



Supplementary Materials for **The Church, intensive kinship, and global psychological variation**

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S1. Measures of kinship intensity

Our analyses rely on two measures of intensive kinship. First, the Kinship Intensity Index (KII) is based on anthropological reports and provides an omnibus measure that combines several elements common to intensive kin-based institutions. Second, we use measures of the actual prevalence of cousin marriages at the country and European-regional levels; cousin marriage is one of the most important aspects of intensive kinship.

S1.1. The Kinship Intensity Index (KII)

The KII consists of five sub-indicators that capture key dimensions of kin-based organization: (1) cousin marriage preference, (2) polygamy, (3) co-residence of extended families, (4) lineage organization, and (5) community organization. The data is taken from the extended *Ethnographic Atlas* (EA) provided by the Database of Places, Language, Culture, and Environment (D-PLACE; see www.d-place.org). The EA contains characteristics of 1,291 pre-industrial ethnicities based on ethnographies written by anthropologists (1–6). We excluded eight ethnicities which are based on pre-1500CE characteristics. Here, we detail each sub-indicator.

1. *Cousin marriage preference*. Marriage is a decisive element of social structure. Beyond merely tying together spouses, marriage encourages the formation of alliances between families, clans, houses and kindreds. Many societies have created social norms prescribing preferences for, or taboos against, various types of kin-marriages. Kin-marriages impact social structure by reinforcing family bonds (underwritten by genetic relatedness and common socialization). Rather than forming extensive ties with genetically unrelated affinal kin, kin-marriages combine affinal and genetic relatedness within the same person. This has consequences for socialization. For example, at least two of the four parents of a first-cousin-marriage couple are siblings and were thus socialized in the same childhood family. The genetic implication is that the offspring of married cousins are more closely genetically related to their extended families compared to the offspring of non-cousin spouses. To the degree that evolutionarily shaped heuristics favor kin, cousin marriage impacts behavior through the channel of kin-selection (7, 8).

The EA contains information on whether an ethnicity prefers cousin marriage, and if so, what type is preferred (variable ea026 in D-PLACE). *Cousin marriage preference* takes the value of 0 if cousin marriage is not preferred; 1 if second- (but not first-) cousin marriage is preferred; 2 if cross-cousin marriage is preferred; and 3 if parallel-cousin marriage is preferred. A parallel cousin is a cousin from a parent's same-sex sibling (e.g., one's father's brother's child), while a cross cousin is a cousin from a parent's opposite-sex sibling (e.g., one's father's sister's child). In unilineal societies cross cousins do not belong to the same lineage, while parallel cousins do. In patrilineal societies the parallel cousin marriage of a son to his father's brother's daughter leads to spouses who belong to the same lineage (in the EA all 44 ethnicities with parallel-cousin marriages are patrilineal). The implied lineage endogamy further increases kinship intensity. See preprint <https://psyarxiv.com/d6qhu/> for a world map on cousin marriage preferences.

The extended EA contains data on cousin marriage preference for 1,042 ethnicities. To enlarge the sample, we predicted cousin marriage preference based on cousin terms (see (9) for a similar approach). The relationship between kinship systems and kin-terms is foundational to Anthropology (10, 11). Kin-terms help to classify genealogically related individuals according to functional roles and communicative demands (12). For example, in a society where cross cousins (e.g., a man's father's sister's daughters) are preferred marriage partners, the two types of cousins are often called by different names. In those societies parallel cousins are frequently called 'brothers' or 'sisters', which underscores the incest taboo via kin-terms and highlights the functional role of kin-terms. The EA contains data on cousin terms classified into eight categories (Crow, Descriptive, Eskimo, Hawaiian, Iroquois, Omaha, Sudanese, and Mixed). To predict cousin marriage preference, we first analyzed the sample of ethnicities with data on both cousin marriage preference and cousin terms. For each cousin term category, we calculated the mean of the cousin marriage sub-indicator. We used the resulting mean values to predict the expected *cousin marriage preference* sub-

indicator for ethnicities where only data on cousin terms are available.¹ This increases the sample by 93 ethnicities to a total of 1,135 observations.

2. *Polygamy*. In many societies around the world, polygamy (especially polygyny) has been common (13). Polygamy fosters kinship intensity: through reproductive skew fewer men reproduce, which increases genetic group relatedness (14, 15). However, this genetic component is only one aspect relating to kinship intensity. A hallmark of polygamous marriage is the formation of a common extended household. As such, polygamy also fosters cohesion because of co-residence: a larger number of genetically-related people cohabit together, thereby re-enforcing and strengthening kinship intensity. What is the impact of the excess of unmarried men for kinship intensity? Unmarried, they neither create extensive or intensive bonds through marriage and most often stay in their natal home keeping close ties with their extended family. Polygyny can impact psychology not only through kinship intensity but also through its implied intrasexual competition, which fosters crime and risk-taking (13). To address the channel of intrasexual competition (e.g., increased risk-taking, violent or criminal activities) through robustness checks, we demonstrate that the regression results hold when using a KII that excludes the polygamy sub-indicator and controls for it separately. The EA (variable ea009 in the D-PLACE dataset) categorizes societies into monogamy (assigned score of 0), occasional or limited polygyny (assigned score of 1), and common polygyny (assigned score of 2). Four societies in the EA are coded as polyandrous. They are likewise ascribed a score of 2 in the polygamy sub-indicator. See preprint <https://psyarxiv.com/d6qhu/> for a world map on polygamy.
3. *Co-residence of extended families*. This variable is defined by how many generations of a family live in the same or adjacent houses. The nuclear family consists of parents and their children; an extended family consists of several generations, each with its own nuclear family, living together (e.g., parents with their adult children, who are likewise married and have children). Cohabiting fosters strong ties among family members. A decisive factor for the formation of extended families is marital residence rules. Extended families can only form when one spouse moves in with the family of the other. The alternative is that both spouses move to a new location (neo-locality), which precludes the formation of an extended family and creates a nuclear one. At the new location, the nuclear family will inevitably form more extensive ties.

The EA contains two variables that capture this aspect of kinship. One is domestic organization (variable ea008 in D-PLACE). We created a variable that is coded 0 for ‘Independent nuclear / Independent polygamous families’, 1 for ‘minimal extent or stem families’, 2 for ‘small extended families’ and 3 for ‘large extended families.’ The other relevant EA variable is marital residence (variable ea012). We created a variable that takes the value 0 for ‘neo-locality,’ 1 for ‘ambilocality’ (individuals can choose which side of the family they relocate to), and 2 for the remaining cases (e.g., ‘patrilocality’, or ‘matrilocality’). Like patri- or matrilocality, ambilocality implies co-residence. However, the fact that the couple can relocate to either the father’s or the mother’s side reveals lower kinship intensity compared to the unambiguous rule of either patrilocality or matrilocality. This is reflected in our coding of the variable.

Neo-locality and co-residence of extended families are incompatible. Consequently, 93% of ethnicities coded as neolocal are also coded as independent nuclear or independent polygamous families. 50% of matrilocal or patrilocal ethnicities are coded as independent nuclear or independent polygamous. This reflects that patri- or matrilocality in the marital residence variable refers to relocation to a community more broadly, while the defining criteria of co-residence for the domestic organization variable is more narrowly referring to the same or adjunct houses. We take the average of the domestic organization and marital residence variables to create a sub-indicator that reveals the *co-residency of extended families*. In cases where the EA has information on only one of the two variables, the sub-indicator is based on the non-missing variable.² See preprint <https://psyarxiv.com/d6qhu/> for a world map on co-residence of extended families.

¹ For ethnicities with data on both cousin marriage preference and cousin terms, we find a highly significant association between the two indicators (Spearman’s $\rho = 0.39$, $N=862$, $P<0.001$). We also calculated how the KII at the ethnicity level correlates to one where the cousin marriage preference sub-indicator is entirely substituted by cousin terms (Spearman’s $\rho = 0.91$, $N=783$, $P<0.001$). The use of cousin-terms to predict cousin marriage preference in only 93 cases thus should not change the KII in a major way.

² We use the non-missing variable to predict the other variable for 38 ethnicities. To do so, we follow a procedure analogous to the one used to predict cousin marriage from the cousin-term variable.

4. *Lineage organization* captures rules of descent. In unilineal societies, descent is exclusive and either traced through the mother's or the father's side. A person hence belongs to only one lineage. This helps structure kin relations and to define non-conflicting obligations. For example, such rules may dictate which side of the family one is obliged to support when conflict arises. This contrasts with bilateral rules of descent. Here, descent is traced through both the mother's and father's sides. It is non-exclusive and—in contrast to unilineal descent—everyone except siblings thus has a unique combination of relatives. This creates a more diverse kin-network with equal ties between both sides of the family, thus decreasing kinship intensity.

One almost universal feature of unilineal descent is lineage exogamy. It may appear that this could offset the kinship intensity of unilineal descent, as lineage exogamy forces people to marry out. However, these marriages often follow additional restrictive rules such as prescriptions to marrying cross cousins or community endogamy, thus contributing to an intensive kinship system. Anthropologists have argued that lineage exogamy itself is the result of strong cohesion within the lineage (11, 16, 17). First, lineage exogamy decreases male competition for women within the lineage. Second, high cohesion within a lineage may activate evolutionarily evolved incest avoidance mechanisms, thus favoring rules about lineage exogamy. *Lineage organization* (EA variable ea043) takes the value 0 for bilateral descent and 1 otherwise (the latter category also contains duolateral, quasi-lineage and ambilineal descent). See preprint <https://psyarxiv.com/d6qhu/> for a world map on lineage organization.

5. *Community organization* varies along two sub-dimensions. The first is whether extended family or clan members all reside in one localized area of the settlement. Localization decreases the interaction with outsiders and thus contributes to kinship intensity. This is particularly apparent when the whole community just consists of one single clan. The second sub-dimension concerns marriage patterns and more precisely whether there is community-level endogamy. Endogamous communities form denser clusters since no outsiders from different villages join the community through marriage. The sub-indicator *community organization* (EA variable ea015) combines these two dimensions and takes the value of 1 if localized clans are present and/or if community endogamy exists. If both are absent, the variable takes the value 0 (this is the case for the two categories “*Agamous communities without localized clans*” and “*Exogamous communities without clan structure*”). A community organization value of 0 thus reflects communities that do not form localized groups and have no tendency towards local endogamy. See preprint <https://psyarxiv.com/d6qhu/> for a world map on community organization.

The Kinship Intensity Index

We computed the KII both at the ethnicity level and the country level. To create the ethnicity-level KII, we standardized each sub-indicator and then took the mean across the five sub-indicators for each ethnicity. We obtained the KII for 977 ethnicities. For ease of interpretation, we then standardized the KII at the ethnicity level. Table S1.1 displays the correlation matrix between the ethnicity-level KII and all five sub-indicators. Figure 1 in the main text shows the distribution of the ethnicity-level KII around the world.

	KII	Cousin mar. pref.	Polygamy	Co-resid. of ext. fam.	Lineage orga.	Com. orga.
KII	1					
Cousin marriage pref.	0.47	1				
Polygamy	0.57	0.05	1			
Co-resid. of ext. fam.	0.57	0.07	0.24	1		
Lineage organization.	0.73	0.22	0.27	0.21	1	
Community orga.	0.59	0.04	0.11	0.15	0.44	1

Table S1.1 Ethnicity-level Pearson correlation between the KII and its sub-indicators

The KII at the country level reflects the population-weighted KII of ethno-linguistic populations that reside within the country. To aggregate, we built on the pioneering work of Giuliano and Nunn (18) and introduced two methodological innovations (see Section S10 for details). For ease of interpretation we standardized the country-level KII. Figure S1.1 gives an overview of the country-level KII. Table S1.2 displays the correlation matrix between the country-level KII and all five country-level sub-indicators.

	KII	Cousin mar. pref.	Polygamy	Co-resid. of ext. fam.	Lineage orga.	Com. orga.
KII	1					
Cousin marriage pref.	0.62	1				
Polygamy	0.81	0.33	1			
Co-resid. of ext. fam.	0.84	0.36	0.57	1		
Lineage organization	0.93	0.50	0.73	0.75	1	
Community orga.	0.67	0.17	0.50	0.47	0.58	1

Table S1.2 Country-level Pearson correlations between the KII and its sub-indicators

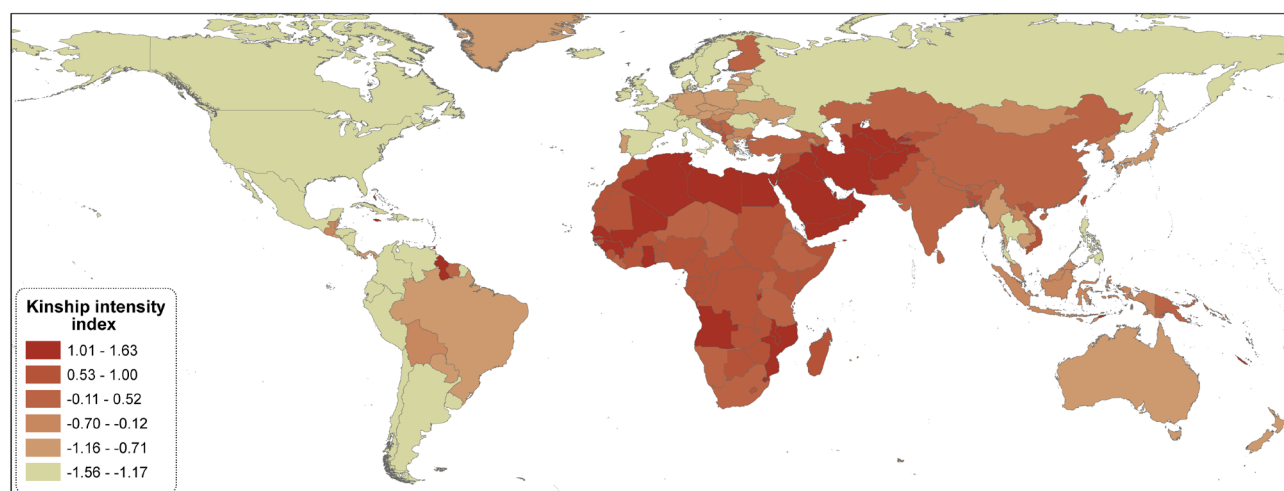


Figure S1.1 Kinship intensity index (KII) across countries. Higher KII corresponds to higher kinship intensity.

S1.2. Prevalence of cousin marriage

Here we describe our indicators of the prevalence of cousin marriage. We have one such indicator defined at the country level, and another one defined at the European-regional level.

Country-level prevalence of cousin marriage

Log percent cousin marriage measures the prevalence of kin marriages up to and including second cousins in the 20th century. It is based on meta-analyses by Bittles (19–21), as reported on www.consang.net. Consequently, the underlying studies vary in their methodology and sampling period. However, *log percent cousin marriage* is highly correlated with the country-level KII sub-indicator *cousin marriage preference* (Spearman's $\rho = 0.69$, $N=73$, $P<0.001$) and the KII (Spearman's $\rho = 0.69$, $N=73$, $P<0.001$). Moreover, genetic correlates of inbreeding and Bittles' data are correlated (22). In cases where multiple studies covered one country, we took the average across the studies. If several studies covered different parts of a country, we approximated a population-weighted country average. We added three countries—Malta (23), Germany (24), and Uzbekistan (using data from the Demographic and Health Surveys)—giving us a total of 74 countries. We use the natural log of *percent cousin marriage* in our analysis, both because the distribution is left skewed and because it reflects a decreasing marginal impact of cousin marriage (e.g., the second kin marriage between two already connected families doesn't double the tightness of their social relationship). Log transformation was straightforward as in no case a country had zero cousin marriages. Figure S1.2 reveals the global distribution.

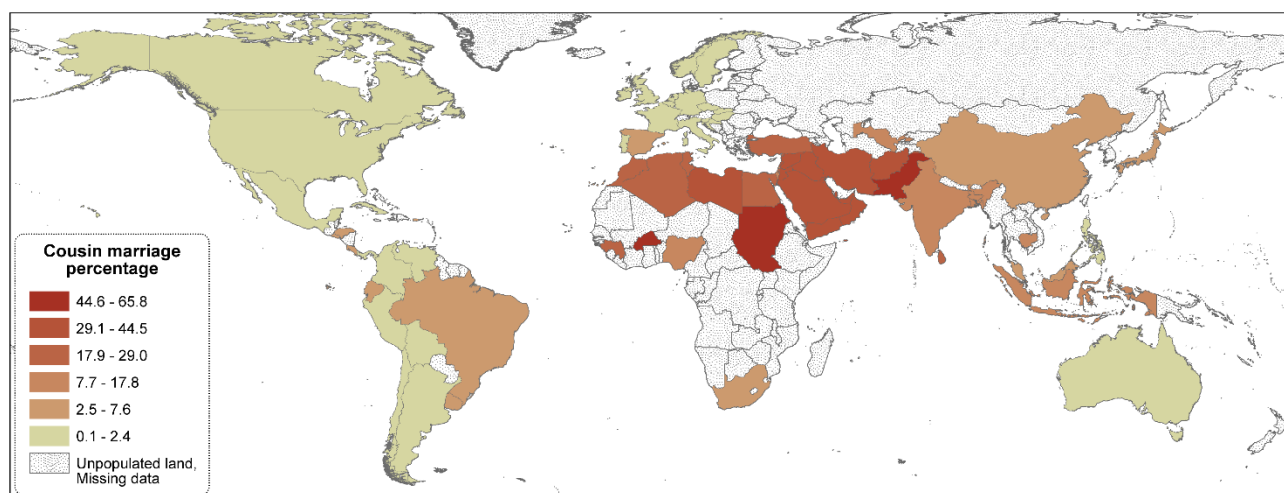


Figure S1.2 Cousin marriage percentage across countries based on meta-analyses by Bittles (19–21). The indicator contains cousin marriages up to and including second cousin marriages.

Prevalence of cousin marriage across European regions

A valuable source of information on 20th century regional intensive kinship in Europe are marital dispensations by the Catholic Church. Individuals who were granted a dispensation (usually involving a payment) could marry relatives within the forbidden degrees. Based on dispensation records stored in the Vatican archives, we obtained data on the prevalence of first cousin marriage for Spain (25), Italy (26), and France (27, 28). We added regional data on the prevalence of cousin marriage in Turkey based on the Demographic and Health Surveys. The resulting regional data measures the prevalence of kin marriages up to and including first cousin marriages. Data on second cousin marriages are missing for Sicily. Years of observations are averages over the years 1911 to 1943 for Spain, 1910 to 1964 for Italy, and 1926 to 1958 for France; for Turkey data were collected in 1998 (in the second wave of the DHS survey in Turkey).

S2. Measures of medieval Church exposure

Here we describe the country and regional measures of medieval Church exposure. Historical background on the Church's Marriage and Family Program (MFP) can be found in (29) and in this pre-print <https://psyarxiv.com/d6qhu/>.

S2.1. Country-level exposure to the MFP and the medieval Church

The two country-level variables Eastern and Western medieval Church exposure are based on Schulz (29). These measures capture the average duration ancestors of modern-day countries' inhabitants were exposed to the Churches' MFP up to the year 1500CE. See Figure 1 in the main text for an overview. The measures are coded in three steps. First, for each country, the starting point of the Church's MFP is determined. Second, the years (up until 1500) during which the country was governed by a Christian ruler are counted. Third, the measure is ancestor-adjusted to account for population movements post-1500.

The year 506CE is the start date for the MFP for countries that were already predominantly within the Western Church's realm when the MFP first consolidated. In 506 the Synod of Agde in Southern France took place—the first documented Synod, which prohibited cousin marriage (earlier cousin-marriage prohibitions due to Emperor Theodosius' in 387 were only short-lived). For the Eastern Church the start date of the MFP is the year 692 when the Synod of Trullo in Byzantium took place. For areas that were not yet Christianized in 506 or 692, exposure starts when the area of a modern-day country was predominantly incorporated into either Church's administration. In most cases, it is the year the first bishopric within the area of a modern-day country was founded. Exceptions are countries that were initially governed by bishops with sees outside of today's national boundaries or countries that were gradually incorporated. Here we take the year in which most of the contemporary country's area was incorporated. The details for each country can be found in Schulz (29).

Church exposure is calculated up to the year 1500. This reflects that the Church's obsession with incest occurred before 1500 (30–32). Restrictions after 1500 were less strict, and dispensations became more common. Also, after 1500 protestant areas did not revert to kin-marriage or polygyny (with a few exceptions among the elites) despite the absence of religious prohibitions and often put secular regulations against cousin marriage (e.g., in Sweden and protestant cities in Switzerland and Germany (33)). Third, the year 1500 allows us to compute ancestor-adjusted measures of medieval Church exposure around the globe. Putterman and Weil (34) created a migration matrix that captures migration between any pair of countries that occurred between the years 1500 and 2000, which we used to create our ancestor-adjusted measure. While we coded countries as either having Western, Eastern or no Church exposure before the year 1500, the migration matrix adjustment changes this. For example, migration of Russians into Estonia will increase Eastern Church exposure in Estonia.

S2.2. Regional indicator of medieval Western Church exposure

We created a measure of medieval Western Church exposure for the regions of the European Social Survey (ESS). This regional measure is based on the foundation and existence of bishoprics between 550 and 1500.

Data on Western Church's bishoprics

We created a geo-coded dataset of the location of Western Church bishoprics' up to the year 1500. Our main data source on the existence of bishoprics is Catholic Hierarchy (<http://www.catholic-hierarchy.org> compiled by David M. Cheney). For additional sources of information, we turned to GCatholic (<http://www.gcatholic.org> compiled by Gabriel Chow) and Menestrel ('Medievalists on the web' <http://www.menestrel.fr>). We cross-validated the data provided in Catholic Hierarchy against GCatholic and Menestrel, and added any bishopric that was missing in Catholic Hierarchy. The three sources are highly consistent with one another. For a few

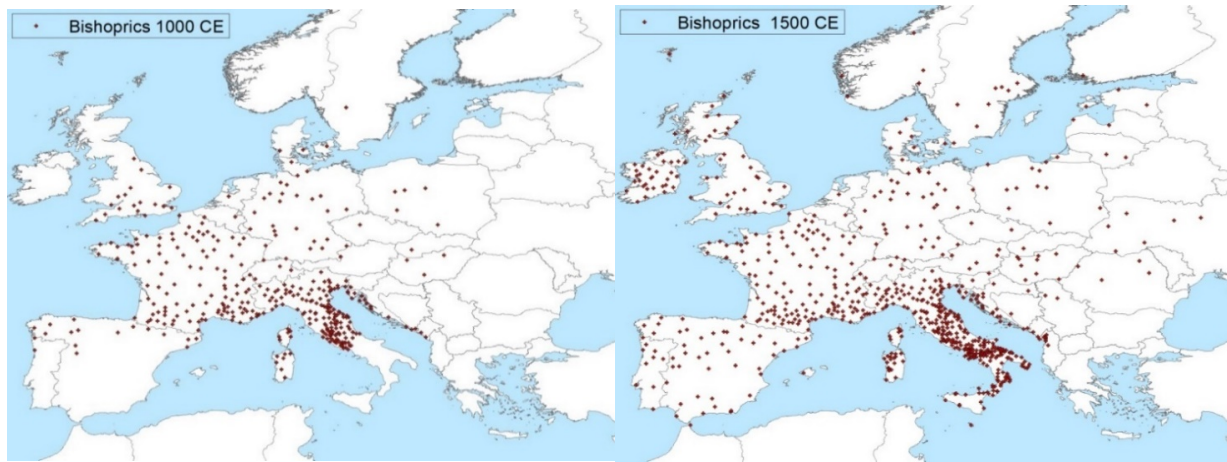


Figure S2.1: Bishoprics in the Western Church in the years 1000, and 1500.

bishoprics, only approximate dates (e.g., ‘3rd century’) were available. In these cases and in case of disagreement of the three data banks, we turned to additional sources (e.g., (35) for Scandinavia or (36) for Europe), or resorted to detailed internet searches.³ For each bishopric, we added GIS-coordinates.⁴

Our dataset only codes exposure to bishoprics that were within the Western Church’s sphere of influence. Despite the presence of bishoprics, certain areas in Italy, Spain and Portugal are not included. For Spain and Portugal, we begin incorporating bishoprics in the year in which the see’s location was reconquered by the Reconquista. Bishoprics under secular Islamic rule are ignored. Southern Italian bishoprics are included after the 11th century Norman conquest when the area was integrated into the Western Church. Before this conquest Southern Italy unlikely experienced the Western Church’s MFP. Many bishoprics were destroyed by the Lombard invasion⁵, and the remaining ones failed to consolidate power and fill the same administrative function with jurisdictional authority as those in the Carolingian Empire.⁶ Local customs prevailed and “religious practices differed not only from one town to another but also from church to church” (Ramseyer (37), p. 8). Lombard duchies in the South recognized Byzantine hegemony, particularly in the years during which Byzantine power was at its height (880 to 960 (38)). Apart from Lombard rule, a large area of Southern mainland was Byzantine, with its weakly-enforced MFP⁷. Meanwhile, Sicily was Islamic.

