

Reply to Henrich et al.: Behavioral variation needs to be quantified at multiple levels

Henrich et al. (1–4) and other scholars [e.g., Herrmann et al. (5)] have used innovative quantitative methods to demonstrate substantial behavioral variation across human populations. Building on this literature, our work (6) demonstrates the need to quantify the relative behavioral variation at different levels (e.g., ethnolinguistic groups, villages, individuals) and identify the relative importance of different mechanisms that drive and maintain this variation. This will help clarify which theoretical accounts of the evolution of large-scale cooperation find empirical support.

We compared the 4% between-village variance in public goods games with the 7% between-society variance in public goods games (5), and we compared the 11.8% between-village variance in the salt decision (with the structure of a multiplayer dictator game) with the 12% between-society variance in ultimatum games (1). The within-society (between-population) variance in our study is similar to the between-society variance in previous studies, suggesting that previous studies may have captured between-population variance rather than between-culture variance, given their study design and analyses. Thus, we do not claim to have demonstrated the true amount of cross-cultural variation but suggest that previous studies may have estimated it inaccurately.

Even where published studies (1–3) sampled multiple populations per society, they did not explicitly estimate the within-culture variance and compare it with the between-culture variance. Instead, they pooled together individuals from the same cultural group irrespective of the population they belonged to. Consequently, their analyses confound populations with cultural groups. We welcome the analyses that Henrich et al. present in their letter (table 1 of ref. 4), where both within- and across-society variances are estimated for different game measures. Yet their implications are unclear without details of the statistical methods used to partition variance at different levels and information on whether within-society variances are significantly smaller than

between-society variances in a statistical sense. Finally, three or fewer populations were sampled for 11 of 15 societies in phase I and for 14 of 16 societies in phase II, which is inadequate to estimate the between-population, within-society variances accurately.

By demonstrating significant between-population, within-society behavioral variation, our paper raises two questions: (i) To what extent, if any, do culturally transmitted norms and individually acquired behavior drive behavioral variation across populations? (ii) If norms exist, at what level do they operate (e.g., ethnolinguistic group, village)? We agree with Henrich et al. (4) that a combination of culturally inherited norms and individually acquired behavior may account for the behavioral variation observed across human populations. We explicitly stated: “It is possible that some of the behavioral variation between our study populations is driven by norms at the level of the population or village unit rather than at the level of the endogenous cultural unit” (ref. 6, p. 14429). However, we reiterate that “. . . this hypothesis needs to be tested empirically.” (ref. 6, p. 14429). Thus, we do not claim that norms cannot be important if demographic or ecological variation is. We simply argue that published empirical analyses do not demonstrate that cultural norms drive observed variation in levels of cooperation across human populations nor do they exclude alternative hypotheses.

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The authors declare no conflict of interest.

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