

The Necessity of Innate Constraints on Cultural Transmission in Theories of Language Evolution

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Over the past few years the notion of cultural transmission has emerged as a key element of many theories of language evolution (e.g., Arbib, 2003; Davidson, 2003; Deacon, 1997; Donald, 1998; Givon, 1998; Tomasello, 2003). Although the exact scenarios differ from each other, the main emphasis is on explaining grammatical structure not as a product of biological evolution, but as emerging through cultural transmission of language across many generations of learners. Many proponents of this perspective on language evolution eschew the idea of Universal Grammar - a large endowment of innate linguistic knowledge (Chomsky, 1965) - as the endpoint of evolution. Nonetheless, in this talk I will argue that innate constraints on language are still necessary - even if one views language as primarily having evolved through processes of cultural transmission.

Without constraints on cultural transmission we would expect to find few commonalities among languages. Yet, the languages of the world – despite their many differences – also share many systematic similarities in their structure and usage, sometimes referred to as linguistic universals. Although the space of logically possible ways in which languages could be structured and used is vast, the world's languages only occupy a small fraction of this space. If the processes of language emergence are focused within the cultural domain then linguistic universals should be unlikely because it is possible to imagine a multitude of culturally useful, and equally adaptive, constraints on linguistic form. That is, cultural transmission on its own cannot explain the existence of universal linguistic patterns; it cannot tell us why language is structured the way it is, nor why language is so readily learnt.

I will argue that to answer these questions we need to include innate constraints on learning in theorizing about cultural transmission, but that these constraints need *not* be linguistic in nature. I will suggest that innate *cognitive* constraints on learning and processing, existing prior to the emergence of language, provided a niche within which cultural transmission could take place. Constraints on these learning mechanisms became “fossilized” in the structure of language because linguistic forms that fit these constraints were more readily learned, and hence propagated more effectively from speaker to speaker (Christiansen 1994; Christiansen, Dale, Ellefson & Conway, 2002). From this perspective, language has been shaped by cultural transmission over many generations to be as learnable as possible by the learning mechanisms of human children. I will point to a series of studies combining artificial neural network simulations and human artificial language learning to illustrate how constraints on sequential learning may be enlisted to explain specific universal properties of language.

I conclude that in order to explain why language looks the way it does today innate constraints must be taken into account when proposing cultural transmission as the primary component of language evolution but that, importantly, these constraints may be entirely cognitive in nature.