Does Wealth Erode Cultural Diversity?

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Abstract

Are the wealthy a culturally homogeneous “global elite,” or do their values still show national and regional differences? Using data from 259,388 people in 92 countries, we examine how household income relates to endorsement of values in different cultural contexts. Although household income correlates with endorsement of post-materialist values at the aggregate level, the strength and even the direction of this correlation varies across cultures. The association is strongly positive in countries that already prioritize post-materialist values, yet it weakens or reverses where such values are endorsed less. For instance, income is positively correlated with support for free democratic elections in Global North countries but negatively in many Global South countries. The consequence of these culturally divergent correlations is that high-income people are more, not less, culturally differentiated than their lower-income counterparts. We next replicate this same finding in a sample of 72,390 people across nine U.S. regions. In this sample, high-income versus low-income people are more culturally differentiated across regions. In both analyses, high-income people are more sharply polarized over religion’s role in public life, tolerance toward stigmatized groups, and the best forms of governance. These results show that wealth correlates with more, rather than less, cultural differentiation.

Does Wealth Erode Cultural Diversity?

Lay people and academics often assume that as people become wealthier, they adopt a shared set of globalist values (1–3). These intuitions may come from images of a "Davos man" who speaks fluent English, has studied abroad, and shares a transnational economic outlook. Is this vision of a "global bourgeoisie" accurate? Or is cultural diversity resilient to rising wealth?

We argue that answering these questions requires comparing correlations of wealth and value endorsement in different cultural contexts. For example, if income has the same correlation with values in all countries, then this would mean that the wealthiest people in each country are equally as culturally differentiated as the poor. But if income has culturally heterogeneous correlations with values, then it could yield cultural convergence or divergence at higher levels of income. By analyzing large surveys of national cultures and U.S. regions, we consistently find heterogeneity that yields divergence—the opposite of the intuitive "global elite" hypothesis.

Wealth and Value Endorsement in Different Cultural Contexts

Social scientists have been interested in the cultural impact of economic development for over a century. The earliest of these theories came from Marx (4), Weber (5), and Durkheim (6), who wrote about the cultural impact of bureaucracy, specialization, and industrialization during the process of modernization. Several decades later, scholars began using quantitative data to build new theories of wealth and culture (7–10). For example, Inglehart, Welzel, and Norris found that people in wealthier countries were more tolerant of marginalized groups, more trusting of strangers (11), more confident in their institutions (8), less religious (7), and more supportive of gender equality (12). Their theory of these differences was that wealth and prosperity led people to shift from materialist, or "survivalist," values (related to security and stability) to postmaterialist, or "emancipative," values (emphasizing autonomy and expression) (13).

Although the post-materialist thesis sought to explain group-level differences, its logic also applies at the individual level (14), suggesting that wealth may change people's values in the same way it changes the values of countries. In support of this symmetry, studies have found that people who make more money or identify as higher class have more independent self-construals (15,16), more trusting of strangers (17,18), less religious (19,20), and report less prejudice towards marginalized groups (21,22). Cognitive interpretations of these findings suggest that all of these outcomes represent forms of social exploration, which is more likely when people feel a sense of material security (22).

These past studies show different ways the wealth correlates with values, but crucially for our paper, they make no predictions about whether wealth should be linked to cultural convergence or divergence. For example, when Inglehart claimed that "the worldviews of rich societies differ markedly from those of poor societies," he added that "this does not necessarily imply cultural convergence" (10). In order for wealth to be linked to convergence or divergence, the marginal effect of wealth on values must vary across cultures. For example, if wealth had a stronger correlation with individualism in Japan (a generally collectivist culture) than in the US (a generally individualist culture), then we would expect that the overall cultural difference between Japanese and US people would be smallest among the wealthiest people in each country.

There is some preliminary evidence of cross-cultural variation in the marginal correlation of income with values, but in the opposite direction than we would predict from a convergence account (23,24). For example, one past study found that higher economic status correlated with

individualism in the US, but collectivism in Japan (25). Other studies have found that wealth is most strongly correlated with secularism in countries that are already the least religious (26), and with pro-environmental attitudes in countries that already have the most pro-environmental attitudes (27,28). These papers tend to focus on specific values and do not speak directly about consequences for cultural homogenization, but their results suggest a provocative possibility: cultural differentiation between countries may be highest, not lowest, among the wealthy.

A New Perspective on Wealth and Cultural Differentiation

Wealthy people are more likely to speak English, travel frequently, attend elite schools in other countries, and work in multinational organizations (29,30). All of these realities may contribute to the intuition that wealthy people may abandon their local traditions in favor of a shared global outlook. But what if wealth did the opposite—widening rather than eliminating cultural differences? This reversal would not only be consistent with the preliminary empirical evidence (24,25,27), it is also theoretically plausible through several different mechanisms.

For example, post-materialist values may only matter after basic needs are met. In affluent societies, even modestly wealthy households have crossed this “basic needs” threshold, so higher income may correlate more strongly with autonomy, tolerance, and trust. In poorer countries, however, even moderately well-off households may still worry about material survival, muting or even nullifying the same correlation. The result would be that household income would correlate more strongly with post-materialist values among the countries that already endorse these values, amplifying cultural differentiation at higher levels of wealth.

A second mechanism involves institutions. Wealth may encourage post-materialist values most strongly when countries have democratic, inclusive institutions that protect civil liberties and redistribute resources (33). In contrast, in countries with weak rule of law or high inequality, wealthy citizens will be incentivized to preserve status hierarchies and guard against exploitation, leading wealth to correlate with lower support for tolerance and trust (34,35). Holding post-materialist values may even jeopardize people’s opportunity to become wealthy in the first place in countries with extractive institutions. An institutional account again suggests that household income would correlate more strongly with post-materialist values in the countries that already endorse these values.

A final mechanism is that money magnifies prevailing norms: affluent people have more freedom to fund schools, media, charities, and social networks that affirm the worldview already dominant in their culture (41). The net effect of this process is that cultural differences—which could have arisen through random drift or systematic cultural evolution (21,38,39)—could be amplified among the people who make the most money in each culture (25).

Our correlational analyses cannot rule for or against these causal theories. Nevertheless, we highlight them here because they all support an alternative perspective on wealth and cultural differentiation. Rather than supporting intuitions about a “global bourgeoisie” or “transnational capitalist class” (1,3), these effects would instead imply that the wealthiest people around the world are most culturally differentiated, whereas the poorest people are the most similar.

Current Research

Our paper analyzes two kinds of dependent variables. The first is value endorsement, which refers to people’s agreement with values. The second is value differentiation, which refers to the extent that people from different cultures show distinct patterns of value endorsement.

Our first set of analyses aim to understand how household income correlates with value endorsement, and how this correlation varies across different countries and regions. We are especially interested in whether cultural variation in the correlation between income and values produces larger or smaller cultural differences in value endorsement among the wealthiest people in each country. Our analysis spans 98 values across countries, and 110 values across US regions, representing a much larger scope than previous papers that have considered cultural variation in how income correlates with specific values like religiosity (26).

Our second set of analyses test whether cultural differentiation is greatest among the wealthiest or poorest people in each country. In other words, do wealthy people in Ghana and Japan hold more culturally distinct values than poor people in Ghana and Japan? We measure cultural differentiation using the *CF*st statistic, an adaptation of the *F*st statistic in genetics. The *CF*st measures the share of total variance that lies between groups rather than within them. A *CF*st of 0 means that two groups are culturally indistinguishable, whereas a value of 1 means that the groups share no overlap—100% of variation is between groups. In other words, higher *CF*st values imply more cultural differentiation.

We calculate the CFst among the people from each country who report high household income, middle household income, and low household income. We can then compare the three sets of coefficients to test our central question. For example, if poorer people are more culturally differentiated than wealthier people, CFst values should be higher when we only consider the poorest people from each country vs. the wealthiest third. The closest analysis to this is a pre-print by White and Muthukrishna (43). This paper uses a CFst approach to argue that education shifts people towards values typical of Western industrialized countries. However, they do not find evidence of homogenization or differentiation across different levels of education.

Our analyses do not permit causal inference, yet they allow us to establish whether cultural differentiation is smallest among people with higher incomes (consistent with a cultural erosion hypothesis) or whether cultural differentiation is actually larger among people with higher versus lower incomes. These findings permit tentative forecasts of whether rising global wealth could eliminate or expand modern cultural differences.

