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The Scaffolded Evolution of Human Communication

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Abstract:

Heintz and Scott-Phillips provide a useful synthesis for constructing a bridge between work by both cognitive scientists and evolutionary biologists studying the diversity of human communication. Here, we aim to strengthen their bridge from the side of evolutionary biology, to argue that we can best understand ostensive communication as a scaffold for more complex forms of intentional expressions.

Main Text:

While the Darwinian revolution has taken much of the force from the idea that humans are separate from the rest of nature, there is no doubt that one of our unique traits is the diversity and open-endedness of our means of expression; constituting something of a major transition in the evolution of our hominid ancestors. Yet, in order to begin an evolutionary investigation into how and why this happened, we require an integration of many sources of data from different fields that have hitherto largely operated independently. It is just such an empirical synthesis that has been offered in the present target article by Heintz and Scott-Phillips (2022). They provide what is effectively a breakdown of the components of human communication to enable an evolutionary reverse-engineering approach for understanding the evolution of this rich, diverse, and open-ended capacity of humans and allowing us to begin the construction of a bridge between the work of evolutionary biologists and cognitive scientists interested in human communication.

Yet, we maintain that this bridge could be strengthened on the evolutionary side. The authors maintain, similarly to Heyes (2019), that evolutionary biologists have remained ‘cognition-blind’ – failing to adequately take into consideration the progress computational cognitive science has made in understanding the mind, and instead relying upon needlessly simplistic and mechanistic ‘hardware’ (as opposed to ‘software’) models. While this is certainly true to some extent (Morin 2016), the criticism can cut both ways and we should likewise not underestimate the blindness of many cognitive scientists towards the resources of modern evolutionary biology. As an example for ‘cognition-blindness’, Heintz and Scott-Phillips argue is the common division of expressive behaviours such as language, instruction, and the like, which they maintain could be seen as part of a single cognitive capacity for ostensive communication. However, by using the analogy of running and walking as sub-functions of

a more general capacity for bipedal locomotion it should be clear that the division of capacities into sub-functions is not at all due to a blindness to cognitive mechanisms. It is the tried-and-proven evolutionary method of reverse engineering to make sense of the phylogeny of different functional capacities of organisms. But it remains still too rare an occurrence that the teleonomic question is asked regarding what cognition is - or particular cognitive capacities such as communicative ability are - *for*, especially in the case of humans. There is thus need for further attention on both sides.

In particular, we think that the bridge between evolutionary biologists and cognitive scientists could be strengthened by considering recent work on ‘scaffolding’ in evolution (Sterelny 2006; Caporael et al. 2014; Veit 2021). Scaffolding refers to traits that facilitate the evolution or for that matter the development of other traits, and may then themselves eventually be lost or repurposed, which could have happened in the evolution of the distinct modes of human expression. If the diversity of human forms of expression has a common evolutionary origin, we would then expect to trace back the evolutionary history to find something like a common scaffold, one that was eventually discarded or at least transformed. While this terminology is not used by Heintz and Scott-Phillips, their proposal that ostensive communication is the common functional core of human communication can be better understood as the claim that direct ostensive communication (i.e. action grounded in communicative intentions) served as an evolutionary scaffold for the evolution of more complex intentional capacities, such as those they describe.

Ostensive communication can additionally be seen as a developmental scaffold as much as an evolutionary scaffold. While development should not be taken to track phylogeny, it can still provide evidence regarding the evolutionary functions and origins of traits; in this case human communication. In the early stages of human development, communication very much proceeds by overtly intentional actions such as pointing (Camaioni et al. 2004; Grassmann & Tomasello 2010), behaviour that decreases as an individual learns more complex forms of intentional expression. The evolution of humans has not yet led to discarding the older mechanism, suggesting that it is of central importance. This indicates that the simpler intentional actions serve to scaffold the development of more complex communication within the learning history of an individual, as well as the evolutionary history of a lineage. These dual lines of support lend further credence to the proposed importance Heintz and Scott-Phillips place on the cognitive mechanisms they describe.

Finally, in investigating this proposal, we urge for more research into the distribution and development of more complex forms of intentional expression in other species. Particularly in our close relatives, the great apes, their capacities may provide useful clues regarding human evolution and why the structures of great ape societies give rise only to prototypical forms of these capacities. As the authors discuss, it seems that apes are able to develop some when raised in more altruistic or cooperative human environments, but their natural social contexts seemingly prevent it. A nice example of this type of ability comes from the observations by Russon & Andrews (2011) on orangutans at Camp Leakey. Here, they catalogued repeated instances of orangutans spontaneously ‘pantomiming’ (i.e. gesturing in which the meaning is ‘acted out’ by the orangutan). Where communication initially failed, some individuals would attempt to rectify the failure through seeking the attention of their audience, and subsequent repetitions or elaborations. These are arguably examples of an individual working to make their communicative intention clear; of ostensive communication. While this context differs of course from orangutan natural social ecology, it provides a nice example of the potential ways in which

more complex forms of communication can be scaffolded and thus provides some insights into how they could have gradually emerged in our lineage.

We think that understanding the evolution of human communicative abilities through the framework of evolutionary scaffolding will help us to strengthen the bridge between work on the evolution of animal communication and the cognitive science of human communication, as well as suggest ways for the integration and cross-collaboration of future work.

Conflict of interest statement:

The authors have no conflicts of interest to report.

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