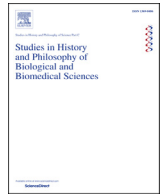


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Essay review

Can cultural evolution bridge scientific continents?

Thomas C. Scott-Phillips

Evolutionary Anthropology Research Group, Durham University, UK

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Cultural Evolution: Conceptual Challenges, Tim Lewens. Oxford University Press (2015). 224 pp. Price £25.00. Hardcover, ISBN: 978-0-19967-418-3

I

The gap between, on the one side, anthropology and sociology, and, on the other, biology and psychology, sometimes feels like a kind of intellectual Bosphorus: a place where the so-called ‘hard’ and ‘soft’ sciences meet, separated by a strait that divides two modes of enquiry and ways of knowing that can seem to come from different continents. What is plain to one can seem absurd to the other. The methods and findings of each can be of much mutual relevance, but the modern history of these waters has too often been one of division rather than synthesis.

Over the past 5 years, Tim Lewens—Professor of Philosophy of Science at the University of Cambridge—has held a major grant from the European Research Council, which aims to expose unacknowledged philosophical differences between the two sides of the strait: differences, for instance, about the nature of human nature, and about what constitutes scientific explanation. His new book, *Cultural Evolution: Conceptual Challenges*, is a major output of this project. In it, Lewens focuses his energies on one of the most prolific recent attempts to bridge the divide, namely research pursued under the banner of ‘cultural evolution’, and epitomised by the work of Rob Boyd, Pete Richerson, Joe Henrich, and their colleagues (see e.g. [Boyd & Richerson, 1988](#); [Henrich, 2015](#); [Mesoudi, 2011](#); [Richerson & Boyd, 2005](#)). Lewens aims in particular to elucidate what the cultural evolutionary project can contribute to contemporary debates about human nature and human life, and whether any of the concerns raised by its sceptics are well-founded. This is, in short, a philosophical evaluation of the cultural evolutionary project.

Lewens goes about his work with care, and in a largely systematic way. A brief summary of the structure of the first chapter of the book—“What is cultural evolutionary theory?”—will suffice to illustrate. §1.1 outlines the chapter to come. §1.2 introduces the first and most intuitive of three types of cultural evolutionism: the *historical* approach. §1.3 is one paragraph long, and it diagnoses the fact that historical evolutionism is not a new idea in and of itself: nobody would deny that cultures change over time. §1.4 and §1.5 then introduce the second and third types of evolutionism: the *selectionist* and *kinetic* approaches (see below for discussion). §1.6 introduces the closely related idea of an epidemiology of representations, and §1.7 points out the remaining holes in this informal taxonomy. In this way, we are systematically introduced to the various vessels that exist for navigating the relevant waters. Subsequent chapters each address a variety of important philosophical questions about the cultural evolutionary project, and all are structured just as cleanly as this—as is the book as a whole, in fact. All in all, *Cultural Evolution: Conceptual Challenges* is a model example of the sort of careful conceptual ground clearing that is the stock-in-trade of philosophers of science. It would be an excellent starting point for anybody wishing to read an independent, evaluative guide to the cultural evolutionary project.

II

As mentioned above, Lewens makes a distinction between *selectionist* and *kinetic* approaches to cultural evolution. Selectionist approaches are those that are committed to the view that the conditions for natural selection hold for culture, at least to some interesting extent; or, put another way, that cultural items are engaged in some sort of competitive (Darwinian?) struggle. The kinetic label is less familiar. The idea is that just as the kinetic theory of gases aims to explain large-scale phenomena (pressure, temperature, etc) as the aggregation of many small-scale events (interactions between individual molecules), kinetic approaches to culture aim at the same. They ask: by what process do many individual human interactions aggregate to widely shared patterns of culture? The challenge is to describe the link between the micro

E-mail address: thom.scottphillips@gmail.com.

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and the macro, in ways that are compatible with methodological individualism.

Lewens presents the cultural evolutionary project as kinetic first, and selectionist second. It is certainly true that both these agendas are present, but unlike Lewens, I don't believe that kinetic explanations are the ultimate end goal of the cultural evolutionary project. Boyd, Richerson, Henrich and their colleagues are indeed kinetic theorists, and they advocate a broadly selectionist approach to that problem, but the link between macro and micro does not seem to me to be the ultimate objective of their work. It is instead a means to a different end, namely to explain human minds and human behaviour.