The degree of integration of the Balkans into the Western Church is ambiguous. Following the Iconoclast controversy (in the 8th and 9th centuries), the jurisdiction over the Eastern part of the ancient Roman province of Illyricum was contested between the Pope and the Byzantine emperor (39). We include Albanian bishoprics once the Western Church revived bishoprics after the Schism of 1054 (40). Also, 7th century Slavic migration into the Balkans destroyed existing Church infrastructure. Only coastal bishoprics without significant influence into the countryside survived. Our measure reaches into the hinterland and thus overestimates regional Church exposure in the Balkans. Our final dataset contains 895 geo-located Western bishoprics that existed at some point prior to the year 1500. Figure S2.1 displays the location of bishoprics in the year 1000 and 1500.

³ If uncertainties could not be resolved, we used estimates by taking the middle year of the century or half century (e.g., the year 250 if the bishopric was founded in the 3rd century) These few uncertainties mostly exist for bishoprics that were established before the 6th century and thus do not affect our Church exposure indicator.

⁴For a small number (N<10) of bishopric, the exact location of the bishopric is debated. We picked the location for which we perceived the greatest consensus. In all cases, the distance between the debated locations is less than 50km.

⁵ In the South Italian duchies of Spoleto and Benevento, only about ten out of several hundred bishoprics still existed in the year 700 (38). Our data sources list more bishoprics in Southern Italy in 700. This partly reflects that destroyed sees often continue to exist as titular sees, in which case the bishop no longer resides at the original location.

⁶ Only in the late 10th century the archbishopric of Salerno began constructing an autonomous ecclesiastical system based on parish rights, Papal over-lordship and Roman canon law (37). This was a slow process in conflict with Byzantine interests (141).

⁷ Around the years 732 to 757, the Byzantine Emperor attached the Hellenized territories of Sicily, Southern Italy and probably Eastern Illyricum to the jurisdiction of the Patriarchate of Constantinople.

Computing regional Church exposure

We divided Europe into pixels of 0.125×0.125 decimal degrees (about 14 by 14km at the equator; 14 by 7km at the latitude of Stockholm). For each pixel in each half-century from the year 550 to the year 1500, we calculated the distance to the nearest bishopric.⁸ In a given half-century, a pixel was assigned the value of ‘1’ if there was a bishopric within 100km of the pixel’s centroid (and ‘0’ otherwise). We then summed each pixel’s exposure over all half-centuries (and multiplied it by $\frac{1}{2}$, to get a measure expressed in centuries), yielding an approximate measure of the duration of the pixel’s exposure to the Western Church’s MFP in centuries:

$$Exp_i = \frac{1}{2} \cdot \sum_{t=550}^{t=1500} Cell_{i,t}, \text{ where } Cell_{i,t} = \begin{cases} 0 & \text{if } distB_{i,t} > 100 \text{ km} \\ 1 & \text{if } distB_{i,t} \leq 100 \text{ km} \end{cases}$$

where t indexes half-centuries increasing in 50-year intervals, i indexes pixels, and $distB_{i,t}$ is the distance between pixel i ’s centroid and the nearest bishoprics at half-century t . Exp_i can thus range from 0 to 10. Next, for each ESS region r , we calculated the region’s Church exposure by taking the mean Exp_i across all the pixels that fall into the region: $Exp_r = Mean(Exp_i | i \in r)$. Exp_r can thus range from 0 to 10. An exposure of 0 implies that in no half-century between the year 550 and 1500 was there a bishopric within 100km of any pixel within the region; a regional exposure of 10 implies that in all half-centuries, all pixels within the region were within 100km of a bishopric. Figure 1 in the main text gives an overview of regional Church exposure.

The 100km radius is informed by three considerations. First, Reyerson (41) estimates that 14th century horseback travel in Italy could cover 50 to 60km a day. This travel time suggests that a 100km radius was well within reach of a bishopric. Second, we checked what percentage of pixels in the realm of the Western Church was covered by bishoprics in 1500; a point in time when the whole of Europe was Christianized and administered by the Church. This criterion is informative on the geographic extent of bishoprics’ jurisdiction. A 100km radius covered 65% of the pixels that fall within today’s countries that fully belonged to the sphere of the Western Church. While this figure is not particularly high, this is largely due to sparsely populated regions in Scandinavia. Excluding Sweden, Finland and Norway increases overall coverage to 88% of pixels. Lastly, we checked that the 100km radius traces the historic extent of bishoprics in newly Christianized areas.

A drawback of the 100km radius is that it ignores political borders. For instance, a bishopric in Christian Spain may reach into Islamic areas. Also, some bishoprics covered larger areas than implied by the 100km radius. Thus, some regions that were undoubtedly exposed to the Western Church at some point in time (e.g., in the Netherlands, Scandinavia, and Austria) are coded as having no Western Church exposure. We conducted robustness checks to show that all results hold for smaller or larger radii (see Section S5.1). We also constructed a population-weighted measure addressing concerns that the indicator may give too much weight to unpopulated pixels within a region. We did this by assigning lower weight to pixels in which there is less population when aggregating to the regional level. The weights are based on pixel-level population estimates for the year 500, taken from (42, 43)); these population estimates are based on geographic factors and assign higher population density to areas that are more easily reached, such as areas close to rivers or far from mountains.

⁸ Starting with the year 550 is consistent with our country-level indicator, which starts at the year 506. If a pixel takes the value of 1 for the year 550, it can be interpreted as a bishopric existing *up to* 550.

S3. Overview of our empirical approach

Our theory, which we laid out in the main text, makes the *a priori* predictions that societies with longer exposure to the Western Church or less intensive kin-based institutions will be more individualistic, less conforming and more impersonally prosocial, and that longer exposure to the Church should be associated with less intensive kin-based institutions. Here we outline our empirical approach and discuss alternative hypotheses. Three features characterize our empirical approach.

First, we selected the set of variables to analyze based on our a priori theoretical predictions. We compiled 24 different psychological outcomes, including laboratory experiments, validated psychological scales, survey questions and ecologically relevant observational data. We selected all outcomes *ex ante*, i.e., before conducting our analyses,⁹ on the basis of (i) their relevance to our theory—i.e., whether we expected kin-based institutions to affect them; (ii) their impact in the social science literature; and (iii) data availability. We then proceeded to transparently report the results of our analyses for all pre-selected variables, regardless of whether or not the results support our theory (see our third point below).

We also selected and constructed the set of explanatory variables *ex ante*, according to anthropological and historical criteria. For example, we defined the KII based on *a priori* anthropological knowledge, by combining *all* EA variables that capture important dimensions of kin-based institutions (see Section S1). Church exposure was coded based on historically informed criteria (see Section S2).

Second, we tested our theory at different, complementary levels of analysis.

- *Section S4* analyzes cross-country data, where we can observe the largest number of psychological outcomes and ecologically more relevant measures that capture real-world behavior, such as blood donations.
- *Section S5* analyzes individuals within European regions and exploits variation within countries. This rules out estimation bias due to unobserved factors that vary at the country level.
- *Section S6* shows that an ecologically relevant dependent variable (blood donations) is significantly and robustly associated with kinship intensity within a single country (Italy).
- *Section S7* compares the psychological outcomes of second-generation immigrants in Europe and links these to the kin-based institutions of their ancestral communities. Comparing individuals, who grew up in the same country but differ in their cultural heritage, rules out estimation bias due to the national-level environment individuals grew up in.
- *Section S8* compares ethno-linguistic populations within countries (not reported in the main text).
- *Section S9* reports on mediation analyses that examine whether the association between Western Church exposure and psychology is mediated by kinship intensity.

Third, we ‘tied our hands’ by estimating parallel sets of specifications across outcomes and measures of kinship intensity and of Church exposure, as well as across levels of analysis. We strove to make our analyses as similar as possible across dependent and independent variables and across levels of analysis. Whenever possible, we analyzed similar dependent and explanatory variables across levels of analysis. We selected and created novel control variables *ex ante* to control for plausible alternative causal pathways that have been advanced in the literature and that could account for our results. We then used these controls consistently across specifications and (to the extent possible) levels of analysis. For example, we constructed a baseline set of geographic control variables that we used consistently in the cross-country, European regional, Italian provincial, and second-generation-immigrant analyses. This approach of following a uniform, pre-specified procedure across variables and levels of analysis had the effect of ‘tying our hands’. The resulting analysis involving hundreds of model specifications, presented without cherry-picking, means that there are cases in which some coefficients drop substantially and/or loses significance.

⁹ The exceptions are Hofstede’s measure of individualism as well as the behavioral measures of cooperation and dishonesty. One of the four authors had already analyzed the relationships between these variables and cousin marriage and Church exposure for presentations.

Endogeneity and discussion of alternative hypothesis

We recognize the difficulty of conclusively establishing an unassailable causal link between Church exposure, kin-based institutions and psychology by analyzing non-experimental historical data. While the results from the analyses at any given level on their own ought to be interpreted with caution (given the potential bias due to unobservables), here we discuss several features of our overall empirical approach that—when taken together—provide strong support for our theory over alternative explanations.

i. Contemporary reverse causality

We analyzed historically ‘deep’ explanatory variables. This rules out estimation bias due to contemporary unobserved factors. The KII is based on the *Ethnographic Atlas*, which aims to capture pre-industrial characteristics of ethnicities before European contact. Church exposure is measured up to the year 1500CE—before the Enlightenment or the Industrial Revolution. Thus, our analyses examine historically deep origins of human psychology. Yet, this does not preclude the possibility that other unobserved deep historical factors may have shaped both kinship intensity and human psychology or that some other factors associated with Church exposure may have been decisive for the observed psychological differences. We next discuss potential endogeneity due to other deep biogeographic variables, and then potential endogeneity due to Church-related factors that spread alongside the MFP.

ii. Endogeneity due to other deep historical factors

Several features of our analysis mitigate the possibility that other historically deep factors bias our estimates.

- 1) *Controls for bio-geographic conditions.* Research has linked bio-geographic conditions to human psychology (49–58). We control for a large set of bio-geographic conditions that may have impacted both kinship intensity and human psychology (Section S4, S5, S6, and S7).
- 2) The *children-of-immigrants analysis* (Section S7) addresses estimation bias due to environmental factors of the country or region of residence. Children of immigrants grew up in the same country but vary in their cultural backgrounds. The analysis should therefore capture only cultural values transmitted by the parents (59, 60). For example, it rules out estimation bias due to any direct effects of geography in the parents’ countries. In several specifications, we also control for origin-country fixed effects, which rules out that origin-country features like the strength of formal institutions or colonial rule bias the estimates.
- 3) Many analyses exploit *within-country variation* (Section S5 to S9). This rules out that unobserved factors at the country level (like GDP, the rule of law, infrastructure or national culture) bias the estimates.
- 4) *Exposure to the Churches’ MFP.* Due to top-down Christianization and shifting spheres of influence following outcomes of wars, which in medieval times carried a large random component, Church exposure can be viewed as a quasi-natural experiment that severs the link between biogeographic factors and kinship intensity. Some examples for the large idiosyncratic component of Church exposure are:
 - The Islamic conquests of the Hispanic peninsula (8th century) and Sicily (9th century).
 - Territorial expansions of the Carolingian Empire, with its strict enforcement of anti-incest legislation and violent Christianization (e.g., the Massacre of Verden in Northern Germany, the Spanish March, Northern Italy).
 - Holy Roman Emperor Otto I’s victory against the (then pagan) Hungarians in 955CE is attributed to rain. Further eastward expansions of Germany after 955 were halted by the Slavic revolt in 983 for almost 200 years. Crusade against the Wends in Northeastern Germany, the Baltic people and Finland lead to forced conversions.
 - Conversion to either the Eastern or Western Church carries a substantial random component—e.g., Bulgarian Zar Boris I choose the Western Church, but defeated by Byzantium, he was forced to choose Eastern Orthodoxy.

This highlights the random, idiosyncratic component in the spread of Christianity. With the exception of Christianization within the Roman Empire, the Western Church almost exclusively established its administration once a Christian secular power took control over a new territory or secular rulers turned to Christianity. Yet, military expansions of Christian rulers were most often driven by strategic considerations—e.g., the Carolingian Empire expanded to create buffer zones. This implies a top-down Christianization which

most often was accomplished by force. The timing of Christianization in a given area therefore seems to be primarily determined by geographic proximity to already Christianized areas and not by the Church strategically prioritizing certain areas—e.g., the relatively late (and forceful) Christianization of the Baltics is likely attributable to their geographic distance from Rome rather than to a strong antipathy towards the Church. Thus, the stochastic component in war-outcomes, together with controls for variables which the Church may have favored in its expansions (such as population density in the year 500CE) mitigate endogeneity concerns.¹⁰

iii. Disentangling the effects of the Churches' MFP vs. those of other Church, Roman or European factors

Church exposure is robustly associated with kinship intensity and human psychology. Though our analysis is unable to fully disentangle the effect of the Churches' MFP from other correlated factors related to the Church, our analysis contains several features that suggest that the Churches' MFP was a decisive element.

- 1) *Controls for contemporary religious adherence and religiousness* (Sections S4, S5, S7, and S8), *the presence of monasteries, universities and bishoprics density* before the year 1500 CE (Section S5). This mitigates the possibility that religious practices *per se* or technological, cultural or religious innovations propagated by monasteries and universities bias our estimates.
- 2) *Use of pre-1500CE Church exposure*. The regional analysis in Section S5 exploits medieval variation in Church exposure in regions of Europe, as well as variation in kinship intensity in regions of Spain, Italy, and France. While these three countries exhibit variation in Church exposure before the 15th century (due to Muslim, Lombard, and Carolingian conquests), all regions within these countries were subsequently firmly in the Catholic Church's sphere. Nonetheless, regions with less pre-1500 Church exposure exhibit higher 20th century cousin marriage rates. This suggests that if some other Church-related factor drives the results, it would have had to co-occur around the timing of the strongest enforcement and largest extent of the MFP, that is, before 1500 CE.
- 3) *Comparison of the Eastern and the Western Churches' MFP* (Section S4). Both Churches are rooted in the same scriptures. Yet, the extent and enforcement of the MFP was stronger in the Western Church. Consistent with our hypothesis, we document that Western Church exposure is more predictive of psychology. A potential confound is Ottoman rule that began in the 14th century in most of the realm of the Eastern Church. However, Schulz (29) demonstrates that institutional differences between areas of the Western vs the Eastern Church had already emerged before.
- 4) *Examination of the variation in secular enforcement within the realm of the Western Church*. In the regional analysis (Section S5), we show that residing in areas that belonged to the Carolingian Empire—a stalwart in the implementation and enforcement of the Church's MFP—is associated with lower kinship intensity and greater WEIRD psychology today, even when controlling for country fixed effects.
- 5) Controls for *historical political entities* like the Carolingian Empire, integration into the Roman Empire (as proxied by the density of Roman roads), socialism, and fixed effects of contemporary countries that often reflect a joint cultural history (Section S5). This mitigates concerns that institutional factors that spread alongside Christianity, such as those related to the Roman Empire, might bias our estimates.
- 6) *Analysis of non-MFP sub-samples* in both the cross-country analysis (Section S4) and in the children-of-immigrants analysis (Section S7). These regressions, which exclude all European countries and their settler colonies, allow us to check whether the relationship between kinship intensity and psychology holds independently of the European experience. The results of the children-of-immigrants analysis demonstrates that this is the case. The coefficients are sizable and mostly significant even in this smaller sample. The evidence is weaker for the cross-country analysis, yet the expected associations are still present.
- 7) *Mediation analysis* (Section S9). The children-of-immigrants mediation analysis suggests that the relation between Church exposure and psychological outcomes is almost entirely mediated by kinship intensity. Mediation analyses at the country and European regional level are likewise consistent with our theory, though the estimates are noisier.

¹⁰ Additional evidence against the notion that pre-existing factors fostered Christianization and thus bias our estimates comes from Schulz (29). Exploiting a panel dataset, he shows in a diff-in-diff analysis that Church exposure is predictive of city-level inclusive institutions. This association cannot be explained by time-invariant factors like preexisting cultural, geographic, or genetic differences.

iv. Discussion of Alternative Hypotheses

Here we highlight three specific alternative hypotheses for explaining the observed psychological variation. First, one might hypothesize that we are capturing the long-term influence of Roman state institutions (unrelated to the Church), and our kinship and Church measures are merely proxying for this. Our analyses address this in four ways: (A) the Roman Empire continued to be intertwined with the Eastern Church for nearly a millennium after the Western Roman Empire dissolved. If we were detecting the role of Roman institutions (say, political institutions), we would see the largest effects for the Eastern Church in our cross-country analyses. Instead, these effects are weak compared to the Western Church—a fact consistent with the Eastern Church’s weaker Marriage and Family program; (B) our analysis within Europe controls for the presence of Roman roads and prosperity in 500 CE, which aims to capture the on-the-ground impact of the Roman state; (C) in the analysis of second-generation immigrants, both of our measures of kinship intensity remain robust predictors of our four psychological outcomes when we exclude all countries with a long history under the Catholic Church and populations with significant European descent (Tables 5 and S7.1). This shows the impact of differences in kinship intensity that don’t trace to the Church, Rome or even Europe; and (D) while our analyses of Italy strongly support our causal model and historical narrative, they can’t be explained by the role of Roman institutions because all of Italy was in the Roman Republic and later under the Roman Empire for over half a millennium. Taken together, our data do not support the view that Roman state institutions, unrelated to the Church, can account for our findings.

Another hypothesis suggests that the medieval Church and kinship intensity are now associated with greater wealth and material security, and that experiencing greater wealth and material security causes the observed psychological shifts (45, 46). Our analyses address this in four ways. First, in our cross-national analyses, three of our measures use only elites or well-off individuals from different countries. Our UN parking ticket measure compares diplomatic delegations, our nepotism measure comes exclusively from corporate executives at the World Economic Forum and our particularism percentages come from corporate managers from around the world. Yet, despite their shared material security, we still find strong relationships using both our kinship intensity and Church duration measures (Table 2 and Section S4.1). Second, in our analyses among European regions and with second-generation immigrants, our predicted relationships are robust to controlling for individual-level measures of income, employment and educational attainment (Tables S5.1 and S7.1). Third, in our second-generation immigrant analyses, we compare only people whose parents came from the same country (but different ethnic groups) who are currently living in the same country and then control for differences in both individual income and the historical prosperity of people’s ancestral ethnicities (Table S7.2). Thus, our results hold even when we keep constant the national wealth of both the originating and current countries of second-generation immigrants as well as people’s individual income and the prosperity of their ancestral ethnicities. Further, the results of our mediation analyses of second-generation immigrants hold even when controlling for income along with our usual battery of controls (Table S9.1). Finally, our analysis of impersonal trust in Italy using three different outcomes is robust to controlling for individual-level measures of educational attainment, wealth and income (Table S6.1). Overall, our analyses provide no hint that our findings could arise from a linkage between the Church and wealth or material security.

Our third alternative suggests that the Church may have actually operated on our psychological outcomes via its encouragement of literacy and schooling, as has been suggested for Protestantism (47). Mitigating this concern, our analyses of the variation among European regions, Italian provinces and second-generation immigrants are all robust to controlling for the educational attainment of individuals. However, one might argue that this influence actually comes from an enduring and pervasive emphasis on education that can’t be captured by measures of individual schooling. To deal with this in our European analysis, we controlled for the presence of medieval universities and five different monastic orders, who may have been involved in schooling (48). Our results hold (Table S5.1). Furthermore, the second-generation immigrant analysis is robust to a non-MFP sample (Table S7.1).

S4. Cross-country analyses

Section S4.1 displays the cross-country associations between the indicators of kinship intensity, medieval Church exposure and each psychological outcome. Regression analyses are reported for outcome variables with a sample size of $N \geq 40$. All outcome variables are detailed in Section S11. Section S4.2 reports on a Principal Component Analysis of the psychological outcomes. Section S4.3 investigates the association between Church exposure and kinship intensity.

S4.1. Kinship intensity, medieval Church exposure and psychology

Regression specification and covariates

We control for a host of covariates. Here, we explain why these are relevant control variables; Section S11 provides detailed descriptions of these variables. Our four *geographic baseline* control variables capture bio-geographic conditions and are included in most specifications:

Ruggedness (Nunn and Puga (61)) and *mean distance to waterways* (Gallup, Sachs and Mellinger (62)). Both variables capture remoteness or market integration which may simultaneously affect distrust towards outsiders and the likelihood to find an unrelated marriage partner (see Henrich et al. (63–65) on market integration and distrust).

Caloric suitability of land for agriculture (Galor and Özak (66)). Controlling for caloric suitability addresses the concern that agriculture may jointly impact psychology and kinship systems. Yet, to defend property, agriculture may have fostered intensive kinship systems, creating a correlation between kinship systems and agriculture (controlling for caloric suitability thus reduces the precision of our estimates).

Absolute latitude captures climatic conditions, and to some degree agricultural conditions as well as the presence of parasites. E.g., Fincher et al. (67) have brought forward the hypothesis that parasite stress, which tends to be higher in tropical climates, leads to tight kin-networks and in-group bias to protect group members from infection (52, 56, 57).

In addition to these geographic baseline controls, we estimated specifications with additional control variables.

Parasite stress (Fincher et al. (56)) could lead to in-group bias. However, this indicator might be endogenous—societies with low kinship intensity might be better equipped to initiate large-scale cooperative projects to reduce parasite stress (45, 68). As such, parasite stress might therefore be a ‘bad control’ that biases the estimates (69).

Percentage tropical climate (Nunn and Puga (61)) is an additional measure for geographic conditions affecting agricultural practices as well as parasite stress.

Irrigation potential (Bentzen et al. (70)). A long-standing hypothesis suggests that irrigation impacts institutions and psychology (55, 70–72). Buggle (55) and Talhelm et al. (51) have shown that irrigation is associated with collectivism and holistic thinking (in case of rice agriculture), respectively. One channel for this association may be kin-networks, as investment in irrigation may lead to increased kinship intensity.

Caloric suitability for oats and *caloric suitability for rye* (Galor and Özak (66)). Researchers have pointed out the importance of a medieval agricultural revolution in Europe (31, 48, 73). Mitterauer (31) describes oats and rye cultivation as a central factor for this agricultural revolution. Controlling for their caloric suitability mitigates the possibility that these agricultural innovations bias the estimates.

Ancestor-adjusted years since the Neolithic Transformation (Putterman (74)). The timing of the Neolithic Transformation can be seen as a proxy for early bio-geographic conditions, since regions with conditions conducive for agriculture witnessed an earlier onset of the Neolithic Transformation (75). An earlier onset also implies that individuals were exposed to newly emerging social structure for a longer period.

Ancestor adjusted genetic heterogeneity (Ashraf and Galor (76)). Galor and coauthors have emphasized the role of genetic heterogeneity for economic prosperity (76), autocracy (77), civil conflict (78), and cultural fragmentation (79).

Continent fixed effects. Given that the MFP originated in Europe (and the Australian and American continents are largely inhabited by people of European descent) there is not much within-continent variation at the cross-country analyses. We therefore expect continent fixed effects to decrease the coefficients for Church exposure.

Fractions of adherents to Catholicism, Protestantism, Orthodox Christianity, other Christian denominations, Islam, Hinduism and Buddhism (Barro and McCleary (80)). These controls aim to disentangle the effect of the MFP from other religion-related factors. While the fraction of Christians is highly correlated with medieval Church exposure, there is independent variation: people in WEIRD countries are increasingly non-religious. In addition, Catholic missionary work after 1500 put less emphasis on the prohibition of consanguineous marriages, both through exemptions for the newly-Christianized and a less stringent enforcement of the kin-marriage ban. Protestant missions usually did not ban cousin

marriages (although, both Churches forbid polygamous marriages). Still, due to the high correlations between the fraction of Christians and medieval Church exposure, we expect the coefficients to be estimated with less precision.

Religiousness (based on the WVS). This variable might itself be endogenous to intensive kinship systems and hence a ‘bad control’ (69). Once kin-networks dissolve, people become more individualistic, and nation states with welfare systems form, religion might lose its importance (81, 82).