Results

Analyses Across National Cultures

Our analysis included 259,388 people from 92 countries across Waves 5–7 of the World Values Survey (WVS). Throughout our results, we often present results as contrasting “Global North” and “Global South” countries, following the United Nations designation. In our supplemental materials, we break results down by other designations (e.g., continent, GDP per capita, etc.).

The analyses in our main text focus on 98 value items, and a standard measure of household income that is included in every WVS wave (see Methods). The limitation of this measure is that it asks about household income subjectively using a 1 – 10 scale. We discuss why this is a limitation and why we nevertheless view the measure as valid in the method section. Our analysis of U.S. regions further addresses this limitation by using real income.

We arrived at the sample of values by identifying all the unique items in the waves 5–7 of the WVS, then excluding items that did not relate to values (e.g., demographic measures like gender) and questions that were only asked in select countries (e.g., confidence in the

European Union) or select waves. Our methods section summarizes our sampling method in detail and describes several robustness checks for our main findings, which our supplemental materials summarize in depth. Our supplemental materials also replicate our results using a PCA approach to reducing the dimensionality of the values.

Household Income and Value Endorsement Across Countries

To test the relationship between household income and value endorsement, we first regressed value endorsement on household income for each country. Then we entered these household income estimates into 98 random effects meta-analyses—one for each value item—that controlled for demographic differences. Each meta-analysis yielded an overall correlation between household income and value endorsement.

Does Household Income Correlate with Post-Materialist Values? Household income correlated significantly with 78 of the 98 items in our sample. Figure 1 shows the overall meta-analytic correlation between household income and value endorsement across all items. Supplementary Table XX reports the full set of *r* correlations and confidence intervals.

One striking pattern that emerged from this analysis was that individual-level household income correlated strongly with the same values as country-level GDP per capita, $r = 0.50$, 95% CIs [0.33, 0.64]. This speaks to the multilevel symmetry of the post-materialist thesis: the wealth of nations and the wealth of households both correlate with values that prioritize impersonal trust, autonomy, and tolerance. For example, household income was positively correlated with trust in people one meets for the first time, $r = 0.07$, 95% CIs [0.06, 0.08] and people with a different nationality, $r = 0.08$, 95% CIs [0.06, 0.09] or religion, $r = 0.07$, 95% CIs [0.06, 0.08]. Household income also correlated positively with confidence in institutions such as banks, $r = 0.08$, 95% CIs [0.06, 0.10], and parliament, $r = 0.06$, 95% CIs [0.05, 0.08], and with more political engagement, including the belief that politics is important, $r = 0.07$, 95% CIs [0.05, 0.08]. We also found evidence for the positive association between higher incomes and acceptance of traditionally stigmatized practices, behaviors, and identities. Larger income correlated significantly and positively with seeing abortion, $r = 0.06$, 95% CIs [0.05, 0.07], homosexuality, $r = 0.07$, 95% CIs [0.06, 0.09], and prostitution, $r = 0.05$, 95% CIs [0.03, 0.06] as justifiable.

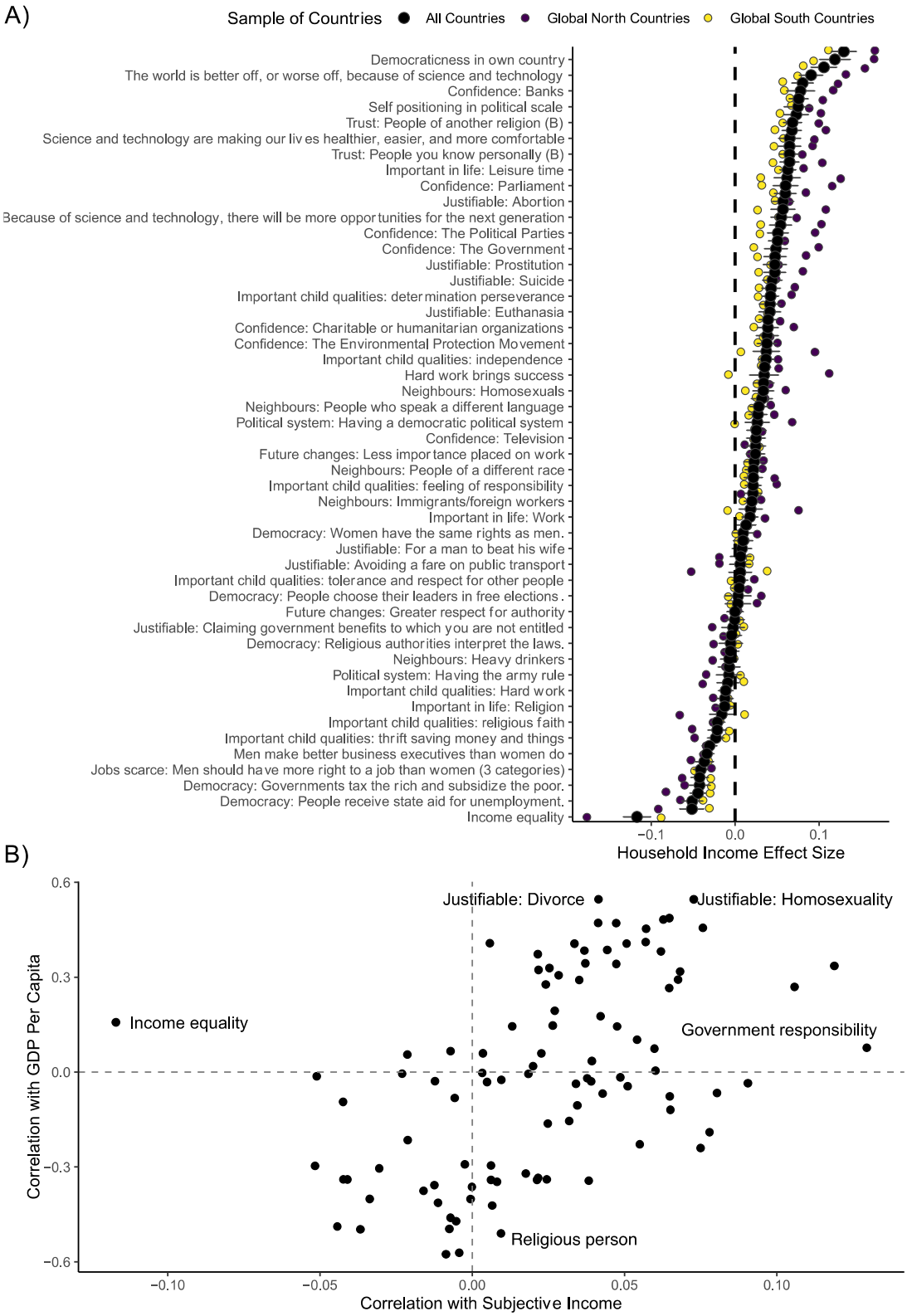

Figure 1. Association Between Household Income and Values. Panel A) The black nodes and confidence intervals represent overall estimates of household income from a random effects meta-analysis across countries. The yellow and purple points represent the country-

specific estimates of household income, with purple nodes representing countries from the Global North and yellow nodes representing countries from the Global South. For ease of interpretation, every second value is visualized on the y-axis. **Panel B)** The relationship between how values are correlated with country-level GDP per capita (y axis) and how they are correlated with household income (x-axis). The x-axis estimates come from our random effects analyses that are displayed in Panel A.

Do Correlations With Household Income Show Cultural Heterogeneity? Although the overall correlations were interesting, they masked high levels of heterogeneity across countries. In most cases, income correlated in the same direction with values across countries, but the correlation was larger in some countries than others. In Figure 1, for example, the values with the highest overall correlation with household income were always more strongly associated with income in Global North countries than for Global South countries. The left panel of Figure 2 shows an example of this heterogeneity for belief that homosexuality is justifiable. Income correlated positively with this belief across 84.81% of countries, but the correlation varied in its magnitude. It was larger in Global North countries like France and Australia than in Global South countries like Vietnam and Malaysia.

