**Notes on Gaulin "Evolutionary Psychology"**
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<u>Gaulin</u>: **Evolutionary psychology is distinguished from the rest of psychology by the questions it addresses.**

<u>The rest of psychology looks at *how* the mind works.</u>  Psychologists in these other areas posit mechanisms to explain competencies or discover reactions.

<u>Gaulin's examples</u>: How does the mind assemble coherent images of the world from retinal input? How do particular hormones affect parental behavior? How do infants learn language?

Gaulin says, in contrast, <u>evolutionary psychology explains *why* the mind works as it does</u>.  Some mechanisms exist because they are adaptations.   In these cases, the answer to why the mechanism exists centrally involves selection of that mechanism over alternative psychologies in an ancestral population because of the fitness advantaged bestowed by possession of the mechanism in contrast with the alternatives then present.

<u>Gaulin's examples of questions addressed by evolutionary psychology</u>:

Why do animate objects draw more visual attention than inanimate ones (New et al. 2007)? Why are men so parental compared to the males of our close primate relatives? Why can young children learn any natural language they encounter while adults cannot?

<u>Questions</u>: Aren't there mechanistic answers to these questions?  For example, it is because of some cognitive mechanism, or some aspect of such a mechanism, that animate objects trigger focus. To continue the example, we might suppose that there is a "setting" on those mechanisms engaged when visual attention is drawn by stimuli that is biased toward the kinds of movements typical of animate objects.  Evolutionary theory only comes in, when it does, to explain how these cognitive mechanisms (or the particular "setting" on them in which we are interested) emerged as an adaptation under selective pressures. The same need to posit proximate causes or mechanisms would go for the other questions Gaulin describes as unique to evolutionary psychology, on the assumption that these mechanisms are indeed adaptations.

<u>Question</u>: Maybe we should talk about this a little. Consider the last question Gaulin asks: "Why can young children learn any natural language they encounter while adults cannot?" One idea would be that the mechanisms responsible for language acquisition are "set" to facilitate early learning and these setting mostly expire and that this arrangement enhances fitness in contrast with alternatives, and so became species typical as a result. Is this plausible?

<u>Challenge</u>: Once we appreciate the role mechanisms play in answering Gaulin's initial set of questions, we might say that the difference in focus between evolutionary psych and the rest of the field is not really that ev psych explains why and the rest of the cog sciences explain how.  The difference is more the contrast between proximate and distal: how it works vs. how it came to be.

<u>Question</u>: Is that a better way to distinguish evolutionary psych from the rest of cog sci?

Gaulin, "Traditional psychology dissects psychological machinery and EP asks what purpose that machinery serves."

Challenge: Aren't computational mechanisms functionally specified?  (E.g. this thing detects edges.) The machinery has a proximate function, and this contributes to an "organism level" function. E.g. helping the animal visually identify threats or opportunities or whatever. As soon as we discuss functions we're doing biology. But are we already doing *evolutionary* biology?  Musn't we interject something further: the ideas of variation and natural selection between variants as a cause of phenotypical change? Again, it would seem the necessary distinction (between biopsych and evolutionary bio psych) is between proximate and distal functions.

Gaulin says, "Darwin (1859) put teleology on a firm scientific footing in the biotic realm. He argued that natural selection shapes every biological mechanism for a purpose, to address some challenge to survival or reproduction. This realization justifies "why" questions about any biological mechanism, and implies that each mechanism has the form it does because that form effectively accomplishes the function for which evolution sculpted it."

Problem: Does this assume that everything (i.e. every phenotypic trait) is an adaptation?  We know that can't be right from the very logic of Darwin's theory.  There must be variation in a population if selection is to occur within that population "on the basis of" that variation.  So some traits must be maladaptive and many traits will be neutral whenever a population is in a position to evolve.  In the absence of selective pressures in some domain, there will be lots and lots of maladaptive designs that persist even though they would diminish or disappear were selective pressures to emerge. Maybe Gaulin doesn't mean to endorse the claim that every trait is an adaptation, but the last sentence seems to assert as much.