In Columns 11 and 12 of the tables in this section, we excluded all countries where the inhabitants’ ancestors experienced more than 120 years on average (i.e., 4 generations of 30 years) of either the Eastern or Western Churches’ MFP. This amounts to excluding all European countries, Australia, New Zealand, South Africa, and most of the Americas (with the exception of Guatemala, Jamaica, Trinidad, and Tobago, Peru, and Haiti) or roughly countries where approximately more than 10% of the population has European ancestry. Even though this decreases the sample size considerably (often times to $N \leq 40$), this tells us whether the associations with the KII and cousin marriage hold independently of the European experience. Evidence that this relationship holds independently of the European experience strengthens the argument that it is kinship intensity and not some other omitted European- or Church-related variable that explains the variation in the dependent variables.

To deal with concern about both spatial correlation and shared culture-historical phylogenies, we also report our analyses with Conley standard errors (83) (Table S4.6). We compute Conley standard errors both using aerial distance and genetic distance between the countries’ populations. The latter accounts for population movements after the year 1500, which led to large geographic distances between some culturally and genetically related individuals (e.g., due to migration of Europeans to the Americas).

In the main regression specifications, we do not control for gross domestic product (GDP) per capita or other contemporary factors. Our main approach to address possible estimation bias due to contemporary factors is to use pre-industrial explanatory measures, like the KII and Church exposure. The within-country (Sections S5 and S6) and second-generation immigrants analyses (Section S7), which control for individual income as well as country and region fixed effects, are further evidence that material prosperity is unlikely to explain the cross-country findings. Moreover, several dependent variables capture the behavior of elites (e.g., nepotism of managers, or parking violations of diplomats). Yet, for completeness, in Table S4.7 below, we control for GDP per capita, even though this is clearly a ‘bad control’ (69), as GDP is most likely affected by kinship intensity.

Analysis

Here, we first report on the analysis of the Individualistic-Impersonal Psychology Scale (*i*) and then on each psychological dependent variable structured along the three psychological packages: (*ii*) individualism & independence, (*iii*) conformity & obedience, (*iv*) impersonal prosociality, which contains (*iv.a*) impartiality and (*iv.b*) impersonal cooperation & trust. Section S11 provides detailed definitions and references for all variables.

i. Individualistic-Impersonal Psychology Scale

We begin with our analysis of the Individualistic-Impersonal Psychology Scale, which aggregates all 17 of our cross-country outcomes (with reverse scaling when necessary so the predicted direction is always positive; see Section S11 for details), and which we constructed for expositional purposes in Figure 2 of the main text. Table S4.1 reports the regression of the Scale on medieval Church exposure, the KII and log percent cousin marriage. The results are consistent with our theory: a longer exposure to the medieval Western Church is highly significantly positively associated with higher scores on the Individualistic-Impersonal Psychology Scale; by contrast, the relation between the Eastern Church and the Scale is not robust to the inclusion of the covariates. The association between the KII and the Individualistic-Impersonal Psychology Scale is likewise significant in all specifications. This is also the case in the non-MFP sub-sample, that is, when we exclude Europe and all its former settler colonies. This is evidence that the relation between KII and psychology does not hinge on the European experience but holds more generally. Similarly, log percent cousin marriage is negatively related to the Individualistic-Impersonal Psychology Scale. In some specifications the coefficients are not significantly different from zero, which may reflect the lower sample size compared to the regressions with the KII as the explanatory variable.

	Individualistic-Impersonal Psychology Scale									Non-MFP sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
W. Church exposure (in 100 yrs.)	0.18*** (0.01)	0.13*** (0.02)	0.11*** (0.02)	0.11*** (0.01)	0.12*** (0.02)	0.13*** (0.02)	0.11*** (0.02)	0.10*** (0.02)	0.10*** (0.03)		
E. Church exposure (in 100 yrs.)	0.07* (0.03)	-0.00 (0.04)	-0.02 (0.04)	-0.01 (0.04)	-0.00 (0.04)	0.01 (0.04)	-0.03 (0.07)	-0.03 (0.04)	-0.05 (0.05)		
<i>N</i>	147	147	147	147	147	147	147	91	147		
<i>R</i> ²	0.506	0.570	0.591	0.614	0.575	0.576	0.675	0.691	0.584		
KII	-0.34*** (0.05)	-0.21*** (0.05)	-0.17*** (0.05)	-0.14** (0.05)	-0.20*** (0.05)	-0.28*** (0.06)	-0.14* (0.07)	-0.23*** (0.06)	-0.18** (0.06)	-0.15* (0.06)	-0.10 (0.06)
<i>N</i>	151	151	151	151	151	151	151	95	151	88	88
<i>R</i> ²	0.252	0.448	0.470	0.502	0.469	0.475	0.615	0.608	0.484	0.056	0.112
Log % cousin m.	-0.26*** (0.03)	-0.15*** (0.04)	-0.14** (0.05)	-0.09 (0.06)	-0.16*** (0.04)	-0.16** (0.06)	0.09 (0.06)	-0.13* (0.05)	-0.12* (0.06)	-0.10 (0.07)	-0.01 (0.06)
<i>N</i>	69	69	69	69	69	69	69	55	69	34	34
<i>R</i> ²	0.456	0.625	0.631	0.674	0.636	0.629	0.780	0.687	0.645	0.050	0.440
Baseline geo. controls	-	yes	yes	yes	yes	yes	yes	yes	yes	-	yes
Parasite stress & tropical area	-	-	yes	-	-	-	-	-	-	-	-
Irrigation	-	-	-	yes	-	-	-	-	-	-	-
Oats suit. & Rye suit.	-	-	-	-	yes	-	-	-	-	-	-
Neolithic. transf. & genetic heterogen.	-	-	-	-	-	yes	-	-	-	-	-
Major religions	-	-	-	-	-	-	yes	-	-	-	-
Religiousness	-	-	-	-	-	-	-	yes	-	-	-
Continent FE	-	-	-	-	-	-	-	-	yes	-	-

Table S4.1: Country-level regressions of the Individualistic-Impersonal Psychology Scale on Western and Eastern Church exposure, the KII, and log percent cousin marriage. Regressions in Column 2 to 9, and 11 contain the geographic baseline (ruggedness, mean distance to waterways, caloric suitability, absolute latitude). Column 3 controls for parasite stress and tropical area; Column 4 for irrigation potential; Column 5 for caloric suitability for rain-fed oats and rye; Column 6 for ancestor adjusted timing of the Neolithic Transformation and ancestor adjusted genetic heterogeneity; Column 7 for the fractions of people adhering to major religions (Catholic, Protestant, Orthodox, other Christian, Muslim, Hindu, Buddhist); Column 8 for religiousness; and Column 9 for continent fixed effects. Columns 10-11 report on the sub-sample that only contains countries where ancestors on average experienced no more than 120 years of Church exposure. Robust standard errors (in parentheses), the number of observations (*N*), and *R*² for each regression are reported. * $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

ii. Individualism & independence

Figure S4.1 illustrates the relationships between Church exposure and kinship intensity with individualism, creativity, embeddedness, and analytical thinking. Following a referee's recommendation, we pre-registered and added our analysis of embeddedness to an earlier version of the manuscript (our pre-specified analysis plan is available at <https://osf.io/efms7/>).

Table S4.2 reports the regression analysis for individualism, creativity and embeddedness. Consistent with the hypothesis that the Western Church's MFP had stronger effects than the Eastern Church's MFP, the regression results reveal robust reduced-form associations of Western Church exposure with individualism, creativity and embeddedness. Similar associations for Eastern Church exposure are not found. Furthermore, the results imply that a one-standard-deviation increase in the KII decreases individualism by 0.36 standard deviations, while doubling the rate of cousin marriages decreases it by 0.21 ($\approx -0.31 \cdot \ln(2)$) standard deviations. Similar effects sizes are found for creativity, and even larger ones are found for embeddedness. In the case of embeddedness, the relation also holds in the non-MFP sub-sample. The associations are generally robust to the inclusion of covariates. Controlling for irrigation potential reduces the significance levels for individualism and creativity, but here too the coefficients have the hypothesized signs. For embeddedness and many other cross-country variables (see below) the association is robust to the inclusion of irrigation potential. Most importantly, the European regional analysis (Section S5) is robust to the inclusion of irrigation potential and the second-generation analysis (Section S7) is robust to the inclusion of actual ancestral irrigation practices (Table S7.2).

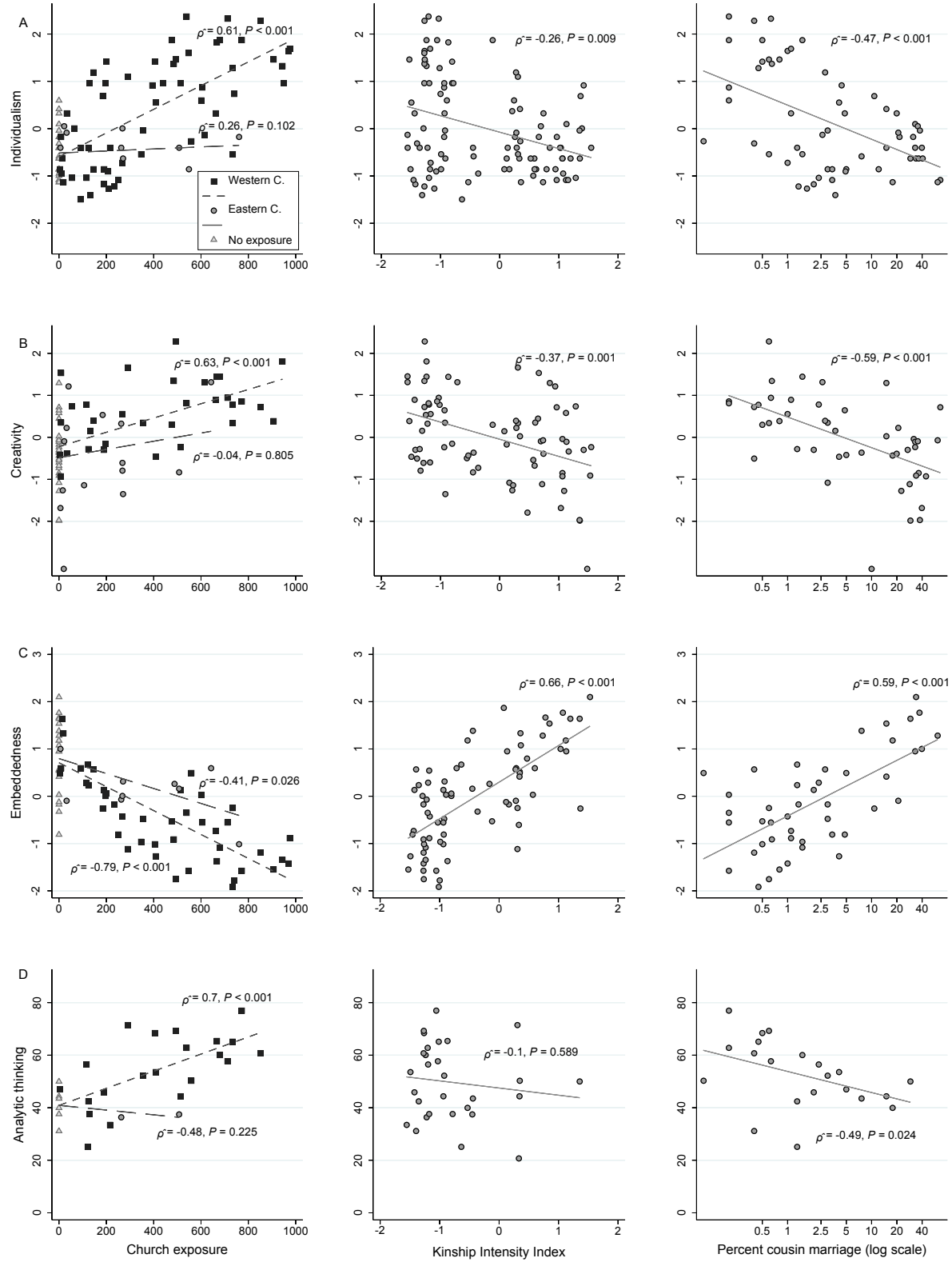


Figure S4.1: Individualism (Panel A), creativity (Panel B), embeddedness (Panel C) and analytic thinking (Panel D) in relation to Church exposure (first column), the Kinship Intensity Index (second column), and percent cousin marriages (third column). Linear best-fit lines are displayed; in the first column, countries primarily exposed to the Western Church are identified with a black dot (short-dashed best-fit lines), and countries primarily exposed to the Eastern Church are identified by a grey diamond (long-dashed best-fit lines). Triangles denote no Church exposure. Reported are Spearman's ρ and associated significance levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Non-MFP sample	
										(10)	(11)
<i>Panel 1: Individualism (std)</i>											
W. Church exp. (in 100 yrs.)	0.24*** (0.02)	0.14*** (0.03)	0.14*** (0.03)	0.14*** (0.04)	0.14*** (0.03)	0.15*** (0.03)	0.19*** (0.04)	0.16*** (0.03)	0.17*** (0.04)		
E. Church exp. (in 100 yrs.)	0.05 (0.03)	-0.08 (0.06)	-0.09 (0.06)	-0.08 (0.06)	-0.07 (0.06)	-0.07 (0.06)	-0.02 (0.07)	-0.04 (0.06)	-0.02 (0.07)		
<i>N</i>	92	92	92	92	92	92	92	75	92		
<i>R</i> ²	0.505	0.668	0.674	0.669	0.672	0.697	0.770	0.686	0.727		
KII	-0.36*** (0.09)	-0.15* (0.07)	-0.16* (0.08)	-0.12 (0.10)	-0.14+ (0.07)	-0.34** (0.10)	-0.24* (0.11)	-0.22* (0.10)	-0.26* (0.10)	0.05 (0.10)	0.10 (0.10)
<i>N</i>	93	93	93	93	93	93	93	76	93	42	42
<i>R</i> ²	0.127	0.543	0.561	0.548	0.558	0.602	0.681	0.563	0.638	0.006	0.274
Log % cousin m.	-0.31*** (0.06)	-0.14+ (0.07)	-0.14 (0.09)	-0.13 (0.12)	-0.14+ (0.08)	-0.20 (0.12)	0.01 (0.13)	-0.17+ (0.10)	-0.19+ (0.09)	-0.01 (0.07)	0.03 (0.07)
<i>N</i>	57	57	57	57	57	57	57	50	57	24	24
<i>R</i> ²	0.274	0.612	0.625	0.613	0.614	0.646	0.740	0.607	0.693	0.000	0.344
<i>Panel 2: Creativity (std)</i>											
W. Church exp. (in 100 yrs.)	0.19*** (0.03)	0.21*** (0.04)	0.23*** (0.05)	0.16*** (0.04)	0.19*** (0.03)	0.21*** (0.04)	0.13** (0.04)	0.22*** (0.05)	0.12+ (0.07)		
E. Church exp. (in 100 yrs.)	0.05 (0.11)	0.07 (0.12)	0.11 (0.13)	0.04 (0.12)	0.11 (0.08)	0.10 (0.12)	0.20 (0.25)	0.07 (0.12)	-0.06 (0.14)		
<i>N</i>	68	68	68	68	68	68	68	68	68		
<i>R</i> ²	0.279	0.341	0.410	0.503	0.499	0.430	0.574	0.342	0.411		
KII	-0.39** (0.12)	-0.37** (0.13)	-0.33* (0.15)	-0.10 (0.14)	-0.28* (0.12)	-0.48** (0.16)	-0.30* (0.14)	-0.31* (0.15)	-0.15 (0.17)	-0.24 (0.18)	0.18 (0.19)
<i>N</i>	71	71	71	71	71	71	71	71	71	36	36
<i>R</i> ²	0.151	0.165	0.186	0.345	0.348	0.272	0.529	0.175	0.337	0.037	0.422
Log % cousin m.	-0.32*** (0.07)	-0.23* (0.08)	-0.19* (0.09)	-0.03 (0.12)	-0.18+ (0.09)	-0.14 (0.10)	0.32 (0.22)	-0.22* (0.11)	-0.05 (0.14)	-0.09 (0.14)	0.22 (0.13)
<i>N</i>	44	44	44	44	44	44	44	44	44	24	24
<i>R</i> ²	0.300	0.363	0.465	0.527	0.494	0.410	0.617	0.363	0.454	0.011	0.638
<i>Panel 3: Embeddedness (std)</i>											
W. Church exp. (in 100 yrs.)	-0.25*** (0.03)	-0.18*** (0.03)	-0.15*** (0.03)	-0.17*** (0.03)	-0.17*** (0.03)	-0.18*** (0.03)	-0.13*** (0.03)	-0.14*** (0.03)	-0.13** (0.04)		
E. Church exp. (in 100 yrs.)	-0.14* (0.05)	-0.04 (0.07)	-0.01 (0.08)	-0.04 (0.07)	-0.04 (0.07)	-0.07 (0.07)	-0.16 (0.15)	-0.04 (0.07)	0.00 (0.08)		
<i>N</i>	68	68	68	68	68	68	68	60	68		
<i>R</i> ²	0.590	0.659	0.691	0.714	0.681	0.721	0.777	0.731	0.713		
KII	0.80*** (0.09)	0.61*** (0.08)	0.58*** (0.09)	0.57*** (0.09)	0.59*** (0.08)	0.63*** (0.11)	0.51*** (0.10)	0.50*** (0.07)	0.57*** (0.12)	0.53*** (0.14)	0.54*** (0.09)
<i>N</i>	71	71	71	71	71	71	71	63	71	24	24
<i>R</i> ²	0.493	0.707	0.716	0.713	0.721	0.708	0.795	0.755	0.729	0.394	0.898
Log % cousin m.	0.39*** (0.08)	0.19* (0.08)	0.10 (0.10)	0.09 (0.09)	0.18* (0.08)	0.09 (0.11)	-0.23+ (0.13)	0.09 (0.08)	-0.04 (0.10)	0.32* (0.14)	0.27+ (0.12)
<i>N</i>	44	44	44	44	44	44	44	40	44	15	15
<i>R</i> ²	0.429	0.599	0.641	0.658	0.679	0.647	0.803	0.723	0.722	0.279	0.860
Baseline geo. cont.	-	yes	yes	yes	yes	yes	yes	yes	yes	-	yes
Parasite stress & tropical area	-	-	yes	-	-	-	-	-	-	-	-
Irrigation	-	-	-	yes	-	-	-	-	-	-	-
Oats & Rye suit.	-	-	-	-	yes	-	-	-	-	-	-
Neolithic. transf. & genetic heterogen.	-	-	-	-	-	yes	-	-	-	-	-
Major religions	-	-	-	-	-	-	yes	-	-	-	-
Religiousness	-	-	-	-	-	-	-	yes	-	-	-
Continent FE	-	-	-	-	-	-	-	-	yes	-	-

Table S4.2: Country-level regression of individualism (Panel 1), creativity (Panel 2) and embeddedness (Panel 3) on Western and Eastern Church exposure, the KII, and log percent cousin marriage. Each column contains 6 regressions, each with a different explanatory and dependent variable. Regressions in Column 2-9, and 11 control for the geographic baseline (ruggedness, distance to waterways, caloric suitability, absolute latitude); Column 3 for parasite stress and tropical area; Column 4 for irrigation potential; Column 5 for caloric suitability for oats and rye; Column 6 for ancestor adjusted timing of the Neolithic Transformation and ancestor adjusted genetic heterogeneity; Column 7 for the fractions of people adhering to major religions (Catholic, Protestant, Orthodox, other Christian, Muslim, Hindu, Buddhist); Column 8 for religiousness; and Column 9 for continent fixed effects. Columns 10-11 report on the sub-sample of countries where ancestors on average experienced less than 120 years of Church exposure. Robust standard errors (in parentheses), the number of observations (*N*), and *R*² for each regression are reported. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

iii. Conformity & obedience

Figures S4.2A and S4.2B illustrates the relationships between Church exposure, the measures of kinship intensity, and the measures of the conformity & obedience package. Table S4.3 reports the regression results for obedience, tradition, and proper behavior. A one standard deviation increase in the KII is associated with a ~7-percentage point increase in obedience and a 0.21 SD increase in tradition, while doubling cousin marriage increases obedience by about 3 ($\approx 4.05 \cdot \ln(2)$) percentage points and tradition by 0.19 ($\approx 0.28 \cdot \ln(2)$) SD. Except when controlling for religiousness or adherence to major religions, all coefficients have the expected sign. Given the association between religious adherence and medieval Church exposure, this is not surprising. The subsequent individual-level analyses (Section S5, S7, S8) will demonstrate that these relationships are unlikely to be driven by contemporary religious adherence. Interestingly, the estimates are larger in magnitude and tend to hold in the non-European ancestry subsample. This is evidence for the importance of kinship intensity independent of the European experience. In contrast to our predictions, there is no significant relationship between kinship intensity and proper behavior.

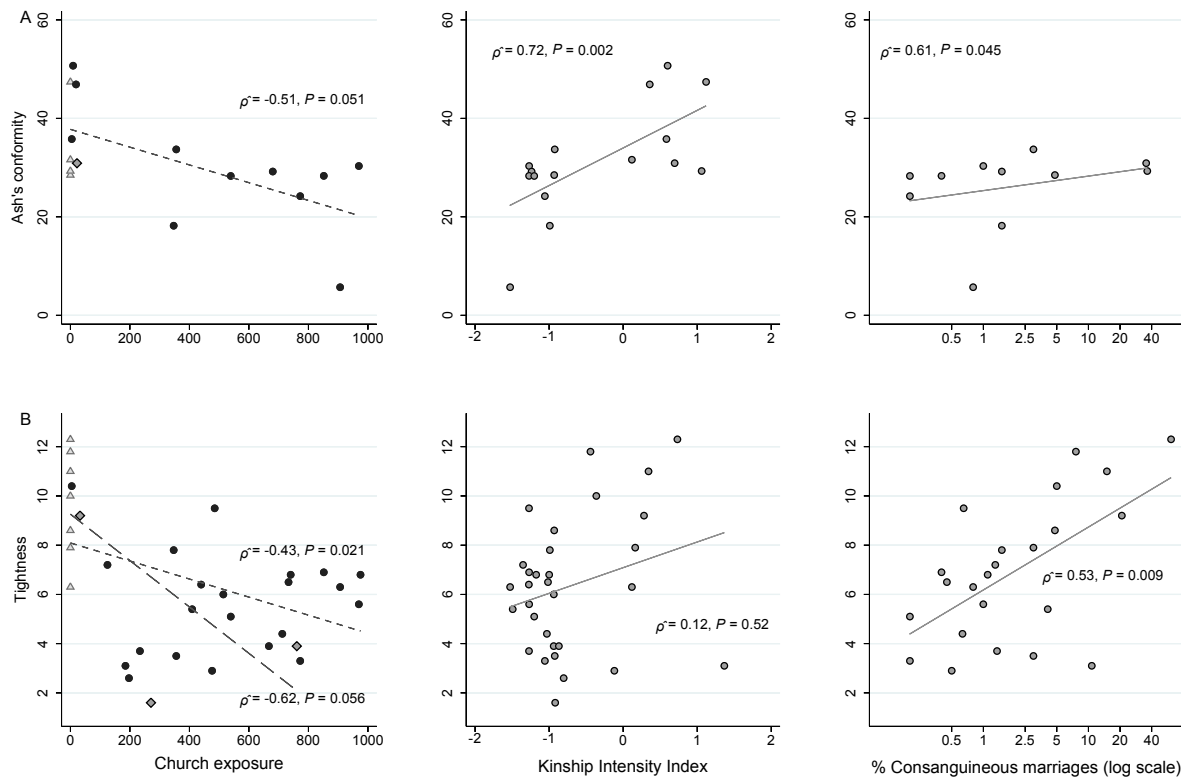


Figure S4.2A: Ash's conformity (Panel A) and Tightness (Panel B) in relation to Church exposure (first column), the Kinship Intensity Index (second column), and percent cousin marriages (third column). Linear best-fit lines are displayed; in the first column, countries primarily exposed to the Western Church are identified with a black dot (short-dashed best-fit lines), and countries primarily exposed to the Eastern Church are identified by a grey diamond (long-dashed best-fit lines). Triangles denote no Church exposure. Reported are Spearman's ρ and associated significance levels.

