



As an undergraduate, most of the professors in the Anthropology Department at my university practiced psychological anthropology, a subfield of sociocultural anthropology that combines theories from various branches of psychology with the study of culture. I decided that I was going to be a psychological anthropologist, and I continued on at the same university, with the same professors, for my graduate degrees. Although I was confident that, to understand human behavior, it was necessary to investigate the interaction of mind and culture, I nevertheless became increasingly dissatisfied with psychological anthropology, which lacks an overarching theory from which to derive hypotheses, and which often eschews hypothesis testing in favor of description and interpretation. Anthropologists usually emphasize the differences between people in different societies, yet, during my doctoral field research, I was impressed by the underlying universalities in human emotions. I began thinking more about human evolution, and, with guidance from several primatologists, I gradually began to invent my own version of evolutionary psychology. I was unaware that such a discipline was already emerging – indeed, many of my ‘new’ ideas had already been formulated more clearly by others. It was a revelation when I attended my first meeting of the Human Behavior and Evolution Society, and discovered a whole field devoted to my area of interest.

Lesson 1: Look beyond your local circle of colleagues. If you are fortunate (as I have been), you will be surrounded by brilliant scholars; however, even the best such group is but a tiny fraction of all of the scientists in the world. Learn from those around you, but do not limit your horizons to their interests or perspectives. Instead, seek out investigators whose views are different from those with which you are familiar.

While I was writing my dissertation, a friend gave me a copy of the newly-published *The Adapted Mind* (Barkow, Cosmides, & Tooby, 1992). Although this book proved to be seminal, unfortunately for me, the key chapters by Leda Cosmides and John Tooby (Tooby & Cosmides, 1992; Cosmides & Tooby, 1992) had minimal impact on me at the time. While I am to blame for not having been more diligent, part of the problem lay in the way that these chapters were written. Much as I admire Drs. Cosmides and Tooby, their early work suffered from two limitations. First, their writing packed numerous complex ideas into overly dense language. Second, their style was dismissive of substantial bodies of prior scholarship, waiving it off as misguided – although I too was critical of conventional social science, I nevertheless knew from my own research that there was much of value therein. Puzzled and put off, I (and others like me) regrettably ignored many aspects of *The Adapted Mind* for quite a while.

Lesson 2: Express your ideas in the manner most likely to be both understood and attended to by your audience – don’t hobble the impact of your work by turning off your audience. Science is a collective effort, as the scope of knowledge about even a single topic is too vast for any one scholar to advance alone. Accordingly, to be a productive scientist, you must shape the thinking and research of others. Being an effective communicator is therefore part of being a good scientist.

While I found some of the remarks in *The Adapted Mind* off-putting, many of the criticisms of conventional social science voiced by evolutionary psychologists are apt. With the caveat that it is important to craft the message in such a way that it is not dismissed, attacking erroneous ideas is a

central component of the scientific process, for it is only through successive improvement that science advances. However, it is a substantial mistake to assume that the work of those who do not share your perspectives has no value. One of the most unfortunate side-effects of the attack on the tabula rasa view of the mind has been the dismissal by many evolutionary psychologists of cultural anthropologists' important contributions in documenting diverse human ways of life.

Lesson 3: Science demands a mixture of arrogance and humility. You must be arrogant enough to believe that you have insights and ideas that are better than those of generations of scholars who came before you, yet you must also be humble enough to recognize that many prior theories and findings are of great value.

Most scholars have no difficulty attacking competing schools of thought and, as I noted, this serves a useful function. However, the same process whereby bad ideas are weeded out must also be applied within one's own discipline. When I first encountered evolutionary psychologists, I was shocked at how often the arrows of their criticisms were only pointed away from their community. Perhaps reflecting our evolved coalitional psychology, there is a very strong tendency to refrain from criticizing those who share one's theoretical premises and styles of research. Yet, the more similar one's own theoretical orientation and methodological skills are to another's, the better one is positioned to criticize their work, and hence the greater the duty to do so.

Lesson 4: Science is advanced by a community of disputatious scholars, hence each investigator must contribute to the debate. Provided that the message is phrased constructively, one of the best things that you can do for your colleagues in evolutionary psychology is to criticize their work; likewise, this is one of the best things that they can do for you. Your colleagues' work, and your own, will be stronger for having survived the gauntlet of collegial criticism. I am fortunate to be surrounded by smart, well-informed people who often disagree with me. Seek out, and help to create, such communities. Even when doing so goes against cultural norms of respect for consensus and authority, teach your students to generate competing hypotheses, ferret out methodological weaknesses, and, above all, voice them.

I noted earlier that many students of evolutionary psychology pay insufficient attention to the diversity of human ways of life. For a number of reasons, this is a mistake.

