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Characterizing the Interaction of Cultural Evolution Mechanisms in Experimental Social Networks

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Abstract

Understanding how cognitive and social mechanisms shape the evolution of complex artifacts such as songs is central to cultural evolution research. Social network topology (what artifacts are available?), selection (which are chosen?), and reproduction (how are they copied?) have all been proposed as key influencing factors. However, prior research has rarely studied them together due to methodological challenges. We address this gap through a controlled naturalistic paradigm whereby participants ($N=2,404$) are placed in networks and are asked to iteratively choose and sing back melodies from their neighbors. We show that this setting yields melodies that are more complex and pleasant than those found in the more-studied linear transmission setting, and exhibits robust differences across topologies. Crucially, these differences are diminished when selection or reproduction bias are eliminated in control studies, suggesting an interaction between mechanisms. These findings shed light on the interplay of mechanisms underlying the evolution of cultural artifacts.