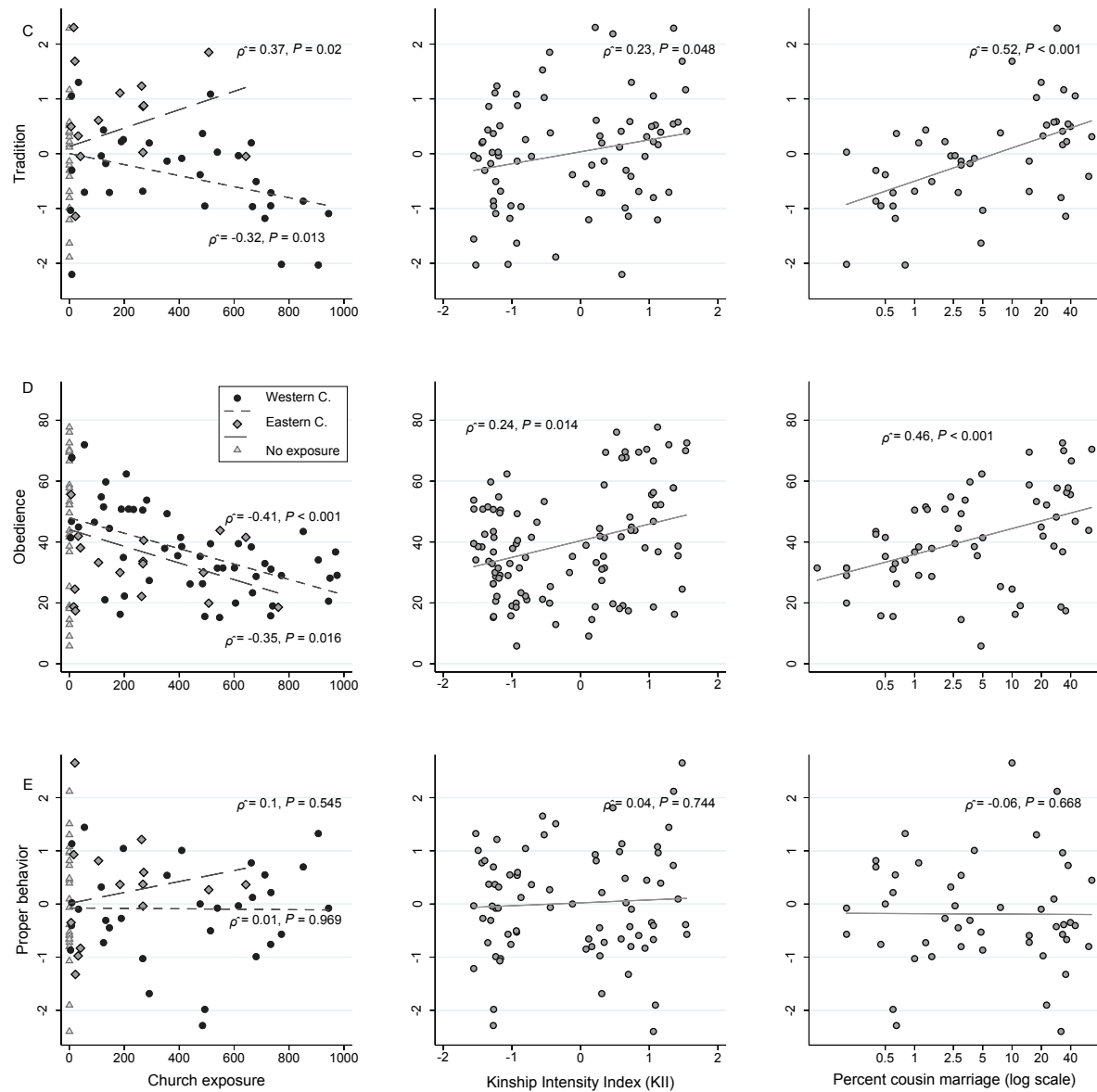


Figure S4.2B: Tradition (Panel C), obedience (Panel D) and proper behavior (Panel E) in relation to Church exposure (first column), the Kinship Intensity Index (second column), and percent cousin marriages (third column). Linear best-fit lines are displayed; in the first column, countries primarily exposed to the Western Church are identified with a black dot (short-dashed best-fit lines), and countries primarily exposed to the Eastern Church are identified by a grey diamond (long-dashed best-fit lines). Triangles denote no Church exposure. Reported are Spearman's ρ and associated significance levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Non-MFP sample	
										(10)	(11)
<i>Panel 1: Obedience (percentage)</i>											
W. Church exposure (in 100 yrs.)	-2.48*** (0.47)	0.11 (0.55)	0.65 (0.57)	0.23 (0.58)	0.04 (0.57)	0.21 (0.51)	-0.68 (0.61)	0.77 (0.48)	-0.52 (0.70)		
E. Church exposure (in 100 yrs.)	-3.67*** (0.94)	0.56 (1.14)	1.23 (1.22)	0.57 (1.17)	0.73 (1.16)	0.38 (1.09)	2.43 (1.66)	0.44 (1.06)	-0.71 (1.27)		
<i>N</i>	92	92	92	92	92	92	92	91	92		
<i>R</i> ²	0.223	0.545	0.586	0.550	0.558	0.620	0.653	0.627	0.635		
KII	6.76*** (1.71)	2.90* (1.44)	2.82+ (1.69)	2.85+ (1.69)	3.51* (1.62)	1.08 (1.92)	5.74** (1.99)	1.90 (1.40)	5.70** (1.72)	8.82* (3.68)	10.81*** (2.97)
<i>N</i>	96	96	96	96	96	96	96	95	96	41	41
<i>R</i> ²	0.152	0.554	0.571	0.554	0.574	0.587	0.670	0.607	0.657	0.127	0.626
Log % cousin m.	4.05*** (0.90)	1.63 (1.16)	0.34 (1.43)	0.74 (1.58)	1.57 (1.27)	0.79 (1.83)	5.10* (2.13)	-0.02 (1.20)	4.63** (1.66)	6.57+ (3.64)	6.06* (2.88)
<i>N</i>	56	56	56	56	56	56	56	55	56	26	26
<i>R</i> ²	0.213	0.442	0.534	0.458	0.444	0.461	0.680	0.548	0.574	0.162	0.504
<i>Panel 2: Tradition (z-scores)</i>											
W. Church exposure (in 100 yrs.)	-0.13*** (0.03)	-0.16** (0.05)	-0.17** (0.06)	-0.13** (0.05)	-0.13** (0.05)	-0.15** (0.05)	-0.09 (0.06)	-0.12* (0.05)	-0.16* (0.07)		
E. Church exposure (in 100 yrs.)	0.16 (0.11)	0.15 (0.14)	0.13 (0.15)	0.17 (0.14)	0.17 (0.11)	0.13 (0.14)	-0.25 (0.20)	0.16 (0.15)	0.16 (0.14)		
<i>N</i>	68	68	68	68	68	68	68	68	68		
<i>R</i> ²	0.221	0.312	0.324	0.378	0.375	0.352	0.522	0.347	0.333		
KII	0.21* (0.11)	0.23* (0.11)	0.23+ (0.13)	0.04 (0.13)	0.16 (0.11)	0.20 (0.16)	-0.00 (0.17)	0.02 (0.13)	0.21 (0.19)	0.31 (0.19)	-0.10 (0.16)
<i>N</i>	71	71	71	71	71	71	71	71	71	36	36
<i>R</i> ²	0.047	0.065	0.068	0.163	0.179	0.119	0.487	0.203	0.133	0.062	0.340
Log % cousin m.	0.28*** (0.07)	0.18* (0.07)	0.17+ (0.09)	0.10 (0.09)	0.21** (0.07)	0.16 (0.12)	-0.13 (0.17)	0.08 (0.07)	0.16 (0.12)	0.21+ (0.10)	0.03 (0.09)
<i>N</i>	44	44	44	44	44	44	44	44	44	24	24
<i>R</i> ²	0.310	0.420	0.423	0.455	0.461	0.422	0.545	0.472	0.463	0.081	0.449
<i>Panel 3: Proper behavior (z-scores)</i>											
W. Church exposure (in 100 yrs.)	-0.02 (0.04)	0.03 (0.04)	0.00 (0.05)	0.06 (0.04)	0.02 (0.05)	0.03 (0.04)	0.10+ (0.06)	0.04 (0.05)	0.05 (0.07)		
E. Church exposure (in 100 yrs.)	0.11+ (0.05)	0.14+ (0.07)	0.10 (0.08)	0.16* (0.07)	0.10 (0.07)	0.13+ (0.07)	-0.20 (0.22)	0.14+ (0.07)	0.17 (0.15)		
<i>N</i>	68	68	68	68	68	68	68	68	68		
<i>R</i> ²	0.025	0.185	0.235	0.259	0.253	0.197	0.325	0.195	0.203		
KII	0.07 (0.12)	0.14 (0.12)	0.16 (0.12)	0.00 (0.13)	0.11 (0.12)	0.11 (0.18)	0.17 (0.19)	0.08 (0.13)	0.21 (0.18)	0.08 (0.21)	0.10 (0.22)
<i>N</i>	71	71	71	71	71	71	71	71	71	36	36
<i>R</i> ²	0.006	0.146	0.212	0.199	0.225	0.147	0.294	0.158	0.163	0.004	0.132
Log % cousin m.	0.03 (0.08)	0.01 (0.08)	0.02 (0.08)	-0.12 (0.08)	-0.04 (0.08)	-0.08 (0.09)	-0.33 (0.23)	-0.02 (0.09)	-0.00 (0.16)	-0.13 (0.11)	-0.21 (0.15)
<i>N</i>	44	44	44	44	44	44	44	44	44	24	24
<i>R</i> ²	0.003	0.155	0.239	0.241	0.228	0.171	0.362	0.160	0.190	0.023	0.210
Baseline geo. controls	-	yes	yes	yes	yes	yes	yes	yes	yes	-	yes
Parasite stress & tropical area	-	-	yes	-	-	-	-	-	-	-	-
Irrigation	-	-	-	yes	-	-	-	-	-	-	-
Oats suit. & Rye suit.	-	-	-	-	yes	-	-	-	-	-	-
Neolithic. transf. & genetic heterogen.	-	-	-	-	-	yes	-	-	-	-	-
Major religions	-	-	-	-	-	-	yes	-	-	-	-
Religiousness	-	-	-	-	-	-	-	yes	-	-	-
Continent FE	-	-	-	-	-	-	-	-	yes	-	-

Table S4.3: Country-level regression of obedience (Panel 1), tradition (Panel 2), and proper behavior (Panel 3) on Western and Eastern Church exposure, the KII, and log percent cousin marriage. Each column contains 9 regressions, each with a different explanatory and dependent variable. Regressions in Columns 2-9 and 11 control for the geographic baseline (ruggedness, distance to waterways, caloric suitability, absolute latitude); Column 3 for parasite stress and tropical area; Column 4 for irrigation potential; Column 5 for caloric suitability for oats and rye; Column 6 for ancestor adjusted timing of the Neolithic Transformation and ancestor adjusted genetic heterogeneity; Column 7 for the fractions of people adhering to major religions (Catholic, Protestant, Orthodox, other Christian, Muslim, Hindu, Buddhist); Column 8 for religiousness; and Column 9 for continent fixed effects. Columns 10-11 report on the sub-sample of countries where ancestors on average experienced less than 120 years of Church exposure. Robust standard errors (in parentheses), the number of observations (*N*), and *R*² for each regression are reported. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

iv. Impersonal prosociality

iv.a. Impartiality

Figure S4.3 illustrates the relationships between medieval Church exposure, the measures of kinship intensity, and four country-level measures of impartiality: the dishonesty dice game, nepotism, particularism and log unpaid parking tickets of diplomats (see Section S11 for details on these variables). Table S4.4 reports the results for unpaid parking tickets and nepotism (all $N \geq 40$). Column 1 of Panel 1 suggests that a one-standard-deviation increase in the KII increases the number of unpaid parking tickets by about 82% ($\approx \exp(0.60) - 1$), and a doubling of cousin marriages increases it by about 30%. The KII remains a significant predictor controlling for the covariates (apart from continent fixed effects). The reduced-form association between Western Church exposure and unpaid parking tickets consistently shows a negative sign. However, the coefficients are not always significant. A similar association is found with nepotism (Panel 2). Here, the negative association between Western Church exposure is particularly robust. 100 additional years of exposure to the Church reduces nepotism by 0.18 standard deviations.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Non-MFP sample	
										(10)	(11)
<i>Panel 1: Log unpaid parking tickets</i>											
W. Church exposure (in 100 yrs.)	-0.20*** (0.04)	-0.13* (0.06)	-0.07 (0.06)	-0.10+ (0.06)	-0.14* (0.06)	-0.12* (0.06)	-0.04 (0.06)	-0.07 (0.06)	-0.01 (0.07)		
E. Church exposure (in 100 yrs.)	-0.09 (0.12)	-0.01 (0.14)	0.05 (0.15)	-0.00 (0.14)	-0.02 (0.15)	-0.02 (0.15)	0.25 (0.22)	0.05 (0.17)	0.13 (0.13)		
<i>N</i>	137	137	137	137	137	137	137	87	137	-	-
<i>R</i> ²	0.129	0.152	0.262	0.178	0.152	0.193	0.247	0.177	0.269		
KII	0.60*** (0.11)	0.52*** (0.13)	0.37** (0.13)	0.45** (0.14)	0.52*** (0.14)	0.43** (0.15)	0.45* (0.20)	0.62*** (0.17)	0.21 (0.17)	0.45* (0.21)	0.34* (0.20)
<i>N</i>	141	141	141	141	141	141	141	91	141	82	82
<i>R</i> ²	0.172	0.205	0.289	0.216	0.205	0.211	0.271	0.271	0.265	0.049	0.087
Log % cousin m.	0.30** (0.11)	0.31* (0.15)	0.23 (0.16)	0.17 (0.17)	0.32* (0.16)	0.13 (0.18)	-0.00 (0.25)	0.17 (0.16)	0.08 (0.21)	0.22 (0.23)	0.04 (0.25)
<i>N</i>	64	64	64	64	64	64	64	52	64	31	31
<i>R</i> ²	0.133	0.146	0.200	0.191	0.148	0.193	0.292	0.226	0.238	0.022	0.135
<i>Panel 2: Nepotism</i>											
W. Church exposure (in 100 yrs.)	-0.18*** (0.03)	-0.13** (0.04)	-0.13** (0.04)	-0.11** (0.04)	-0.12** (0.04)	-0.14*** (0.04)	-0.14*** (0.04)	-0.11* (0.04)	-0.14** (0.05)	-	-
E. Church exposure (in 100 yrs.)	0.07 (0.05)	0.09 (0.07)	0.08 (0.07)	0.09 (0.07)	0.09 (0.07)	0.07 (0.07)	0.03 (0.06)	0.09 (0.07)	0.08 (0.09)	-	-
<i>N</i>	104	104	104	104	104	104	104	80	104	-	-
<i>R</i> ²	0.318	0.402	0.404	0.437	0.404	0.450	0.630	0.476	0.441		
KII	0.27** (0.09)	0.15+ (0.09)	0.14 (0.09)	0.05 (0.09)	0.14 (0.09)	0.30** (0.12)	0.17+ (0.10)	0.21+ (0.12)	0.25* (0.12)	0.12 (0.15)	0.04 (0.14)
<i>N</i>	108	108	108	108	108	108	108	84	108	48	48
<i>R</i> ²	0.066	0.286	0.286	0.340	0.298	0.357	0.593	0.399	0.343	0.013	0.161
Log % cousin m.	0.28*** (0.06)	0.23** (0.08)	0.23* (0.09)	0.16 (0.11)	0.23** (0.08)	0.28* (0.13)	-0.00 (0.14)	0.21+ (0.11)	0.30* (0.12)	0.17 (0.10)	0.07 (0.12)
<i>N</i>	55	55	55	55	55	55	55	47	55	21	21
<i>R</i> ²	0.236	0.421	0.423	0.445	0.432	0.443	0.624	0.500	0.461	0.082	0.138
Baseline geo. controls	-	yes	yes	yes	yes	yes	yes	yes	yes	-	yes
Parasite stress & tropical area	-	-	yes	-	-	-	-	-	-	-	-
Irrigation	-	-	-	yes	-	-	-	-	-	-	-
Oats suit. & Rye suit.	-	-	-	-	yes	-	-	-	-	-	-
Neolithic. transf. & genetic heterogen.	-	-	-	-	-	yes	-	-	-	-	-
Major religions	-	-	-	-	-	-	yes	-	-	-	-
Religiousness	-	-	-	-	-	-	-	yes	-	-	-
Continent FE	-	-	-	-	-	-	-	-	yes	-	-

Table S4.4: Country-level regressions of log unpaid parking tickets per diplomat (Panel 1) and nepotism (Panel 2) on Western and Eastern Church exposure, the KII, and log percent cousin marriage. Each column contains 6 regressions, each with a different explanatory and dependent variable. Regressions in Column 2 to 9, and 11 contain the geographic baseline (ruggedness, mean distance to waterways, caloric suitability, absolute latitude). Column 3 controls for parasite stress and tropical area; Column 4 for irrigation potential; Column 5 for caloric suitability for rain-fed oats and rye; Column 6 for ancestor adjusted timing of the Neolithic Transformation and ancestor adjusted genetic heterogeneity; Column 7 for the fractions of people adhering to major religions (Catholic, Protestant, Orthodox, other Christian, Muslim, Hindu, Buddhist); Column 8 for religiousness; and Column 9 for continent fixed effects. Columns 10-11 report on the sub-sample that only contains countries where ancestors on average experienced no more than 120 years of Church exposure. Robust standard errors (in parentheses), the number of observations (*N*), and *R*² for each regression are reported. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

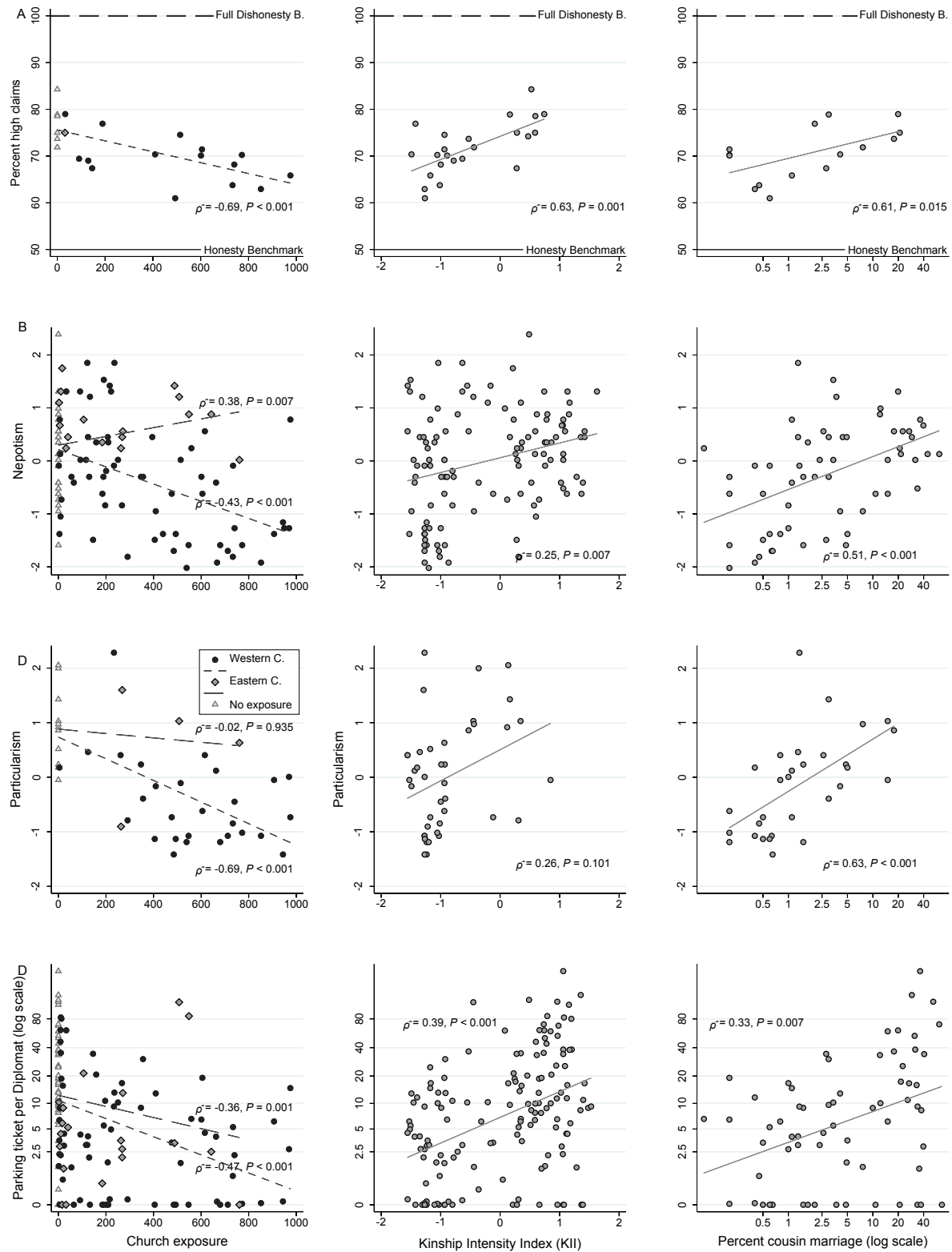


Figure S4.3: Dishonesty dice game (Panel A), nepotism (Panel B), particularism (Panel C) and UN diplomatic parking tickets per diplomat (Panel D) in relation to Church exposure (first column), the Kinship Intensity Index (second column), and percent cousin marriages (third column). Linear best-fit lines are displayed; in the first column, countries primarily exposed to the Western Church are identified with a black dot (short-dashed best-fit lines), and countries primarily exposed to the Eastern Church are identified by a grey diamond (long-dashed best-fit lines). Triangles denote no Church exposure. Reported are Spearman's ρ and associated significance levels.

iv.b. Impersonal cooperation, fairness and trust

Figure S4.4 illustrates the relationships between Church exposure, the measures of kinship intensity and our four country-level measures of impersonal cooperation, fairness and trust: (1) voluntary blood donations per 1000 inhabitants (2) first-period public goods contribution (without punishment), (3) public goods contribution (with punishment), and (4) out-ingroup trust. Table S4.5 reports the regression results for the dependent variables voluntary blood donations and out-ingroup trust (both with sample sizes $N \geq 40$).

Table S4.5 shows that both the KII and log percent cousin marriage are significantly negatively associated with blood donations. A one-standard-deviation increase in the KII decreases donations by 7.5 units (per 1000 inhabitants). Doubling cousin marriages decreases blood donations by about 4 ($\approx 5.70 \cdot \ln(2)$) units. The association is mostly robust to the inclusion of the covariates, though the estimates decrease in magnitude. Given the high correlation between the Church's MFP and the share of major religions, it is hardly surprising that the coefficients are insignificant when major religions are held constant. The same is true for religiousness, which may be an outcome of kinship intensity (as more individualistic people place less weight on religion). Consistent with the hypothesis that the MFP was more comprehensive and had stronger enforcement under the Western Church, the coefficient on Eastern Church exposure is only significant in the specification without the baseline controls (Column 1). Kinship intensity is likewise quite robustly associated with out-ingroup trust.

To confirm that our blood donations variable is indeed measuring impersonal prosociality (rather than capturing mainly donations to family members), we also analyzed the fraction of blood donations to family members (out of the total blood donations).¹¹ While the willingness to give to family members should be universally high (independent of kinship intensity), people in low kinship intensity countries can benefit from higher levels of donations by strangers. We therefore predict that there will be either no relation or that higher kinship intensity will be associated with a larger fraction of total blood donations to family members. Consistent with this, the raw correlations reveal a significant positive relation between the fraction of blood donations to family and (i) the KII (Spearman's $\rho = 0.29$, $N=175$, $P<0.001$), (ii) log percent cousin marriage (Spearman's $\rho = 0.45$, $N=68$, $P<0.001$), and a negative one for the (iii) Western Church exposure (Spearman's $\rho = -0.32$, $N=147$, $P<0.001$). These results are generally not robust to the inclusion of covariates (these regression results can be found in the accompanying Stata script).

We also analyzed the associations of kinship intensity with generalized trust and fairness (see accompanying Stata script). Generalized trust and generalized fairness have the draw-back that depending on a country's kinship intensity, the two questions may be understood quite differently. In additional analyses we show that in low-kinship-intensity countries, the generalized trust question is strongly associated with out-ingroup trust, and that this association is weaker or nonexistent in high-kinship-intensity countries. Thus, there are between-country differences in how the question is understood. Within countries, the generalized trust question is related to trust to unrelated strangers (see accompanying stata script). Unsurprisingly, thus, at the country-level the relation between Church exposure, kinship intensity and generalized trust and fairness are less robust.

¹¹ Family and replacement donations are not included in our main indicator, voluntary blood donations. In this case, a friend or family member of the recipient donates blood to replace the stored blood used in a transfusion, ensuring a consistent supply.

