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Review of David Buller's *Adapting Minds*

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Popularisations of evolutionary psychology have had a truly remarkable success. Judging by the popular press one could be forgiven for think that contemporary psychology is essentially co-extensive with evolutionary psychology. In the academy evolutionary psychological has been subject to some extremely hard-hitting and destructive attacks, but to date no approachable, popular critique has been available. The present volume aims to fill this void. I am not completely convinced it succeeds in this, but I find it valuable nevertheless.

The volume's title is an allusion to *Adapted Mind* (Barkow, Cosmides & Tooby, 1992). The allusion not only identifies the main target, but also the central problems with that target. The target is the Kuhnian research program of Evolutionary Psychology, of which *Adapted Mind* is a "classic." (The capitals are used to distinguish the research program from the discipline of evolutionary psychology. I will henceforth refer to the research program as EP.) The main problems are signalled by the changes to that title: (i) pluralising the "mind" highlights a lack of a unitary *human nature* - there are rather a number of evolutionary solutions out there, rather than just one; while (ii) replacing 'adapted' with 'adapting' amounts to a denial of the completion of evolution in the Pleistocene period - evolution is a continuing process even for human minds. A majority of the text is devoted to a critique of specific EP theses concerning such topics as massive modularity, mate preference and marriage, and parenting; book-ended with broader

philosophical issues—the theoretical foundations of EP at the beginning and EP's claim to be developing a *science* of human nature at the end. It is important to note that although the volume is a destructive attack on EP, it is not a dismissal of evolutionary psychology the discipline. Buller is guardedly optimistic about evolutionary psychology, although his reasons for such optimism are not clear.

Chapters 1 and 2 are background for the hoped popular audience. Both can be skimmed by anyone familiar with the basics of evolution, genetics and EP. Chapter 1 ("Evolution") is a successfully pithy account of orthodox Neo-Darwinian evolutionary biology, with a very approachable section on genetics. Chapter 2 ("Mind") is a purely expository account of the fundamental tenets of EP. This chapter is a little denser and certainly more theoretical than Chapter 1. The real work starts with Chapter 3 ("Adaptation"). Buller begins by arguing that EP cannot be defeated with one monstrous attack, requiring instead assault on a number of fronts. EP has no single underlying flaw, so critique must be on a thesis-by-thesis basis. The devil, as usual, is in the detail. More importantly, the detail is necessarily empirical. EP's theoretical underpinning are too impoverished to supports its specific theses; thus its claims must stand on empirical evidence alone. But EP is not up to the challenge: it "attempts to substitute armchair reasoning for the necessary empirical research". The substitution comes by way of its reliance on adaptation.

EP hopes to make psychological processes understandable by detailing the problem-situations they were adapted to solve. According to EP, the problem situations were those confronting our Pleistocene ancestors. Buller argues there are insurmountable problems with such an approach. First, we can never get enough detail about the problems There are obvious epistemic difficulties with coming to know problems from the distant past. Second, what constitutes a problem-domain is partially dependent on the psychology, so EP's preferred argument strategy tends to be circular. Third, as I will discuss below, there is no problem-situation that is stable over evolutionary time. Fourth, even if the problem-situation was stable and could be precisely described it would not define a unique problem-solving mechanism. Problems simply do not specify their solutions. Not all adaptive problems must be solved (e.g., the problem of flight) and even when a solution is reached it does not spring into being fully formed. Evolution tinkers: it proceeds by modifying and co-opting available mechanisms. Thus there is no straightforward mapping of problem onto solution; we also require knowledge of the existing mechanisms upon which evolution tinkered. But we do not have that information. Thus EP's reliance on adaptation does not offer theoretical grounding for its specific claims, which, thereby, stand or fall on the empirical evidence alone. Undermining such evidence is Buller's major concern.