By way of illustration, consider the introductions to the project's major books. Boyd and Richerson's *Culture and the Evolutionary Process* (1988) begins by making the point that culture complicates the question of how Darwin's theory of natural selection can be used to explain human behaviour. Their self-set goal is to address this. As they put it, "this book outlines a Darwinian theory of the evolution of cultural organisms" (p.2). Note the final two words: not "culture", but "cultural organisms". Boyd and Richerson were both originally trained in biology, and their goals here remain biological ones: to use an evolutionary approach to explain the form and behaviour of a certain type of species, namely those with culture. In pursuing this goal they have made important contributions to the anthropological goal of explaining culture itself, but this is not their foremost concern. This remains true in their more recent and more accessible book, *Not By Genes Alone* (2005). The clue is in the name: what they want to explain is human minds and human behaviour, and the point they want to make is that to do this, you can't just look at genes and genetic evolution (this is why they are sometimes called 'Dual Inheritance Theorists'). They write that one of the main headline points they want to make is that "culture is critical for understanding human behaviour" (p.3). They could also have stressed that the opposite is true too; but they do not, because that is not their main concern. This is why ideas about biological processes—such as, say, cultural group selection—are far more prominent and important in the work of cultural evolutionists than are ideas about cultural processes (such as, say, habitus). More generally, when they write that culture is critical, the main targets they have in mind are others who also aim to explain human minds and behaviour, in particular sociobiologists, evolutionary psychologists, and human behavioural ecologists. In all, while the cultural evolutionary project certainly does develop kinetic and selectionist explanations of culture, some of which are important in their own right, these contributions to knowledge do not seem to be the ultimate *raison d'être* of the work.

An important point of comparison here is with the work of Dan Sperber and his colleagues (the 'Paris school'; see e.g. Boyer, 1998; Claidière, Scott-Phillips, & Sperber, 2014; Morin, 2016; Sperber, 1996; Sperber & Claidière, 2008; Sperber et al., 2010). Unlike Boyd, Richerson, Henrich, and their colleagues (the 'California school'), the Paris school really do aim at kinetic explanations of culture as ends in their own right. This is clear throughout Sperber's seminal book *Explaining Culture* (1996), but you don't need to pick up the book to see this, since the goals are stated right there in the title. Lewens recognizes that the California school and the Paris school are each important points of contrast for one another, but he does not see that in at least this one important respect they are close to opposites. The California school aims to explain human minds and human behaviour, and they develop explanations of culture as a means to this end. In contrast, the Paris school aims to explain culture, and they develop explanations of human minds and human behaviour as a means to that end. This difference of agenda may help to explain why, despite several years of mostly productive dialogue, the two schools of thought do still sometimes seem to talk

past one another (compare e.g. Henrich & Boyd, 2002, with Claidière & Sperber, 2007). It seems a missed opportunity that Lewens does not bring attention to this difference. In fact, Lewens chooses to not much discuss the Paris school, beyond the extent to which they are relevant to his main topic, which is the output of the California school.

III

Lewens' headline conclusions are balanced. On the one hand, he articulates well why population thinking can and should be a very important tool for the study of cultural dynamics. On the other hand, he frequently warns against overreach. Darwin's theory of natural selection provides a framework around which the biological sciences are organised, and some cultural evolutionists have argued that the social sciences can and should be similarly organised around some version of cultural evolutionism. Consider, for instance, the subtitle of Alex Mesoudi's book *Cultural Evolution: How Darwinian theory can explain human culture and synthesize the social sciences* (2011). Lewens assesses the arguments for this claim in some detail, and concludes very much against it: "there is little credible prospect for radically reorganizing the social sciences around a central commitment to a selectionist approach to cultural change... what evolutionary approaches have to offer is more modest" (p.183). What cultural evolutionists have to offer the social sciences is a set of useful tools, but no grand theory.

One of these useful tools is, as mentioned, mathematical models of population change (these can be populations of individuals, or populations of cultural items, or even both). Indeed, an abundance of such models is how the cultural evolutionary project made its name, and this continues to be an important methodology. Lewens' guide to the merits and perils of the method is recommended reading. Without going into mathematical detail, he explains what these models can tell us, and why. He also highlights, just as importantly, what they cannot tell us, what the potential pitfalls are, and he brings attention to some cases where the findings of modelling work have been overinterpreted.