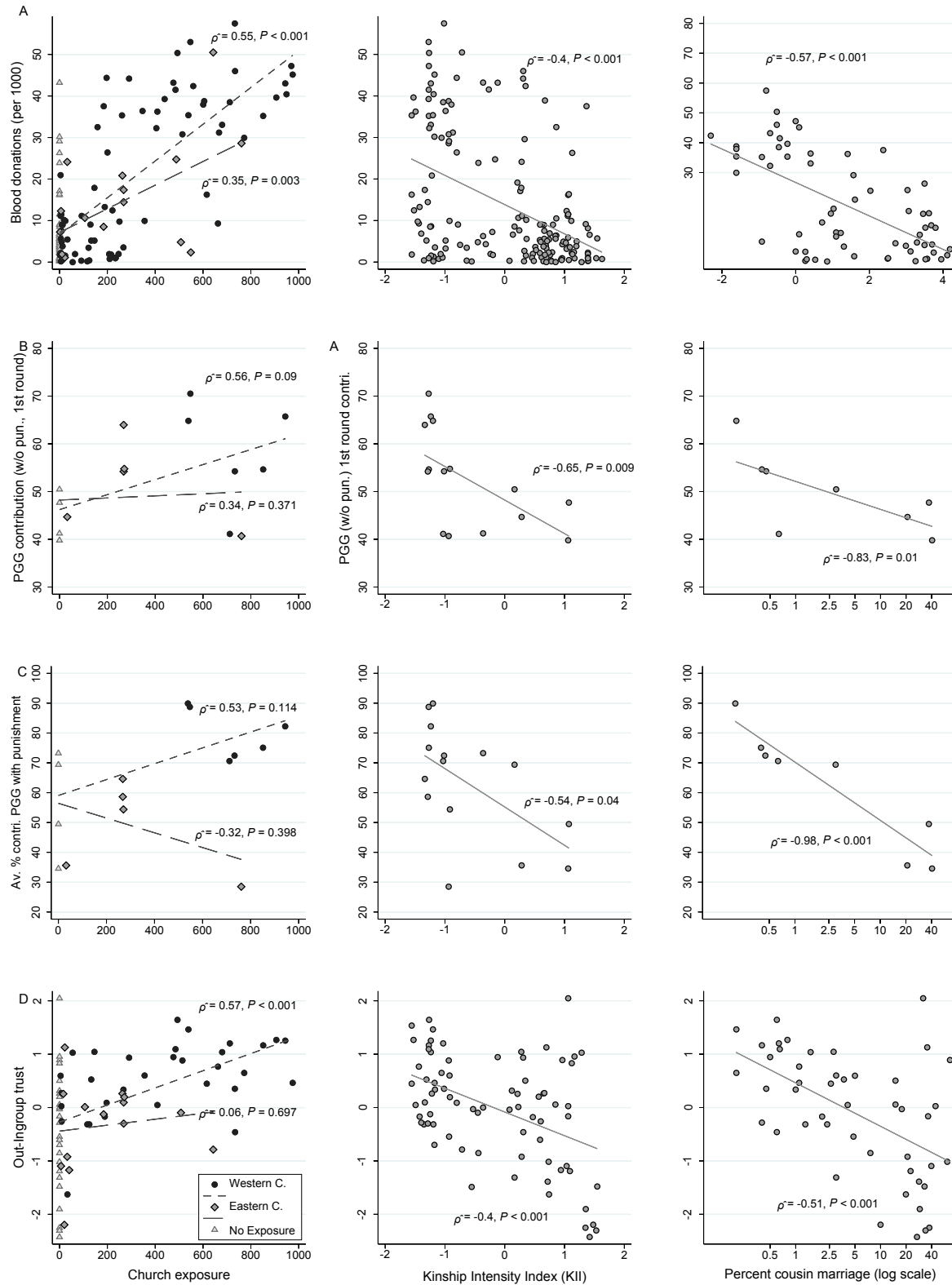


Figure S4.4: Voluntary blood donations (Panel A), public goods game contribution (without punishment, first round in percent of endowment, Panel B), public goods game contribution (with punishment, in percent of endowment, Panel C) and out-ingroup trust (Panel D) in relation to Church exposure (first column), the Kinship Intensity Index (second column), and percent cousin marriages (third column). Linear best-fit lines are displayed; in the first column, countries primarily exposed to the Western Church are identified with a black dot (short-dashed best-fit lines), and countries primarily exposed to the Eastern Church are identified by a grey diamond (long-dashed best-fit lines). Triangles denote no Church exposure. Reported are Spearman's ρ and associated significance levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Non-MFP sample	
										(10)	(11)
<i>Panel 1: Voluntary blood donations (per 1,000 inhabitants)</i>											
W. Church exposure (in 100 yrs.)	4.39*** (0.32)	2.77*** (0.46)	2.43*** (0.49)	2.66*** (0.48)	2.56*** (0.48)	2.75*** (0.47)	3.23*** (0.52)	2.22*** (0.59)	3.11*** (0.51)	-	-
E. Church exposure (in 100 yrs.)	3.14** (1.08)	1.24 (1.44)	0.73 (1.48)	1.24 (1.44)	0.82 (1.46)	0.87 (1.45)	1.38 (2.83)	0.56 (1.73)	0.85 (0.92)	-	-
<i>N</i>	135	135	135	135	135	135	135	82	135		
<i>R</i> ²	0.564	0.661	0.675	0.666	0.673	0.671	0.710	0.641	0.714		
KII	-7.50*** (1.21)	-2.84** (1.06)	-2.20+ (1.15)	-2.23+ (1.17)	-2.80** (1.03)	-4.75** (1.44)	-2.29 (2.02)	-2.03 (1.66)	-3.08* (1.37)	-3.27+ (1.84)	-2.78 (1.69)
<i>N</i>	138	138	138	138	138	138	138	85	138	79	79
<i>R</i> ²	0.222	0.547	0.580	0.557	0.578	0.574	0.606	0.554	0.612	0.085	0.218
Log % cousin m.	-5.70*** (0.73)	-2.06* (0.91)	-1.56 (0.95)	-1.97 (1.21)	-2.16* (0.88)	-3.91** (1.14)	-1.95 (1.73)	-1.92+ (0.95)	-1.50 (1.29)	-0.81 (1.37)	-0.21 (1.31)
<i>N</i>	62	62	62	62	62	62	62	50	62	28	28
<i>R</i> ²	0.390	0.684	0.744	0.684	0.702	0.719	0.725	0.711	0.752	0.012	0.168
<i>Panel 2: Out-ingroup trust</i>											
W. Church exposure (in 100 yrs.)	0.18*** (0.03)	0.18*** (0.04)	0.19*** (0.04)	0.15*** (0.04)	0.19*** (0.04)	0.18*** (0.04)	0.10* (0.04)	0.17*** (0.04)	0.08 (0.06)		
E. Church exposure (in 100 yrs.)	0.05 (0.07)	0.01 (0.06)	0.04 (0.06)	-0.01 (0.06)	0.06 (0.06)	0.04 (0.06)	-0.14 (0.14)	0.01 (0.06)	-0.15 (0.14)		
<i>N</i>	67	67	67	67	67	67	67	67	67	-	-
<i>R</i> ²	0.298	0.364	0.441	0.476	0.436	0.407	0.610	0.369	0.411		
KII	-0.47*** (0.12)	-0.40** (0.12)	-0.34* (0.14)	-0.23+ (0.14)	-0.37** (0.12)	-0.54*** (0.14)	-0.22 (0.13)	-0.36* (0.13)	-0.21 (0.16)	-0.28 (0.18)	0.04 (0.18)
<i>N</i>	70	70	70	70	70	70	70	70	70	35	35
<i>R</i> ²	0.236	0.271	0.303	0.359	0.343	0.345	0.590	0.279	0.344	0.053	0.380
Log % cousin m.	-0.39*** (0.08)	-0.32** (0.11)	-0.26+ (0.14)	-0.17 (0.14)	-0.27* (0.11)	-0.35* (0.14)	0.44* (0.17)	-0.31* (0.13)	-0.13 (0.15)	-0.05 (0.14)	0.22 (0.14)
<i>N</i>	44	44	44	44	44	44	44	44	44	23	23
<i>R</i> ²	0.368	0.403	0.440	0.488	0.517	0.408	0.761	0.403	0.456	0.003	0.455
Baseline geo. controls	-	yes	yes	yes	yes	yes	yes	yes	yes	-	yes
Parasite stress & tropical area	-	-	yes	-	-	-	-	-	-	-	-
Irrigation	-	-	-	yes	-	-	-	-	-	-	-
Oats suit. & Rye suit.	-	-	-	-	yes	-	-	-	-	-	-
Neolithic. transf. & genetic heterogen.	-	-	-	-	-	yes	-	-	-	-	-
Major religions	-	-	-	-	-	-	yes	-	-	-	-
Religiousness	-	-	-	-	-	-	-	yes	-	-	-
Continent FE	-	-	-	-	-	-	-	-	yes	-	-

Table S4.5: Country-level regressions of voluntary blood donation per 1,000 inhabitants (Panel 1) and out-ingroup trust (Panel 2) on Western and Eastern Church exposure, the KII, and log percent cousin marriage. Each column contains 9 regressions, each with a different explanatory and dependent variable. Regressions in Column 2 to 9, and 11 contain the geographic baseline (ruggedness, mean distance to waterways, caloric suitability, absolute latitude). Column 3 controls for parasite stress and tropical area; Column 4 for irrigation potential; Column 5 for caloric suitability for rain-fed oats and rye; Column 6 for ancestor adjusted timing of the Neolithic Transformation and ancestor adjusted genetic heterogeneity; Column 7 for the fractions of people adhering to major religions (Catholic, Protestant, Orthodox, other Christian, Muslim, Hindu, Buddhist); Column 8 for religiousness; and Column 9 for continent fixed effects. Columns 10-11 report on the sub-sample that only contains countries where ancestors on average experienced no more than 120 years of Church exposure. Robust standard errors (in parentheses), the number of observations (*N*), and *R*² for each regression are reported. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

Additional Analyses & Robustness Checks

Here we report on additional analysis. Analyses (*i.* to *iii.* below) can be found in our accompanying Stata script.

i. Family ties

Alesina and Giuliano (84–86) have demonstrated the importance of family ties for important economic outcomes like home production, labor force participation of women and young adults, generalized trust and political participation. Their family ties measure captures attitudes towards the nuclear family (see Section S11 for details on this measure). We find that there is a positive association between family ties and kinship intensity, though it is not particularly robust to the inclusion of covariates.

ii. KII without polygyny

Polygynous marriages may affect psychology through channels other than kinship intensity. For instance, when a large share of society's male population is unmarried due to lack of marriageable women, this may influence psychology—e.g., unmarried males may engage in riskier and more violent behavior to increase their chances

of finding a marriage partner (13). We recreated the KII excluding the polygamy sub-indicator and included the polygamy sub-indicator as an additional control in the regressions. The results hold in this specification.

iii. Year of observation

Our measure of KII rests on ethnicity-level information compiled by ethnographers, and the year which the ethnicity's information refers to varies across *EA* ethnicities. Similarly, the year the log percent cousin marriage was measured varies across countries. We included the relevant year of observation for the KII or log percent cousin marriage as an additional control in the regressions. The results hold in this specification.

iv. Conley standard errors (to adjust for spatial and cultural correlation)

Here we report standard errors that have been corrected for spatial correlation following the methodology of Conley (83). Correlation between error terms is modeled as declining function of the aerial distance between countries, up to a threshold of 5,000km (we set this threshold following (76)).

This approach does not fully capture cultural clusters that emerged due to migration. For example, the New World falls mostly outside the 5,000km radius from the Old World, yet they have a similar cultural background. We therefore corrected the standard errors based on genetic distance, also using the methodology of Conley (83). Genetic distance is a proxy for the timing of divergence between different societies: Spolaore and Wacziarg (87) and Muthukrishna et al. (88) demonstrate that genetic closeness is predictive of cultural similarity. We approximated a Euclidean plane using genetic distance between all country pairs using population-adjusted genetic distance based on Spolaore and Wacziarg (89). Correlation is modeled as declining away from each observation up to a threshold of $F_{ST} = 0.098$, which represents the genetic distance between Russia and Germany.

Table S4.6 reports the regressions results. In addition to robust standard errors, Conley standard errors based on aerial distance are reported in square brackets and Conley standard errors based on genetic distance are reported in curly brackets (significance stars refer to the robust standard errors). Table S4.6 reveals that standard errors do not change much across the different specifications.

	Individualism & independence			Conformity & obedience			Impersonal cooperation, trust		Impartiality	
	Individualism	Creativity	Embeddedness	Obedience	Tradition	Proper behavior	Blood donations	Out-group Trust	Log parking tickets	Nepotism
	(4)	(6)		(1)	(2)	(3)	(7)	(12)	(9)	(10)
W. Church exp.	0.14***	0.21***	-0.18***	0.10	-0.16**	0.03	2.76***	0.18***	-0.13*	-0.13**
Robust st. errors	(0.03)	(0.04)	(0.03)	(0.55)	(0.05)	(0.04)	(0.46)	(0.04)	(0.06)	(0.04)
Conley (geodesic)	[0.03]	[0.04]	[0.03]	[0.60]	[0.05]	[0.04]	[0.52]	[0.03]	[0.07]	[0.04]
Conley (genetic)	{0.02}	{0.03}	{0.03}	{0.64}	{0.05}	{0.02}	{0.36}	{0.04}	{0.07}	{0.04}
E. Church exp.	-0.08	0.07	-0.04	0.51	0.15	0.14*	1.23	0.01	-0.01	0.09
Robust st. errors	(0.06)	(0.12)	(0.07)	(1.13)	(0.14)	(0.07)	(1.44)	(0.06)	(0.14)	(0.07)
Conley (geodesic)	[0.04]	[0.08]	[0.05]	[1.00]	[0.11]	[0.05]	[0.95]	[0.05]	[0.10]	[0.05]
Conley (genetic)	{0.05}	{0.07}	{0.05}	{1.08}	{0.12}	{0.04}	{0.73}	{0.03}	{0.09}	{0.06}
N	93	68	68	94	68	68	136	67	138	105
R ²	0.668	0.341	0.659	0.548	0.312	0.185	0.667	0.364	0.149	0.413
KII	-0.15*	-0.37**	0.61***	2.66*	0.23*	0.14	-3.11**	-0.40**	0.52***	0.15*
Robust st. errors	(0.07)	(0.13)	(0.08)	(1.42)	(0.11)	(0.12)	(1.09)	(0.12)	(0.13)	(0.09)
Conley (geodesic)	[0.11]	[0.15]	[0.07]	[1.22]	[0.13]	[0.09]	[1.27]	[0.13]	[0.10]	[0.15]
Conley (genetic)	{0.11}	{0.17}	{0.08}	{1.40}	{0.16}	{0.08}	{1.08}	{0.15}	{0.11}	{0.15}
N	95	71	71	98	71	71	141	70	143	109
R ²	0.524	0.165	0.707	0.554	0.065	0.146	0.523	0.271	0.205	0.298
Log % cousin m.	-0.14*	-0.23*	0.19*	1.67	0.18*	0.01	-2.06*	-0.32**	0.31*	0.23**
Robust st. errors	(0.07)	(0.08)	(0.08)	(1.16)	(0.07)	(0.08)	(0.91)	(0.11)	(0.15)	(0.08)
Conley (geodesic)	[0.08]	[0.08]	[0.09]	[0.78]	[0.06]	[0.06]	[0.65]	[0.08]	[0.13]	[0.06]
Conley (genetic)	{0.05}	{0.09}	{0.09}	{0.91}	{0.06}	{0.05}	{0.79}	{0.10}	{0.13}	{0.08}
N	57	44	44	57	44	44	62	44	64	55
R ²	0.612	0.363	0.599	0.439	0.420	0.155	0.684	0.403	0.146	0.421
Baseline Set	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Table S4.6 Country-level OLS regressions of the psychological measures on Western and Eastern Church exposure, the KII, and log percent cousin marriage. Each column contains the results of 3 regressions, each with a different explanatory variable. All regressions control for geographic baseline set of covariates (ruggedness, mean distance to waterways, caloric suitability, and absolute latitude). Robust standard errors are reported in parentheses, Conley standard errors based on geodesic distance in square brackets, and Conley standard errors based on genetic distance in curly brackets. Significance levels reported are based on robust standard errors: * $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

v. *Controlling for GDP per capita*

In the regressions reported above, we do not control for GDP per capita. Including GDP per capita as a covariate is problematic, since it is likely an outcome of kinship intensity. Indeed, trust is essential for economic prosperity (90–92), and our study reports a negative association between kinship intensity and trust. Further, kinship intensity fosters corruption (Akbari et al. (93)), hinders the development of large-scale, well-functioning institutions (Schulz (29)), is negatively associated with creativity (see Table S4.1 above) and hampers the diffusion of technology (94). In ongoing work, we find that intensive kinship is negatively associated with GDP per capita. GDP per capita is thus ‘bad control’, leading to biased estimates (69).

As we discuss in our ‘Discussion of Alternative Hypotheses’ in Supplementary S3, it is unlikely that GDP confounds our analysis. First, we use explanatory variables that are unaffected by today’s GDP: the KII is based on the *Ethnographic Atlas*, which aims to capture pre-industrial characteristics. Medieval Church exposure is similarly a historically ‘deep’ variable. Second, we control for the timing of the Neolithic transformation, which captures early development. Third, some of the cross-country measures we analyze reflect the psychology of the more well-off segments of societies (e.g., nepotism of managers and parking ticket violations by diplomats); the results we find with these measures are similar to the results obtained with other measures that are based on more representative samples (e.g., out-ingroup trust). Fourth, the subsequent analyses show that the association

	Individualism & Independence						Conformity & Obedience			
	Indi- vidualism		Creativity		Embedded- ness		Obedience		Tradition	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
W. Church exposure	0.25*** (0.03)	0.20*** (0.03)	0.19*** (0.03)	0.21*** (0.04)	-0.26*** (0.03)	-0.15*** (0.03)	-1.88** (0.58)	-0.22 (0.68)	-0.13*** (0.03)	-0.08+ (0.05)
E. Church exp.	0.06 (0.04)	0.03 (0.03)	-0.07 (0.08)	0.07 (0.12)	-0.20*** (0.05)	-0.07 (0.06)	-3.49** (1.13)	-2.39* (1.04)	0.28*** (0.08)	0.21+ (0.10)
<i>N</i>	83	98	59	71	64	71	84	98	59	71
<i>R</i> ²	0.523	0.539	0.322	0.290	0.606	0.712	0.222	0.367	0.316	0.219
KII	-0.38*** (0.09)	-0.06 (0.09)	-0.41** (0.13)	-0.34** (0.12)	0.85*** (0.08)	0.41*** (0.10)	5.82** (1.75)	1.96 (1.87)	0.27* (0.11)	0.07 (0.11)
<i>N</i>	83	99	61	73	66	73	87	101	61	73
<i>R</i> ²	0.188	0.364	0.181	0.155	0.654	0.743	0.207	0.301	0.142	0.091
Log % cousin m.	-0.33*** (0.07)	-0.17* (0.07)	-0.33*** (0.08)	-0.30*** (0.08)	0.41*** (0.08)	0.21* (0.09)	4.01*** (0.89)	1.91 (1.16)	0.31*** (0.06)	0.20* (0.07)
<i>N</i>	54	59	41	46	44	45	54	60	41	46
<i>R</i> ²	0.327	0.424	0.312	0.293	0.505	0.635	0.303	0.291	0.395	0.306
Pop. dense ICE	yes	-	yes	-	yes	-	yes	-	yes	-
Log GDP per cap.	-	yes	-	yes	-	yes	-	yes	-	yes

	Conform & Ob.		Impartiality				Impersonal cooperation, trust			
	Proper Behavior		Log parking tickets		Nepotism		Blood donation		Out-ingroup trust	
	(11)	(12)	(15)	(16)	(17)	(18)	(13)	(14)	(19)	(20)
W. Church exposure	-0.00 (0.05)	0.06 (0.05)	-0.22*** (0.04)	-0.08 (0.06)	-0.21*** (0.03)	-0.06+ (0.03)	4.17*** (0.42)	2.70*** (0.42)	0.22*** (0.04)	0.14** (0.04)
E. Church exposure	0.16+ (0.08)	0.17** (0.06)	-0.13 (0.17)	-0.01 (0.12)	0.02 (0.07)	0.15** (0.04)	1.69+ (0.88)	1.84+ (0.97)	0.15* (0.07)	0.00 (0.07)
<i>N</i>	59	71	121	143	89	110	118	141	59	70
<i>R</i> ²	0.035	0.086	0.146	0.187	0.359	0.452	0.581	0.655	0.350	0.251
KII	0.13 (0.14)	-0.06 (0.14)	0.60*** (0.12)	0.42** (0.13)	0.34** (0.10)	0.03 (0.08)	-6.64*** (1.09)	-3.19** (1.06)	-0.55*** (0.13)	-0.33* (0.14)
<i>N</i>	61	73	125	147	92	113	130	160	61	72
<i>R</i> ²	0.035	0.035	0.177	0.247	0.114	0.384	0.388	0.520	0.293	0.215
Log % cousin m.	0.07 (0.09)	-0.09 (0.09)	0.32** (0.10)	0.21 (0.13)	0.30*** (0.07)	0.14* (0.06)	-5.98*** (0.73)	-3.37*** (0.84)	-0.44*** (0.09)	-0.23* (0.10)
<i>N</i>	41	46	61	66	51	58	59	64	41	46
<i>R</i> ²	0.017	0.050	0.181	0.198	0.248	0.502	0.524	0.565	0.422	0.337
Pop. dense ICE	yes	-	yes	-	yes	-	yes	-	yes	-
Log GDP per cap.	-	yes	-	yes	-	yes	-	yes	-	yes

Table S4.7 Country-level OLS regressions of the psychological measures on Western and Eastern Church exposure (upper rows), the KII (middle rows), and log percent cousin marriage (lower rows). Each column corresponds to a different dependent variable and contains the results of 3 regressions, each with a different explanatory variable. All regressions control for the log GDP per capita (in 2000 dollars). Even-numbered columns contain the geographic baseline (ruggedness, mean distance to waterways, caloric suitability, and absolute latitude). Robust standard errors are reported in parentheses. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

between kinship intensity and psychology holds within countries (Sections S5, S6 and S8), as well as among second-generation immigrants who grew up in the same country or region (Section S7) and hence in an environment with similar GDP per capita. Moreover, in Sections S5, and S6, we control for individual income, education and labor market outcomes, while in Section S7 we control for income, wealth and education.

In Table S4.7 we report regressions that control for population density in 1CE and log GDP per capita. Controlling for Population density, a widely used proxy for historical prosperity, mitigates concerns that we are picking up deep, pre-Christian differences in prosperity. All results are robust to controlling for population density. As predicted, the results are less robust when we control for the highly endogenous contemporary GDP per capita. Still the coefficients mostly have the expected signs, and oftentimes are significant.

S4.2. Principal Component Analysis (PCA) of the psychological variables

In this section, we investigate the correlation structure of the country-level psychological outcomes based on principal component analyses (PCA). We conducted two PCAs. The first PCA contains the five psychological outcomes for which there are at least 100 country-level observations (individualism, obedience, parking ticket violations, nepotism, and blood donations). The PCA sample consists of the 64 countries with non-missing data for all five psychological outcomes. The PCA reveals that the first component has an eigenvalue of 3 and explains 60% of the variation, and that the second component has an eigenvalue of 0.77 and explains 15% of the variation. In the second PCA we added variables that have at least 75 observations (embeddedness, out-group trust, tradition, behave properly, and creativity). The PCA sample consists of the 39 countries with non-missing data for all ten psychological outcomes. For this PCA the first component has an eigenvalue of 5.2 and explains 52% of the variation. The second component has an eigenvalue of 1.2 and explains 12% of the variation. The PCAs thus provide evidence of the existence of one dominant component that explains most of the cross-country variation in the psychological outcomes we study.

Since we selected our outcomes based on how kin-based institutions should have shaped people's psychology, we suspect that the intercorrelations among our outcomes capture—at least in part—the cultural evolutionary process in which kin-based institutions shaped people's psychology. Yet, while a common factor that captures the effects of kin-based institutions may have shaped these psychological outcomes, one cannot infer that the psychological outcomes are indistinct from each other; while the psychological variables are empirically related at the cross-country level, it does not follow that they are conceptually related at the individual level. We also note that the PCA results do not provide empirical support for our grouping of the psychological variables into three packages ('individualism & independence', 'conformity & obedience', and 'impersonal prosociality'). The grouping was done for expositional convenience. A PCA on the four dependent variables of the European regional analysis provides evidence for two components: one loading on generalized trust and fairness and the other loading on individualism-independence and conformity-obedience (see accompanying Stata script).

