

Turning Garbage into Gold: Evolutionary Universals and Cross-Cultural Differences

Mark Schaller
University of British Columbia

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There's an old saying that one man's garbage is another man's gold. Scientists are fond of adapting this adage to their endeavors. "One person's noise is another person's signal," "One person's error variance is another's grant proposal," that sort of thing. I'm reminded of this perspective when I hear evolutionary psychologists talk about cross-cultural differences. Evolutionary psychologists are professionally interested in human universals – cognitive mechanisms, and their cultural manifestations, that are common across all people in all places. Given this emphasis, cross-cultural differences are easily treated as a sort of garbage, as superficial noise masking the more fundamental pan-human mechanisms lurking within.

Cross-cultural differences are, of course, the focus of many productive programs of research conducted by cultural psychologists. Although some evolutionists might be tempted to view these documented differences as mere noise, plenty of empirical evidence reveals that it's a kind of noise that's worth listening to if we want to predict people's thoughts, feelings, and behavior.

To a large extent, any scholarly emphasis on human universals over cultural differences – or vice versa – is really just a matter of taste. And in matters of taste, there is a very human tendency to defend one's own preferences by denigrating the different preferences of others. Just as many cultural scholars are leery of evolutionary psychology, it's also common to find evolutionary psychologists who express some special distaste for the documentation of cross-cultural differences. That's too bad. Antipathy toward cross-cultural differences can blind evolutionary psychologists to some very promising and productive lines of inquiry.

The time has come, I think, for evolutionary psychologists to embrace cross-cultural variability with the same enthusiasm as we embrace human universals. This attitude has prevailed for years among many anthropologists (e.g., Boyd & Richerson, 2005), but it has yet to catch on much among evolutionary enthusiasts in psychology and the other cognitive sciences. What can we do about this? I have three suggestions – three wishes perhaps – for lines of evolutionary psychological inquiry that grapple more fully with cross-cultural variability. If these wishes come true, the result should be a deeper appreciation for the many evolved mechanisms of the human mind, and their many implications within contemporary human environments.

Wish 1: Exploit Cross-Cultural Differences to Test Evolutionary Hypotheses

Among the findings cited most commonly by evolutionary psychologists are those that document similarities across dozens of different cultures (e.g., Brown, 1991; Buss, 1989). There is no denying the rhetorical power of these findings. But there is also an unfortunate flip side to this rhetorical tool. When cross-cultural similarity is trumpeted as evidence for evolution, it's easy for skeptics to assume a sort of contrapositive corollary, and to argue that any evidence of cross-cultural variability must therefore undermine the evolutionary argument. This isn't so, of course. But the fact that many intelligent people think it's so suggests that evolutionary psychologists would be smart to tackle the implications of cross-cultural differences head-on.

In fact, for many evolutionary hypotheses, certain kinds of cross-cultural differences don't pose a problem so much as they pose an opportunity. Many evolutionary hypotheses logically imply specific differences between specific cultural populations; and so existing cross-cultural variability provides a terrific – and often very convincing – test of those hypotheses.

Why is this? Because many evolved psychological mechanisms are functionally flexible and context-sensitive. These mechanisms operate as "decision rules" in which specific classes of stimuli trigger specific kinds of responses. Consider the psychology of fear. The capacity for fear evolved, surely, because the actual experience of fear can yield functional benefits in the presence of actual threats. But the experience of fear is not without costs either. For this reason, we don't go around being scared all the time; rather, fear is triggered

by the perception of stimuli (such as sudden loud noises) that heuristically signal the actual presence of threat. It is this stimulus-response mechanism, and not merely the capacity for fear itself, that evolved. Similarly, just as the capacity for sexual desire evolved, so too did some set of stimulus-response mechanisms through which the actual experience of desire is stimulated by the perception of fitness-connoting cues (such as symmetry and other subjectively "attractive" physical features). Moreover, the operation of evolved stimulus-response mechanisms may be moderated by additional psychological inputs indicating further the functional utility of the response within some specific context. Thus, a fearful response to loud noises is particularly pronounced under conditions in which people feel especially vulnerable to harm – such as when they are in the dark (Grillon, Pellowski, Merikangas, & Davis, 1997). And men are likely to judge physically attractive women to be willing mates, especially under conditions in which they themselves are feeling especially romantically aroused (Maner et al., 2005).

Evolved stimulus-responses mechanisms are moderated not only by moment-to-moment variations in context, but also by chronic aspects of temperament and personality. The appearance of a coalitional outgroup triggers perceptions of danger more strongly in the dark, and also more strongly among people who chronically perceive the world to be a dangerous place (Schaller, Park, & Faulkner, 2003). Similarly, just as men are especially likely to over-estimate an attractive woman's sexual willingness when they are themselves temporarily aroused, they may also be more likely to do so if they chronically prefer a promiscuous approach to mating (Maner et al., 2005). It doesn't matter whether these chronic individual differences result from genetic variation or from differences in socialization practices; these differences can moderate the strength of the psychological response yielded by an evolved stimulus-response mechanism.