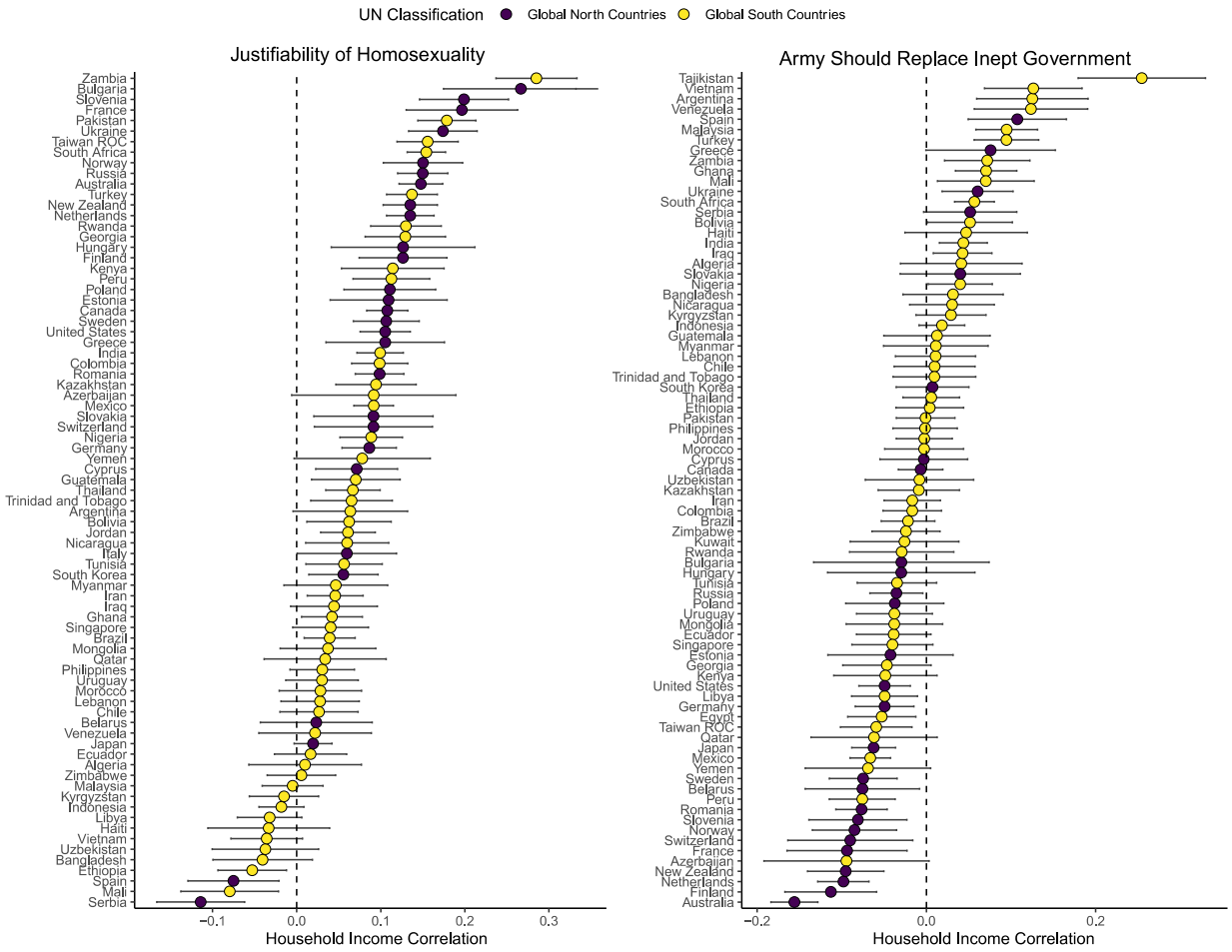

Figure 2. Value Endorsement and Household Income Across Countries. Correlation between household income and endorsement of two values across countries, and nodes at shaded by UN classification.

In other cases, the correlation actually reversed in direction. The right panel of Figure 2 shows an example of this reversal for endorsement that the army should step in when the government is inept. Household income correlated positively with endorsement of military intervention in 40.74% of countries and negatively in the remaining 59.26%. The negative correlations were more likely in Global North countries like Sweden and Belarus whereas the positive correlations were more likely in Global South countries like India and Venezuela. Another example of directional reversal was agreement that people rely too much on science and not enough on faith was negatively correlated with income in most Global North countries but positively in most Global South countries. As a result of these diverging correlations, the overall income correlation of the "science versus faith" item was not significant, $r = 0.006$, 95% CIs [-0.008, 0.02], but this null overall result hid meaningful cultural variation.

One interesting difference between the two items in Figure 2 is that the belief that homosexuality is justifiable involves people's personal moral preferences, whereas the belief about the army should inept governments involves people's preferences about collective institutions. In general, we found that items asking about people's personal preferences tended to show cultural heterogeneity in the magnitude of their correlation with income, whereas people's preferences about collective institutions were more likely to show correlation reversals. We summarize this pattern in more detail in our supplemental materials.

Was this heterogeneity across countries meaningful, beyond what we would expect from sampling error? There are several methods of answering this question in random effects meta-analysis. By every metric, the effect of household income was meaningfully heterogeneous. For example, the Cochrane's *Q* test estimates whether there is significantly greater heterogeneity across samples than would be expected under random sampling error. We found that every value had significant Cochrane's *Q* tests heterogeneity at the $p < 0.001$ level. Another metric is the I^2, which computes the proportion of total variability in effect sizes that is due to true heterogeneity rather than sampling error alone. I^2 estimates above 50% communicate moderate levels of sampling heterogeneity, whereas estimates above 75% communicate high levels of heterogeneity. In our analyses, All 98 I^2 values were greater than 50%, indicating at least moderate heterogeneity across countries, and 91 of the models had estimates above 75%. Regardless of metric, correlations involving household income are meaningfully different.

In Figure 3, we show how this heterogeneity can yield diverging rates of value endorsement between countries at the highest levels of household income. In Figure 3, mean level of value endorsement is plotted at each step of household income for Global South and Global North countries. We visualize this for 9 illustrative items that cover different kinds of values. For each of 9 items that we plot, household income has unique associations in the Global North and Global South. Crucially for our interest in wealth and cultural diversity, the gap between value endorsement in Global North countries and Global South countries becomes larger as people's household incomes become higher. For example, people who reported the minimum household income of "1" were more likely to say that God was important in their life in Africa ($M = 0.96$) than in Europe ($M = 0.66$), but for people who reported the maximum household income of "10," this difference the gap was even larger (Ms = 0.95 vs. 0.51). We did not just observe this pattern for the items that we choose to visualize here—78.57% of values in our sample showed a bigger North-South difference at the highest level of household income than the lowest.

