AEA Papers and Proceedings 2020, 110: 319–323
https://doi.org/10.1257/pandp.20201071

Ancient Origins of the Global Variation in Economic Preferences†

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Risk, time, and social preferences form the building blocks of a large class of models in both micro- and macroeconomics. Empirical work shows that these preferences vary substantially within and across populations. In addition, in line with economic models, controlled preference measures predict a large set of both individual-level economic decisions and country-level outcomes such as per capita income, donations and volunteering, and the frequency of armed conflicts (Falk et al. 2018, Dohmen et al. 2018). The insights that preferences exhibit large variation both across and within countries and that this heterogeneity correlates with economic outcomes at both levels of aggregation raise the question of the origins of large-scale preference variation.

This paper takes an approach in which we (i) focus on explaining the global variation in preferences, as opposed to heterogeneity within a given population; (ii) investigate the *very* deep origins of preference heterogeneity; and (iii) consider multiple preferences and attitudes in a unified empirical approach by using a dataset that makes use of experimentally validated, quantitative estimates of preference parameters. The key idea is to link the global preference heterogeneity to the structure of humankind's ancient migration out of Africa, a sequence of events that has attracted recent interest in the comparative development literature (Spolaore and Wacziarg 2009, Ashraf and Galor 2013). We document that these temporally distant migration movements have shaped today's heterogeneity in risk, time, and social preferences, both across and within countries, albeit to heterogeneous degrees across preferences.

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† Go to https://doi.org/10.1257/pandp.20201071 to visit the article page for additional materials and author disclosure statement(s).

I. Hypothesis

According to the widely accepted "Out of Africa" theory, the initial dispersal of early humans on our planet occurred through a large number of discrete migratory steps, each of which consisted of a subsample of the original population breaking apart and leaving the previous location to move on and found new settlements elsewhere.

The main hypothesis underlying this paper is that the pattern of successive breakups and the resulting distribution of ancestral (temporal) distances across populations affected the distribution of economic preferences we observe around the globe today. After splitting apart, these subpopulations often settled geographically distant from each other and hence lived in separation. There are at least two channels through which the length of separation of two groups might have had an impact on between-group differences in preferences. In the online Appendix, we present a model that formalizes these intuitions.

First, if two populations have spent a long time apart from each other, they were subject to different historical experiences. Recent work highlights that economic preferences are malleable by idiosyncratic experiences or, more generally, by the composition of people's environment. Thus, the differential historical experiences that have accumulated over thousands of years of separation might have given rise to different preferences as of today.

Second, whenever two populations spend time apart from each other, they develop different population-level genetic pools due to random genetic drift or location-specific selection pressures. Given that attitudes like risk aversion, trust, and altruism are transmitted across generations (Dohmen et al. 2012) and that part of this transmission appears to be genetic in nature (Cesarini et al. 2009), the different genetic endowments induced by long periods of separation could also generate differences in preferences.

II. Data

The analysis combines data on economic preferences around the globe with proxies for long-run human migration patterns and the resulting ancestral distances. We briefly describe the main data features here; see the online Appendix for details.

The data on risk, time, and social preferences are part of the Global Preferences Survey (GPS), a recently released large-scale survey dataset on economic preferences from representative population samples in 76 countries that is described in detail in Falk et al. (2018). The data are now publicly available at https://www.briq-institute.org/global-preferences/home. The GPS data (i) are based on an ex ante experimental validation procedure of the survey items; (ii) make use of representative samples in 76 countries, for a total sample size of 80,000 participants worldwide; (iii) are geographically representative in that they cover countries on all continents and of all development levels; and (iv) were collected though the professional infrastructure of the Gallup World Poll. The data include individual-level measures on risk aversion, patience, negative reciprocity, altruism, positive reciprocity, and trust.

To measure risk taking, the set of survey items includes two measures of the underlying risk preference—one qualitative subjective self-assessment and one quantitative measure. The subjective self-assessment directly asks for an individual's willingness to take risks: "Generally speaking, are you a person who is willing to take risks, or are you not willing to do so? (0–10)." The quantitative measure is derived from a series of five interdependent hypothetical binary lottery choices. In each of the five questions, participants have to decide between a 50–50 lottery to win x or nothing (which was the same in each question) and varying safe payments y. The questions are interdependent in the sense that the choice of a lottery results in an increase of the safe amount y being offered in the next question, and vice versa. By adjusting the safe payment according to previous choices, the questions "zoom in" on the respondent's certainty equivalent. The self-assessment and the outcome of the quantitative lottery procedure are then aggregated into a single index that describes an individual's degree of risk taking.

