Beyond nature versus culture: a response to comments

I am grateful to the three correspondents for thoughtful and supportive comments on my paper. I detect considerable convergence in our views on both the promise and the difficulty of an adequate integration of Darwinian ideas into social science. I will not respond here point by point, since the commentaries raise deep, open questions that would require at least another full article to address. Nor do I wish to burden the reader with repetition of points already made in the main article. Instead, I would like to conclude briefly by pointing out some key ways in which the problems that evolutionary social scientists face are actually very similar to the problems that evolutionary biological scientists face. That is, the difficulties which strike us in applying something as simple as the theory of evolution to something as complex as human social life are in fact the very same difficulties which we encounter when applying that same theory to something as complex as organic life more generally. This point may help to bring social and biological researchers together. It is not that the one faces complexities and difficulties of a different order than the other faces; rather, both face great complexities, and the challenges in the two cases are often parallel.

Dazzling diversity

The comments remind us that the human ethnographic record is one of dazzling diversity. Populations in similar ecologies with similar population densities and production systems are organized in strikingly different ways, ways that could not be predicted a priori and which depend to a considerable extent on historical contingency. But before we conclude that ‘[t]he rich complexity of human social systems may seem dazzling compared to the apparently simple and limited explanations ... offered by evolutionary theorists’ (Layton, p. 248), let us remind ourselves that the very same point could be made in respect of all organic life. Over 70 million years, a single mammalian ancestor has given us over 5,000 radically different ways of making a living, from 30 millimetre bumblebee bats, to 30 metre blue whales. Some mammals have gone down the road of speed, some of size, some of arboreality, some of flight; some have gone for numerous and frequent offspring and fleeting sexual relations, others for extended pair bonds and few offspring with extended care. Males may be larger than females and adorned, or the same size, or smaller; seasonality may be dealt with by storage, or
migration, or hibernation, or being large, or being small. Although this dazzling variation – all of which occurs within one rather small branch on the tree of life – is constrained by ecology, it is not exhausted by it. Indeed, within similar habitats or the very same one, one may find many different mammals making their livings in quite different ways. Different lineages have different histories, and these gave them different affordances, different paths across what became effectively different fitness landscapes.

Thus, the contrast between the simplicity of the theory and the complexity of the record is not a peculiarity of social science. It is the very heart of what evolution always produces. Darwin’s is precisely a theory of how a few simple forces, applied to a contingent and stochastic world, a world in which history matters, produce dazzling diversity from homogeneous origins. This is the meaning of the famous ‘tangled bank’ passage which concludes the first edition of *The origin*:

> It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us (Darwin 1996 [1859]: 360).

Complexity of outcome is not an obstacle to applying evolutionary theory, but rather a sign that this is a case where an appropriately nuanced evolutionary theory is needed.

**The comparative method**

In view of the above, it is easy to despair at the possibility of prediction, of generalization, in both evolutionary social science and evolutionary biology. The outcomes seem so variable, so unpredictable *a priori*, that there appears little point in trying to do anything more than describe what is there. However, this counsel of despair can be easily avoided if one is appropriately clear what it is that one is trying to do. Prediction of the exact evolutionary path that any particular lineage (culture) will take is indeed more than one could hope for. However, an understanding of the dynamics of evolution allows predictions to be made at a comparative level instead. For example, lineages facing high rates of mortality will tend to invest in early and frequent reproduction, and often small adult size (‘fast’ life history), compared to those facing lower mortality rates, which will tend to evolve a slower life history of large size, fewer births, and later age at sexual maturity. This prediction is made by theory, and amply confirmed by comparative data across species (Promislow & Harvey 1990). There may be many, contingent, unpredictable, reasons why mortality is high or low in a particular time and place – the indrii, for example, experiences low mortality by being big and happening to live in Madagascar, where there are no large carnivores, whereas bats experience low mortality because they can fly – but the point is that we can make ‘if-then’ hypotheses which are amenable to test with comparative data: if (for whatever reason) mortality is high, then early reproduction is likely to evolve. As well as differences *between* species, this very same principle powerfully explains differences in age at reproduction *within* the human population, whether it be the contrast between pygmy and non-pygmy populations in Africa and Asia (Migliano, Vinicius & Lahr 2007), or the difference across poor and affluent neighbourhoods in Chicago (Wilson & Daly 1997). That the reasons for the mortality differences are so diverse, and the proximate mechanisms by which adaptation is achieved multifarious (genetic selection, cultural transmission, individual cost-benefit calculation), makes no difference to the elegance and generality of the functional explanation.
The lesson of this is that evolutionary hypotheses are often best tested using comparative evidence from many cultures rather than within any single culture (see, for some examples, Fincher, Thornhill, Murray & Schaller 2008; Holden & Mace 2003; Low 1988; Quinlan 2007; Schaller & Murray 2008). This is equally true for biologists, but for social scientists it constitutes a change of emphasis from usual ethnographic practice, where individual researchers concentrate on just one culture, about which they wish to understand everything, rather than a question, which they test across all cultures. Evolutionary biologists are satisfied if they can explain even a small portion of the variation across many taxa, whereas ethnographers want to understand deeply how the various components of one culture fit together. However, the gains from trade between the two approaches are very high here. There can only be good cross-cultural databases if there are good ethnographers of every culture, just as there can only be good cross-species databases if there are good descriptions of each species. Thus, a fruitful collaboration between ethnographers and evolutionists lies in the creation and exploitation of comparative data on human cultural and social organization, with the richness of ethnographic data, and the hypothesis-generating power of evolutionary theory.

**Diversity of mechanism is not diversity of function**

A final point to make about the diversity of the ethnographic record is that diversity of mechanism is not diversity of function. This echoes Dunbar’s point about the need to differentiate functional explanations (why is X retained in the form it is?), mechanistic ones (how does X work?), and historical or phylogenetic ones (where did X come from?). These distinctions are not always made clearly in social science, but they are crucial, not least because different mechanisms with different historical origins can serve the same function. The wings of birds and those of bats, for example, have arisen in quite different ways, at different times, from different substrates. However, given the fundamental aerodynamic pressures on flight, the functional reasons for their current shapes can be studied without regard to this difference in their origins. Similarly, human societies organize, for example, the provision of public goods using different traditions or institutions which were moulded out of different socio-cultural raw materials. However, regardless of what they were built from, or how they hold their normative power, they are moulded by the same fundamental conflicts and possible solutions well described by evolutionary theory (West, Griffin & Gardner 2007). Thus, we should be wary of rejecting common functional hypotheses for patterns of behaviour just because their phenomenology, proximate mechanism, or historical origin is demonstrably diverse. Tinbergen’s four whys are just as useful for social science as they are for biology more generally, and indeed they might become a useful interface for reconciling explanations not just between biology and social science, but amongst the various human sciences (psychology, sociology, anthropology, history, economics) as well.

**REFERENCES**


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