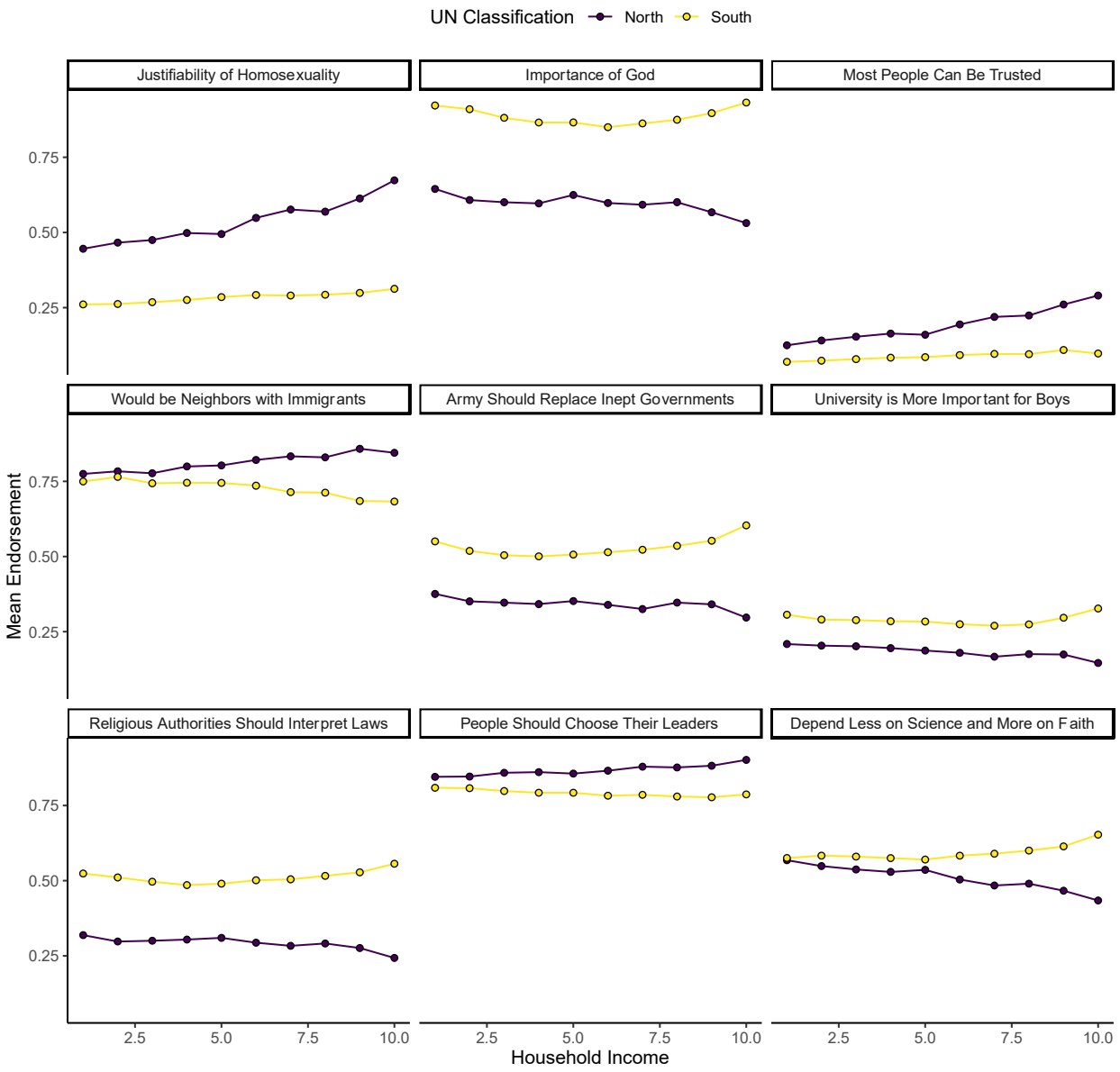

Figure 3. Value endorsement of 9 values aggregated to Global North versus South as well as each step in Household Income, as measured by the WVS.

One of the most striking elements of Figure 3 is that, for many values, the North-South gap in value endorsement accelerates at the very highest levels of household income. For example, lower-income and middle-income people in the Global North and South are equally divided over whether university is more important for boys than girls. But the divide then accelerates among high-income people who report 7-10 out of 10 on the household income scale. We saw the same pattern for many other items, such as the belief that people should depend less on technology and more on religion, that God is important, that homosexuality is justifiable, and that the army should replace governments when the government is incompetent. This pattern is meaningful because it speaks against the idea that people in the Global South might adopt Western values if they become wealthy "enough" to cross some post-materialist threshold. If this were true, then we would see convergence at the very highest levels of household income.

We present more analyses in the supplemental materials, including the statistics that underlie Figures 1-3 and more analyses that explore why household income has heterogeneous value correlations across cultures. These analyses find that cross-cultural variation in income inequality, GDP per capita, religiosity, and political freedom all contribute to this heterogeneity. We interpret these analyses in light of the three possible mechanisms from our introduction.

The most important takeaway from all of these analyses is that household income has heterogeneous correlations with values across countries, and this heterogeneity means that the wealthiest people from each country have more culturally polarized values than the poor. We next tested whether this pattern yields greater cultural differentiation at higher levels of wealth.

Household Income and Value Differentiation Across Countries

Our analyses of value endorsement focused on mean differences between countries. Although these analyses are insightful, they do not control for within-group heterogeneity, and so they are not ideal for assessing whether populations are culturally distinct. If two populations are internally heterogeneous, then their between-group disagreement may not matter because it is dwarfed by their within-group disagreement. A gold standard measure for addressing this concern is the *CF*st statistic—adapted from the *F*st statistic in genetics—which focuses on the ratio of between-group variation to within-group variation (42).

We used the *CF*st statistic to test whether the wealthiest people in each culture were more or less culturally differentiated than the poorest people in each culture. Our approach was to subset the WVS into lower-income, middle-income, and higher-income people from each country, and then to calculate the *CF*st statistics for pairs of countries from each income tier. If the *CF*st was higher, on average, for the higher-income tier, this would be evidence that higher-income people are more culturally differentiated than lower-income people.

We chose these three tiers of income for two reasons. The first was that the WVS already classifies people into three tiers by transforming the 10-level household income variable into a 3-level variable comprised of people who report low household income (values of 1–3), middle household income (values of 4–7), and high household income (values of 8–10). Using the WVS classification means that we did not need to make our own classification decisions. The second reason was that three classifications meant that we had enough people in each income level to calculate reliable *CF*st values across cultures. If we had created more income groups, then the sample size of each group may not have been stable enough for *CF*st estimates.

The one drawback of classifying people based on subjective income is that most people report being middle income (see supplemental materials), and this imbalance in the sample size can confound comparisons between the three income groups. Our methods section describes a bootstrapping procedure we used to balance the sample replicated our analyses across 10 subsamples with balanced sample sizes for each country and each income level within a country. In Table 1, we report the results of our analysis for each randomly seeded sample.

Are High-Income People More Culturally Differentiated Than Low-Income People? Our analyses found that cultural differentiation is greater for higher-income people than for lower-income people. This was consistently true across a series of mixed effects models—one for each random subsample—with random intercepts varying for each country in the pairwise comparison, and pairwise *CFst* regressed against income group with lower income set as the reference group. In every single one of these models, cultural differentiation across countries was significantly greater for higher-income people than for lower-income people (see Table 1).

Table 1.
Cultural Differentiation Among Higher- and Middle-Income People Contrasted with Value Differentiation Among Lower-Income People Across 10 Random Sampling Seeds

Income Contrast	Seed	b	SE	t	p	LLCI	ULCI
Higher Income	1	0.005	0.001	4.70	< 0.001	0.003	0.007
Higher Income	2	0.003	0.001	3.11	0.002	0.001	0.005
Higher Income	3	0.002	0.001	2.12	0.034	0.0002	0.004
Higher Income	4	0.003	0.001	3.10	0.002	0.001	0.005
Higher Income	5	0.004	0.001	3.55	< 0.001	0.002	0.006
Higher Income	6	0.003	0.001	2.83	0.005	0.001	0.005
Higher Income	7	0.003	0.001	3.15	0.002	0.001	0.006
Higher Income	8	0.002	0.001	2.27	0.023	0.0003	0.005
Higher Income	9	0.003	0.001	3.20	0.001	0.001	0.006
Higher Income	10	0.003	0.001	2.46	0.014	0.001	0.005
Middle Income	1	0.005	0.001	4.29	< 0.001	0.003	0.007
Middle Income	2	0.005	0.001	4.19	< 0.001	0.002	0.007
Middle Income	3	0.001	0.001	0.82	0.413	-0.001	0.003
Middle Income	4	0.004	0.001	3.41	0.001	0.002	0.006
Middle Income	5	0.004	0.001	3.31	0.001	0.001	0.006
Middle Income	6	0.004	0.001	3.46	0.001	0.002	0.006
Middle Income	7	0.005	0.001	4.41	< 0.001	0.003	0.007
Middle Income	8	0.002	0.001	1.99	0.047	0.00003	0.004
Middle Income	9	0.003	0.001	2.74	0.006	0.001	0.005
Middle Income	10	0.003	0.001	2.78	0.006	0.001	0.005

The most surprising finding in these models—given what we observed in our value endorsement analyses—was that middle-income and higher-income people did not significantly differ in their cultural differentiation. In our supplemental materials, we present more in-depth analyses of within-country heterogeneity to explain this finding. Nevertheless, for the sake of our main thesis, the important point is that higher-income people were more culturally differentiated than lower-income people—the opposite of the global elite hypothesis.

Which Values Show the Highest Income-Dependent Differentiation? Having found that higher-income people are more culturally differentiated than lower-income people, we next explored whether this effect was larger for some values than others. Did certain kinds of values have particularly high levels of "income-dependent differentiation"—cultural differentiation that increased at higher household income levels?

We were most interested in two variables. The first variable was the overall *CF*st of each value. This variable allowed us to test whether higher-income people are especially differentiated on the values that are generally the most polarizing across countries. The second variable was the "post-materialism" of each value. Past theories of wealth and culture argue that wealth increases post-materialist values stressing autonomy over traditionalism and obedience (8,10). However, our analyses of value endorsement found that household income was more strongly tied to post-materialist values in the Global North compared to the Global South, suggesting that the wealthy might be especially differentiated on post-materialist values.

