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Robert C. Richardson: *Evolutionary Psychology as Maladapted Psychology*, Pp. xi + 213. Cambridge, MA: MIT Press

Broadly speaking, evolutionary psychology is the attempt to supplement psychological theorizing with the central tenets of evolutionary biology. In the narrow sense, it is an *adaptationist program* trying to discover the psychological mechanisms that underlie our current behavior by regarding our mind as an integrated collection of *adaptations*–traits present today because they solved adaptive problems *Homo sapiens* recurrently encountered during evolutionary time, like choosing a mate, detecting cheaters, recognizing emotional expressions, acquiring a language, remembering the location of edible plants etc.

Evolutionary psychology in the narrow sense, as advocated by, e.g., David Buss, Leda Cosmides, John Tooby and Steven Pinker, is the target of Richardson's book. At issue are the evolutionary credentials of evolutionary psychology, not its quality as a psychological research program. Richardson's strategy is to examine 'what we would need to know in order to vindicate the *evolutionary* claims of evolutionary psychology' (p. viii) and to see whether we actually know or at least could know it. His verdict is negative: 'we are unlikely ever to have the sort of evidence that would be required to make it reasonable to embrace the hypotheses of evolutionary psychology' (p. 38). This is particularly problematic, he ventures, because the claims of evolutionary psychology have social impact 'and, for theories that matter more, we should expect better evidence' (p. 34).

The controversial claim is not that our psychological faculties have *evolved*. It is that they are *adaptations*, and, more specifically, adaptations *for* solving particular adaptive problems. Richardson admits that psychological faculties have evolved, and that some or even most of them may be adaptations; yet, he insists, in some cases we just do not know enough to establish that they are adaptations, and we rarely, if ever, know enough to establish that they are adaptations for finding a mate, acquiring a language, engaging in social cooperation etc. Consequently, Richardson's book centers around two questions: What do we have to know in order to establish that a trait is an adaptation for solving a particular adaptive problem? and Can we know this for the traits discussed by evolutionary psychologists?

To answer the first question, he discusses three approaches that are successfully used to evaluate adaptationist explanations in evolutionary biology: (1.) reverse engineering, (2.) adaptive thinking, and (3.) comparative analysis.

(1.) *Reverse engineering*: Reverse engineering tries to infer the historical function of an organism's traits from its current structure: One is 'beginning with the "solution" and inferring what the ecological "problem" must have been if those traits were to evolve' (p. 42). The difficulty is that current function underdetermines historical cause. For instance, although structural considerations suggest that the feathered wings of birds solve the aerodynamic problem of sustaining flight, they are compatible with many other possibilities, and additional information in fact reveals that feathers cannot be adaptations for flight because they were present already in non-flying dinosaurs (p. 181). Hence, 'unless supplemented and augmented in a variety of ways [by information regarding population structure, phylogenetic history, ecological conditions etc.; S.W.], considerations of design are inconclusive and likely misleading' (p. 52).

(2.) *Adaptive thinking*: Adaptive thinking 'begins with the ecological "problems"an organism confronts and explains or infers the likely "solutions" based on the problems' (p. 42). Again, such inferences must be supported by additional information about: (i.) selection (including the very fact of selection, its strength, and the trait variation underlying it), (ii.) ecological factors, (iii.) heritability, (iv.) population structure, or (v.) trait polarity (is the alleged adaptation a derived or a primitive trait?). We need not have detailed information on any of these issues, but successful adaptationist explanations in evolutionary biology require knowing at least something about some of them (pp. 99-104).

(3.) *Comparative Analysis*: Adaptationist explanations can be confirmed or disconfirmed by comparing 'a trait or behavior to phylogenetically related ancestors and conditions' (p. 148). If a trait originated in a line for which its alleged evolutionary function would have been irrelevant, the adaptationist explanation is disconfirmed. Conversely, if a trait historically evolved more than once

in response to similar evolutionary environments, the adaptationist explanation receives support.

According to Richardson, knowing these sorts of things is required in evolutionary biology to establish that a trait is an adaptation and what it is an adaptation for. Since it 'is evolutionary biology that defines the context in which the adaptive claims of evolutionary psychology should be assessed' (p. 37), this leads to the second question: Can we know these sorts of things for the traits discussed by evolutionary psychologists?

(1.) *Reverse engineering*: For psychological faculties we seem to lack the supplementary information needed to back the inference from structure to function. In the case of Buss' research on the evolution of sex differences in jealousy, for instance, we know nothing about group structure and size, mating structures, similarities between ancestral and current group structures, or the alleged differences in mating behavior in ancestral groups (pp. 60-64). Yet, it is only such knowledge that could disambiguate the ambiguous structural information. Without it, inferring that sex differences between males and females are adaptations to different adaptive problems 'is not a very compelling case of reverse engineering' (p. 64), and just as error-prone as the inference that the feathers of birds are adaptations for flying.

(2.) *Adaptive thinking*: Something similar holds for the supplementary information required in the case of adaptive thinking. Richardson discusses Pinker's research on language (pp. 124-132) and Cosmides and Tooby's research on reasoning and social exchange (pp. 132-136). Although the little we know about selection, ecology, heritability, population structure, and trait polarity in these cases suggests that we are indeed dealing with adaptations, he concludes, it is entirely silent on the question what language and reasoning are adaptations *for*. Hence, '[e]ven given that human language or reasoning is an adaptation, ... we should not think we have explained the proposed design with the sorts of general suggestions that are warranted' (p. 137).