Cultural differences operate very much like other individual differences. Evolved stimulus-response mechanisms may be predictably moderated by any element of cultural knowledge that heuristically informs individuals about the functional utility of that stimulus-response mechanism. Just as the inescapable fact of personality differences provides an opportunity to test rigorously-specified theories in evolutionary psychology, the inescapable fact of cultural differences also provides a terrific opportunity to test these theories – and potentially to provide compelling evidence in their support.

Here's an example: According to one evolutionary perspective on interpersonal attraction, subjective assessments of physical attractiveness are based on morphological features (such as symmetry) that are predictive of disease-resistance and long-term health outcomes. It is partially for this reason, presumably, that physical attractiveness plays such an important role in the process of mate selection. If so, it follows that individuals should be especially likely to use physical attractiveness as a mate-selection criterion under conditions in which the threat of disease is especially high. Gangestad and Buss (1993) cleverly capitalized on cross-cultural differences to test this evolutionary hypothesis. Consistent with the hypothesis, results revealed that individuals do place greater priority on a mate's physical attractiveness within cultures that historically have faced greater threats from parasitic diseases.

This is just one example, and it illustrates an empirical strategy that can be applied broadly to assist evolutionary inquiries into the workings of the human mind. When we employ this strategy, cross-cultural differences are no longer a conceptual nuisance; they're an empirical asset.

Wish 2: Employ Cross-Cultural Differences to Inspire Deeper Theorizing

The magnitude of the specific stimulus-response phenomenon might predictably differ across different cultural circumstances, but surely there should be universality in the existence of the basic stimulus-response phenomenon itself. It's tempting to think so. And if so, it may seem troubling to an evolutionary perspective when – as often happens – identical stimuli produce fundamentally different responses in different cultures. An obvious example occurs in the domain of food. The exact same food (e.g., durian, hamburger) may stimulate an appetitive response in one culture, while inspiring utter disgust in another.

Of course, this isn't troubling at all; it is entirely compatible with an evolutionary perspective. The evolved stimulus-response mechanisms that generate affective responses to food aren't taking raw sensory information as their inputs. Nor are they taking immediate interpretations such as "durian" or "hamburger" as their inputs. Rather their inputs – the stimuli that trigger the affective responses – are further interpretations in which the perceived information is appraised in some functionally meaningful way. What's universal here is not the link between some raw sensory stimulus and some specific psychological response. What's universal is the link between some functional appraisal ("edible food"; "potential poison") and a specific psychological response.

This point has been made by many scholars, and has been applied particularly well to the study of emotions, within which the role of appraisal processes is fundamental (Mallon & Stich, 2000). This line of reasoning has implications for many other psychological phenomena as well. In some of my own evolutionarily-informed research, I've explored the extent to which the perception of certain categories of people (e.g., coalitional outgroups, people with morphologically unusual physical features) automatically arouse cognitions connoting specific kinds of threat (e.g., threat of physical injury, threat of disease). But there is no single universal recipe for features that allow others to be appraised as members of a coalitional outgroup. Specific kinds of features – language, surname, skin color – may serve that purpose in some cultural contexts, but not others. Nor is there any single recipe for features that are morphologically unusual; subjective assessments of unusualness are dependent on the normative features in the local population. Consequently, even though evolved stimulus-response mechanisms may indeed be triggered when we encounter outgroup members or morphological oddities, the specific manifestation of these universal processes may look rather different depending on different cultural learning environments (Maner et al., 2005; Park, Faulkner, & Schaller, 2003).

It's one thing to acknowledge this point; it's quite another to figure out the details. To achieve that deeper scientific goal, it will be important to consider the relations between different kinds of mental modules implicated in the entire stream of psychological events through which sensory information eventually triggers some sort of consequential psychological response. At the very least, it will be necessary to consider relations between three kinds of modules:

(a) The focal stimulus-response modules, through which functional inferences (e.g., "potential poison") trigger some specific psychological responses (e.g., disgust).

(b) Appraisal modules, through which those functional inferences ("potential poison") are generated from raw sensory stimuli.

(c) Learning modules, through which developing organisms learn the specific rules that help them efficiently appraise specific kinds of raw sensory stimuli in specifically functional ways.

It's easy to assert that all of these modules are adaptations (for a review of the evolution of learning modules, see Moore, 2004). And it's certainly useful to explore the operation of each kind of module on its own. Indeed, one byproduct of the modular view of the human mind (which is certainly a popular view among evolutionary psychologists) is the implicit prescription to study each module in conceptual isolation. But the actual operations of these modules are not independent of each other. Information acquired through the operation of learning modules informs the operation of appraisal modules, and outputs of these appraisal modules serve as inputs into stimulus-response modules. The mind may indeed be a collection of functionally-distinct modules, but to truly describe how the mind works – how it transforms simple sensory inputs into complicated cognitive outputs – it is necessary to carefully articulate the specific relations between these different modules.