Both of these key variables correlated with income-based differentiation (see Figure 4). Values that have the highest overall *CF*st levels also had the highest income-dependent differentiation, $r = 0.26$, 95% CIs [0.06, 0.43]. Calculating the correlation with post-materialism was slightly

more complicated. Past studies have calculated each item's relevance to post-materialism by taking it's absolute correlation with the emancipative values variable that is published by the WVS(23). For example, belief that homosexuality is justifiable ($|r|$ = 0.64) and that men make better political leaders than women ($|r|$ = 0.53) both correlated strongly with the index. We followed the same approach, and found that our resulting measure of "emancipative relevance" was positively correlated with income-based differentiation, r = 0.39, 95% CIs [0.21, 0.54]. The WVS also publishes a measure of secularization alongside its measure of emancipation. When we followed the same approach to calculate "secular relevance," it was more weakly tied to income-based differentiation, r = 0.20, 95% CIs [0.006, 0.39]. When both variables were included in a multiple regression, income-based differentiation was significantly associated with emancipative relevance, b = 0.36, SE = 0.10, t = 3.59, p < 0.001, 95% CIs [0.16, 0.56], but not secular relevance, b = 0.08, SE = 0.10, t = 0.78, p = 0.44, 95% CIs [-0.12, 0.28].

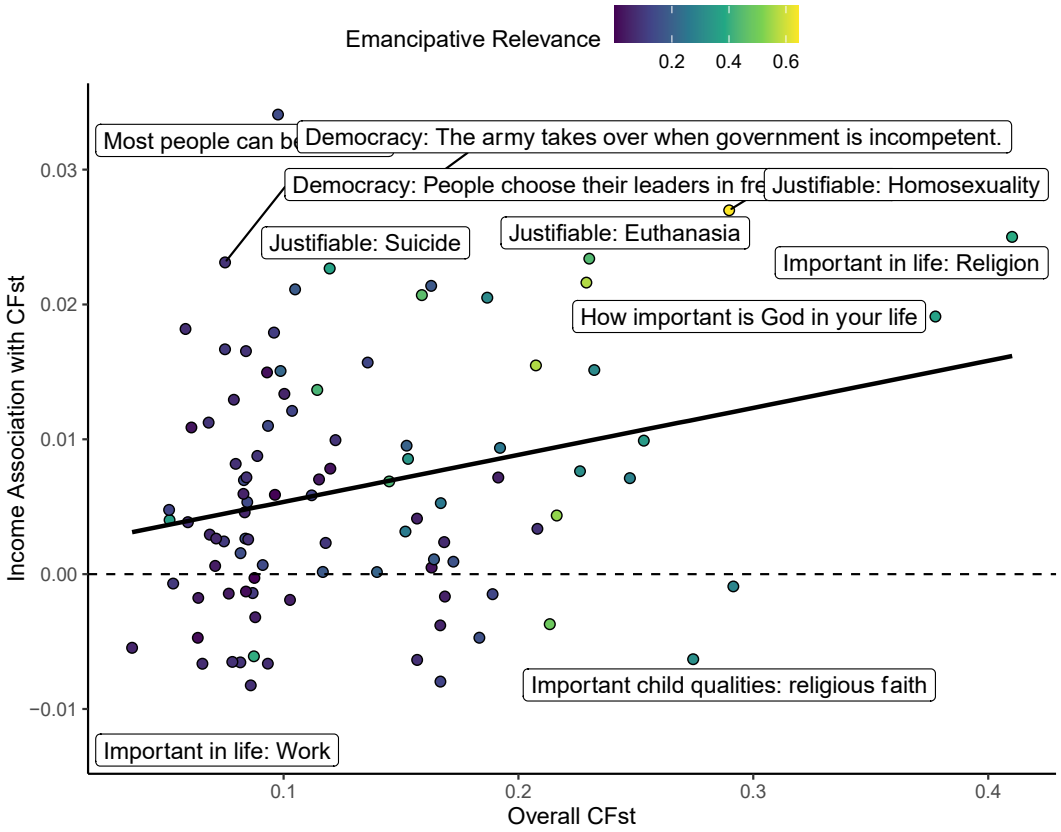

Figure 4. Cultural Differentiation Across Values. The y-axis represents cultural differentiation for high earners minus cultural differentiation for low earners. The x-axis represents general cultural differentiation across all household income groups. Each node is a value item, and is shaded by its absolute correlation with the emancipative values index published in the WVS.

It is important to note that emancipative relevance and overall *CF*st variables are not independent from one another. The values with the highest overall *CF*st also have the most emancipative relevance. This is not surprising, since countries are generally polarized over post-materialist values. When we entered emancipative relevance and overall *CF*st into the same regression, we found that income-based differentiation was significantly associated with emancipative relevance, b = 0.38, SE = 0.12, t = 3.09, p = 0.003, 95% CIs [0.13, 0.62], but not overall *CF*st, b = 0.02, SE = 0.12, t = 0.17, p = 0.86, 95% CIs [-0.21, 0.26]. In other words,

income-based differentiation is highest for the values that are generally most culturally polarizing because these culturally polarizing values are post-materialist in nature.

In sum, these analyses of cultural differentiation show consistent evidence that the wealthy are more culturally differentiated than the poor. Our analyses of value endorsement show that this differentiation arises because household income correlates strongly with post-materialist values in countries that already hold these values, but its correlation decreases in size or reverses in Global South countries where post-materialist values are less endorsed. In our supplemental materials, we summarize further analyses where we investigate the effect in different waves of the WVS and test whether factors like GDP per capita or Gini can explain why household income correlates with value endorsement in some countries but not others.

Analyses Across US Regions

We next tested whether we would find the same results across regions of a single country: the United States. For this analysis, we used the General Social Survey (GSS) data from 1972 to 2022, including 59,860 people and 110 value items in our analyses (See Method section). GSS categorizes the US into nine culturally meaningful regions, such as “New England’ and “Mountain,” allowing us to compare the regional difference in values.

Our main text presents these GSS analyses in less depth than the WVS analyses (see supplemental materials for more details). However, we felt that it was important to include this US analysis because (a) it allowed us to directly replicate many of our cross-country analyses, (b) in a more conservative sample of cultural groups that varied less in their institutional characteristics, (c) using a real measure of inflation-adjusted household income rather than subjective income, (c) with a pre-registered approach (https://aspredicted.org/q85z-c5xf.pdf. We used the same models to analyze US regions that we used for our cross-cultural analyses.

Household Income and Value Endorsement Across US regions

Household income correlated significantly with 96 of the 110 items in our sample. As with the cross-cultural analysis, household income was generally correlated with higher endorsement of post-materialist values. For example, household income was positively correlated with agreement that people can be trusted, $r = 0.16$, 95% CIs [0.14, 0.18], that people should be able to receive an abortion, $r = 0.16$, 95% CIs [0.15, 0.17]. In contrast, household income correlated negatively with agreement that children must obey if they want to learn, $r = -0.15$, 95% CIs [-0.16, -0.14], and that it is better for men to work while women tend the home, $r = -0.15$, 95% CIs [-0.16, -0.14]. We noted, however, that many GSS items were not designed to measure endorsement of post-materialist values. In fact, many items pitted multiple post-materialist values against each other. For example, one item asked respondents whether racists should be allowed to speak in public, pitting free speech against benevolence. Supplementary Table XX reports the full set of *r* correlations and confidence intervals. In Supplemental Figure XX, we reproduce a version of Figure 1, showing the correlation of household income with each value for each of the nine regions.

Correlations between household income and values unsurprisingly showed less heterogeneity across US regions than it did across cultures. In sum, 41 of 110 items (42.73%) showed significant Cochrane’s *Q* tests heterogeneity at the $p < 0.05$ level and 40 of 110 items (36.36%) had I^2 values greater than 50%, indicating at least a moderate heterogeneity across regions for these value items (see supplemental materials for full set of results). These tests are highly

sensitive to sample size, and the low sample size of 9 regions in this analysis means that significance should be interpreted with caution.

Nevertheless, there was interesting regional variation in the correlation between household income and value endorsement. For example, Figure 5 shows that household income positively correlated with belief in life after death in the West South Central, yet the same correlation was negative for East North Central, South Atlantic, Pacific, and Middle Atlantic areas. Similarly, household income positively correlated with favor for death penalty for murder in Southern areas including East South Central and West South Central, but negatively correlated with it in Northern areas, like New England and Middle Atlantic areas.