S4.3. Medieval Church exposure and kinship intensity

Here we investigate the relationship between Church exposure and our two measures of kinship intensity at the country level. Table S4.8 reports the results from regressions of the KII (Panel 1) and log percent cousin marriage (Panel 2) on Eastern and Western Church exposure. The covariates are identical to those used in the main analysis from Section S4.1. The results paint a coherent picture. An additional 100 years of Western Church exposure reduces the KII by about 0.24 standard deviations (Column 1). While the coefficients of Eastern Church exposure are generally smaller, *F*-tests reveal that they are not significantly different from the coefficients of Western Church exposure. Column 1 also reveals that an additional 100 years of Western Church exposure is also associated with a decrease in the rate of cousin marriages of about 38% ($\approx (\exp(-0.48) - 1)100$). Eastern Church exposure is not significantly associated with the frequency of cousin marriages, which reflects limited statistical power due to the small number of countries in the sample that are predominantly Orthodox.

One drawback of the KII is that the *Ethnographic Atlas* contains only a few ethnicities in Europe. As described in Sections S1 and S10, for the cross-country analyses we used EA data from ethnicities with similar languages to interpolate the KII sub-indicators when EA data were missing for an ethnicity. The KII is therefore not well-

suited to examine within-Europe variation, which is where the bulk of the variation in Church exposure resides. Therefore, some caution is warranted when interpreting the country-level results. The relationship between medieval Church exposure and cousin marriages is stronger in the subsequent (European) regional analysis (see Section S5.4). There, we exploit regional variation within Europe to demonstrate that there is a similar association between Church exposure and kinship intensity, as proxied by cousin marriages. Moreover, Korotayev (95) demonstrates that all ethnicities that experienced ‘deep-Christianization’ (i.e., were Christianized before the year 1500) are characterized by an absence of lineages. Similarly, following Korotayev’s coding of ‘deep-Christianization’ (and extending it to the added D-PLACE ethnicities that were not coded in the data analyzed in Korotayev’s original article) we find a highly significant difference in the KII between those ethnicities that experienced ‘deep-Christianization’ ($Mean\ KII = -1.57, SD = 0.12, N = 38$) and those that did not ($Mean\ KII = 0.06, SD = 0.03, N = 939$); ($t(975) = 10.4, P < 0.0001$).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Panel 1: KII</i>									
W. Church exposure (in 100 yrs.)	-0.23*** (0.02)	-0.21*** (0.03)	-0.20*** (0.03)	-0.18*** (0.03)	-0.22*** (0.03)	-0.19*** (0.02)	-0.10*** (0.03)	-0.15*** (0.03)	-0.09* (0.04)
E. Church exposure (in 100 yrs.)	-0.20*** (0.05)	-0.16** (0.06)	-0.17** (0.06)	-0.15** (0.05)	-0.18** (0.06)	-0.21*** (0.05)	0.12* (0.05)	-0.13* (0.06)	-0.00 (0.07)
<i>N</i>	146	146	146	146	146	146	146	91	146
<i>R</i> ²	0.402	0.434	0.502	0.478	0.447	0.670	0.695	0.478	0.636
<i>Panel 2: Log % cousin marriage</i>									
W. Church exposure (in 100 yrs.)	-0.47*** (0.05)	-0.43*** (0.07)	-0.39*** (0.07)	-0.36*** (0.07)	-0.46*** (0.07)	-0.32*** (0.06)	-0.03 (0.05)	-0.31*** (0.07)	-0.04 (0.09)
E. Church exposure (in 100 yrs.)	-0.67 (2.14)	-0.55 (2.41)	-1.29 (2.61)	-1.77 (2.45)	-0.43 (2.30)	-3.56+ (1.93)	-2.71 (1.87)	-1.73 (2.62)	-0.69 (1.86)
<i>N</i>	69	69	69	69	69	69	69	55	69
<i>R</i> ²	0.619	0.651	0.706	0.725	0.700	0.788	0.858	0.689	0.775
Baseline Controls	-	yes	yes	yes	yes	Yes	yes	yes	yes
Parasite stress & tropical climate	-	-	yes	-	-	-	-	-	-
Irrigation	-	-	-	yes	-	-	-	-	-
Oats and rye	-	-	-	-	yes	-	-	-	-
Aa. Timing of Neolithic Transf./ Aa. genetic heterogeneity	-	-	-	-	-	yes	-	-	-
Major religions	-	-	-	-	-	-	yes	-	-
Religiousness	-	-	-	-	-	-	-	yes	-
Continent FE	-	-	-	-	-	-	-	-	yes

Table S4.8 Country-level regressions of the KII (Panel 1) and log percent cousin marriage (Panel 2) on Western and Eastern Church exposure. Each column contains 2 regressions, each with a different dependent variable. Regressions in Columns 2-9 contain the geographic baseline (ruggedness, mean distance to waterways, caloric suitability, absolute latitude). Column 3 controls for parasite stress and tropical area; Column 4 for irrigation potential; Column 5 for caloric suitability for rain-fed oats and rye; Column 6 for ancestor adjusted timing of the Neolithic Transformation and ancestor adjusted genetic heterogeneity; Column 7 for the fractions of people adhering to major religions (Catholic, Protestant, Orthodox, other Christian, Muslim, Hindu, Buddhist); Column 8 for religiousness; and Column 9 for continent fixed effects. Robust standard errors are reported in parentheses. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

S5. European regional analyses

This section exploits regional variation in medieval Western Church exposure and kinship intensity, as proxied by cousin marriages, in Europe. We focus on four psychological dependent variables derived from the European Social Survey (ESS). For the dimension of impersonal prosociality, these are generalized trust and generalized fairness;¹² for the other two dimensions, we created a psychological measure of conformity-obedience and a measure of individualism-independence. See Section S11 for details on these dependent variables.

Section S5.1 establishes a robust association between Western Church exposure and psychology, and Section S5.2 between kinship intensity and psychology (across the regions of four countries for which we have data on cousin marriages: Spain, Italy, France and Turkey). Section S5.3 reveals an association between Church and Carolingian Empire exposure on the one hand, and prevalence of cousin marriages on the other.

S5.1 Western Church exposure and psychology across European regions

Here, we link regional Western Church exposure to the ESS-based psychological measures.

Matching Church exposure to ESS regions.

The ESS reports the sub-national regions in which the survey was conducted. For each ESS region, we calculated Western Church exposure (see Section S2.3 for details). We aimed to maximize the number of observations in the ESS by using the data from all waves (Waves 1-8, conducted between 2002 and 2016). Regions for some country/wave combinations are not reported, so we could not use the data. In some instances, the ESS regions of a country changed between waves. In this case we aimed to use the more disaggregated regional classification to increase regional variation in our sample. In some rare cases the more finely grained regional aggregation did not follow widely used classifications and a straightforward reconciliation with national administrative units was not possible. In those cases, we chose the waves with a more common regional classification. The sizes of the ESS regions are not homogenous across countries. Consequently, regional Church exposure is defined at different resolutions for different regions. The average number of respondents per region is 516 (SD: 552, Median: 303). We excluded immigrants and children of immigrants from the analysis since their ancestors did not experience their regions' Church exposure.

Specifications and covariates

In all specifications, we control for basic individual characteristics (gender, age, age²), country and wave fixed effects. Country fixed effects rule out that the estimates are biased by country-level omitted factors. In Columns 2-10 of Table S5.1, we control for a geographic baseline that parallels the country level one (terrain ruggedness, mean distance to the coast, caloric suitability, and absolute latitude—see Section S11 for details on all covariates). In Column 3, we control for six 'further geographic controls' (precipitation, mean temperature, elevation, presence of rivers and lakes, and caloric suitability for oats and rye). These controls aim to capture factors like remoteness, market integration, agricultural techniques, and climate. Several scholars have stressed the importance of a medieval European agricultural revolution (31, 48, 73). Mitterauer (31) highlights the role of oats and rye in this revolution. We thus control for caloric suitability for both oats and rye.

To address concerns that we capture legacies from political entities, we control for Roman road density (Column 4) and exposure to the Carolingian Empire (Column 5). Even though this Empire was the heartland of the Church's MFP, controlling for it allows us to demonstrate that our results do not hinge on it and are unlikely to be driven by some Carolingian feature other than the MFP. In Column 6 we control for whether a region has a socialist history (based on the European divide along the Iron Curtain). In additional analyses we show that our results hold in a sample which includes only regions with a socialist history (see the accompanying Stata script).

Column 7 controls for the presence of five monastic houses (Cluniac, Cistercians, Premonstratensians, Franciscans, and Dominicans), for exposure to medieval universities and for the average number of medieval bishoprics per km² in a given region. These covariates are described in detail in Section S11. Controlling for the five monastic houses is a proxy for technological innovation as well as cultural and religious practices that are associated with monasticism. Similarly, exposure to universities and bishopric density capture the presence

¹² At the country level, kinship intensity is only related to trust in some specifications. Based on the WVS (see Section S8.2) we found that within European countries the generalized trust question does a better job in measuring impersonal trust (that is, trust in strangers).

of administrative centers as well as technological and educational advancements. While Church exposure and bishopric density both capture dimensions of the Church's influence, there is an important distinction between the two variables. Church exposure was constructed to trace the extent of Western Christianity; it does not take the number of bishoprics in an area into account. For example, a region with many bishoprics can have the same Church exposure as a region with a single bishopric (where the radius of this bishopric covers the whole region). Given that bishoprics relied on a parish system (the administration level below the bishopric), regions with only a few bishoprics could still vigorously implement the MFP. The bishopric density, on the other hand, captures the effects of bishoprics as administrative and cultural centers. Clearly though, controlling for bishopric density is conservative since a larger number of bishoprics may still have aided in enforcing the MFP. Similarly, monasteries capture some aspects of the Church's influence and may have helped enforce the Church's MFP. Both the emergence of widespread monastic movements starting in the 10th century and the foundation of universities were likely impacted by the Church's MFP: both monasticism and universities are forms of voluntary non-kin-based corporations (96) that arose after the MFP had dissolved extended kin-groups. Due to this endogeneity, monasteries and universities are 'bad controls' (69). Column 8 controls for respondent's religious denomination (whether Roman Catholic, Protestant, Eastern Orthodox, other Christian, Jewish, Muslim, or other non-Christian) and religiousness. This partly addresses concerns that our results may be biased by other factors related to religion. To the degree that kinship intensity fosters religiosity or decreases atheism, these controls may also be endogenous and thus 'bad controls'.

In Column 9, we control for the individual's educational attainment (indicator variables for tertiary, secondary, or primary education or less), income (indicator variables for below, above median income, and missing data)¹³ and labor market status (indicator variables for unemployed and searching for a job, as well as inactivity in the labor market). All these variables may likewise be endogenously caused by kinship intensity: e.g., individuals, who experienced high kinship intensity may put less emphasis on schooling. At the same time, controlling for these variables addresses concerns that the estimates might be biased due to some other Church-related factor that works through education, income or employment. For example, bishoprics may have promoted schooling (e.g., through cathedral schools) along with the MFP. Column 10 controls for estimates of population density in the year 500 CE and dummy variables for (self-reported) city-size (big city, suburb or outskirts of big city, town or small city, country village, farm or home in countryside). Including historic population density estimates mitigates concerns that Church exposure may have been endogenously determined by the Church moving strategically into economically prosperous regions. City-size is included because our measure of Church exposure is based on bishoprics. As administrative centers, bishoprics may have fostered city growth in the area of the see (97). At the same time, city life may shape psychology.

Results

All regressions reported in Table S5.1 paint a consistent picture: exposure to the medieval Western Church is associated with higher generalized trust, fairness, individualism-independence, and lower conformity-obedience, even after controlling for country and wave fixed effects and basic individual controls. Column 3 contains a large set of geographic covariates, making geographic features an unlikely explanation for our findings. Controlling for institutional legacies like the presence of Roman roads, exposure to the Carolingian Empire, and a socialist political history does not alter the coefficients much. Only in the regression of individualism-independence on Church exposure do the coefficients become insignificant when controlling for socialist regions (Column 6), Roman Roads (Column 4) or the Carolingian Empire (Column 5), and the latter is not surprising given the Empire's central role in the enforcement of the Church's MFP.

Column 7 demonstrates that the results are robust to controlling for the presence of the five monastic orders, universities and bishopric density. Column 8 reveals that controlling for an individual's religious denomination and religiousness does not change the covariates. Together, Columns 7-8 are evidence of the importance of the medieval Church's MFP, independent of religious practices or features of monasticism. Controlling for

¹³ The elicitation of income changed between waves of the ESS. We only use two categories of income (above/below median) since this allows us to find a reasonable common overlap and therefore use all waves. In addition, about 26% of the respondents did not state their income. We therefore include an indicator variable capturing this since dropping those observations would considerably decrease power and may introduce a selection problem into our analysis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Panel 1: Generalized trust (z-scores)</i>										
W. Church exposure (<i>N</i> = 228,844; <i>Regions</i> = 440)	0.010** (0.003)	0.012*** (0.004)	0.011** (0.004)	0.012*** (0.003)	0.008* (0.003)	0.007* (0.003)	0.014*** (0.004)	0.012*** (0.003)	0.008* (0.003)	0.012*** (0.003)
<i>R</i> ²	0.147	0.147	0.147	0.147	0.147	0.147	0.147	0.149	0.164	0.148
<i>Panel 2: Generalized fairness (z-scores)</i>										
W. Church exposure (<i>N</i> = 227,388; <i>Regions</i> = 440)	0.011*** (0.003)	0.012*** (0.003)	0.010** (0.003)	0.012*** (0.003)	0.009** (0.003)	0.010** (0.003)	0.014*** (0.003)	0.012*** (0.003)	0.008** (0.003)	0.012*** (0.003)
<i>R</i> ²	0.142	0.142	0.142	0.142	0.142	0.142	0.142	0.144	0.155	0.142
<i>Panel 3: Conformity-obedience (z-scores)</i>										
W. Church exposure (<i>N</i> = 208,587; <i>Regions</i> = 440)	-0.012* (0.006)	-0.015** (0.005)	-0.018*** (0.005)	-0.012* (0.005)	-0.010* (0.006)	-0.011* (0.006)	-0.013* (0.006)	-0.018** (0.005)	-0.012* (0.005)	-0.013** (0.004)
<i>R</i> ²	0.212	0.213	0.214	0.213	0.213	0.213	0.214	0.244	0.226	0.220
<i>Panel 4: Individualism-independence (z-scores)</i>										
W. Church exposure (<i>N</i> = 208,587 <i>Regions</i> = 440)	0.009* (0.005)	0.009* (0.005)	0.009* (0.004)	0.008 (0.005)	0.005 (0.005)	0.005 (0.005)	0.009* (0.005)	0.011* (0.004)	0.007* (0.004)	0.008* (0.004)
<i>R</i> ²	0.069	0.069	0.070	0.070	0.070	0.070	0.070	0.078	0.086	0.072
Geographic baseline	-	yes	yes	yes	yes	yes	yes	yes	yes	yes
Further geo. controls	-	-	yes	-	-	-	-	-	-	-
Roman roads	-	-	-	yes	-	-	-	-	-	-
Carolingian Emp.	-	-	-	-	yes	-	-	-	-	-
Socialist	-	-	-	-	-	yes	-	-	-	-
Monastic presence, bishopric d. University exposure	-	-	-	-	-	-	yes	-	-	-
Religious denom. & Religiousness	-	-	-	-	-	-	-	yes	-	-
Education, income & employment	-	-	-	-	-	-	-	-	yes	-
Pop. dens. 500CE & city size	-	-	-	-	-	-	-	-	-	yes
Country & wave FE, & basic indi. Controls	Yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Table S5.1: Individual-level OLS regression of ESS-based psychological variables (z-scores) on Church exposure. Each column reports on four regressions, each with a different psychological outcome variable. All columns control for country and survey wave fixed effects, as well as basic individual characteristics (gender, age, and age²). Columns 2-10 contain the set of geographic baseline controls (ruggedness, distance to the coast, caloric suitability, and absolute latitude). Column 3 controls for further geographic controls (precipitation, mean temperature, elevation, presence of river/lake, irrigation potential, caloric suitability for oats and rye). Column 4 for Roman roads; Column 5 for exposure to the Carolingian Empire; Column 6 for socialist history; and Column 7 for exposure to the Cluniac, Cistercians, Premonstratensians, Franciscans, and Dominicans houses, as well as for exposure to universities and for bishopric density (between the year 500 and 1500CE). Column 8 contains indicator variables for the religious denomination of the respondents (no denomination, Roman Catholic, Protestant, Eastern Orthodox, other Christian, Jewish, Muslim, other non-Christian) and self-reported religiousness (on a scale from 0 to 10). Column 9 controls for educational attainment (indicator variables for primary education or less, secondary, tertiary education), income (indicator variables for above/below median income and whether data on income is missing) and labor market status (unemployed and searching for a job, inactivity in the labor market). Column 10 controls for population density estimates in 500CE and current size of the city in which the respondent lives. Robust standard errors clustered at the 442 or 441 regions that are reported in parentheses. * $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

education, labor market status and income (Column 9) as well as contemporary city size and population density in the year 500 CE (Column 10) likewise does not change the coefficients much.

Additional analysis / robustness check

Our accompanying Stata script allows one to reproduce the following additional analyses:

- We show that the association between Church exposure and the psychological outcomes holds when including only regions with a socialist history in the analysis. Hence these results do not rely on differences between East and West Germany, the Italian North/South divide, or the Carolingian Empire.
- We show that the results are robust to alternative coding of Church exposure, based on larger or smaller radii around bishoprics (as described in Supplementary S2, our default coding assumes a 100km radius). Generally, Church exposure based on 125km radius reveals the strongest associations. Furthermore, an indicator which takes population density in the year 500AD into account (see Section S2.2), reveals stronger associations compared to the non-population weighted one.
- We show that regions that were part of the Carolingian Empire are robustly associated with WEIRD psychology. This is consistent with the accounts of historians, who have consistently pointed out that the area of the Carolingian Empire experienced the strictest enforcements of the Church's MFP (30).

S5.2 Kinship intensity and psychology in regions of four European countries

Figure 3 in the main text reveals a strong association of log percent cousin marriage with the ESS-based psychological measures for regions in France, Spain, Italy, and Turkey. Table S5.2 corroborates this finding with a regression analysis. The regression specifications parallel the previous analysis of Section S5.1.

For generalized trust and fairness, the estimates consistently show a significant association. Doubling cousin marriage decreases trust by about $0.09 \approx 0.135 \ln(2)$ and fairness by $0.08 \approx 0.116 \ln(2)$ standard deviations. The coefficients are robust to the inclusion of covariates. Even when controlling for educational attainment, labor market status and income—variables that are likely endogenous and negatively impacted by cousin marriage—the coefficients remain significant and do not decrease by much. Only when controlling for the presence of five monastic orders, exposure to medieval universities and bishopric density (Column 6) does the coefficient for generalized fairness become insignificant. Yet, monastic houses and bishopric density may likewise have favored the enforcement of the Church's MFP. For conformity-obedience most coefficients are likewise significant. For individualism-independence the coefficients are not significant. Given that the regressions are based on data from only 68 regions and that country fixed effects remove the between-country variation, this is not too surprising. The raw correlations in Figure 3 of the main text are all significant.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>Panel 1: Generalized trust (z-scores)</i>									
Log % cousin marriage	-0.126***	-0.087**	-0.087*	-0.087**	-0.090*	-0.048*	-0.091**	-0.068*	-0.076*
(N = 21,670, Regions = 68)	(0.036)	(0.033)	(0.036)	(0.033)	(0.039)	(0.028)	(0.033)	(0.033)	(0.032)
R ²	0.135	0.137	0.139	0.137	0.137	0.139	0.140	0.156	0.139
<i>Panel 2: Generalized fairness (z-scores)</i>									
Log % cousin marriage	-0.116**	-0.085**	-0.097*	-0.085**	-0.064*	-0.043	-0.087**	-0.067*	-0.074*
(N = 21,540, Regions = 68)	(0.035)	(0.031)	(0.038)	(0.031)	(0.036)	(0.033)	(0.032)	(0.033)	(0.030)
R ²	0.126	0.128	0.129	0.128	0.128	0.129	0.128	0.140	0.130
<i>Panel 3: Conformity-obedience (z-scores)</i>									
Log % cousin marriage	0.101**	0.088*	0.059	0.088*	0.063	0.106**	0.055	0.075+	0.076+
(N = 18,931, Regions = 68)	(0.035)	(0.041)	(0.040)	(0.041)	(0.048)	(0.037)	(0.034)	(0.039)	(0.039)
R ²	0.197	0.198	0.201	0.198	0.199	0.203	0.256	0.214	0.202
<i>Panel 4: Individualism-independence (z-scores)</i>									
Log % cousin marriage	-0.026	-0.012	-0.010	-0.013	-0.002	-0.028	0.007	-0.002	-0.002
(N = 18,931, Regions = 68)	(0.037)	(0.044)	(0.046)	(0.044)	(0.049)	(0.033)	(0.040)	(0.041)	(0.043)
R ²	0.053	0.053	0.057	0.053	0.053	0.058	0.070	0.072	0.056
Geographic baseline	-	yes	yes	Yes	Yes	yes	Yes	yes	yes
Further geographic contr.	-	-	yes	-	-	-	-	-	-
Roman roads	-	-	-	Yes	-	-	-	-	-
Carolingian Empire	-	-	-	-	Yes	-	-	-	-
Monastic presence, bishopric d.	-	-	-	-	-	yes	-	-	-
University exposure	-	-	-	-	-	-	-	-	-
Religious denom.	-	-	-	-	-	-	yes	-	-
& religiousness	-	-	-	-	-	-	-	-	-
Education, income & employment	-	-	-	-	-	-	-	yes	-
Pop. Dens. 500CE	-	-	-	-	-	-	-	-	yes
& city size	-	-	-	-	-	-	-	-	yes
Country & wave FE; basic ind. char.	yes	yes	yes	Yes	Yes	yes	yes	yes	yes

Table S5.2: Individual-level OLS regressions of the ESS-based psychological measures (z-scores) on log percent cousin marriage. Each column reports on four regressions, each with a different psychological outcome variable. All regressions contain country fixed effects (for Spain, Italy, France, Turkey), survey-wave fixed effects and basic individual-level controls (gender, age, age²). Column 2 adds the geographic baseline (terrain ruggedness, distance to the coast, caloric suitability, and absolute latitude); Column 3 controls for precipitation, temperature, elevation, distance to river & lakes, irrigation potential, caloric suitability for oats and rye; Column 4 for Roman roads; Column 5 for the Carolingian Empire; Column 6 for exposure to Cluniac, Cistercians, Premonstratensians, Franciscans, and Dominicans houses, as well as for exposure to universities and for bishopric density (between the year 500 and 1500CE). Column 7 for individuals' religious denomination (Catholic, Protestant, Eastern Orthodox, other Christians, Jewish, Muslim, other non-Christian religions) and religiousness; Column 8 for educational attainment (primary or less, secondary, tertiary education), income (indicator variables for above/below median income and whether data on income is missing) and labor market status (unemployed and searching for a job, inactivity in the labor market); and Column 9 for population density estimates for the year 500CE and (contemporary) city size. Robust standard errors clustered on the 68 or 67 regions in the sample are reported in parentheses. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

S5.3 Church exposure, Carolingian Empire and kinship intensity

Here, we investigate the role of Western Church exposure and of the Carolingian Empire on 20th century cousin marriage in regions of Spain, France, Italy and Turkey. We expect to find a stronger association between exposure to the Carolingian Empire and cousin marriage than between Church exposure and cousin marriage. First, historians have consistently pointed out that the Carolingian Empire experienced the strongest enforcement of incest prohibitions. Second, historic accounts and admixture studies suggest that there were non-negligible relocations of Moriscos from southern Spain to northwestern areas after the year 1500 CE (98). Since they experienced no or a shorter Church exposure this will add noise to the estimates. Third, Church exposure is a noisier measure than Carolingian Empire: the former is an approximation based on a 100km radius around bishoprics. It reaches into territories of South Italy and Spain that were not exposed to the Western Church's MFP.

Table S5.3 reports the regression results. The specifications largely parallel the previous ones in Sections S5.1 and S5.2. Lacking individual variation in the dependent variable, here the unit of observation is the region. The specification thus does not control for individual characteristics. Column 1 does not include country fixed effects, but all other columns do. Most of the within-country variation in Church exposure in Spain and Italy stems from conquests, which carry a large random component. In the case of Spain and Italy, these conquests exhibit a North/South gradient. Absolute latitude thus exhibits a high degree of collinearity with Church exposure.¹⁴ We therefore exclude the covariate absolute latitude in all specifications except in Column 5.

