LANGUAGE ACQUISITION AND LANGUAGE EVOLUTION: LESSONS FROM DUAL INHERITANCE THEORY

Josh Linden

Correspondence: jsl169@georgetown.edu
Department of Linguistics, Georgetown University, Washington, DC, United States

Dual Inheritance Theory (DIT; Richerson & Boyd 1978; Russell & Muthukrishna 2021) is emerging in biological anthropology and related fields as a leading candidate for a plausible and highly explanatory account of the recent evolutionary history of our own species. A growing canon of literature spanning many decades has explored its implications in detail and found robust empirical support across the social sciences. The theory is built on three core assertions: 1) that early hominins gained the genetic capacity to acquire and transmit information culturally as well as genetically, 2) that such cultural information would itself be subject to natural selection, giving rise to a second system of inheritance operating on a distinct set of selectional principles and 3) that *culture-gene coevolution* would allow the human genome to continue to optimize for the changing conditions created by the cultural environment (Henrich & McElreath 2007). Together with the logic of evolution by natural selection, these axioms give rise to a detailed outline of the development of human cognition with consistent empirical support across such diverse domains as evolutionary biology (Herrmann et al. 2007), evolutionary psychology (Chudek & Henrich 2015), social psychology (Gervais et al. 2021), psychoanalysis (Whitebook 2019), psychological anthropology (Paul 2018), anthropology (Henrich 2016), sociobiology (Boyd & Richerson 1980), economics (Laing 2008), animal cognition (Horner & Whiten 2004) and many others.

Nonetheless, DIT remains all but absent from theoretical linguistics and its vast implications for the study of language and particularly of language evolution have not been explored. There has been relatively little agreement among theoretical linguists about even how to study language evolution, although some significant progress has begun to appear in the last decade. Fitch (2017) insightfully suggests a multicomponent approach, in which we refrain from

assuming language was *an* innovation and instead ask which innovations might make it up, and he introduces the term *Derived Component of Language (DCL)* to refer to any element of language that we hypothesize arose in humans or our immediate ancestors after our evolutionary divergence from chimpanzees. He further points out the necessity of creating multiple plausible hypotheses and comparing them to each other experimentally rather than considering each model's plausibility in isolation.

Adopting and extending this framework, the current inquiry explores the theoretical implications of assuming that language evolution happened primarily as described by DIT: as a series of culturally transmitted innovations achieved on human timescales and continuously adapted to by our genetics on longer timescales. I show how this assumption reinforces Fitch's (2017) *staged-protolanguages model* approach, and I create an explicitly nonspecific Fitchian model in which the uniquely human elements of language arise in some unknown order DCL_1, DCL_2, …, DCL_n. Situating these as a series of coevolved traits arising within DIT, I extrapolate the model into the present and conclude that the empirical facts of language acquisition are especially likely to differ under competing Fitchian hypotheses.

Informed by existing DIT models of how information is transmitted between communities and across generations (e.g. Boyer 1998; Linquist 2007), I propose that two domains featuring partial acquisition are of most pressing interest to the evolutionary linguist: the overlapping but distinct stages of linguistic competence we observe in first-language (L1) learners, and the empirical facts of *homesign*. The former include the babbling stage, first words, the two-word stage, the multi-word stage and an extended process of refinement and complexification (Salim & Mehawesh 2014). The latter refers to the structured communicative systems that arise in Deaf children growing up without exposure to a signed language (Franklin et al. 2011; Coppola & Newport 2005). Homesigners reliably engage in manual babbling, invent signs with diverse meanings and begin to combine them to enter the two-word and multi-word stages (Morford 1996). They do not, however, develop all further elements of Universal Grammar, and this is highly informative in light of the coevolutionary optimization loops the present model describes. I borrow the term *cognitive dependency* (Seuren 2006) from psycholinguistics and cognitive semantics, which I formalize within the DIT framework by analogy to *exaptation* (Gould & Vrba 1982) in evolutionary biology. I then use it to argue that if DCL_i is reliably observed in homesign or at some stage of L1 acquisition while DCL_j is not, it is likely that $i < j$. Finally I consider briefly which potential orderings of DCLs preliminarily appear best supported.

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