The measure of patience is also derived from the combination of responses to two survey measures, one with a quantitative and one with a qualitative format. The quantitative survey measure consists of a series of five hypothetical binary choices between immediate and delayed financial rewards. Similar to the elicitation of risk preferences, the questions are interdependent in the sense that the delayed payment is increased or decreased depending on previous choices. The qualitative measure of patience is given by the respondent's self-assessment regarding their willingness to wait on an 11-point Likert scale, asking "How willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?"

The GPS includes six survey items that map into three prosocial traits: altruism, positive reciprocity, and trust. While these behavioral traits are conceptually distinct, they are all commonly associated with "positive" social interactions. Because these three variables are highly correlated and to reduce the number of dependent variables (and associated multiple testing concerns), we collapse them into a prosociality score that consists of the unweighted average of the three variables.

Negative reciprocity was elicited through three self-assessments that probed respondents about their willingness to take revenge if they are treated unjustly or to punish others for unfair behavior, either toward themselves or toward a third person.

We combine these data on economic preferences with proxies for the temporal patterns of ancient population fissions—that is, proxies for the length of time since two populations shared common ancestors. First, we employ two measures of the F_{ST} genetic distance between populations (Spolaore and Wacziarg 2009). As population geneticists have long noted, whenever two populations split from each other in order to found separate settlements, their genetic distance increases over time due to random genetic drift. Thus, the genetic distance between two populations is a measure of *ancestral* or *temporal* distance. Second, we make use of the observation that linguistic differences closely track the structure of separation of human populations and employ two measures of linguistic distance as explanatory variable. We collapse these genetic and linguistic measures into a summary statistic of ancestral distance between populations. Details can be found in the online Appendix.

III. Country-Level Evidence

The empirical analysis starts with documenting that the absolute difference in risk, time, and social preferences between two countries is significantly increasing in the respective populations' ancestral distance. Since ancestral distance refers to a pair of countries, our analysis necessitates the use of a *dyadic* regression framework, which takes each possible pair of countries as unit of observation. Accordingly, we match each of the 76 countries with every other country into a total of 2,850 country pairs and, for each trait, compute the absolute difference in (average) preferences between the two countries. We then relate our ancestral distance measure to this absolute difference in preferences between the respective populations. Our regression equation is hence given by

$$(1)\quad |p_i - p_j| \;=\; \alpha + \beta d_{i,j} + \gamma_i f_i + \gamma_j f_j + \epsilon_{i,j},$$

where p_i and p_j represent some average preference in countries i and j, respectively; $d_{i,j}$ represents ancestral distance; f_i and f_j represent country fixed effects; and $\epsilon_{i,j}$ is a country-pair-specific disturbance term. We run this regression separately for each preference measure and additionally for a summary statistic of overall preference dissimilarity that consists of the sum of the absolute preference differences across preferences.

As is standard practice in dyadic analyses, such as in gravity regressions of bilateral trade, every specification presented below includes country fixed effects d_i and d_j—that is, a fixed effect for each of the two countries that appears in a country pair observation—to take out any unobservables that are country specific.[1] The standard errors are clustered at the level of the first and of the second country of a given country pair.

Panel A of Table 1 summarizes the results. All regression coefficients are expressed in terms of standardized betas—that is, both the dependent and the independent variables are normalized into z-scores and the dependent variable is then multiplied by 100, so that the coefficient can be interpreted as the percent change of a standard deviation in the dependent variable in response to a one standard deviation increase in the independent variable.

Column 1 documents that a summary statistic of preference differences (which consists of the sum of the absolute differences across preference dimensions) is strongly and significantly related to ancestral distance. The associated t-statistic equals 5.0, and the point estimate suggests that a one standard deviation increase in ancestral distance is associated with an increase of 22 percent of a standard deviation in differences in preferences. Columns 2 through 5 break this pattern down into the separate preferences. The results are strongest for risk aversion and prosociality. For negative reciprocity and patience, the point estimates are positive but small in magnitude and only marginally statistically significant.

IV. Within-Country Evidence

In a next step, the paper studies the subnational relationship between preferences and ancestral distance. Compared with between-country regressions, within-country analyses have the important advantage that they allow one to hold constant many features of people's contemporary environments that are difficult to account for in cross-country analyses. To this effect, we use individual-level information about respondents' country of birth and construct virtual populations by averaging preferences across migrants from a given country of birth in a given country of residence. In essence, these analyses compare, for example, the difference in preferences between French and Nigerians who currently live in the United States with the difference between Italians and Japanese who also live in the United States. Thus, the unit of analysis is no longer a country pair but rather a migrant population pair in a given country of residence.

