

REVIEW

KIM STERELNY

The Evolved Apprentice: How Evolution Made Humans Unique

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As philosophers have begun to express scepticism with traditional briefs for their discipline—including various forms of conceptual analysis and metaphysical speculation—some have suggested instead that our role should be to draw together the results of many different sciences, with the aim of providing a balanced and coherent image of our place in nature that is both conceptually disciplined and properly grounded in empirical enquiry. One problem levelled at this synthetic mission-statement for philosophy is that it makes the business too demanding: it is simply implausible that anyone can attain the necessary critical mastery of such a wide range of fields. Kim Sterelny's wonderful new book, which knits together results from ethnography, theoretical biology, cognitive science, and biological anthropology, constitutes an intimidating possibility-proof for others who would aim at such syntheses.

The book's subtitle indicates its main goal: Sterelny aims to outline our distinctive capacities when compared with other species, and to explain how we came to acquire those capacities. Unsurprisingly, he argues that the most salient feature of humans is our ability to construct, augment, and mobilise vast storehouses of shared information. The surprises come when we examine the answers Sterelny gives to the question of how we got to be so good at these activities.

First, there is comparatively little philosophy in this book, if by 'philosophy' one means the sort of discussion that goes on in the pages of our professional journals. There isn't even much philosophy of science. This is as it should be:

Sterelny is in the business of offering a plausible narrative account of how we came to be so reliant, and so good, at transmitting increasingly informative bodies of expertise from one generation to the next. That account is guided and constrained by cognitive and anthropological accounts of changes in social and mental organisation over evolutionary time. It is not offered with great certainty, but at the same time it is far more than a mere ‘how-possibly’ explanatory sketch: it is something like a detailed ‘quite-probably-actually’ narrative. The account is nonetheless philosophical, partly because of its speculative nature, partly because Sterelny’s synthesis is an armchair activity parasitic on the empirical work of others, and partly because the sort of conceptual ground-clearing loved by philosophers is essential as the elements of Sterelny’s story are combined.

Second, one of the most refreshing themes of Sterelny’s treatment is his resistance to the notion that the expansion of our information storage and acquisition abilities has been driven by a single key event or process. It is evident that a plausible evolutionary story for the development of a complex capacity like this one certainly does not require one pre-eminent explanatory factor. That said, the absence of a single key factor makes it epistemically harder to recover the actual concatenation of events that were responsible, and more challenging to tell that story in the form of a linear narrative.

Third, the sorts of explanatory tools Sterelny draws on to tell his story are of an extremely eclectic kind. It is a mark of how far things have come since Barkow, Cosmides and Tooby ([1992]) put forward a manifesto for evolutionary approaches to the mind twenty years ago that Sterelny draws at times on notions of extended cognition, embodied cognition, niche-construction, multi-level selection, and so forth, in articulation of the thesis that ‘human cognitive competence is a collective achievement and a collective legacy’ (p. xii). These explanatory resources, all of which signal movements away from an image of human culture as the largely epiphenomenal expression of genetically-inherited adaptations residing in the brains of human individuals, may eventually help to bring the biological anthropologist’s vision of the genealogy of human cognition into closer harmony with the social anthropologist’s vision of the constitution of human cultures.

Sterelny’s overall account defies any simple summary, in large part because he is so sceptical of simplifying explanatory models. Consider, for example, that the sharing of information is often subject to various forms of deception and free-riding:

individuals may not bother to learn for themselves, instead sponging off the knowledge acquired by others; they might learn for themselves and refuse to share that knowledge with others; and finally they might fake their way into a reciprocating community of knowledge-sharers by disseminating misinformation that costs them nothing to generate. Sperber ([2000]) suggests that folk epistemology—or, as he puts it, ‘a logical module specialized in checking the validity of arguments’—is our solution to this problem: we actively assess the claims of others for consistency, reliability, and so forth, for this lowers our chances of being duped by epistemic free-riders and deceivers. In response to this, Sterelny argues for a far more differentiated view of information-sharing itself: sometimes we stand to gain by fobbing others off with misinformation, but sometimes (as, for example, when others observe the manufacturing practice of artisans) it is rather difficult to lay false trails, and in any case the valuable information one leaks is likely to fall onto one’s own kin. So the costs and benefits of information-sharing are not uniform across contexts. Moreover, folk epistemology is not solely a tool for policing informational freeloaders: there are often synergies to be had, of benefit to all, when the shaky opinions of each are amalgamated into a more reliable consensus view. Such synergistic benefits are better secured when our confidence can be quantified and assessed.