Chapter 4 (written with Valerie Gray Hardcastle) concerns massive modularity (henceforth MM), the claim the human mind is made of many dedicated, domain-specific and informationally-encapsulated systems. According to EP, each module *must* be encoded in an independent gene complex, because each module has been shaped by a *particular* problem, and, hence, must result from independent selective forces shaping it. Thus each module must be the result of mutations that added to (or successively modified) a gene complex responsible for the development of that module. But, Buller argues, this conflicts with our knowledge of the brain. Genetically encoded mass

modularity implies brain size would correlate (cross-species) with the size of the genome. This is not the case. Moreover, brain development does not appear to be genetically hardwired, but is extremely plastic with the over-production of neurons and connections that are then selective eliminated as a result of environmental factors. While this sub-section is thought provoking and forcefully argued it suffers a major flaw; namely, a lack of sufficient referencing. Indeed, this is one of the persistent problems with the book. No doubt the lack of detailed citations (and even the placement of those there are at the end of the volume) is intended to allow the text to be easily read. It achieves this, but at a cost to the scholarly value of the work.

Having argued our knowledge of the brain is in conflict with MM, we move to the usual *arguments* in support of MM; namely, arguments from (i) the diversity of the problems to be solved, (ii) recurrent structure, (iii) poverty of the stimulus and (iv) parallels between psychological abilities and linguistics (grammar). Argument (i) is dismissed as over-generalised rhetoric masquerading as argument. EP's idea is simple—the huge range of problems facing our ancestors could not possibility be solved by a single mechanism—but trades on a misconception—that general-mechanisms entail general solutions. It is clearly possible, however, for domain-general mechanisms to produce domain-specific solutions. Consider how imitation of one's parents would result in different behaviour in mate selection, food gathering and threat avoidance. Argument (ii) is a close ally of (i). The claim is that in order for an adaptation to evolve there must be a stable environment and a stable population, but the argument continues, although each individual problem may have a stable structure, there is none when all problems are considered together; hence, there must have evolved a number of distinct systems for each problem. But if there are *no* stable problems, evolution will favour the development of psychological plasticity. And there is every reason to think the problem domain for our ancestors was extremely flexible. Consider social intelligence. Successful social acting, as EP rightly notes, demands cheater and defector detection. But the development of such detectors will fuel the development of more sophisticated cheating and defection; demanding further improvements in detection and so on. We enter an arms-race. Thus to the extent our evolutionary environment is constituted by other actors there will be no stable problem-situation. (Note social actors are just a particularly vivid example; some predators and competitors will produce the some problem). (iii) Poverty of the stimulus arguments are criticized on a structural level for demonstrating at best the need for innate *knowledge*, not full-blown modularity. Finally, (iv) the parallel with innate grammar is subject to three strong criticisms. First, *pace* Fodor, there is every reason to believe that language is unique, so considerations from the modularity of grammar do not easily translate into arguments for the modularity of other capacities. Second, language is extremely complex whereas many of the modules proposed by EP are not. Third, given the lack of complexity, initial biases in the brain can explain the appearance of sub-systems that appear modular. While interesting and probably close to the mark, this discussion is fairly swift. The same is not true of Buller's meticulous attack on Social Contract Theory (SCT), to which I now turn.

Apart from Universal Grammar, SCT is perhaps the most widely known example of a (proposed) mental module, and one of the few modular theories with any empirical support beside pathology data (which can be suggestive at best). The evidence comes from studies employing the Wason selection task, which tests the ability to reason with

"If p then q" locutions. Extensive research has demonstrated that people deal very badly with this connective, often falling for one of two fallacies: namely, denying the antecedent (if not-p then not-q) or affirming the consequence (if q then p). But people are systematically better at social presentations of the tasks. And the improvement is independent of familiarity; performance improves even if the conditional mentions non-existent social rules in purely imaginary societies. Cosmides and Tooby have argued that to explain this 'one is forced to invoke content-specifized inferential machinery, including social contract algorithms' (Fiddick, Cosmides & Tooby, 2000; p. 5). Buller challenges this. He argues that social and non-social forms of the Wason task are not logically equivalent. Social presentations of the task implicate deontic rules, whereas non-social presentations implicate indicative rules. And deontic rules are not true conditionals. Thus the systematic difference in performance is attributed not to differences in content, but differences in logical form. Things are worse than this. First, the implication from systematic preference for social presentations to modularity must also assume a symbolic instantiation of logic rules (Parsell 2005). Second, the EP move must also assume that the surface grammar reflects the underlying logical structure. Once these assumptions are given up, the Wason data no longer support modularity. This section of the text is the most scholarly, exhaustive and persuasive. But it is unlikely, due to its length and detail, to appeal to Buller's hoped general audience. In contrast, the final section on general intelligence is far too brief.

