Steps toward convergence: Evolutionary psychology's saga continues

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Let us not ask whether the brain is "really" a biological computer. The more productive question is whether it is useful to think of the brain as a computer, one designed by evolution to solve problems of adaptation via specialized "circuits" and "architecture." Does this biocomputational approach, pioneered by Leda Cosmides and John Tooby (1) and then developed and expanded by them and others [such as David Buss (2, 3), Geoffrey Miller (4, 5), and Steven Pinker (6)] lead to theory and research that further our understanding of human behavior? Critics notwithstanding (e.g., ref. 7), the evidence of the article in this issue of PNAS (8), indeed, of the myriad books and research papers produced by the Cosmides–Tooby school of thought, is "yes." But, of course, there are caveats.

Sell, Tooby, and Cosmides (8) posit the existence of welfare tradeoff ratios (WTRs), the ratio between the welfare of another and that of the actor. These WTRs are presented as "not just post hoc theoretical constructs but . . . real neurocognitive elements within the human motivational architecture." If Sally's WTR "circuitry" is giving a relatively high weight to Jane's interests rather than her own, the ratio will be in Jane's favor and she will do well in her negotiations with Sally over resources. We humans have therefore been selected to seek to increase the WTR others are according us, and we can do this because the WTR not only "integrates" relatively fixed factors such as kinship, reciprocation, and aggression, but also takes many other factors into account, including our readiness to get angry. In effect, we may unconsciously use anger to bully another into recalculating a WTR in our favor, causing that person to give more weight to our interests than they otherwise would. But who uses anger in this tactical way? "Anger is more likely to be triggered when an actor is positioned to make the price of resisting recalibration high" (8). People who are more "formidable" (physically stronger) than others (generally males) are more able to "inflict costs on the target" and are therefore more likely to use anger. So are those who are more able to confer benefits on others, e.g., the attractive, especially attractive women. Sell, Tooby, and Cosmides predict that those who are formidable or attractive should have a "greater sense of entitlement," be more prone to anger, and be more likely to see conflicts resolved in their favor than the less formidable or attractive. Once a favorable settlement has been reached, anger should wane. Their data are largely consistent with these expectations. Attractive women and strong men are more likely than others to use anger to increase WTRs.

Does Hypothesis Intuitiveness Matter?

Here is a small point: Some reviewers privilege the counterintuitive hypothesis, dismissing the intuitive with "trivial, we already knew that." Are Sell, Tooby, and Cosmides (8) simply using complex language to make commonsense predictions? They would argue, to the contrary, that frequent anger is often labeled a sign of weakness or even of pathology rather than an attribute of the already advantaged. In fact, however, folk wisdom tends to take the contrary view, seeing the strong and attractive as often self-centered and selfish. This folk observation, if accurate, would be consonant with the theory and findings summarized in the previous paragraph. Let us ignore that possible fact. The degree to which a hypothesis is or is not consistent with folk wisdom or intuition is not ordinarily relevant to a scientific evolutionary psychology: if we accept that human intelligence is largely a social intelligence and a product of social competition then it would be surprising indeed if folk wisdom was not sometimes accurate.

Traits that we may find unsavory are nevertheless also products of our evolutionary history.

Anger and Culture

A more substantial issue is whether there are alternative evolutionary treatments competing with Sell, Tooby, and Cosmides' theory of the use of anger in social interaction. It turns out that other approaches are more complementary than competitive. For example, Fessler (9) argues that "the male flash of anger is 'designed' to diminish transgressions in the service of acquiring and maintaining control over a variety of economic and social resources." Rather than theorizing about the brain, however, Fessler focuses on explaining cultural variation in the use of anger. He predicts that the importance of male anger will be high in societies in which "valuable resources can be [more easily] appropriated," "overarching social institutions" offer less rather than more protection, and the preservation of social relationships is relatively unimportant because individuals do not depend heavily on those relationships. He finds strong support for this thesis in his analysis of Nisbett and Cohen's (10) important work on honor cultures in the American South and Southwest. Fessler's approach is particularly useful for social scientists working in naturalistic settings, where people have established social relationships and are mindful of how their current behavior may affect their reputations. In such settings, even a biocomputational approach would require a much broader range of inputs and calculations than anger and attractiveness. Sell, Tooby, and Cosmides, who are fully aware that they have tested "just two out of a larger potential set of negotiative factors," would likely agree. There is no logical contradiction between Fessler on the one hand and Sell, Tooby, and Cosmides on the other, and there is no apparent impediment to the development of a broad theory of anger that integrates the two sets of ideas.