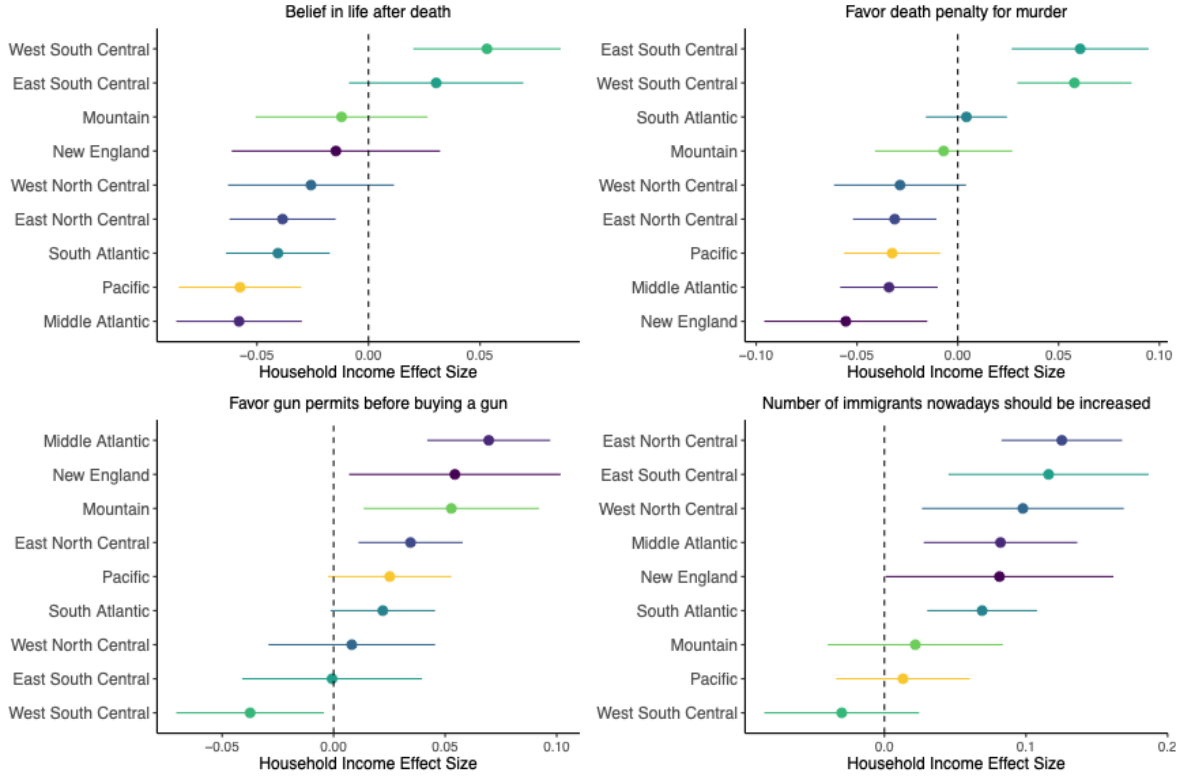

Figure 5. Value Endorsement and Household Income Across the US regions. Correlation between household income and endorsement of two values across regions of the US.

In our cross-cultural analysis, we found that household income correlated most strongly with values in places where these values were already endorsed more strongly, leading to polarization among the wealthy. Did we find the same thing among regions? Our approach to testing this question was to take the standard deviation (*SD*s) of region means at the lowest household income bracket (the lower one third) and the highest income bracket (the upper one third). For 65% of items, the *SD*s were larger in higher-income group than in lower-income group, suggesting that wealth is linked to higher cultural differentiation across regions just like it is across countries. However, this effect was smaller than what we found across countries, and it did not control for within-region variability. To more rigorously test the question of whether cultural differentiation is higher among high-income people than low-income people, we used a *CF*st approach.

Household Income and Cultural Differentiation Across US regions

Our central research question was whether people with higher household incomes would show more cultural differentiation across US regions than people with lower household incomes, just as we had found across countries. To do this analysis, we categorized people into three income categories roughly equal in sample size based on household income tertile.

Are High-Income People More Culturally Differentiated Than Low-Income People? We fit two mixed effects models with pairwise *CFst* regressed against income group with lower income set as the reference group, and random intercepts varying for each region in the pairwise comparison. These analyses found that cultural differentiation across regions was significantly greater for higher-income people than for lower-income people, but no significant difference was found between middle-income and lower-income group (see Table 2). When using middle income as the reference group, cultural difference across regions was marginally greater for higher-income people than for middle-income people, $b = 0.32$, $SE = 0.18$, $t(105) = 1.83$, $p = 0.069$, 95% CIs [-0.02, 0.66]. These results suggested that in the US, the jump in cultural differentiation happens from the middle-income group to the higher-income group, and that middle-income and lower-income people do not show significant differences in cultural differentiation.

Table 2.
Cultural Differentiation Among Higher- and Middle-Income People Contrasted with Value Differentiation Among Lower-Income People in the US.

Income Contrast	*b*	SE	t	p	LLCI	ULCI
Higher Income	0.39	0.18	2.24	0.027	0.05	0.74
Middle Income	0.07	0.18	0.40	0.686	-0.27	0.41

Which Values Show the Highest Income-Dependent Differentiation? In our cross-cultural analysis, we found that income-dependent differentiation was highest for items (a) that varied the most overall across countries (overall *CF*st) and (b) that were post-materialist, indexed through high emancipative relevance. Was income-dependent differentiation highest for the same items in the GSS?

We calculated overall *CF*st using the same procedure that we used in the cross-cultural data. However, we could not use the same metric of "emancipative relevance" to calculate post-materialism in the GSS because there is no "emancipative values" index published in the GSS. Instead, we used the relevance of each item to liberal-conservative ideology, reasoning that "progressive" values and "post-materialist" values are conceptually very similar, if not isomorphic. We calculated ideological relevance using the same absolute correlation procedure that we used to calculate emancipative relevance in our cross-cultural analyses.

Both of these key variables correlated with income-based differentiation (see Figure 7). Values that have the highest overall *CF*st levels also had the highest income-dependent differentiation, $r = 0.55$, 95% CIs [0.40, 0.66]; ideology relevance was also positively correlated with income-based differentiation, $r = 0.45$, 95% CIs [0.28, 0.58]. When we entered ideology relevance and overall *CF*st into the same regression, we found that income-based differentiation was both significantly associated with ideological relevance, $b = 0.26$, $SE = 0.09$, $t = 3.10$, $p = 0.002$, 95% CIs [0.10, 0.43], and overall *CF*st, $b = 0.44$, $SE = 0.09$, $t = 5.10$, $p < 0.001$, 95% CIs [0.27, 0.60]. In other words, values that are highly relevant to left-right political ideology and values which were differentiated across regions showed the greatest gap in regional differentiation among high-income versus low-income Americans.