First, in generating new ideas, we often begin with our own folk models about human nature. Being cultural in origin, such folk models necessarily capture only a portion of the range of human behavior, and hence we are likely to overlook important aspects of psychology that are not prominent in our own culture's portrait of the mind (Fessler, 2010). Moreover, if we first fail to study the record of human diversity, and then later fail to test our ideas cross-culturally, we run the risk of tautologically confirming our culture's folk model using data obtained from participants who subscribe to those same beliefs. Consider the following example: academics belong to subcultures that prescribe prestige-based status and proscribe dominance-based status. Correspondingly, scholars have largely presumed that women could be expected to value the former in a male mate, and devalue the latter. These presumptions were then confirmed by studying the preferences of university women, i.e., members of the same subculture. However, a broader ethnographic perspective indicates that not all women share these preferences; a broader adaptationist approach views dominance traits as having value in some ecologies; and testing a broader sample reveals that, in a highly adaptive fashion, women prefer dominance in men as a function of the extent to which they perceive themselves as being in need of protection from violence (Snyder et al., in press).

Lesson 5: Understanding human diversity is vital to generating and testing hypotheses about the mind. Read ethnographies describing other cultures, travel whenever the opportunity presents itself, and try to surround yourself with colleagues who are familiar with disparate ways of life - what

seems self-evidently true about humans to you may not seem so to others. If there is reason to suspect that the features of the mind at issue could be variable across groups, whenever possible, employ samples that vary along potentially relevant dimensions.

A second reason to attend to human diversity is that many adaptations can be expected to be facultatively adjusted or deployed. In order to test for such possibilities, or even to recognize that they might exist, we must consider the range of physical and social ecologies that humans inhabit. Consider, for example, the case of sex differences in reactions to sexual versus emotional infidelity. In their pivotal paper on the subject, Buss et al. (1992) insightfully noted that this effect should vary across cultures as a function of the degree of male parental investment. However, although much research has now been done on jealousy, some in cultures other than that of the original authors, nonetheless, investigators have yet to compare results across samples selected specifically with regard to variation along this critical dimension. A preliminary effort in this regard (Yamashita, 2005) suggests that the Na (Mosuo) culture of Southwest China could provide an ideal setting for such an investigation. However, as this example suggests, testing hypotheses across ecologies that differ along functionally relevant axes will not always be easy.

Lesson 6: Facultative adjustment is a neglected feature of many evolutionary hypotheses; one likely reason for this is that acquiring relevant data often requires working with less accessible populations. Convenience is not a good reason for neglecting important questions. Scientists in other disciplines venture into space, or to the depths of the oceans, in pursuit of scientific knowledge; surely evolutionary psychologists can gather data from people who are not just like themselves.

The third reason to attend to human diversity is arguably the most important of all. Humans are profoundly different from other species, yet much of contemporary evolutionary psychology (including much of my own work) examines topics that could plausibly be explored in many species. The single most important difference between humans and other species is our reliance on cultural information. While it is likely true that a portion of the variation between societies identified by cultural anthropologists and cultural psychologists is actually due to common expression of facultative adaptations in a common environment (Tooby & Cosmides, 1992), it is also likely true that such cases are the exception rather than the rule, as the vast majority of such variation will be due to acquired cultural information (Richerson & Boyd, 2004). The archeological record indicates that culture has shaped behavior from the very beginnings of humanity. That we have had such a long history of reliance on cultural information, and that it has played such a central role in our survival, indicates that biological and cultural evolution must have long been taking place in tandem, with feedback relationships between the two processes (ibid.). Of particular importance for evolutionary psychology, this means that we should expect a rich suite of adaptations dedicated to the acquisition, use, and transmission of cultural information (Fessler, 2006; Fessler & Machery, in press). While some scholars are beginning to address such topics (e.g., Barrett, 2005), the field remains wide open.

Lesson 7: The least-explored aspect of evolutionary psychology, that of adaptations for culture, is arguably the most important. We have been addressing relatively straightforward topics, such as mate selection or aggression, that are directly analogous (and, often, homologous) with other species. As long as we confine ourselves to such topics, we will fail to explain many of the most important aspects of human behavior.

Why has so much attention been devoted to the evolutionary psychology of mate selection, mateships, and mate retention? It is true that these are domains in which behavior has a direct effect on fitness, and hence that we should expect to find adaptations at work here. However, the same is also true of foraging, food selection, food preparation, and the effects of caloric intake, yet there is much less work in this area (for some exceptions, see Wang & Dvorak, 2010; New, Krasnow,

Truxaw, & Gaulin, 2007). Indeed, until recently, humans probably spent far more time, energy, and attention in pursuit of food than they did in pursuit of mates, so much so that specialized adaptations are apparently required to cyclically supercede the former in favor of the latter (Fessler, 2003). Hence, while I acknowledge that areas of behavior, cognition, and emotion are informed by mating issues, nevertheless, I am skeptical of attempts to explain large swaths of human experience in these terms. I suggest that the reasons that evolutionary psychologists have devoted so much attention to these issues are as follows: 1) it is easy to study many aspects of mating phenomena in university undergraduate samples, as young people are motivated to address such topics; 2) many of the relevant predictions are consonant with folk models, hence hypotheses are readily generated from intuitions; and 3) many of the central questions are readily derived from highly accessible concepts such as parental investment theory - one need not know much about evolutionary biology or human history to generate many of these hypotheses.