Chapters 5-7 move from the philosophical significant analysis of modularity, to the sexy issues of mating, marriage and parenthood. Although I do not have the space to discuss these topics in detail, it is worth mentioning that Buller, in offering alternatives to EP's take on things, does offer a correction to one of the persistent problems of EP: namely, focusing exclusively on "survival of the fittest" explanations rather than the full gamut of evolutionary factors. The book closes (Chapter 8 "Human Nature") by returning to the more philosophically engaging issue of human nature. Buller argues that the idea of a human nature is antithetical to the central ideas of evolution. There are two prima facie plausible grounds for human nature: a characterisation of the essence of a "normal" human or the human species. But the division between normal and abnormal has no place in contemporary evolutionary biology. And the correct account of species within evolution shows them to have no essences. The argument here draws on some of the more interesting literature in the philosophy of biology, which appears to demonstrate that species are not natural kinds, but individuals. Accepting species as individuals means the program of identifying the essential nature of a species crumbles. Individuals do not have essential properties. Moreover, individuals cannot feature in scientific *laws*. Buller concludes that an "*evolutionary* science of human psychology will not only abandon the quest for humans nature, but, with it, the quest to be a science in the model of physics or chemistry" (p. 457; emphasis in the original). While I agree psychology shouldn't be modelled on physics, the argument here is unlikely to convince most: the premise seems far more controversial than the conclusion. The claim that species are individuals is pretty startling stuff and Buller does not provide enough argument to convince those not already familiar with the rather specialised literature.

Overall, this is a really nice demolition job on EP. It is tightly argued throughout. While successful as a general critique the volume does suffer some flaws. There is a lack of a coherent positive program. Many hypothesis and theories are used as alternatives to

EP's take on the empirical evidence, but these are not used to inform a unified theoretical position. This makes a number of the proposed alternatives seem rather ad hoc. Perhaps there can be no coherent positive program at present, but just a range of explanations of various traits and behaviour awaiting theoretical integration. Buller would probably endorse this; in the Epilogue (p. 481) he explicitly states that there is no suitable unified alternative to EP presently available. Still he believes that the discipline in which to look for such unification is evolutionary psychology. It is not clear to me that this is actually the case. Coherence may actually reside at a level above psychology—at the level of culture—rather than the level below. Indeed, many of Buller's claims point to the conclusion that it is cultural, non-physical inheritance that may be the missing glue. Buller criticises EP for its implicit commitment to natural theology, but he may be committed to an equally unjustifiable and lamentable assumption of reductionism. This does not impact the success of his destructive program, but it may explain his pessimism concerning the present prospects of an integrated account by restricting his gaze. I fail to see the basis for Buller's optimism concerning evolutionary psychology. Indeed, many of the resources he uses to assault EP seem to be reasons to doubt the usefulness of evolutionary psychology. He has successfully show that EP is not really evolutionary, but failed to show that evolution is likely to provide much of a resource when it comes to developing an integrated theoretical position concerning the nature of the human mind.

Second, the volume cannot decide what it wants to be. By having one foot in both the academic and popular ballparks it fails to play a really good game of either. As an academic title it suffers from being too cute—e.g., the sections of mate selection are called "Women Seeking Men" and "Men Seeking Women" respectively—and lacks the necessary citation details in places (e.g., the entire sub-section on neural plasticity is almost without references). This limits its usefulness in the academy. It is not an appropriate undergraduate text. And the postgraduate interested in these areas should have mastered this material. In the student population then, the book it probably only valuable to advanced students in areas outside evolutionary psychology, philosophy of biology and the like who need a swift inoculation against EP. There are probably many students in ethics and epistemology. As a popular title it is far too long, covers too much material and is far too detailed in places: even the most enthusiastic amateur is unlike to want to spend 30 pages on the use of the Wason selection task as evidence for mental modularity.

But despite its flaws the volume is recommended reading for anyone who has been hitherto convinced by EP or is showing the tendency to be so convinced; anyone who is interested in the impact on evolution on the mind; and anyone who is interested in such sexy issues as human mate choice, jealousy and human nature.

References

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