Evolutionary social science beyond culture

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Abstract: Mesoudi et al.'s case can be improved by expanding to compelling selectionist explanations elsewhere in the social sciences and by seeing that natural selection is an instance of general selectionist process. Obstacles include the common use of extreme idealizations and optimality evidence, the copresence of nonselectionist social processes, and the fact that selectionist explanations often presuppose other kinds of social explanations.

Mesoudi et al. do a nice job of arguing for the usefulness of evolutionary models in the social sciences. In what follows, I suggest that they both understate their case and underestimate some of the problems that evolutionary models face in the social sciences.[1]

There are substantial bodies of social science research employing variation/selection/retention models that Mesoudi et al. do not cite, and some of that work is probably more rigorous than the work they do cite. One such area is organizational ecology in sociology (Hannan & Freeman 1989). This work develops large databases to show that different organizational strategies – generalist and specialist – cause differential survival and persistence of organizations in different kinds of environments (fine-grained, patchy, etc.). The arguments made parallel much of Endler's reasoning which Mesoudi et al. cite as a paradigm. In my view, this work is very well done and strongly supports Mesoudi et al.'s case.

Another important body of work comes from the enormous amount of work done in game theory in economics, political science, and history. The most obviously relevant is evolutionary game theory, which took its inspiration from Maynard Smith but has since been developed with considerably more mathematical rigor by economists (e.g., Gintis 2000). But even standard rational-choice game theory studies are relevant, since the Nash equilibrium they describe is unlikely to be reached by rational agents working out in their heads the relevant equilibrium but, instead, by a trial-and-error process where strategies are competing with each other and survive because of their payoffs. The work of Bates et al. (1998) is a particularly strong instance of this research program that combines detailed historical evidence with rigorous modeling.

Mesoudi et al. also understate their case at a theoretical level in several ways. First, they claim that borrowing of models and formalism across fields is unusual, when in fact it is standard practice in several areas. It is standard practice in physics, particularly in the search for what are called "universalities" (see Morgan & Morrison 1999; Batterman 2002). Applying the same formalism across multiple domains is a way of unifying different fields without reducing them to some more fundamental level. Advocates in evolutionary game theory explicitly invoke this rationale for their work (Gintis 2000).

Second, the authors' case could be made stronger by explicitly noting that evolutionary mechanisms can be described at various levels of abstraction in terms of details of the process. At the most abstract, selectionist mechanisms identify a causal effect of a character (strategy, practice, etc.) and show that having that effect causes the trait to persist. There are various ways to realize such causal processes, where direct copying and differential survival of genes is a paradigm case. But even in biology, literal copying is not essential (heritability can be achieved by other routes). So the common doubts about evolutionary accounts in the social sciences on the grounds that social selection is not analogous to the biological, miss the point. At one level, they are trivially analogous: As causal processes they are dynamical systems that we can trace through state space. The real question is whether there is differential survival and persistence, not whether there are social "genes." You can think the memes idea hopelessly fuzzy and still think there are good selectionist explanations. The work of Hannan and Freeman (1989) is a case in point.

I would argue that Mesoudi et al. miss such support for their case because they restrict their discussion to explanations of culture. Obviously there is much more to the social sciences than cultural anthropology or the study of ideas, beliefs, and so on. Moreover, there are good reasons to think that culture as information in people's heads sets up an unnecessarily difficult situation. There are multiple problems here. Identifying units is hard, even if it can sometimes be done. Moreover, there is much cognitive science and social science research that suggests that "information in the head" is the wrong way to think about culture. From cognitive science the support comes from the idea that mental process are essentially tied up with an external "scaffold" that makes information processing possible in the first place (Clark 1997). From the social sciences, the argument is that knowledge and culture are distributed across individuals and embedded in institutions, social practices, and organizations (Hutchins 1995). These facts explain both why the narrow notion of culture may be hard to work with and why the social sciences gravitate toward selection mechanisms of practices, institutions, organizations, and so on.

On the downside, there are four important obstacles that Mesoudi et al. do not much discuss. (1) On their view, formal models are an important route to progress and should be in the social sciences as well. However, at least one social science – economics – uses formal models extensively; models based on idealizations that will make your head swim. So there is the big question of when and where evolutionary game theory is telling us something about the world. (2) Selectionist explanations in the social sciences are often supported by optimality arguments rather than direct evidence of selection, and the value of these arguments is an open question. (3) Selectionist causal processes are not incompatible with other, nonselectionist processes acting at the same time, as Mesoudi et al. acknowledge in the case of drift. A norm, for example, may promote coordination and persist in part because it does so, but may also exist in part because it furthers the interests of the powerful. This is not an inherent problem, but it may be a common one in the social case and it definitely does complicate things. (4) It is unclear how far selectionist stories can go in the social sciences, because frequently a selectionist account (cf. Bates et al. 1998) takes as given the organizational and institutional structures that determine payoffs and possible strategies. Perhaps these situations describe a social parallel to the kind of issues that worry advocates of niche construction and developmental systems in biology, and so these ought to be issues the authors are sensitive to, given their own work in this area.

NOTES

1. The comments that follow are based on Kincaid (1996, Ch. 4; 2006)

Cultural evolution is more than neurological evolution

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Abstract: Advancing a general Darwinian framework to explain culture is an exciting endeavor. It requires that we face up to the challenge of identifying the specific components that are effective in replication processes in culture. This challenge includes the unsolved problem of explaining cultural inheritance, both at the level of individuals and at the level of social organizations and institutions.

https://doi.org/10.1017/S0140525X06329081 Published online by Cambridge University Press