The regressions reveal an association between cousin marriage and both Church exposure and the Carolingian Empire (Columns 1 and 2). About 77 percent of the variation of log percent cousin marriage is explained by Church exposure, while 61 percent is explained by the Carolingian Empire (Column 1). These numbers would doubtless increase if we accounted for the impact of Islam in Sicily, and the forceful population movements after the 15th century in Spain. Even though the sample contains only 68 regions (with within-country variation in Western Church exposure across only 56 regions, since Turkey was not exposed to the Western Church), the estimates are robust to the inclusion of the covariates—only when controlling for latitude do they become insignificant in the case of Church exposure. The results are consistent with our hypothesis that the Carolingian Empire is a more robust predictor than Western Church exposure based on radiuses around bishoprics.

	Log % cousin marriage							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
W. Church exposure (<i>N</i> = 68)	-0.278*** (0.020)	-0.109* (0.045)	-0.103* (0.047)	-0.060* (0.035)	-0.020 (0.032)	-0.102* (0.047)	-0.105* (0.048)	-0.155** (0.046)
<i>R</i> ²	0.770	0.856	0.858	0.927	0.937	0.859	0.859	0.893
Carolingian Empire (<i>N</i> = 68)	-1.936*** (0.200)	-0.916*** (0.164)	-1.001*** (0.189)	-0.607*** (0.166)	-0.443* (0.178)	-0.995*** (0.190)	-1.003*** (0.193)	-1.021*** (0.182)
<i>R</i> ²	0.608	0.888	0.892	0.935	0.941	0.893	0.892	0.910
Geographic baseline w/o latitude			yes	yes	yes	yes	yes	yes
Absolute latitude					yes			
Further geographic controls				yes	yes			
Roman roads						yes		
Pop. dens. 500AD							yes	
Monastic presence, bishopric d. University exposure								yes
Country FE		yes	yes	yes	yes	yes	yes	yes

Table S5.3: Regional level OLS regressions of log percent first cousin marriages on Western Church exposure (upper row) and exposure to the Carolingian Empire (lower row). Included are regions of Spain, France, Italy, and Turkey. Columns 2-8 control for country fixed effects. In Columns 3 to 8 the geographic baseline without absolute latitude is added (terrain ruggedness, distance to the coast, caloric suitability). Columns 4-5 contain further geographic covariates (precipitation, temperature, elevation, presence of river or lake, irrigation potential, caloric suitability for oats and for rye); Column 5 absolute latitude; Column 6 controls for Roman roads; Column 7 contains estimates for population density in the year 500CE; and Column 8 controls for exposure to Cluniac, Cistercians, Premonstratensians, Franciscans, and Dominicans houses, as well as for exposure to universities and for bishopric density (between the year 500 and 1500CE). Robust standard errors are reported in parentheses. * $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

¹⁴ The Church exposure variable does not capture the fact that Brittany in the Northwest of France was not part of the Carolingian Empire and was in the realm of the Celtic Church (which did not enforce the Church's MFP) for several centuries. So, the Church exposure variable is missing an important source of variation which is not along the North/South gradient (while the Carolingian Empire contains this source of variation).

S6. Italian provincial analyses

In this section, we focus on variation within Italy. For many decades, all of Italy experienced the same formal national institutions and for many centuries, the same religion. Yet, for a considerable portion of the medieval period, parts of Italy did not experience the Western Church's MFP. While the Western Church, supported by the Carolingian Empire, implemented and enforced its marriage rules in northern and central Italy, this was not the case in southern Italy. Until the 11th century, Sicily was Islamic and mainland South Italy was governed by Byzantium and Langobardic duchies, which were not integrated into the Western Church's administration (see Section S2.3).

We use four dependent variables, all taken from Guiso et al. (99). The first variable is blood donations in Italian provinces (number of 16-ounce blood bags collected per 1000 inhabitants in 1995)—an ecologically relevant measure capturing impersonal cooperation. Common national regulations together with the fact that blood donations are collected by a single organization in Italy mitigate the possibility that provincial variation in blood donations reflects differences in infrastructure or quality standards. Our hypothesis predicts that higher rates of cousin marriage decrease blood donations. Figure S6.1 displays the provincial variation in the rate of first cousin marriages and in blood donations; the data support our hypothesis.

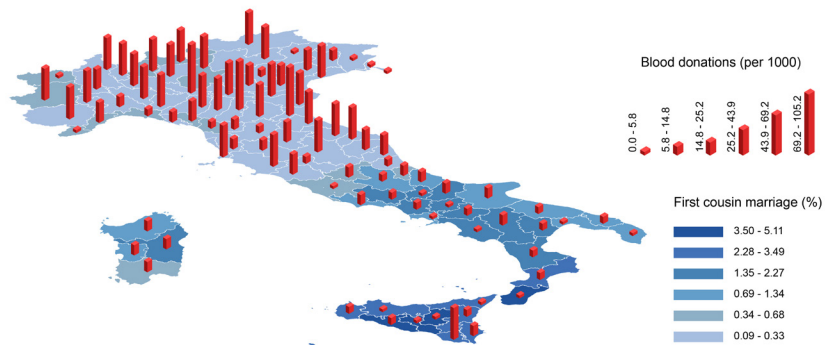


Figure S6.1 First cousin marriage rate and blood donations in the provinces of Italy.

The three other dependent variables, which are based on the representative Survey of Households Income and Wealth (SHIW) conducted by the Bank of Italy, are a binary variable indicating whether a household has loans from friends or family; a binary variable indicating whether a household uses checks; and a variable that measures the percentage of financial wealth that is held in cash. The three latter variables capture the level of development and trust in impersonal financial institutions. Our hypothesis predicts that higher rates of cousin marriage increase the probability of borrowing from friends or family, decrease the use of checks, and increase the share of financial wealth held in cash.

Regression specification

We conducted regression analyses for all four dependent variables. For the blood donations variable, which is defined at the provincial level, we conducted provincial-level regressions; for the other three dependent variables, which are defined at the household level, we report household-level regressions and cluster standard errors at the province level. Columns 2-8 in Table S6.1 include the geographic baseline without absolute latitude. As in Section S5.3 (Table S5.3), we exclude absolute latitude from the baseline because it is highly collinear with the medieval Church's MFP and cousin-marriage rates. However, for completeness we control for absolute latitude in Columns 6 and 8. Columns 3-5 include further geographic control variables: caloric suitability for oats and rye, elevation, slope, precipitation, and presence of rivers and lakes. Columns 4 and 5 include average years of schooling in the province (in 1981, based on (99)). In Column 5 we also control for household wealth, income and education (years of schooling of the household head), likewise based on (99). Note that these variables are likely 'bad controls,' since they are probably endogenous to kinship intensity; estimates in Columns 4 and 5 might therefore be biased (69). Columns 7 and 8 contain fixed effects both for the Kingdom of Naples and the Kingdom of Sicily. This addresses the possibility that our estimates may be capturing differences in political entities that existed from the 11th century onwards.

Results

The regression coefficients for blood donations reported in Table S6.1 all go in the predicted direction and are significant and robust to the introduction of the covariates. When the rate of cousin marriage doubles, blood donations decrease by around $8 \approx 11.79 \cdot \ln(2)$ 6-ounce blood bags per 1000 inhabitants (Column 1). The R^2 in Column 1 is high: Log % first cousin marriage explains 32% of the variance. The coefficients for the household-level regressions (Panels 2-4)—with one exception—likewise all go in the hypothesized direction: Log % first cousin marriage is associated with a higher probability of having loans from friends and family (Panel 2), a lower probability of using checks (Panel 3) and a higher percentage of financial wealth in cash (Panel 4). When controlling for absolute latitude and for the Kingdoms of Naples and Sicily, the significance and size of the coefficients decrease. The decrease is not surprising given that the borders of the Kingdoms of Naples and Sicily and absolute latitude covary with historical differences in the Church's MFP. Prior to the establishment of the Kingdoms of Naples and Sicily, those areas were either not exposed or exposed to a weaker MFP compared to the north of Italy, which was part of Carolingian Empire. Controlling for the average education level of the region, the household's wealth, income and the household head's education does not change the coefficients by much.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Provincial-level regressions</i>								
<i>Panel 1: Blood donations (per 1000 inhabitants)</i>								
Log % first cousin marriage	-11.79***	-8.75***	-9.78**	-12.66***		-11.05**	-8.49**	-8.19*
<i>N</i> = 92 provinces	(1.80)	(1.84)	(3.07)	(3.33)	-	(3.77)	(2.68)	(4.04)
R^2	0.321	0.473	0.530	0.562	-	0.476	0.506	0.506
<i>Household-level regressions</i>								
<i>Panel 2: Loans from friends and family</i>								
Log % first cousin marriage	0.012***	0.012***	0.017***	0.018***	0.016**	0.017***	0.006	0.010*
<i>N</i> = 32,664	(0.002)	(0.003)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)
R^2	0.005	0.005	0.006	0.006	0.010	0.005	0.006	0.006
<i>Panel 3: Use of checks</i>								
Log % first cousin marriage	-0.098***	-0.073***	-0.067*	-0.037	-0.034*	-0.030	-0.018	0.026
<i>N</i> = 32,664	(0.016)	(0.017)	(0.028)	(0.022)	(0.019)	(0.037)	(0.030)	(0.035)
R^2	0.038	0.048	0.058	0.068	0.282	0.050	0.057	0.061
<i>Panel 4: Financial wealth in cash (fraction)</i>								
Log % first cousin marriage	0.100***	0.081***	0.065***	0.057***	0.052***	0.044*	0.030*	0.004
<i>N</i> = 32,664	(0.010)	(0.011)	(0.017)	(0.014)	(0.013)	(0.017)	(0.012)	(0.009)
R^2	0.085	0.099	0.109	0.111	0.216	0.103	0.108	0.111
Baseline controls (w/o latitude)	-	yes	yes	yes	yes	yes	yes	yes
Additional geographic controls	-	-	yes	yes	yes	-	-	-
Av. years of schooling province	-	-	-	yes	yes	-	-	-
Education / income / wealth	-	-	-	-	yes	-	-	-
Absolute latitude	-	-	-	-	-	yes	-	yes
Kingdom of Naples and Sicily FE	-	-	-	-	-	-	yes	yes

Table S6.1: OLS regression of blood donations (per 1000 inhabitants, Panel 1), loans from friends and family (Panel 2), use of checks (Panel 3) and percent financial wealth in cash (Panel 4) on log percent first cousin marriages. Panel 1 reports provincial-level regressions, while Panels 2-4 reports household-level regressions. Columns 2-8 include the baseline set of geographic control variables w/o absolute latitude (terrain ruggedness, distance to the coast, and caloric suitability). In Columns 3 to 5, caloric suitability for oats, caloric suitability for rye, elevation, slope, precipitation, presence of river and lakes, and temperature are added. Columns 4 and 5 control for average years of education (in the year 1981); Column 5 adds individual education (number of years of schooling), income, and wealth for the individual-level regressions. Columns 6 and 8 control for absolute latitude, Column 7 and 8 for Kingdom of Naples and Kingdom of Sicily fixed effects. Robust standard errors (clustered at the provincial level in Panels 2-4) are reported in parentheses. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

S7. Epidemiological approach: Children of immigrants in Europe

To get closer to establishing causality, we follow the epidemiological approach (59, 60) and restrict our analysis to the adult offspring of immigrants to Europe. We are interested in whether the kinship intensity of immigrants' origins predicts their children's psychological outcomes. Children of immigrants growing up in the same country face the same societal-level environment but differ in their cultural heritage. In principle, this approach removes estimation bias due to societal-level factors such as formal institutions or infrastructure.

We conducted two analyses. In Section S7.1, we investigate the association between origin *country* kinship intensity and the psychology of children of immigrants. In Section S7.2, we focus on the ancestral *ethnicity*, which allows us to control for other ethnic characteristics and control for country-of-origin fixed effects.

This approach addresses estimation biases that arise at the societal level of residence, but other factors could still potentially bias our estimates. First, the children of immigrants are a selected sample. The degree of kinship intensity of the origin country may affect the type of individuals emigrating. The results should therefore be viewed as pertaining to this selected sample. Second, children of immigrants may experience differential discrimination, or select themselves endogenously into specific regions, which in turn may impact trust. To mitigate these concerns, we control individual characteristics like 'feeling discriminated against' and labor market participation. In robustness checks, we control for city size and residence-region fixed effects, thus only exploiting variation among children of immigrants who faced the same regional customs and institutions.

Third, other origin-country characteristics may determine both kinship intensity in the parent's country of origin and the children of immigrants' psychological variables. For example, political instability of the originating country may impact both intensive kinship and vertically transmitted trust. Several features of our approach mitigate this possibility. First, the KII is based on the *Ethnographic Atlas* (EA), which aims to capture ethnicities' characteristics before European contact (or industrialization). Similarly, Church exposure is likewise a 'deep' historical variable. As such, it is unlikely that our estimates are biased by short- or medium-term characteristics of the originating country such as political instability or colonialization. We also control for the geographic baseline of the originating country. In Section S7.2, we focus on the kinship intensity of the parents' ancestral ethnicity (instead of origin country). This allows us to control for other characteristics of ethnicity *and* for origin-country fixed effects. This approach rules out estimation bias due to origin-country-level factors and mitigates the possibility that other ethnicity-level factors bias the estimates. By doing this, we go beyond what is standard in the epidemiological approach (see also Galor et al. (100) for this strategy).

S7.1. Kinship intensity of the parents' country of origin and psychology

The psychological outcome variables are from the European Social Survey (ESS) and are the same as in Section S5: generalized trust, generalized fairness, conformity-obedience, and individualism-independence. The ESS covers 36 mostly European countries (Israel and Turkey are also included). We restrict the sample to those individuals who were born in their current country of residence and have mothers who were born in a different country. We use wave 2-8, which contains information on the origin country of respondents' parents, and created explanatory variables by matching the ESS respondents to their mothers' originating countries' KII, log percent cousin marriage and Church exposure.

Regression specifications and covariates

Each panel in Table 6.1 presents results for a different dependent variable, and for each dependent variable and in each column we report three regressions each with different explanatory variables: (i) KII, (ii) log percent cousin marriage, and (iii) Eastern and Western Church exposure. All regressions include basic individual controls (age, age², and gender), resident country fixed effects, and ESS-wave fixed effects. In Column 2-8, the geographic baseline (of mother's origin country) is added. This baseline is the same as in the cross-country analysis. Columns 3 and 6 contain continent fixed effects of mother's origin country. In Column 4 we add further individual-level controls (indicator variables for being married, feeling discriminated against, having secondary education, having tertiary education, being unemployed and searching for a job, being inactive in the labor market, having above median income and whether income data is missing). These variables might themselves be the outcome of kinship intensity and therefore could be considered as 'bad controls' (69). For example, Alesina and Giuliano (84, 86) demonstrate a strong association between nuclear family ties and labor

market participation. In Columns 5 and 6, we add indicator variables for individuals' religious denomination (Catholic, Protestant, Eastern Orthodox, other Christian, Jewish, Muslim, other non-Christian; no denomination

	Full sample						Non-MFP sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel 1: Generalized trust (z-scores)</i>								
W. Church exp. (mother's o. country)	0.018** (0.006)	0.020** (0.006)	0.004 (0.006)	0.014** (0.005)	0.010+ (0.005)	0.002 (0.005)		
E. Church exp. (mother's o. country)	0.012 (0.013)	0.025+ (0.015)	-0.006 (0.013)	0.019 (0.014)	0.014 (0.015)	-0.002 (0.013)		
R^2	0.090	0.092	0.093	0.121	0.123	0.123		
KII (mother's o. country)	-0.074*** (0.013)	-0.099*** (0.015)	-0.084*** (0.015)	-0.078*** (0.014)	-0.068*** (0.014)	-0.063*** (0.014)	-0.107** (0.034)	-0.085* (0.038)
$(N_{Full\ sample} = 15,092, N_{Non-MFP} = 4,073)$								
R^2	0.091	0.094	0.094	0.121	0.123	0.123	0.067	0.102
Log % cousin m. (mother's o. country)	-0.057*** (0.008)	-0.071*** (0.014)	-0.075** (0.021)	-0.055*** (0.011)	-0.049*** (0.012)	-0.050* (0.020)	-0.058 (0.036)	-0.043 (0.034)
$(N_{Full\ sample} = 8,943, N_{Non-MFP} = 3,630)$								
R^2	0.093	0.096	0.096	0.129	0.130	0.130	0.068	0.106
<i>Panel 2: Generalized fairness (z-scores)</i>								
W. Church exp. (mother's o. country)	0.016** (0.006)	0.016* (0.006)	-0.002 (0.006)	0.010 (0.006)	0.003 (0.007)	-0.006 (0.007)		
E. Church exp. (mother's o. country)	0.001 (0.009)	0.002 (0.011)	-0.035** (0.012)	-0.005 (0.010)	-0.013 (0.010)	-0.030* (0.012)		
$(N = 14,567)$								
R^2	0.076	0.077	0.079	0.104	0.106	0.107		
KII (mother's o. country)	-0.067*** (0.007)	-0.080*** (0.012)	-0.060** (0.018)	-0.059*** (0.012)	-0.041* (0.015)	-0.037* (0.015)	-0.090 (0.056)	-0.071 (0.063)
$(N_{Full\ sample} = 15,030, N_{Non-MFP} = 4,058)$								
R^2	0.076	0.078	0.078	0.103	0.106	0.106	0.061	0.087
Log % cousin m. (mother's o. country)	-0.061*** (0.006)	-0.076*** (0.010)	-0.076*** (0.020)	-0.059*** (0.009)	-0.048*** (0.009)	-0.049* (0.021)	-0.096** (0.029)	-0.079* (0.034)
$(N_{Full\ sample} = 8,919, N_{Non-MFP} = 3,620)$								
R^2	0.082	0.083	0.083	0.111	0.113	0.114	0.064	0.090
<i>Panel 3: Conformity-obedience (z-scores)</i>								
W. Church exp. (mother's o. country)	-0.029*** (0.007)	-0.029** (0.010)	-0.005 (0.009)	-0.026** (0.009)	-0.013* (0.005)	-0.005 (0.006)		
E. Church exp. (mother's o. country)	-0.052* (0.020)	-0.053*** (0.012)	-0.005 (0.014)	-0.048*** (0.010)	-0.029*** (0.008)	-0.014 (0.012)		
$(N = 13,389)$								
R^2	0.124	0.127	0.129	0.155	0.217	0.218		
KII (mother's o. country)	0.122*** (0.017)	0.123*** (0.032)	0.070* (0.034)	0.107*** (0.030)	0.059** (0.020)	0.035 (0.025)	0.075* (0.034)	0.054* (0.029)
$(N_{Full\ sample} = 13,815, N_{Non-MFP} = 3,706)$								
R^2	0.127	0.128	0.130	0.156	0.217	0.217	0.094	0.123
Log % cousin m. (mother's o. country)	0.067*** (0.015)	0.089*** (0.018)	0.064*** (0.016)	0.076*** (0.019)	0.046*** (0.010)	0.039* (0.014)	0.118** (0.035)	0.094** (0.033)
$(N_{Full\ sample} = 8,208, N_{Non-MFP} = 3,289)$								
R^2	0.119	0.123	0.123	0.153	0.229	0.229	0.082	0.115
<i>Panel 4: Individualism-independence (z-scores)</i>								
W. Church exp. (mother's o. country)	0.019* (0.008)	0.024** (0.007)	0.014* (0.007)	0.021** (0.006)	0.012* (0.005)	0.013* (0.005)		
E. Church exp. (mother's o. country)	0.025 (0.016)	0.035** (0.012)	0.015 (0.017)	0.030* (0.011)	0.021+ (0.011)	0.023 (0.015)		
$(N = 13,389)$								
R^2	0.057	0.058	0.058	0.084	0.099	0.099		
KII (mother's o. country)	-0.065* (0.024)	-0.075* (0.028)	-0.056+ (0.029)	-0.060* (0.023)	-0.029 (0.019)	-0.029 (0.021)	-0.073 (0.045)	-0.057 (0.043)
$(N_{Full\ sample} = 13,815, N_{Non-MFP} = 3,706)$								
R^2	0.056	0.057	0.057	0.083	0.097	0.097	0.058	0.082
Log % cousin m. (mother's o. country)	-0.044** (0.015)	-0.067*** (0.012)	-0.068** (0.021)	-0.056*** (0.012)	-0.036** (0.012)	-0.046* (0.023)	-0.093** (0.030)	-0.073* (0.028)
$(N_{Full\ sample} = 8,208, N_{Non-MFP} = 3,289)$								
R^2	0.055	0.058	0.058	0.084	0.100	0.101	0.063	0.090
Basic individual controls	yes	yes	yes	yes	yes	yes	yes	yes
Resident country & wave FE	yes	yes	yes	yes	yes	yes	yes	yes
Mother's o. country geographic baseline	-	yes	yes	yes	yes	yes	yes	yes
Further individual controls	-	-	-	yes	yes	yes	-	yes
Religious denom. & religiousness	-	-	-	-	yes	yes	-	-
Origin continent FE	-	-	yes	-	-	yes	-	-

Table S7.1: OLS regressions of the ESS-based psychological outcomes on Western and Eastern Church exposure (in 100 years) in the origin country of the respondent's mother, KII, and log percent cousin marriage. Each column contains results from 12 separate regressions. Each observation is a respondent with an immigrant mother. Columns 7 and 8 report results for the sub-sample where all origin countries that experienced more than 120 years of either Churches' MFP are excluded; $N_{Non-MFP}$ denotes the size of this sub-sample. All regressions control for basic demographic variables (age, age², gender), as well as ESS wave and residence country fixed-effects. Columns 2-8 add the baseline set of origin country controls (absolute latitude, ruggedness, caloric suitability for agriculture, mean distance to waterways). Columns 4-6 and 8 include further individual indicator variables (marriage status, feeling discriminated against, secondary education, tertiary education, unemployed and searching for a job, inactivity in the labor market, low/high income, and missing data for income). Columns 5 and 6 include the respondent's religious denomination and religiousness. Columns 3 and 6 contain origin continent fixed effects. Robust standard errors clustered at the resident country are reported in parentheses. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

is the excluded category) and religiousness (measured on an 11-point scale from 0 to 10). Although religious adherence exhibits a high correlation with the measures of kinship intensity due to the medieval Churches' marriage regulations, it is important to demonstrate that religious adherence is not driving our estimates.

We were interested in whether the relationship between kinship intensity and the psychological variables holds more generally or whether it is driven by the European experience alone. If it holds more generally, this mitigates concerns that the relationship between Church exposure and psychology is driven by an omitted factor specific to the European experience. Paralleling the cross-country regression analysis in Section S4, we excluded all respondents whose mothers are from a country where the average person's ancestors were exposed to either the Western or Eastern Church by more than 120 years (the Non-MFP sample, Columns 7 and 8).

Results

The results reveal a robust association between our two measures of kinship intensity and Church exposure on the one hand and the psychological variables on the other. As expected, the coefficients decrease when we add (potentially endogenous) individual controls like education or religious denomination. However, most coefficients remain significant. When we add continent fixed effects, the coefficients in some specifications become insignificant. This is particularly the case for Church exposure, where there is less within-continent variation. In Section S7.2, we demonstrate that the association between the ethnicity-of-origin KII and the psychological variables generally hold even when we control for origin country fixed effects. This suggests that the insignificant coefficients when continent fixed effects are included are not a source of concern. Surprisingly given our hypothesis and the cross-country evidence, we find that the coefficients on Eastern and Western Church exposure are similar in magnitude, although standard errors for Eastern Church exposure are large.

In the non-MFP sub-sample, the associations between kinship intensity and the psychological variables consistently have the expected sign. Due to the smaller size of the non-MFP sub-sample, the coefficients are less significant than in the full sample, although they are mostly larger in magnitude. Kinship intensity is thus associated with the psychological outcomes independently of the European experience.

Robustness checks

The results similarly hold (i) when focusing on the father's originating countries' kinship intensity and Church exposure and (ii) when averaging across both parents' originating countries; (iii) using two-way clustering (101) on both the residence country and the mother's origin country; (iv) including region-of-residence fixed effects and controlling for city-size; and (v) for the KII without polygyny (and controlling for polygyny separately). All results can be reproduced with the accompanying Stata script.

S7.2. Kinship intensity of ancestral ethnicity and psychological outcomes

Matching and sample

Here we matched children of immigrants to their ancestral ethnicity. Based on the ESS, we coded whether children of immigrants speak a first or second language at home that is non-native to the resident country. Based on those languages, we matched individuals to ethnicities in the EA.¹⁵ In cases where both the first and second language were non-native, we matched the first language. The final sample consists of individuals born in European countries, whose mothers immigrated and who speak at least one non-native language at home. Individuals fathers are either native born or from the same origin country as the mother. 38% of children of immigrants in the ESS speak a first or second language at home that is non-native to the resident country. Out of those, we could match 99% to an EA ethnicity.