Lesson 8: The current overemphasis on mating-related phenomena in evolutionary psychology probably reflects a tendency to begin with the easy topics; it is time for more evolutionary psychologists to tackle more difficult and, arguably, more important areas.

Despite having originally been trained as a psychological anthropologist, for over a decade I have been employed in the biological anthropology program at UCLA. Being surrounded by experts in human evolution, and being responsible for teaching courses about human evolution, I have been forced to learn more about evolutionary processes, population genetics, and the details of our species' history. The same is true with regard to both the ethnography of extant hunter-gatherer societies (useful as a source of information in reconstructing ancestral selection pressures), and the study of nonhuman primate species (useful as a source of information regarding both selection processes and ancestral traits). Although I consider myself under-educated in all of these areas, I suspect that this is true to an even greater degree of many of my colleagues in evolutionary psychology. A rich understanding of these topics is required if we are to explore many of the most important aspects of human nature. To illustrate the potential impact of such knowledge, consider how it can open up additional possibilities even with regard to the work of scholars who are already very sophisticated evolutionists. Evolutionary psychologists studying the psychology of race have argued that, because the phenotypic features now used as racial markers were clinally distributed in ancestral populations, ancestral humans would never have encountered different "races," hence the psychology of race must actually reflect some other psychology, such as that of coalitions (Kurzban, Tooby, & Cosmides, 2001) or ethnies (cultural groups) (Gil-White, 2001). However, it is increasingly likely that humans and their predecessor species were often sympatric with other hominid species (for example, see Green et al., 2010). This raises the possibility that the mechanisms underlying the psychology of race evolved to address not interactions with coalitions or ethnies, but interactions with other species, thereby explaining the essentialism characteristic of the psychology of race (see Gil-White, 2001).

Lesson 9: A rigorous evolutionary psychology requires a thorough familiarity with theories and findings pertaining to many aspects of evolution. Disciplines differ from one another for good reason, as there is efficiency in a division of labor. However, evolutionary psychology is, by its nature, interdisciplinary. Hence, to do evolutionary psychology well, scholars cannot afford the usual luxury of narrow specialization - our field requires much more homework. This is not to say that evolutionary psychologists must be experts in all of the disciplines that their work contacts; obviously, this is not practical. Rather, the solution is a combination of diligent pursuit of information outside of one's own area and membership in a highly interdisciplinary community of scholars. Texts are beginning to appear aimed at educating evolutionary psychologists in this regard (e.g., Nettle, 2009), but often there is no substitute for direct exposure to both the primary literatures and the practitioners thereof - I myself have learned as much from discussions around

the lunch table with esteemed evolutionists as I have from reading books.

One facet of evolution that is often under-appreciated by evolutionary psychologists is the impact of the history of an adaptation on its operation. When first investigating a postulated adaptation, it is a useful heuristic to assume a high degree of optimality. However, if we are to understand the details of how a given adaptation operates, we must recognize that selection frequently produces imperfect mechanisms. Although there are many sources of constraints on optimality, one that is of substantial importance for evolutionary psychology stems from the fact that, rather than arising *de novo*, adaptations usually evolve through the modification of existing traits. A wide variety of psychological phenomena are thus best described as kluges, inelegant solutions created by modifying and combining existing adaptations (Marcus, 2008). Consider, for example, the emotion disgust. There is increasing evidence that sexual disgust is a discrete adaptation that regulates mating behavior (Lieberman, Tooby, & Cosmides, 2003; Fessler & Navarrete, 2003; Fessler & Navarrete, 2004). Yet, it appears that sexual disgust is accompanied by nausea and similar qualia associated with ordinary disgust. These reactions have nothing to do with sexual behavior, and impose costs on the individual (ranging from a reduced likelihood of exploiting available feeding opportunities to temporary incapacity). Why do these qualia occur? The likely answer is that disgust originally evolved to regulate feeding behavior so as to ingestion of toxins and pathogens; through a process of co-optation, this emotion was duplicated and modified so as to address a different adaptive challenge, that of avoiding suboptimal reproductive behavior. Nausea and related qualia are thus an intrinsic part of ordinary disgust; because sexual disgust is a kluge derived from ordinary disgust, sexual disgust retains features that are not optimal for the purposes of regulating reproductive behavior (Fessler & Gervais, 2010).