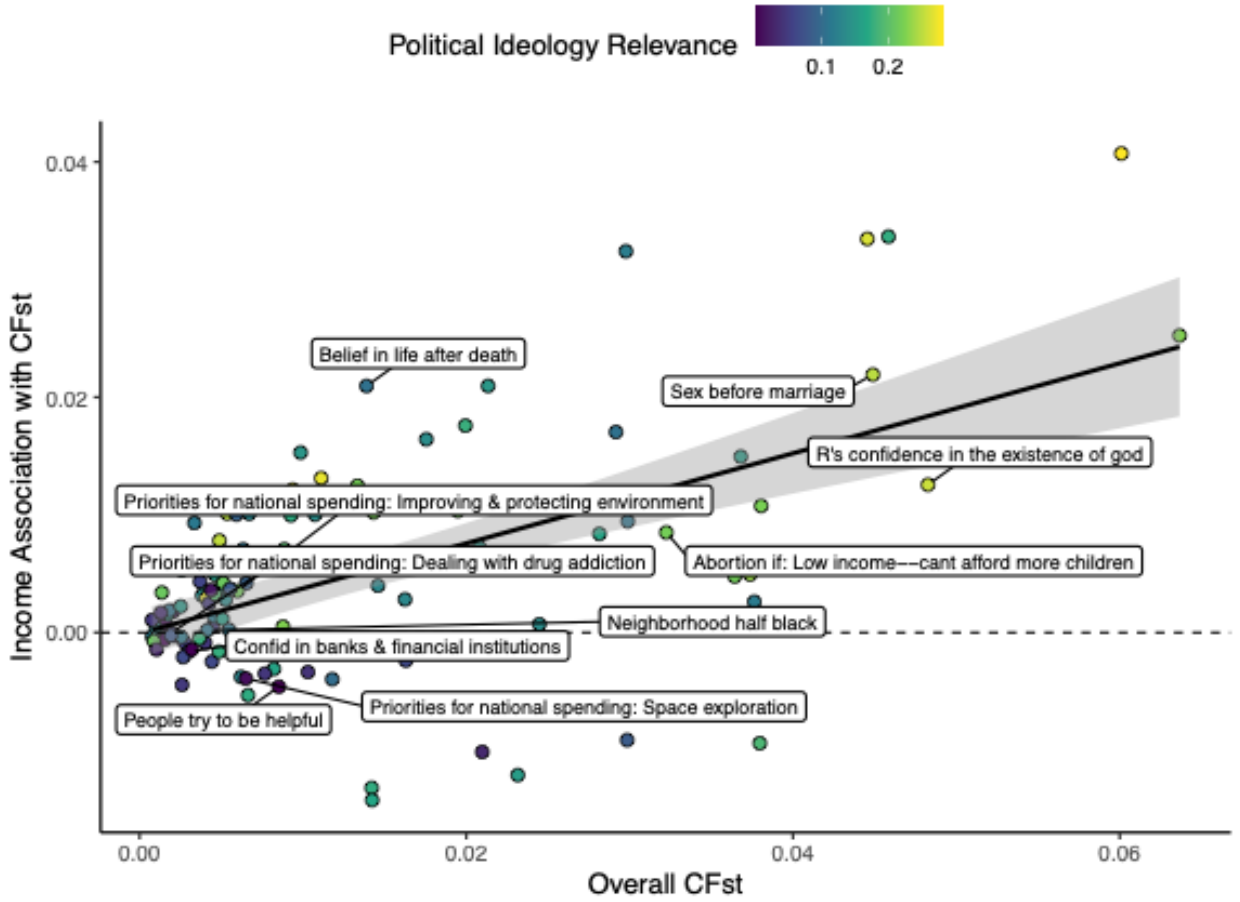

Figure 7. Cultural Differentiation Across Values. The y-axis represents cultural differentiation for high earners minus cultural differentiation for low earners. The x-axis represents general cultural differentiation across all household income groups. Each node is a value item, and is shaded by its absolute correlation with political ideology variable in the GSS.

In our supplemental materials, we include more analyses of US regions. These include a figure depicting the correlation of household income with each of the 110 values in each region, a breakdown of our main results by GSS wave, and further examination of why some items correlated with more income-based differentiation among regions than others.

Discussion

Trends in technology, trade, and geopolitics have created progressively prosperous generations over the last century. Between 1820 and 2019, the share of the population living in extreme poverty, defined as less than $1.90 per day, has declined from 76% to 9%. This trend towards economic growth is true for most countries, and is most prominent in East Asia. Between 1950 and 2016, GDP per capita increased by a factor of 32.2 in South Korea, 30.4 in Taiwan, and 27.5 in Singapore, compared to the 4.4-fold growth at the global level. As a result of these trends, there is now a growing middle class in most world nations. How will global rises in wealth impact the world's cultural diversity?

- **Discussion Point:** Return to the mechanisms in the introduction
- **Limitation:** Household income is just one form of wealth. We don't look at capital

- **Limitation:** We don't capture mobility

Method

Sample Size and Sampling Procedure. The World Values Survey (WVS) is an international research program devoted to measuring the social, political, economic, and religious values of individuals around the world using regular surveys. The WVS website contains comprehensive information about its research procedures (https://www.worldvaluessurvey.org). This includes information about translation procedures and fieldwork training. In addition to publishing data each wave, the WVS publishes a time-series file containing data from all waves. The WVS has not surveyed the same people over time in this file. Rather, each timepoint contains a demographically representative snapshot of people in a country at a particular point in time. The WVS also publishes a list of variables indicating which items are asked in different waves, and a list of countries indicating which countries are surveyed in each wave. The timeseries dataset is published in many different formats. We downloaded the Rdata format.

We focused on a sample of 95 countries that had been included in either Wave 5 (58 countries, 85,149 individuals), 6 (61 countries, 89,565 individuals), and 7 (65 countries, 94,278 individuals) of the WVS. In total, these waves contained 268,992 participants. Samples are designed to be representative of people aged 18 and older residing within private residences in each country, regardless of their citizenship or language. The WVS employs probability sampling and stratified sampling to achieve these targets, and their procedure has been relatively similar in each WVS wave. They offer case weights to compensate for small deviations with respect to sex-age, rural-urban, or education. In our supplemental materials, we show that the main results of our study are essentially identical when we incorporate these weights.

- Mention Global North versus Global South definition

Household Income. The longitudinal WVS contains a "Scales of Income" question (X047_WVS) which includes the following instructions: "On this card is an income scale on which 1 indicates the lowest income group and 0 the highest income group in your country." We would like to know in what group your household is. Please, specify the appropriate number, counting all waves, salaries, pensions, and other incomes that come in." The WVS also provides a supplemental item (X047R_WVS) which groups participants into low-income (1-3), middle-income (4-6) and upper-income (7-9).

We used this subjective income measure because the WVS does not ask about objective household income or wealth. The main limitation of the measure is that it is difficult to compare these income values directly across countries. Someone in a developing country making $40,000 USD might accurately report that they are in a higher income group in their country, even though they objectively make less money than someone who is in a higher income group in the USA. A secondary limitation is that people might interpret the question differently across cultures. For example, US and European participants disproportionately report being "middle class" leading subjective income to be normally distributed, but this bias may not characterize people in all cultures.

We conducted several preliminary analyses that address these limitations and show that subjective income item is a valid measure of household income. For example, we found that subjective income ratings linearly predicted participants' feeling of financial security, as well as their feeling of choice and control in life, and these relationships were virtually identical across developed and developing countries (see supplemental materials). We also found the same

normal distribution of subjective income, in which most people reported being middle income, across countries. Finally, we found that people's reports of subjective income correlated positively with both raw and logged GDP per capita (adjusted for purchasing power), such that the average person in wealthier countries reported higher subjective income than the average person in poorer countries. Our regional analyses involve a measure of real income and show the same results, lending further support to our inferences involving subjective income in our cross-national analyses. Although subjective income is not an ideal measure, these analyses suggested that the measure was valid for testing our research questions.

Measuring Values. The WVS is composed of a small rotating core of items, and a larger set of items that appear in specific waves of the survey. We included 105 value items that were administered in waves 5, 6, and 7 of the WVS. There was sufficient overlap between these waves that we could measure a large number of items over multiple timepoints. Expanding the analysis earlier, to Waves 3 or 4, would have required fewer items. The WVS also publishes indices for emancipative values and secular values. We used these published indices to calculate emancipative and secular value relevance.

We excluded items measuring demographic characteristics, well-being (e.g., subjective state of health), and features of the environment (e.g., how long the participant had gone without eating), leaving a set of items focused on values. We list our full set of items in Supplemental Table XX, along with the label that WVS provides for each item and the item category.

We normalized all items using the same min-max normalization procedure described in Jackson and Medvedev(23). We also replicated our main results using a median-split normalization procedure, and we report these results in the supplemental materials.

Our supplementary materials summarize an approach where we first used a principal components analysis to reduce the number of value variables, and then analyzed the PCs rather than the individual value items. These results were substantively identical to what we present here. However, since the PC solution did not explain a high degree of variation, our primary analyses focused on individual items.

Calculation of Value Endorsement.

Calculation of Value Differentiation.

Cross-Region Analysis.

Sample Size and Sampling Procedure. The General Social Survey (GSS) is a nationally representative survey of adults in the United States, which is designed to monitor changes in both social characteristics and attitudes using personal-interview surveys. The GSS website contains comprehensive information about its research procedures (https://gss.norc.org/us/en/gss.html). Like the WVS, the GSS is also cross-sectional, meaning the respondents are different in each wave. The GSS has been conducted since 1972 on a yearly basis, the most recent data accessible to the public is conducted in 2022. Therefore, our analyses were based on the 1972-2022 cross-sectional cumulative data, directly downloaded from the official website in the SAS format.