Models can serve several epistemic functions, but most models of cultural evolution are of one particular type: they are proof-of-concept models, the aim of which is to develop causal explanations (see Servadio et al., 2014). Lewens points out that to accept the conclusions of the models, we should be convinced of three things: (1) that the phenomenon to be explained is real; (2) that the model shows how, given certain assumptions, one particular explanation, and not others, is able to account for the phenomenon; and (3) that the assumptions, both implicit and explicit, are sound. He then takes us through a specific example, namely Henrich's influential model of technological adoption (2001). This model aims to show that the characteristic S-shaped curve is in large part the consequence of conformist bias (the curve is S-shaped because there is slow adoption at first, then faster adoption, and then slow again as the technology becomes widespread). In this case, what needs to be shown is: (1) that technological adoption really does follow an S-shaped curve; (2) that a group of conformist individuals will produce an S-shaped curve, under a range of general conditions, but groups of individuals with other types of psychological dispositions will not; and (3) that the psychological dispositions invoked by the model (specifically, a particular type of conformist bias) are genuine. If all these conditions are satisfied, then we should, Lewens explains, accept Henrich's claim that of patterns of the adoption of technology are in large part explained by patterns of conformity.

Let us accept condition (1). Lewens examines conditions (2) and (3) in some depth, and concludes that both are less secure than they initially appear. Perhaps much less so, in fact. (2) is less secure

because even if Henrich's model does fit the facts, it is not specific enough to rule out several other alternative, plausible explanations. One obvious alternative is plain accessibility: the more widely spread an innovation is, the more likely we are to encounter it, to appreciate its utility, and hence to adopt it (Morin, 2016). An S-curve may follow. No conformity needed. Yet Henrich's model does not rule out this possibility, or several others. As such, "Henrich has not given any clear reason why his preferred mathematical model is uniquely suited to a representation of one competing hypothesis over another" (p.118), and condition (2) is not secured. Neither is condition (3): "at least in the case of conformist bias, the body of [empirical] evidence is weaker than has sometimes been thought" (p.122). Lewens is consequently unimpressed that the results of this model have been presented in later papers as clear, even decisive evidence of the existence of conformity bias. He expresses the point with British understatement: "this form of apparent empirical confirmation is illusory" (p.128). In all, by working through this example in detail, Lewens illustrates well the potential pitfalls of evolutionary modelling. Lewens is keen to show that modelling can be a very effective tool, but just as keen to show that it must be used with care, caution, and attention, if we are to place any confidence in the conclusions derived.

One important issue Lewens does not discuss is whether the language of 'biases' is a good one in the first place. There is abundant empirical data that individuals are non-random in their choices of what to learn and who to learn from, and also that as it spreads through a population, cultural information gets transformed in non-random ways. These data are commonly interpreted by cultural evolutionists as evidence of 'social learning biases', defined as "non-random rules governing from whom people learn, what they learn, and how they transform what they learn during the process of learning" (Mesoudi, 2016, p.18). Many such supposed biases have been thus labelled: "When we add the counter-intuitive bias... and the social bias... to the hierarchical bias... and gender-stereotype bias..., we can begin to see a provisional list of content biases emerging from the experimental literature" (Mesoudi & Whiten, 2008, p.3492). These biases are, furthermore, often assumed or argued to be innate, adaptive products of biological natural selection: "Selection very likely built such rules into the innate structure of our minds" (Richerson & Boyd, 2002, p.740).

Perhaps not all cultural evolutionists would subscribe to the nativist claim, but even putting that aside, the language of social learning biases has always struck me as an impoverished view of the mind. Cognition is surely not simply a collection of biases and heuristics, whether innate or otherwise. How the mind works is obviously not a simple matter, but our knowledge is further advanced than this. Moreover, it is disputable whether social learning biases have any natural ontology in the first place (Heyes & Pearce, 2015). Non-random choices about who to learn from may arise from cognitive mechanisms that are not specifically social. This point matters because if social learning biases do not have natural ontologies, then claims about their evolution, and their role in cultural evolution, quickly become slippery and ambiguous. What sort of mechanism is it, exactly, that is supposed to have evolved? I expect that the California school of cultural evolution would agree that deeper integration with the findings and insights of cognitive science would be a desirable advance, but they have not much pursued such integration to date.