(3.) *Comparative analysis*: There are two problems with comparative analysis. First, the phylogenetic information we have does not show decisively whether, e.g., our language and reasoning faculties indeed originated in the *Homo sapiens* line. If anything, it suggests that they are features of a broader taxonomic class, and if that is correct, then '[i]f we treat these as specifically human adaptations, for all we know we are focused on the wrong taxonomic level' (p. 171). Second, since comparative analysis supports adaptationist explanations by showing that a trait historically evolved more than once in similar evolutionary environments, the very uniqueness of human language and reasoning makes them unsuited for such explanations (p. 166). Hence, Richardson concludes, '[u]nderstood as an evolutionary hypothesis, what we are offered by evolutionary psychologists is inadequate' (p. 169).

Richardson offers a detailed, biologically well-informed and interesting analysis of the difficulties that arise when Darwinian reasoning is applied to the human mind. In particular, he re-directs our attention to Gould and Lewontin's famous observation that adaptationist stories are too often too uncritically acknowledged as true explanations. Yet, he goes far beyond a mere rehearsal of the 'story telling charge' by showing in exquisite detail how explanations in evolutionary biology set a reasonable standard while 'the sort of information that is available does not support the adaptive explanations common within evolutionary psychology' (p. 158)–a point that has so far not received lots of attention but definitely deserves to be taken seriously.

Evolutionary psychologists must either they deny that they have to meet the standards Richardson argues for, or hold that they actually can meet them. The latter strategy is not very promising, given how little we know of the social structure of our ancestors' families, groups and societies, the variation in their psychological faculties, their heritability, and the relevant selection pressures. (Of course we know that our ancestors had to find food, mates, secure sexual and social relationships etc., but the explanations based on this are too vague and indeterminate to establish the much more concrete claims made by evolutionary psychologists.)

What is left is thus to deny that the standards endemic to evolutionary biology do not have to be met. Evolutionary psychology may have other methods for supporting its evolutionary claims. One issue Richardson is woefully playing down, for instance, is that adaptationist thinking has generated some surprising predictions which, when tested psychologically, proved to be correct. Cosmides and Tooby's hypothesis of a 'cheater detection module' or Silverman and Eals' hypothesis of characteristic female superiorities in spatial abilities are prime examples for cases where adaptive thinking lead to empirical hypotheses that were later confirmed by psychological tests. The fact that this would be unlikely were they merely

just-so-stories that happen to be compatible with the facts, one could argue, provides ample support even in the absence of detailed knowledge of our ancestors' social and ecological environment. Of course, this does not help with reverse engineering (like Margie Profet's explanation of pregnancy sickness as an adaptation for protecting the embryo against maternal ingestion of toxins) and comparative analysis, since there no predictions are made, but adaptive thinking seems to be evolutionary psychologist's favored strategy anyway (in fact, it is the one explicitly recommended by Cosmides and Tooby).

Richardson may respond that this does not warrant the claim that these faculties are adaptations *for* detecting cheaters, or *for* solving different spatial problems, given that to 'know the evolutionary explanation requires knowing what something is an adaptation for-the conditions in response to which it evolved' (p. 182). However, it is a legitimate question what else these faculties should be. What evolutionary scenario could have lead to a faculty that allows us to detect violations of conditional social contract rules? On the one hand, if that trait is not even an adaptation, how else could it have come about? Richardson repeatedly points out that '[t]here are in fact many alternatives to adaptive explanations that are fully evolutionary' (p. 58), but he never explains in any detail how these alternatives could have lead to the kind of traits studied by evolutionary psychologists, and he never directly addresses the argument of evolutionary psychologists that sufficiently complex structures must be due to natural selection. One the other hand, if it is an adaptation, but not an adaptation for detecting violations of conditional social contract rules, what could it possibly be an adaptation for that had this kind of side effect? There is simply no remotely plausible alternative.

The point is: If our capacity to detect violations of conditional social exchange rules is established by psychological experiments, if there are grounds for thinking that it is an adaptation, and if we lack any remotely plausible alternative what it could be an adaptation for, then this seems to constitute good enough evidence for the evolutionary psychologist's view of the matter, even if we lack the kind of knowledge we have in biological cases. These are big 'Ifs', of course. Even if they can be met in a couple of paradigm cases, it is true that not even these (compared to evolutionary biology lowered) standards are met often enough to warrant evolutionary psychologists' claim that our mind contains a vast number of specific adaptations. This certainly limits the aspirations of evolutionary psychology as a revolutionary research paradigm in psychology and the social sciences, and rightly so, but it still leaves us room to appreciate the better pieces pf research carried out under the label of 'evolutionary psychology'.

For readers new to the debate, Richardson covers the basic theories, arguments, concepts, and some valuable background material. One may quibble over the details, but the book is interesting and unlikely to lead anyone seriously astray. I agree with Richardson that some psychologists need to clean up their methodology. Maybe many do. But that presumably holds for scientists of all fields, and for the reasons just sketched, I don't think it shows that evolutionary psychology is irrevocably flawed. Evolutionary psychologists may be able to make up for their weaknesses concerning the typical evolutionary evidence by offering a plausible overall package of biological, psychological, and perhaps anthropological considerations that is empirically testable–if not biologically, then psychologically.