So here's another reason why it will be worthwhile to take cross-cultural differences seriously: By confronting cross-cultural variability head-on, we force ourselves to think hard about learning and appraisal mechanisms, and the specific ways in which those mechanisms feed into the stimulus-response algorithms that are the primary focus of most evolutionary psychological inquiries. This sort of thinking should inspire more sophisticated theorizing. At the very least, it seems necessary if we want to offer more complete and coherent explanations for the complicated patterns of evidence that emerge when we observe different peoples in different environments.

I say this on the basis of personal experience. I'm not immune to the allure of explanatory parsimony, and so in my research on evolved mechanisms of social cognition, I would really prefer not to observe cross-cultural differences. But empirical data don't always cooperate with my simple-mindedness. Cultural variability keeps popping up. In attempting to confront this variability directly, and to tie it to a coherent evolutionary framework, my colleagues and I have had to consider not only the stimulus-response mechanisms of primary conceptual interest, but also ancillary mechanisms pertaining to learning and appraisal (e.g., Maner et al., 2005; Park et al., 2003). The stories we ultimately must tell aren't nearly as simple as we might hope for. But I'm convinced that we are getting closer to the truth about the way that evolved mental mechanisms actually operate.

Wish 3: Explore the Evolutionary Origins of Cross-Cultural Diversity

In order for those first two wishes to be fulfilled, evolutionary psychologists must be receptive to insights generated by our scholarly cousins who study culture and cultural differences. Happily, evolutionists can give

just as well as we get. The tools of evolutionary psychology may help us address a fundamental question about culture that is often ignored by cultural psychologists themselves: How do these cultural differences arise in the first place?

This is not a question that is addressed much by evolutionary psychologists. Sure, lots of evolutionists offer arguments about the adaptive value of culture or about the ways in which evolved psychological mechanisms give rise to universal elements of culture (e.g., Atran & Norenzayan, 2004). There is also excellent work on evolved mechanisms that maintain different cultural practices after they have emerged (e.g., Henrich & Boyd, 1998). But the actual origins of cross-cultural diversity haven't received much serious attention. If there is a standard evolutionary explanation for cross-cultural differences, it's this: Because evolved psychological mechanisms are functionally flexible, they are responsive to differences in local ecologies – to the unique opportunities, threats, and constraints afforded by the physical and social world around them – and so different ecologies afford superficially different cultural solutions to the same underlying adaptive problems (Sperber & Hirschfeld, 2004; Tooby & Cosmides, 1992). This is entirely sensible. And because it's so sensible, it's tempting to think that there's not much to be gained by addressing the topic further.

On the contrary; there is plenty to be gained. It's easy to assert that cultural differences will emerge in response to different ecological circumstances, but our job isn't complete until we explain more fully just *how* this actually happens. How do specific ecological circumstances give rise to specific kinds of cultures? How do the particular thoughts and actions of individuals (which are highly variable within any population, even under identical ecological circumstances) coalesce into the coherent patterns of ritual and norm that define a culture?

This isn't easy stuff. The evolved psychological processes that shape patterns of cultural difference are responsive not only to obvious elements of the physical ecology, but also to subtle and shifting aspects of the social ecology – such as the distribution of traits, attitudes, and behavioral tendencies within the population itself. We change our beliefs and behaviors in response to the inclinations of others in our ecological neighborhood; our neighbors consequently recalibrate their own beliefs and behaviors; and this affects us once more (see Kenrick & Sundie, this volume). Over time, these dynamic interactions among neighbors can transform random variability across a social landscape into distinct clusters of different norms – the beginnings of coherent cultural differences (Harton & Bourgeois, 2004). How does evolutionary psychology fit in? Among other things, evolutionary considerations inform us about the kinds of information that are especially influential to others, about the specific kinds of social interactions that govern the direction and magnitude of social influence, and about the operation of individual decision rules that direct the propagation of information through these interactions. Preliminary work in this area of "dynamical evolutionary psychology" has begun to yield new insights about the origins of cultural differences in evolutionarily fundamental behavioral domains such as aggression, cooperation, and mating (Kenrick, Li, & Butner, 2003). This exciting new line of research implicates a whole new strategy through which the evolution of the human mind can be productively connected to the study of cross-cultural differences.

Envoi

Evolutionists wax ecstatic about the diversity of life. Yet, when we turn our attention to human nature, we tend to focus more on unity than on diversity. Evolutionary psychologists will surely continue to have a special affection for cross-cultural similarities. But that doesn't mean we can't love cross-cultural differences just as dearly. At the very least, we'll be wise to treat these differences as more than mere statistical noise. In articulating my three wishes, I've tried to identify a few research strategies through which cross-cultural differences can be transformed from subjective garbage into scientific gold. My hope is that scholars will put more effort into this kind of alchemy.

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