Gaulin: We can confirm hypotheses about the diet of our ancestor populations by observing the design of our gustatory system by seeing what "risks and rewards" it was designed to detect.

Questions: How good are these inferences?  What are some of the challenges they face?

Gaulin: We can use what we know about the challenges our ancestors faced as inspiration for hypotheses about the psychological mechanisms which evolved "to" solve those challenges (i.e. these mechanisms bestowed a fitness advantage because humans endowed with them were better able to solve the target challenges better than conspecifics).

Gaulin's example: For example, recognition of the evolutionary benefits of reciprocity points to the cognitive and emotional machinery that would be needed to support such a system of exchange (Cosmides and Tooby 1987).

Comment: This is a valuable heuristic role for evolutionary psych.  But we still need to confirm or test these hypotheses with experimental psych and cognitive neuroscience to see whether the hypothesized mechanisms really did evolve and persist to this day, right?

**Reverse engineering v planned comparison**:

Reverse engineering: Consider the emotion of disgust. The prevailing EP hypothesis is that disgust functions to steer us away from sources of contamination. The requisite elements are that the emotion be negative in a way that induces revulsion and avoidance, and that it be triggered only by polluting stimuli. If disgust were triggered by any non-polluting situations (e.g., in neutral or healthful contexts or in situations that were dangerous in some other way, such as heights or potential predators), or if it produced other outputs such as hunger, sexual arousal, or a desire for elevated social status, the hypothesis should be rejected.

Questions: What role does ev psych play in evaluating the hypothesis that the mechanisms responsible for disgust function to steer us away from contaminants? Does it just explain why we have this mechanism? Or does it explain further facts about it? What role do the other cognitive sciences play in explaining why people are disgusted by that which disgusts them?

Planned comparison: If mechanism x evolved to serve function y, then x should be present where function y is important to survival or reproduction and absent elsewhere. Eyes provide a classic example. They are hypothesized to have the function of forming images from reflected light. Hence, where there is no light, natural selection should have eliminated eyes as a waste of resources. The absence of eyes in many separate cave-dwelling lineages—including bony fish, shrimp, crayfish, insects, spiders, and salamanders (all of whose non-cave-dwelling relatives have eyes)—counts as strong evidence for the hypothesis.

Questions: How determinate is the assignment of function? (How do we differentiate between Gaulin's assignment of function and alternatives that are closely related: e.g. the eyes evolved to enable animals to see or the eyes evolved to enable animals to discriminate shapes and colors?

Gaulin: Evolutionary psychology is an approach not a subdiscipline.

As is clear from these examples, evolutionary psychology is not a subfield of psychology such as developmental or clinical psychology. Instead, it is an approach to the entire field of psychology.

Question: How does this characterization square with the initial definition according to which evolutionary psychologists answer "why?" questions distinct from those pursued elsewhere in cognitive science?

Gaulin: research on sexuality and reproduction has been overrepresented in the EP literature,

Explanation: (1) Because the reproductive success that spreads traits depends on the ability to negotiate sex, sexual psychology is expected to have been strongly shaped by evolution. (2) the sexes provide a natural arena for the method of planned comparisons whenever a given function is more critical to survival or reproduction in one sex than in the other.

Questions: Are these valid reasons for focusing on sexual psychology? How might this focus distort the field?

Sexual selection theory: whenever one sex has the potential to produce offspring at a higher rate than the other, the "faster" sex will be forced to compete for reproductive access to the "slower" sex.

Prediction: Male reproductive strategies emphasize quantity and female strategies emphasize quality.

Possible Discussion Topic: What is the evidence for or against this prediction of sexual selection theory?

Another topic: Consider Gaulin et al on jealousy: is this work evolutionary psychology? The thesis is that the distinction between emotional and sexual betrayal is not a "natural" one insofar as it doesn't accurately capture a divide in contemporary experiences of jealousy. What does this have to do with evolution?