Although a large proportion of items vary across years, the GSS comprises a core set of items (i.e., the replicating core) that are repeated in many rounds. We focused on items in the replicating core in our analyses for consistency. To further simplify the data structure and gather

more valid datapoint, we recoded the decade that every respondent belongs to, and then treated each decade as a wave (the only exception is the last wave, which is composed of the data from 2012 to 2022, to make use of the data of 2022). There is a REGION variable in every round of the GSS, which coded nine meaningful cultural regions of the United States, including New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific areas. In total, our data consisted of 72,390 representative adults over the age 18 from these nine regions.

Measuring Income Differences. We used a household income variable named CONINC from the GSS as the basis of income groups. CONINC is an inflation-adjusted income variable converting family income to 19 rankings based on the dollar value of year 2000, which makes the income levels more comparable among rounds. We defined the lower-, middle-, and upper-income groups as the first, second, and last third in the distribution of CONINC in every decade. In our supplementary analyses, we alternatively adopted a subjective income variable similar to the one in the WVS, named FINRELA. This item asks respondents “compared with American families in general, would you say your family income is far below average, below average, average, above average, or above average?” Again, the tertiles were used to define the three subjective income groups. Both income variables are available for every round of the GSS.

Measuring Values. The replicating core of the GSS consists of a section named “Attitude and Opinions”, and all our value items were chosen from this section. We refined a list of value items by excluding items on stereotypes (e.g., how poor or rich black people are), behaviors (e.g., frequency of religious service attendance), identity (e.g., political party affiliation), and well-being (e.g., general happiness). We also removed items that are only implemented once, which left us with 155 items. The GSS sometimes experiments the format of the same variable, so one variable could have several versions, differentiated by the suffixes of items, such as “NV”, “V”, "G", "Y", and "X". We treated these variations as the same variable and combined their data together, named with uniform names without suffixes. In these ways, we included 110 value items in our formal analyses, which belong to 14 topic categories. The procedure above and the final value item list were preregistered (https://osf.io/k8cjb/?view_only=a031a4aaaff340c3bff1ee91e41d28cf).

Analysis Strategy.

Supplemental Materials

1. **Further Information About Study 1 Sample**

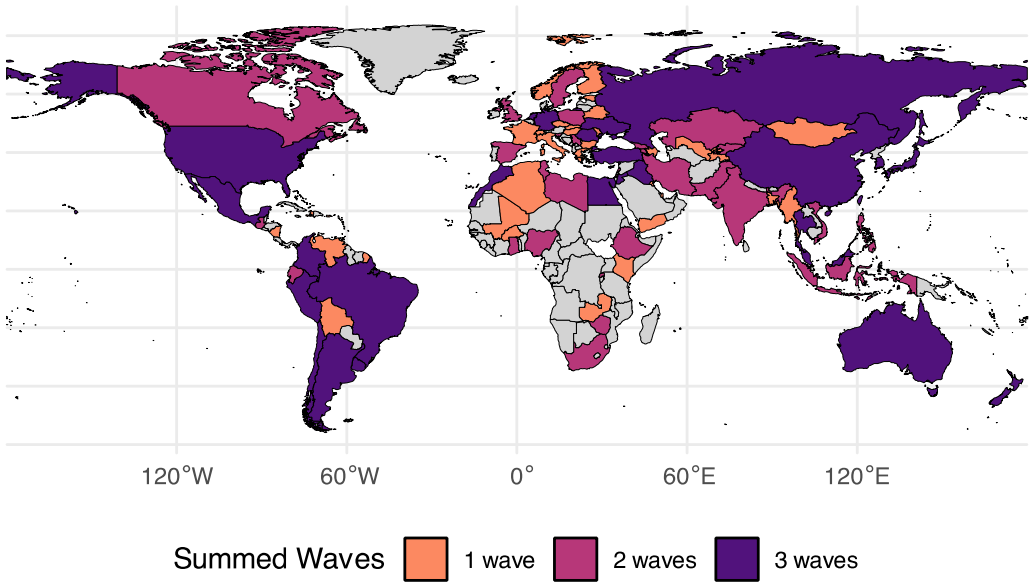

Figure 1. The sample of 92 countries included in the cross-country analysis. Countries are shaded according to how many waves they appear in within our dataset.

2. **Validating the Study 1 Measure of Household Income**
3. **Replicating Results Using a Principal Components Analysis**
4. **Complete Correlations Between Wealth and Value Endorsement**
5. **Complete Results of Random Effects Meta-Analyses**

- Including Cochrane's Q tests

6. **Further Visualizations of Value Endorsement at Different Levels of Wealth**

- Also include the threshold analyses

7. **Further Visualizations of Value Endorsement Across Countries**
8. **Decomposing Results by World Value Survey Wave**
9. **Evaluating Evidence for a Threshold Account of Household Income**

- A linear slope fits the correlation between household income and value endorsement better than any threshold function

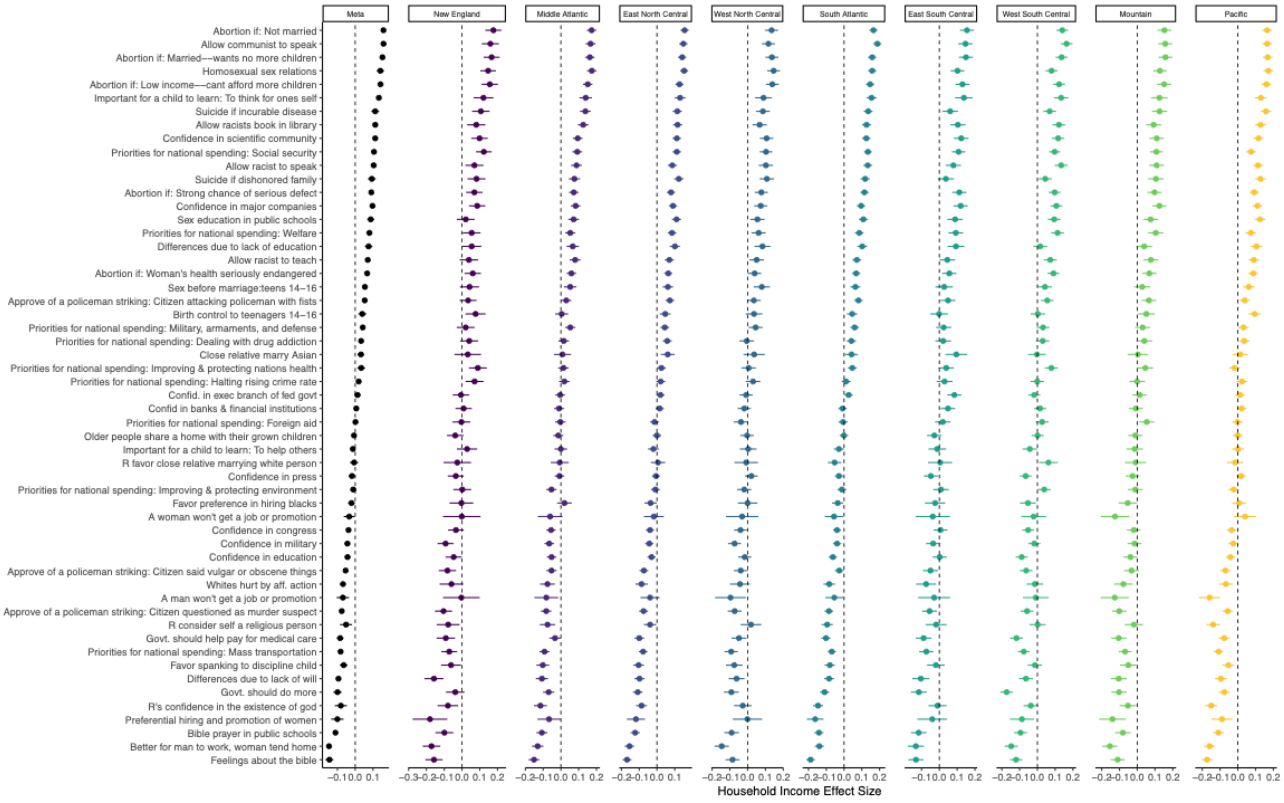

Figure 5. Association Between Household Income and Value Across American Regions. The black nodes and confidence intervals represent overall estimates of household income from a random effects meta-analysis across countries. For ease of interpretation, every second value is visualized on the y-axis.

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