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Comment

In Silico Linguistics Comment on "Modeling the cultural evolution of language" by Luc Steels

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Three ingredients play a central role in the study of origins and evolution of language and meaning: biological constraints, knowledge transmission between successive generations (vertical transmission) and achievement of a common knowledge within a single generation (horizontal transmission). Different emphasis has been put on each of the above mentioned factors and different approaches can be categorized according to these factors, as most clearly described by Luc Steels in [1]. Steels focuses in particular on the relevant evidences that have been collected (see for instance [2]) in favour of a fundamental role played by horizontal transmission. New theoretical and computational tools as well as synthetic modeling approaches have now reached sufficient maturity to contribute significantly to the ongoing debate in cognitive science. From the modeling point of view, a major achievement is the demonstration that a population of individuals is able to bootstrap consensus on a shared communication system, as the outcome of solely local interactions, referred to as Language Games [3], among peer individuals. Simple models based on this idea [4,5] are also able, when coupled with cognitive non-language-specific biases, to explain regularity and recurrent patterns observed in various languages [6] not sharing a common evolutionary history. Furthermore, by simulating populations of individuals playing language games, it is possible to explain the double nature of language, which is both in continual evolution and stable enough to ensure communicative success [7]. It is worth mentioning how the development of new modelling tools has been recently paralleled by advances in information and communications technologies, enabling, for the first time, the possibility of precisely mapping the interactions, whether embodied and/or symbolic, of large numbers of actors. As was the case with biology, the combination of these two elements can trigger a significant boost in the ongoing transition of linguistics into an experimental discipline, where multiple evolutionary paths, timescales and dependence on the initial conditions can be effectively controlled and modelled.

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