IV

Cultural evolution is often seen as—indeed, often presents itself as—being in competition with evolutionary psychology. Lewens is right to point out that, despite their differences, these two approaches do nevertheless share some important epistemic

commitments. He emphasises in particular how both use some version of 'methodological adaptationism': the heuristic tool which recommends "consideration of the circumstances in which our species evolved...", because this "...is likely to provide us with various heuristic insights when it comes to formulating hypotheses about how our minds and bodies work right now" (p.148; see also Godfrey-Smith, 2001; Lewens, 2009). Lewens argues that where the two schools differ is not here, in their adaptationism, but instead in what they choose to focus their adaptationism on: "Roughly speaking... one evolutionary camp [cultural evolutionists] emphasizes whom we acquire our representations from, while the other [evolutionary psychologists] emphasises what sort of representational content we find easiest to handle" (p.149).

This is true enough, up to a point, but there are more important and more nuanced differences. In particular, while Lewens is right that both approaches are committed to some form of adaptationism, and hence that they both attempt to describe what sort of cognitive architecture is most likely to enhance human fitness (in ancestral environments at least), there are big differences in how they each go about this.

Cultural evolutionists typically justify claims about human adaptation by using mathematical models to show that real-world phenomena can only be explained, or are most likely to be explained, if humans possess the hypothesised adaptations. The S-shaped curve of technological adoption discussed above is an example. Evolutionary psychologists argue differently. They emphasise how natural selection tends to encourage functional specificity at all levels of analysis, and they hence view the mind as a collection of tools, each effectively designed for a particular purpose. Correspondingly, they argue that the most appropriate way to identify adaptation is to identify functional specialization, and that doing so will, in addition, help to guide our hypotheses about how the mind works. Consider, as just one recent example, theory of mind: the ability to mentally represent others' mental representations. Several recent experiments, motivated by an evolutionary perspective, now show that false beliefs (a type of mental representation) are processed more quickly than are false signs (a type of public representation) (Cohen & German, 2010; Cohen, Sasaki, & German, 2015). Such data are suggestive of design: they suggest that theory of mind is functionally specialised for social life, rather than being just one manifestation of a generalised ability to represent representations. For the evolutionary psychologist, this is good evidence of the action of biological natural selection.

Cultural evolutionists are, as Lewens notes, committed to some form of adaptationism, but despite this they have not much pursued this type of argument from design. As mentioned above, cultural evolutionists stress the importance of social learning biases, and often claim that these biases are important biological adaptations. One way to defend this claim would be show evidence of functional specialization i.e. evidence that these biases operate only, or more effectively, on culturally-acquired information than on the same information acquired from, say, social but not cultural sources. Yet such research has not been pursued. This is regrettable, since good data of this sort, about the extent to which the relevant cognitive mechanisms are functionally specialised for handling culturally acquired information, would be very informative for debates about the nature of the human evolutionary niche (compare e.g. Boyd, Richerson, & Henrich, 2011; Pinker, 2010). This is, incidentally, another point of difference with the Paris school, who have hypothesized that cognitive mechanisms for filtering incoming information are functionally specialized to handle information originating in one-to-one interaction, but *not* information propagated on a larger, cultural scale (Sperber et al., 2010).

Lewens' general conclusions about the adaptationism of cultural evolutionists are indicative of his conclusions as a whole: "the cultural evolutionists's adaptive thinking should be highly deferential to work in developmental psychology, neuroscience, ethnography, and so forth. These disciplines will not be eclipsed by cultural evolutionary work: on the contrary, if cultural evolutionary work is to make progress, its practitioners will need to steep themselves in these more traditional approaches" (p.161). Lewens is keen to encourage deeper integration between the natural and the social sciences, and he clearly believes that the cultural evolutionary project has some promise. At the same time, he sounds many important notes of caution. He wants more bridges across the intellectual Bosphorus, but he also wants specialists on both sides to be much more involved in the design work. All who share his wishes would be wise to pay attention.

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