This sort of variegated account of the functions of our informational practices and dispositions is important because Sterelny’s overall account takes the form—somewhat reminiscent of Darwin’s project when he tells the story of the development of the moral sense—of a historical narrative constrained by a commitment to gradualism. If information-sharing can only evolve given a set of reasonably sophisticated forms of epistemic assessment, then we might worry about how these complex evaluative abilities could possibly come to exist prior to the practices they police. If, instead, information sharing can at least begin to establish itself without such policing, then our problem is reduced.

In a similar vein, Sterelny argues that the social transmission of valuable information does not require—although it now involves—dedicated adaptations *for* social learning. Consider a juvenile who simply spends time conducting trial-and-error learning in the vicinity of an accomplished artisan. The juvenile will be able to experiment with discarded raw materials and prototypes: such raw materials are suitable to their final offices, the prototypes are in various states of completion, and the locale in which they are found is likely to be a safe one in which to experiment.

The juvenile is once again likely to be related to the artisan, which reduces any costs to the master of allowing this sort of learning. Here we have a socially and materially structured environment that greatly eases the inventive burden on an individual learning how to produce tools, in a way that does not require any specific cognitive adaptations for informational inheritance: it is social *transmission* without social *learning* (see also Lewens [2012]). That said, once the benefits of social transmission are established, they can constitute further adaptive pressures in favour of directed social learning, quasi-formal teaching, and so forth. Sterelny's historical account allows that these early forms of social transmission may be entirely re-structured as the informational economy itself begins to generate new selective problems.

Sterelny frequently replaces appeals to key evolutionary events with rather more complex interactive processes. Social foraging—especially hunting, where individuals combine to attack large mammals—presents numerous demands. Making weapons is a highly skilled, multi-stage process. Hunting itself requires coordination and communication. It also presents significant rewards in terms of the food resources it yields. On the one hand, then, reliable and rich food supplies cannot be acquired without the passing on down generations of information regarding weapon-manufacture, the discovery and preparation of underground tubers, and so forth. On the other hand, these food supplies fuel the resource-hungry brains that are required for such demanding forms of learning. A cycle of reciprocal intensification follows: energy-sapping learning creates a demand for rich forms of food to fuel it, while the need to acquire rich forms of food intensifies the requirement for valuable techniques to be passed from one generation to the next. Sterelny's choice of the term 'feedback' to describe this ascending spiral is perhaps not the most perspicuous, but the underlying mechanism is plausible. As these sorts of mechanisms then come to interact with each other, it becomes increasingly hard to view our cognitive evolution as guided by any one process of overwhelming importance.

I close with a rather more speculative remark on Sterelny's project. His picture of human cognitive evolution is repeatedly framed in the language of information: 'the social environment, not just individual minds, has become increasingly organized to support the flow of information across the generations' (p. 27). Sterelny says almost nothing in this book about what he intends by 'information', but this is probably a strength rather than a weakness of his presentation. Consider, for example, that most fashionable accounts of 'information' as used in evolutionary contexts (for

example, those of Shea [2012], inter alia; Bergstrom and Rosvall [2011]; and even Sterelny's own earlier explicit theorising on these matters (Sterelny, Smith and Dickson [1996])) require that the vehicles of inherited information—whether they are genes, patterns of behaviour, or cognitive states—be *selected for* the role of bringing about resemblance. Such accounts are challenged by the plausible examples Sterelny gives—such as the case of unintentional leakage of artisanal skill to a juvenile, outlined above—where informational transmission occurs *prior* to the selection of specialised structures *for* transmission.

Sterelny's informational framework is perhaps best interpreted in an open-ended heuristic manner: valuable forms of knowledge-how and knowledge-that somehow appear in one individual, having previously resided in another. Such a reproductive phenomenon is naturally described as the 'transmission of information', but Sterelny cannot be accused (as some have been in the genetic context) of using this informational formulation to obscure the detailed causal processes of re-generation. On the contrary, one of Sterelny's goals in this rich and rewarding book is to examine a variety of possible mechanisms for how these phenomena are brought about: perhaps 'accidentally', via the normal operation of pre-existing processes of individual trial-and-error learning, situated in a felicitous environment; perhaps by the action of tailor-made modules; or more usually (as Sterelny prefers) by a variety of hybrid mechanisms.

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