Lesson 10: Attending to the evolutionary history of a psychological adaptation will often shed light on important features of it, including features that limit its optimality. While the case of disgust invites analysis of this type, not all adaptations are so readily examined. One useful tool that, to date, remains under-utilized in much of evolutionary psychology is comparative analysis. Exploring both homologies and analogies in other species can shed light on the ancestral features of an adaptation, the selective pressures that shaped it, and the nature of other adaptations that are prerequisites for the human version of the trait (see Fessler & Gervais, 2010 for discussion). Note that this is particularly important given my call to explore human adaptations for culture (Lesson 7, above), as understanding from whence such adaptations arose may illuminate how humans became unique in this regard.

Thus far I have urged evolutionary psychologists to employ more demanding methods, acquire more extensive knowledge, and tackle more difficult problems. This should not be interpreted to mean that any one investigator, particularly a junior scholar, should exclusively pursue such an agenda. In designing a research program, it is useful to distinguish between uncanny and mundane predictions. An uncanny prediction is one that is incongruous with both current scientific understanding of the phenomenon and any corresponding folk models, i.e., the prediction specifies aspects of the world that are hitherto unrecognized. In contrast, a mundane prediction is one that is consistent with our current understanding of the world, be it scientific or folk. If supported, uncanny predictions have a large impact on scientific knowledge – they provide substantial *prima facie* evidence supporting the hypothesis from which they were derived, and they open up new areas of empirical exploration. In contrast, when mundane predictions are supported, they have far less impact on scientific knowledge. Typically, a variety of existing perspectives can account for familiar phenomena, hence supported mundane predictions provide marginal evidence for the hypothesis from which they were derived; likewise, because the given effects are already familiar, such findings do not lead to new areas of empirical exploration. Most uncanny predictions will fail, and most mundane predictions will succeed. This is because existing scientific perspectives, and many folk models, will generally be

accurate, hence hypotheses that are incongruent with such knowledge will often be incorrect, while hypotheses that are congruent with it will often be correct. Phrased in cost/benefit terms, uncanny predictions are thus a high-risk, high-yield enterprise, while mundane predictions are a low-risk, low-yield enterprise.

Lesson 11: It is important to have a balanced research portfolio composed of a mixture of uncanny and mundane projects. A scholar who exclusively pursues uncanny projects risks repeated failure, which the institutions of academia will penalize. A scholar who exclusively pursues mundane projects will have many successes, but each will be relatively minor, leading to minimal rewards. Pursuing a mix of projects maximizes the likelihood of achieving an optimal balance of impact and productivity.

Designing a research portfolio is a pragmatic enterprise. However, there are also deeper components to the practice of evolutionary psychology. As a student, I experienced a disturbing epiphany, one that I have since observed in many of my own students. Studying the diversity of the world's moral systems leads to the conclusion that one inherited a particular set of values because, by chance, one was born into a particular cultural environment. Studying the evolution of life leads to the conclusion that there is no supernatural causation therein. Studying gene-culture co-evolution and the evolved psychologies of morality and religion leads to the conclusion that, rather than having any intrinsic validity, systems of values and beliefs are simply group-functional devices that evolved to engage adaptations in individual minds. The net result of these conclusions is a disturbing sense of being rudderless, adrift without any moral imperatives. One of the greatest personal challenges of being an evolutionary psychologist is thus to determine how to lead a moral life once the curtain has been pulled back to reveal the causes behind humanity's beliefs and values. Nevertheless, while the path is not clearly marked, the same theories and findings that produce this crisis can also offer a solution. Recognizing the causes of beliefs and values empowers us, for it allows us to choose more freely from among them. Recognizing that evolutionary processes lie behind ethnocentrism and inter-group hostility weakens their grip on us. Above all, recognizing that evolved mechanisms adjust prosocial and antisocial behaviors in accord with prevailing levels affords the opportunity to shape moral ecologies. As is obviously true with regard to the physical environment, but is more profoundly true with regard to the social environment, to a degree that is unprecedented in the history of life, humans create their own world. Recently, Margo Wilson, one of evolutionary psychology's founders, died. In eulogizing her, colleagues recalled how Margo mentored numerous students, assisted in developing scientific programs around the globe, remained optimistic in the face of discrimination, and fostered cooperation and good will wherever she went. As John Tooby observed at her memorial, Margo Wilson showed evolutionists how to be moral.

Lesson 12: The findings and insights of evolutionary psychology create a moral crisis, but within that crisis lies an opportunity to make the world a better place - it is up to each of us to pursue that opportunity. And that, I believe, is the most important lesson that I have learned thus far.

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The picture was chosen by the ICCI.