Putting Ontological Status Aside

Have Sell, Tooby, and Cosmides (8) conclusively established that as we interact with others our neurological systems are automatically calculating WTRs? No, not unless one has a great deal of faith in construct validity: accurate prediction can make a construct useful but

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is not, in my opinion, sufficient for one to be as certain of its ontological status as are Sell, Tooby, and Cosmides. What has been demonstrated is that the WTR construct, like the biocomputation perspective in which it is situated, is at this point in history a productive way in which to apply the evolutionary perspective to human behavior. It is leading to theory, hypotheses, and data that are broadly compatible with other evolutionary perspectives rather than developing into an encapsulated and self-perpetuating citation circle. Eventually the Cosmides and Tooby biocomputational approach may be replaced by more complex theoretical formulations, but in the meantime, as the Bohr model of the hydrogen atom did in its day for particle physics, that approach is moving us forward and does not appear to have any demonstrably superior competition. Why, then, has there been so much opposition to the approach, some of it rather emotional? The answer may have to do with the unromantic portrait of human psychology it is painting.

Perfectibilité Perdue

The most notable finding of the article by Sell, Tooby, and Cosmides (8) is that the strong and attractive, the people who are presumably winners in life, use anger to improve their bargaining position with those less strong and attractive. Assuming this finding is replicated cross-culturally and with convergent methodologies, what we have here is one more rip in the romantic portrait of our species that many nonevolutionists would prefer to continue to enjoy. From the unsentimental perspective of evolution, however, not just anger but sexual jealousy, male sexual insistence, infidelity (on the part of both men and women), sibling rivalry, preoccupation with one's relative standing, nepotism, and individual and collective aggression are not pathologies or even errors to be corrected once and for all by morality and religion or at least proper child socialization, they are strategies that have often, at least in the past, been biologically adaptive. Like socially valued traits such as love, loyalty, cooperativeness, and forgiveness, traits that we may find unsavory are nevertheless also products of our evolutionary history. Evolutionary psychology is the enemy of those who, like some Marxists, espouse the perfectibility of our species and therefore reject a field that asserts that the less attractive elements of our evolved human nature are not errors to be eliminated on our way to perfection but battles each generation must fight anew. Perhaps there are ways in which the tendency to use anger as a negotiating tactic may be mitigated, just as good parenting can mitigate sibling rivalry. From the perspective of Sell, Tooby, and Cosmides (8), however, tactical anger is part of our biology and cannot be definitively eliminated by, say, a change in the distribution of wealth.

It is perhaps romanticism, a nostalgia for a *perfectibilité perdue* that, in part, has fueled the relentless attacks on the application of evolutionary biology to the psychology of our species. Segerstråle (11) has ably described the deliberate campaign against E. O. Wilson's foundational *Sociobiology: The New Synthesis* (12), a campaign that now targets evolutionary psychology (13). Antievolutionist attacks have waned, in recent years, as Darwin's insights have gradually spread from field to field and now, in an often lamentably simplified form, are part of popular discourse. The particular approach represented by Sell, Tooby, and Cosmides (8), however, continues to draw fire, perhaps because their biocomputationalism unabashedly locates our "failings" in the architecture of the human brain.

This is not to say that criticisms of this field are always entirely empty. For example, the plasticity of the developing human brain pointed out by Buller (7) and Gibson (14) suggest that biocomputational modules are likely to be variable and contingent, but it is difficult to see this as a fatal conceptual weakness because the framework easily encompasses such variability. Even if the Cosmides and Tooby school of thought is indeed guilty, at times, of simplification, that is only to be expected: theoretical models necessarily simplify, and when predictions nevertheless receive empirical support it is difficult to argue that a simplification is excessive.

It would be interesting to see Sell, Tooby, and Cosmides (8) move on to link their work to the construct of self-esteem, an idea that received rather early evolutionary attention (15–17). In this view, self-esteem is an internal indicator of perceived relative standing within one's membership groups. If the WTR is the construct calculating how much weight the actor should give to the interests of the other, the other's demand/requirement for accommodation may depend on that individual's level of self-esteem. Formidability and attractiveness would be just two of the factors affecting level of self-esteem, which would also be in part situational. The point here is that the article in this issue of PNAS (8) is just one part of a broad enterprise of research and theory that, while not yet ready for full integration, is at least on its way.

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