced.

The DSM, it is widely agreed, remains in need of much work. But to encourage the use of such a fundamentally misguided understanding of human evolutionary history as the basis for restructuring and reordering the way in which we deal with mental disorders is thus not only theoretically problematic but potentially therapeutically dangerous as well. Again, when it comes to the treatment modifications that would follow from such a restructuring, the authors suggest nothing more than speculative hypotheses and do nothing to point the way toward a methodology for constructing an improved set of treatment plans for dealing with mental disorders. Until evolutionary approaches to psychology takes seriously the fact that humans have evolved in a wide variety of, to a large extent self-constructed, adaptive environments, it is not a good candidate for the theoretical foundation for a radically new approach to the taxonomy, diagnosis, and treatment of mental disorders.



## Notes

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<sup>1</sup> D. Murphy and S. Stich, "Darwin in the Madhouse," in *Evolution and the Human Mind: Modularity, Language, and Meta-cognition*, Peter Carruthers and Andrew Chamberlain, eds. (Cambridge University Press, 2000), 62-92.

<sup>2</sup> The current edition at this time is the DSM-V, but at the time of their paper, the DSM-IV, although they sometimes refer instead to the DSM-III. The differences do not matter for the present purpose, since none of the revisions was driven by taking the approach of evolutionary psychology as central to the taxonomy. Thus, all are equally problematic from the perspective taken by the authors.

<sup>3</sup> See J. Barkow, L. Cosmides, and J. Tooby, eds., *The Adapted Mind* (Oxford University Press, 1992), chap.1 for a general account of the approach of evolutionary psychology and a variety of postulated "must-solve" problems and their associated modules.

<sup>4</sup> Cf. Barkow, et al., *The Adapted Mind*, and S. Pinker, *How the Mind Works* (W.W. Norton & Co., 2009).

<sup>5</sup> I restrict my discussion in this paper to these two basic types. The authors also discuss conditions that are typically considered disorders but on their account might not be. Those include histrionic personalities and sociopathy. These, they argue, involve no failure on the part of the mind of the person so much as they result in problems for those around them. On their account such conditions are not disorders but rather frequency-dependent strategies for resource acquisition.

<sup>6</sup> The reciprocal relations module is more commonly known as the "cheater-detection module," made famous initially by Leda Cosmides in her Ph.D. dissertation and subsequently elaborated on by Cosmides and Tooby in *The Adapted Mind*. This is perhaps the flagship example of an "established" evolutionary psychology module—despite well-argued competing analyses of the data such as that of P. Davies, J. Fetzner, and T. Foster, "Logical Reasoning and Domain Specificity: A Critique of the Social Exchange Theory of Reasoning," *Biology and Philosophy* 10 (1995): 1-37, and D. Buller, *Adapting Minds: Evolutionary Psychology and the Persistent Quest for Human Nature* (Bradford Books, 2005).. Davies, et al 1995 and Buller, 2005.

<sup>7</sup> Murphy and Stich, "Darwin in the Madhouse," 79.

<sup>8</sup> See E. Hagen, "The Functions of Postpartum Depression and the Implications for General Depression." Paper presented at the Tenth Annual Meeting of the Human Behavior and Evolution Society, Davis, CA, 8-12 July 1998.

<sup>9</sup> See Barkow, et al., *The Adapted Mind*, chap. 3.

<sup>10</sup> Murphy and Stich, "Darwin in the Madhouse," 75.

<sup>11</sup> Murphy and Stich, "Darwin in the Madhouse," 82.

<sup>12</sup> Murphy and Stich, "Darwin in the Madhouse," 82, footnote 11.

<sup>13</sup> Pinker, *How the Mind Works*, 42.

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