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CULTURAL EVOLUTION OF CULTURAL SYSTEMS

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We present a general modeling framework to study cumulative cultural evolution. Previous models of cultural evolution generally focused on how a predefined set of cultural elements may compete and spread in a population. Others models allow creation of new cultural variants, but only along a single dimension. The core idea of our framework is instead that cumulative cultural systems are characterized by multiple dependencies between different traits, that is, the appearance as well as the success of a new trait depend on the overall state of the system. In particular, the likelihood that a cultural trait will appear and spread in a population is affected by the presence and/or by the absence of other cultural traits that can facilitate or inhibit it. We study, with both mathematical (population level) and individual based models, how these dependencies influence the evolution of cultural systems. We focus in particular on how these dependencies can generate cultural diversity, and we show how quasi-stable differentiated cultural systems can emerge from previously homogenous cultures (cultural speciation).

Keywords: cumulative culture, cultural diversification, mathematical models, individual based models.