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DIFFERENT BEHAVIOURAL REPERTOIRES AMONG EIGHT ORANG-UTAN POPULATIONS ARE BEST EXPLAINED BY SOCIABILITY AND CULTURE, RATHER THAN GENETIC OR ECOLOGICAL SIMILARITY

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Opinions about the explanation of geographic variation in behavioural repertoires among animal populations vary dramatically. While some researchers see it as evidence for culture, others are not convinced, arguing that social learning is invoked spuriously. In both camps, however, there is agreement that if variation in these behavioural repertoires is clearly correlated with ecological and genetic similarity, then the case for social learning as an explanation for these patterns is less plausible without further evidence. Here, we present the most exhaustive dataset in any primate species to address this question. We used a combination of long-term behavioural (>50'000 hours of focal observation including 28 behavioural variants) and remote sensing data (habitat productivity and type, local climate, vegetation) as well as a genetic similarity measure (n=233 wild individuals) from eight orang-utan populations. We found a strong positive association between local culture repertoire size and the potential for social transmission of behavioural elements (Spearman correlation test $\rho=0.76$, $p<0.05$), indicating that sociability positively affects the size of cultural repertoires within populations. The observed patterns of geographic variation in behaviour among populations, however, cannot be explained by ecological or genetic similarities: Partial Mantel tests between cultural, genetic and ecological distance were all non-significant (12 matrix permutation tests, n=10'000 permutations). Our results provide strong support for a 14mya origin of culture in the hominoid lineage, giving us insight into the likely extent of culture in the last common ancestor of the great apes.

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