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# Cultural evolution in populations with heterogeneous and variable preferences

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**Abstract.** Theoretical and empirical work in cultural evolution often assume populations in which individuals all agree on the quality of a given cultural trait (i.e. they have homogeneous preferences), and where those preferences are stable in time. Yet, these assumptions are not always met: for example, an uneven distribution of information in a population could lead to heterogeneous preferences; moreover, in some cultural domains (e.g. aesthetic culture), diverse preferences may be the norm rather than the exception. We present an agent-based model in which we can control the heterogeneity of preferences, as well as the effect of cultural traits on the evolution of preferences. We find that assuming homogeneous or heterogeneous preferences leads to different predictions on several outcomes. First, populations with greater heterogeneity of preferences converge toward greater cultural diversity. Second, while we replicate the classical result that increasing opportunities to learn socially leads to less diversity in homogeneous populations, we find that this relationship is reversed in heterogeneous populations. We show that this happens because increasing social learning opportunities leads the distribution of cultural traits to converge toward the distribution of preferences. We also look at the consequences of allowing cultural traits to modify the preferences of individuals that possess them. This can for example capture self-reinforcing beliefs, or traits where the acquisition costs make individuals less likely to switch to

25 another trait after possessing them for some time. We find that such “attractive” cultural traits  
26 naturally emerge in our model, and that they tend to decrease cultural diversity when preferences  
27 are not homogeneous. Overall, by showing that the effect of different parameters on cultural  
28 diversity are dependent on the assumed distribution of preferences, we highlight the importance of  
29 taking into account the possible heterogeneity of preferences when making predictions about  
30 cultural dynamics.