For 54 countries in our sample, we have information about the country of birth of our respondents. We compute the average level of a given preference at the level of country of residence times country of birth. In other words, for each country of residence, we compute the average preference of respondents from a given

[1] The empirical results suggest that such country fixed effects indeed go a long way in addressing omitted variable concerns. For instance, in the analyses presented below, for patience and negative reciprocity we sometimes observe statistically significant *negative* coefficients on ancestral distance if country fixed effects are not included, which we find very hard to interpret. These results entirely disappear with country fixed effects.

TABLE 1—RELATIONSHIP BETWEEN ABSOLUTE PREFERENCE DIFFERENCES AND ANCESTRAL DISTANCE

	Dependent variable: Absolute difference in:				
	All preferences (1)	Risk taking (2)	Prosociality (3)	Neg. recip. (4)	Patience (5)
Panel A. Cross-country					
Ancestral distance	0.22	0.14	0.14	0.038	0.11
	(0.05)	(0.07)	(0.04)	(0.02)	(0.06)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	2,850	2,850	2,850	2,850	2,850
R^2	0.48	0.62	0.48	0.47	0.52
Panel B. Cross–migrant populations					
Ancestral distance	0.11	0.061	0.048	0.063	0.086
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Country of residence fixed effects	Yes	Yes	Yes	Yes	Yes
Country of birth fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	4,838	4,827	4,802	4,775	4,803
R^2	0.30	0.24	0.27	0.26	0.22

Notes: The table shows ordinary least squares estimates. In panel A, the unit of observation is a country pair. Here, the standard errors (in parentheses) are two-way clustered at both countries in a pair. In panel B, the unit of observation is a population pair, which is defined as two groups of migrants who currently reside in the same country but were born in different countries. Here, the standard errors (in parentheses) are two-way clustered at both countries of birth in a pair. In both panels, the variable in column 1 is constructed as the sum of the absolute difference of preference differences in a population pair across the different preference measures in columns 2–5.

country of birth. In line with prior literature, we restrict the sample to migrant populations, although we have verified that including the native populations in a given country of residence does not affect the results. This procedure gives rise to 598 "populations." We match each population with each other population but keep only those population pairs that share a common country of residence to be able to conduct a within-country analysis. Then, as before, we assign temporal distances to population pairs on the basis of their countries of origin. Using this procedure, we end up with 6,232 population pairs from 144 countries of origin who currently live in 49 countries. Our estimating equation is given by

$$(2) \quad |p_{i,z} - p_{j,z}| = \alpha + \beta d_{i,j} + \gamma_i f_i + \gamma_j f_j + \gamma_z f_z + \epsilon_{i,j,z},$$

where $p_{i,z}$ and $p_{j,z}$ represent some average preference for people who currently reside in country z yet were born in countries i and j, respectively; f_i and f_j are country of birth fixed effects; f_z are country of residence fixed effects; and $\epsilon_{i,j,z}$ is a disturbance term. As before, we employ a two-way clustering strategy and cluster at the level of both countries of origin.

Working with subnational groups comes at the cost that the number of respondents from any given country of birth in a given country of residence can be very small, which implies that "population-level" preferences are measured with large error. To account for this, we restrict attention to population pairs that consist of at least three respondents—that is, in which one population consists of at least one and the other population of at least two respondents. This is a conservative procedure yet still eliminates the most extreme forms of misattributing individual-level variation to population-level heterogeneity. Within this set of observations, the average number of respondents in both "populations" combined is ten.

Panel B of Table 1 presents the results. Across all preferences, temporal distance is strongly and significantly related to differences in preferences. Thus, temporal distance is predictive of preference differences even among people who share the same contemporary country of residence. These results are even stronger than in the between-country case. This set of results not only adds credibility to our identification strategy but also represents a methodological innovation on past work on temporal or genetic distance, which—unlike other work in the cultural economics tradition—has largely considered cross-country variation.

V. Discussion

This paper takes a step toward uncovering the roots underlying the large global variation in core economic preferences. Our main contribution is to establish that the global variation in economic preferences partly has its origins in the structure and timing of very distant ancestral migration patterns. This highlights that if we aim at understanding the ultimate roots of preference heterogeneity, we might have to consider events very far back in time. While this paper uncovers a novel stylized fact, the underlying mechanisms are less clear at this point. We hope that future research will be able to shed light on these mechanisms. More generally, the GPS provides an ideal dataset to study the global variation in economic preferences.

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