Regression specification and covariates

The ethnicity-level matching based on language allows us to control for ethnicities' characteristics *and* fixed effects for the immigrant mothers' originating country. Ancestral ethnicity-level characteristics may impact both ethnicities' intensive kinship and their culturally transmitted psychological characteristics found in

¹⁵ The EA data provided by D-PLACE links each ethnicity to a dialect or language based on Glottolog (Hammarström (115)). In some cases, D-PLACE data on ethnicities' dialects is more detailed than the ESS language classifications. In these cases, we moved up the language tree (based on Glottolog) to arrive at the language level. In cases where several ethnicities spoke dialects of the same language, we took the average over the ethnicities that speak the same language.

immigrants' children. For example, Buggle (55) finds that a history of irrigation is associated with lower individualism. We thus control for ethnicities' subsistence (reliance on fishing, animal husbandry, and agriculture), use of irrigation, settlement complexity and the level of jurisdictional hierarchy (Columns 2-5 and 7-10). We also control for mother's origin-country fixed effects to address omitted variables bias at the origin country level (Columns 6-10). The other covariates parallel those used in the previous Section 7.1.

Results

As predicted, the regressions reveal a negative association of KII with generalized trust, fairness, individualism-independence, and a positive one with conformity-obedience. The coefficients remain significant when we include ethnicity-specific controls (Column 2) and individual-level controls (Column 3). Controlling for religious denomination and religiousness, the significance level decreases, but the size of the coefficients does not change much (Columns 4, 5). This decrease may be due to 'bad controls' (69) since many of the covariates may be endogenous to kinship intensity. All coefficients exhibit the expected sign when controlling for origin-country fixed effects (Columns 6-10). While the results are mostly significant in Columns 6-7, significance levels decrease when controlling for potentially endogenous individual factors (Columns 8-10).

Because the sample is a selected one, the estimates may be biased upward, as individuals who do not adopt the language of their resident country may also have a higher propensity to follow norms of their mother's originating ethnicity. Nevertheless, the analysis demonstrates that, in this selected sample, the relationship between kinship intensity and psychology holds even when controlling for origin-country fixed effects or other ethnicity-level factors. Comparing the estimates to those reported in Table S7.1 demonstrates that the magnitudes of the point estimates are broadly consistent.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Panel 1: Generalized trust (z-scores)</i>										
KII	-0.084***	-0.060*	-0.042+	-0.041	-0.034	-0.071**	-0.067+	-0.052	-0.067+	-0.056
(mother's o. ethnicity)	(0.020)	(0.024)	(0.024)	(0.027)	(0.026)	(0.020)	(0.039)	(0.037)	(0.035)	(0.034)
N	3,231	3,231	3,231	3,231	3,231	3,325	3,325	3,325	3,325	3,325
R ²	0.065	0.070	0.090	0.072	0.092	0.101	0.103	0.121	0.104	0.122
<i>Panel 2: Generalized fairness (z-scores)</i>										
KII	-0.071**	-0.083*	-0.073*	-0.067+	-0.064	-0.039	-0.105+	-0.097+	-0.102+	-0.097+
(mother's o. ethnicity)	(0.021)	(0.033)	(0.033)	(0.039)	(0.038)	(0.025)	(0.056)	(0.054)	(0.059)	(0.058)
N	3,213	3,213	3,213	3,213	3,213	3,306	3,306	3,306	3,306	3,306
R ²	0.065	0.068	0.082	0.072	0.086	0.099	0.102	0.115	0.105	0.118
<i>Panel 3: Conformity-obedience (z-scores)</i>										
KII	0.146***	0.175***	0.149***	0.097*	0.082*	0.180***	0.169***	0.140**	0.098*	0.074+
(mother's o. ethnicity)	(0.029)	(0.042)	(0.039)	(0.044)	(0.039)	(0.029)	(0.046)	(0.044)	(0.046)	(0.043)
N	2,987	2,987	2,987	2,987	2,987	3,078	3,078	3,078	3,078	3,078
R ²	0.151	0.154	0.178	0.201	0.222	0.195	0.195	0.217	0.238	0.256
<i>Panel 4: Individualism-independence (z-scores)</i>										
KII	-0.097**	-0.104**	-0.089**	-0.069*	-0.062*	-0.134**	-0.109*	-0.095*	-0.077+	-0.067
(mother's o. ethnicity)	(0.032)	(0.029)	(0.026)	(0.033)	(0.030)	(0.041)	(0.042)	(0.042)	(0.041)	(0.040)
N	2,987	2,987	2,987	2,987	2,987	3,078	3,078	3,078	3,078	3,078
R ²	0.054	0.064	0.078	0.077	0.090	0.101	0.105	0.118	0.116	0.128
Basic individual controls	Yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes
Resident country & wave FE	Yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes
Mother's o. country	Yes	yes	yes	yes	yes	-	-	-	-	-
baseline controls	-	-	-	-	-	yes	yes	yes	Yes	yes
Mother's o. country FE	-	yes	yes	yes	yes	-	yes	yes	Yes	yes
Mother's o. ethnicity controls	-	-	yes	-	yes	-	-	yes	-	yes
Further individual controls	-	-	-	yes	yes	-	-	-	Yes	yes
Religious denom.	-	-	-	yes	yes	-	-	-	-	-
& religiousness	-	-	-	-	-	-	-	-	-	-

Table S7.2 OLS regression of the ESS-based psychological variables on the KII of the ancestral ethnicity of the mother according to language spoken at home. Each observation is the child of an immigrant mother. All regressions control for basic individual controls (age, age², gender), as well as wave of survey and region of residence fixed effects. Columns 1-5 include controls for baseline controls in the mother's origin country (absolute latitude, ruggedness, caloric suitability for agriculture, and mean distance to waterways), while Columns 6-10 instead include mother's origin country fixed effects. In Columns 2-5 and 7-10, we include ethnicity-specific controls (reliance on fishing, animal husbandry, and agriculture as means of subsistence, use of irrigation, settlement complexity and the presence and level of jurisdictional hierarchy at the ethnicity level). Columns 3, 5, 8, and 10 include further individual indicator variables (marriage status, feeling discriminated against, secondary education, tertiary education, unemployed and searching for a job, inactivity in the labor market, low/high income, and missing data for income). Columns 4, 5, 9, and 10 include controls for religious denomination and religiousness. Robust standard errors clustered at the resident country level are reported in parentheses. + $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

S8. Ethno-linguistic within-country analyses

In this section, we add evidence for the association between kinship intensity and psychology by exploiting within-country variation in the KII among (non-immigrant) individuals with different ethnic backgrounds. This analysis complements the European-regional analysis of Section S5 since it contains a larger and more diverse sample of countries. We also used these data to investigate what the generalized trust question measures (see the following preprint: <https://psyarxiv.com/d6qhu/>) and find that within European countries it is associated with trust towards strangers, while this is not the case across countries.

Matching

The analysis is based on the WVS, which contains information on respondents' ethnicity. We used the same WVS-dependent variables as in the cross-country analysis (see Section S11 for details). We matched individuals to their ethnicities' KII in the *Ethnographic Atlas* (EA) in two steps. First, we matched the EA ethnicities to the Ethnologue based on the language codes provided in D-PLACE. Matching to the Ethnologue allows us to code whether an individual's ethnicity is native to the country. We excluded individuals who reported a non-native ethnicity. Second, we matched the WVS ethnicities manually to the Ethnologue. The WVS only contains data on ethnicities for a subset of countries, and sometimes the ethnic information is coarse. We used only those observations that could be matched to the EA in a straightforward manner.

Regression specification and covariates

To rule out estimation bias due to country-level omitted variables, we include country fixed effects. In addition, all regressions control for survey wave fixed effects and basic individual controls (gender, age, and age²). All even-numbered columns control for the importance individuals place on religion (which varies between 0 for 'not at all important' and 3 for 'very important'), dummy variables for religious denomination, and educational attainment (four categories). These further individual-level covariates may be endogenous to kinship intensity and may thus be 'bad controls' (69).

Results

Table S8.1 reveals that, within countries, people who belong to an ethnicity with a higher ancestral KII score higher on obedience ($P = 0.12$, in Column 1), tradition, and lower on creativity, out-ingroup trust and generalized trust. We do not find a significant relation with fairness or proper behavior. All results are quantitatively and qualitatively similar when controlling for educational attainment, religiousness, and religious denominations. This is further evidence that religious practices do not drive our results.

	Conformity & obedience						Individualism & independence		Impersonal prosociality					
	Obedience		Tradition		Proper behavior		Creativity		Out-ingroup trust		Gen. trust		Gen. fairness	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
KII	0.04	0.04 ⁺	0.11***	0.08**	0.02	0.02	-0.06**	-0.06*	-0.01**	-0.02**	-0.02*	-0.02 ⁺	0.00	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
<i>N</i>	46'744	46'744	26561	26561	26561	26561	26561	26561	24442	24442	44743	44743	27213	27213
<i>R</i> ²	0.151	0.157	0.115	0.157	0.064	0.071	0.052	0.069	0.114	0.118	0.090	0.093	0.081	0.084
<i>Countries</i>	41	41	28	28	28	28	28	28	26	26	41	41	27	27
Religious denom.		yes		yes		yes		yes		yes		yes		yes
Religiousness		yes		yes		yes		yes		yes		yes		yes
Education		yes		yes		yes		yes		yes		yes		yes
Country & wave FE														
Basic indiv. controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

Table S8.1: OLS regression of the WVS-based psychological variables on the KII. All regressions include country and wave fixed effects as well as basic individual controls (age, age² and gender). In addition, all even-numbered columns control for religious denomination, religiousness and education levels (no formal or inadequate primary education, primary education and incomplete secondary, secondary and incomplete tertiary, tertiary education). Robust standard errors clustered at the country level are reported in parentheses. ⁺ $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

S9. Mediation analysis

Our analyses in Supplementary S4-S8 established a robust empirical link between exposure to the medieval Western Church, kinship intensity, and a range of psychological outcomes. According to our theory, the effect of the medieval Western Church on psychology was partly mediated by kin-based institutions—i.e., the Church had both a ‘direct effect’ on psychology, independent of kin-based institutions, as well as an ‘indirect effect’ on psychology, whereby it affected kin-based institutions which in turn affected psychology. To examine the extent to which the effect of Church exposure on psychology was mediated by kin-based institutions, we conducted a suite of mediation analyses.

We caution that these analyses are ‘exploratory’, because they rely on strong assumptions and because our historical data do not allow us to reliably identify the causal effects of the Church and kin-based institutions on psychology. Also, mediation analyses typically require large samples to have adequate statistical power (Fritz and MacKinnon (146)), and some of the analyses we conducted were likely not well-powered.

Theory and Methods.

We closely follow the ‘Theory and Methods’ from the mediation analysis in Okbay, Beauchamp et al. (147); see Supplementary Information Section 6.1 of that paper). Following (147), thus, we build on Baron and Kenny’s (148) standard regression approach to mediation analysis, extending their framework to accommodate covariates.¹⁶ We estimate the following population regression model:

$$(1) \begin{aligned} E^*[Y|X, \mathbf{M}, \mathbf{C}] &= \theta_0 + \theta_1 X + \boldsymbol{\theta}'_2 \mathbf{M} + \boldsymbol{\theta}'_3 \mathbf{C} \\ E^*[M_k|X, \mathbf{C}] &= \beta_{0k} + \beta_{1k} X + \boldsymbol{\beta}'_{2k} \mathbf{C} \quad \text{for each } k = 1 \dots m, \end{aligned}$$

where $E^*[A|B]$ denotes the linear projection of A onto B , Y is the dependent variable of interest (in our case, the psychological outcome of interest), X is the treatment variable (in our case, exposure to the medieval Western Church), $\mathbf{M} = [M_1, \dots, M_m]$ is a vector of mediators (in our case, measures of kinship intensity), and \mathbf{C} is a vector of control variables.

Figure S9.1 illustrates the main pathways in the model, for the case with a single mediator. According to the model, a change in X induces both a direct change in Y (θ_1) and a change in M_1 (β_{11}), and that latter change in M_1 in turn induces a change in Y (θ_{21}). It is in that sense that M_1 mediates part of the relationship between X and Y .

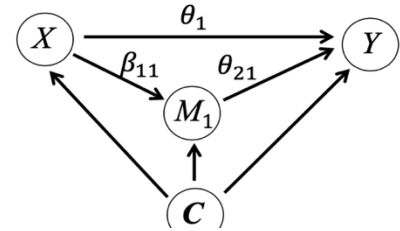


Figure S9.1 Schematic of the mediation model, with the generic variables X and M_1 for the treatment variable and mediator.

Following (147), we can re-write model (1) in reduced form as a function of X and \mathbf{C} only:

$$\begin{aligned} E^*[Y|X, \mathbf{C}] &= E^*[E^*[Y|X, \mathbf{M}, \mathbf{C}]|X, \mathbf{C}] = E^*[Y|X, E^*[\mathbf{M}|X, \mathbf{C}], \mathbf{C}] \\ &= \theta_0 + \theta_1 X + \boldsymbol{\theta}'_2 E^*[\mathbf{M}|X, \mathbf{C}] + \boldsymbol{\theta}'_3 \mathbf{C} \\ &= \theta_0 + \theta_1 X + [\theta_{21} E^*[M_1|X, \mathbf{C}] + \dots + \theta_{2m} E^*[M_m|X, \mathbf{C}]] + \boldsymbol{\theta}'_3 \mathbf{C} \\ &= \gamma_0 + \gamma_1 X + \boldsymbol{\gamma}'_2 \mathbf{C}, \end{aligned}$$

where $\gamma_0 \equiv \theta_0 + \boldsymbol{\theta}'_2 \boldsymbol{\beta}_0$, $\gamma_1 \equiv \theta_1 + \boldsymbol{\theta}'_2 \boldsymbol{\beta}_1$, and $\boldsymbol{\gamma}'_2 \equiv \boldsymbol{\theta}'_3 + \theta_{21} \boldsymbol{\beta}'_{21} + \dots + \theta_{2m} \boldsymbol{\beta}'_{2m}$.

We refer to γ_1 as the *total effect* of X on Y , to θ_1 as the *direct effect* of X on Y , and to $\boldsymbol{\theta}'_2 \boldsymbol{\beta}_1$ as the *indirect effect* of X on Y . The total effect is equal to the sum of the direct and indirect effects. The direct effect captures the extent to which Y changes when X increases by one unit, with \mathbf{M} held fixed. The indirect effect captures the extent to which Y changes when X is held fixed, but the mediators are changed to the levels they would have attained had X increased by one unit; it captures the part of the total effect mediated by \mathbf{M} .

¹⁶ In the psychological literature, mediation models are often estimated via structural equations modeling (SEM). We considered using SEM, e.g., to implement the multilevel model proposed by Krull and MacKinnon (208), but refrained from doing so because this would have required making distributional assumptions that may not be realistic for some of the analyzed variables (e.g., exposure to the Western Church and log percent cousin marriage), and because our preferred approach with clustering of the standard errors is more flexible than Krull and MacKinnon’s random coefficients approach

The *ratio of the indirect effect to the total effect*, $\frac{\theta'_2 \beta_1}{\gamma_1}$, provides an estimate of the relative importance of the causal channel running through the mediators. This ratio will be positive and between zero and one [0, 1] if the indirect and direct effects have the same signs; it will be positive and larger than one if the indirect effect is larger than the direct effect and the two effects have opposite signs. And, it can even be negative if the indirect effect is smaller than the direct effect and these two effects have opposite signs.

Our theory does not rule out direct effects of Western Church exposure (X) on psychology (Y) independent of its effect on kin-based institutions (\mathbf{M}), and is agnostic about whether the Church's direct and indirect effects on psychology will have the same sign or not. However, our theory does predict that a substantial part of the total effect of Church exposure on psychology was mediated by kinship intensity. Our theory thus predicts positive and sizeable ratios (say, greater than roughly 0.5, although there is of course no clear cutoff) of the indirect to the total effects.¹⁷

To obtain estimates of the total, direct, and indirect effects, we first estimated the following regressions with Stata, using the standard 'regress' command (to estimate the various linear regressions with the ordinary least squares (OLS) method) as well as the 'suest' and 'nlcom' commands.

$$\begin{aligned} Y &= \theta_0 + \theta_1 X + \theta'_2 \mathbf{M} + \varepsilon; \\ M_k &= \beta_{0k} + \beta_{1k} X + \varepsilon; \quad k = 1 \dots m; \\ Y &= \gamma_0 + \gamma_1 X + \varepsilon. \end{aligned}$$

Each column in Table S9.1 below reports the results corresponding to one mediation analysis with one dependent variable (Y ; a psychological outcome), one treatment variable (X ; Church exposure), and two mediators (\mathbf{M} ; the KII and log % cousin), with the data on second-generation immigrants in Europe.¹⁸ These mediation analyses involve psychological outcomes defined at the level of the individual as well as a treatment and mediators defined at a higher (cluster) level, namely at the level of the immigrant mother's country of origin.¹⁹ We estimated all regressions at the level of the individual and clustered the standard errors of all regressions at the higher level. We also report bootstrapped confidence intervals around our estimates of the ratios. We obtained those confidence intervals with the Stata 'bsample' command, using 1000 bootstrap samples and resampling clusters (taking each resampled cluster as is—i.e., without resampling within the clusters).²⁰

Results

Table S9.1 reports the results of our mediation analyses using our data on second-generation immigrants in Europe. As can be seen from Panel 1, consistent with our theory and with the results reported in Table S7.1, the total effect (γ_1) of Church exposure on psychology is significant and in the predicted direction for all psychological outcomes. In Panel 3, the effect of Church exposure on psychology becomes insignificant in most specification once kinship intensity (as proxied by the KII and log percent cousin marriage) is controlled for. In other words, the *direct* effects — independent of kinship intensity — of Church exposure on psychology are small and insignificant, and the large and significant *total effects* of Church exposure on

¹⁷ We note that a *ratio that exceeds unity is not inconsistent with our theory*: it could be the case that Church exposure indirectly had a large negative effect on a psychological outcome (through its effects on the mediator, kinship intensity), but directly (i.e., independently of the mediator) had a small negative effect on the outcome. In that case, the ratio $\frac{\theta'_2 \beta_1}{\theta_1 + \theta'_2 \beta_1}$ would exceed unity.

¹⁸ For each such mediation analysis, we used the same set of observations across all regressions that were conducted for the analysis (i.e., we dropped observations with missing values for any of the variables used in the analysis), to ensure that the estimated total effect is equal to the sum of the estimated indirect and direct effects. The results were not sensitive to this procedural step.

¹⁹ In the analyses reported in Section S7, we clustered the standard errors at the level of the second-generation immigrant's country of residence; the results below are very similar if we cluster the standard errors at the level of the country of residence instead.

²⁰ The analytical standard errors may be misleading given the limited number of clusters. For the same reason, the bootstrapped confidence intervals also ought to be interpreted with caution; further the clusters are unbalanced, which may lead to overly large confidence intervals. With clustered data, both analytical and bootstrapped standard errors and confidence intervals ought to be interpreted with caution in small samples. (See Cameron and Miller (150), Hesterberg (153), MacKinnon (154), and Sherman and Le Cessie (151) for a more thorough discussion of these issues.)

psychology are almost entirely attributable to the Church's large *indirect effects* via kinship intensity (Panel 4). Indeed, as can be seen in Panel 5, almost all estimated ratios of the indirect to the total effects are significantly larger than zero and close to or larger than unity, and most confidence intervals around the estimated ratios include unity. This is consistent with kinship intensity mediating a substantial share, or 100%, of the total effect of Church exposure on the psychological outcomes.

We also conducted mediation analyses with our cross-country and European regional datasets. Given that mediation analyses demand particularly large samples for adequate statistical power (134), the results—while generally consistent with our theory—are not precisely estimated, with wide confidence intervals. Due to space constraints, we do not report the results of our analyses here; these results are available from the authors upon request and can be replicated with the accompanying Stata script.

	Generalized trust		Generalized fairness		Conformity-obedience		Individualism-independence	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Panel 1: Total effect</i> (γ_1) of W. Church exposure on Y , from estimating $Y = \gamma_0 + \gamma_1 \text{W. Church} + \gamma_2' C + \varepsilon$								
W. Church (γ_1)	0.019** (0.007)	0.024*** (0.006)	0.020** (0.007)	0.018* (0.008)	-0.024** (0.008)	-0.032*** (0.006)	0.018** (0.006)	0.027*** (0.007)
<i>Panel 2: Effect</i> (β_{11}) of W. Church exposure on KII, from estimating $\text{KII} = \beta_0 + \beta_{11} \text{W. Church} + \beta_{21}' C + \varepsilon$								
W. Church (β_{11})	-0.216*** (0.020)	-0.186*** (0.038)	-0.216*** (0.020)	-0.186*** (0.038)	-0.214*** (0.020)	-0.186*** (0.038)	-0.214*** (0.020)	-0.186*** (0.038)
Effect (β_{12}) of W. Church exposure on log % cousin m., from estimating $\text{Log \% cousin m.} = \beta_0 + \beta_{12} \text{W. Church} + \beta_{22}' C + \varepsilon$								
W. Church (β_{12})	-0.397*** (0.053)	-0.252*** (0.059)	-0.397*** (0.053)	-0.252*** (0.059)	-0.395*** (0.053)	-0.249*** (0.057)	-0.395*** (0.053)	-0.249*** (0.057)
<i>Panel 3: Direct effect</i> (θ_1) of W. Church exposure on Y , from estimating $Y = \theta_0 + \theta_1 \text{W. Church} + \theta_{21} \text{KII} + \theta_{22} \text{log \% cousin m.} + \theta_3' C + \varepsilon$								
W. Church (θ_1)	-0.012* (0.007)	0.002 (0.006)	-0.021*** (0.006)	-0.011* (0.005)	0.013 (0.010)	-0.004 (0.007)	0.001 (0.010)	0.013 (0.009)
KII (θ_{21})	-0.032 (0.031)	-0.046* (0.022)	-0.074** (0.026)	-0.073** (0.023)	0.073* (0.043)	0.078* (0.029)	-0.029 (0.036)	-0.033 (0.030)
Log % cousin m. (θ_{22})	-0.061*** (0.013)	-0.054*** (0.014)	-0.063*** (0.012)	-0.064*** (0.016)	0.054** (0.019)	0.053* (0.022)	-0.027 (0.019)	-0.031 (0.020)
<i>Panel 4: Indirect effect</i> of W. Church exposure on Y : $\theta_2' \beta_1 = \beta_{11} \theta_{21} + \beta_{12} \theta_{22}$								
$\theta_2' \beta_1$	0.031*** (0.007)	0.022** (0.007)	0.041*** (0.007)	0.030*** (0.007)	-0.037*** (0.009)	-0.028*** (0.007)	0.017* (0.009)	0.014* (0.007)
<i>Panel 5: Ratio of the indirect to the total effects of W. Church exposure on Y: $\theta_2' \beta_1 / \gamma_1 = (\beta_{11} \theta_{21} + \beta_{12} \theta_{22}) / (\theta_1 + \beta_{11} \theta_{21} + \beta_{12} \theta_{22})$</i>								
$\theta_2' \beta_1 / \gamma_1$	1.64** (0.52)	0.92*** (0.24)	2.09*** (0.53)	1.61*** (0.45)	1.54** (0.53)	0.86*** (0.20)	0.94* (0.53)	0.52* (0.27)
95% confidence int.	[0.70, 5.21]	[0.50, 3.00]	[1.07, 4.04]	[0.62, 4.87]	[0.51, 3.77]	[0.26, 1.49]	[-0.32, 3.10]	[-0.07, 1.71]
N	8,943	8,943	8,919	8,919	8,208	8,208	8,208	8,208
Basic ind. Controls	yes	yes	yes	yes	Yes	yes	yes	yes
Resident c. & wave FE	yes	yes	yes	yes	Yes	yes	yes	yes
Eastern Church exp. (mother's o. country)	yes	yes	yes	yes	Yes	yes	yes	yes
Geo. Baseline (mother's o. country)	-	yes	-	yes	-	yes	-	yes
Income	-	yes	-	yes	-	yes	-	yes

Table S9.1: Mediation analyses with second-generation immigrants data, of the effect of Western Church exposure on our four psychological outcomes: generalized trust (columns 1-2), generalized fairness (columns 3-4), conformity-obedience (columns 5-6) and individualism-independence (columns 7-8), with the KII and log % cousin marriage as the mediators. Each observation is a respondent with an immigrant mother. Western Church exposure, the KII, and log % cousin marriage are those of the respondent's mother's country of origin. All regressions reported in a given column contain the same number of observations. All columns control for basic individual controls (age, age², gender), ESS wave and residence country fixed-effects, as well as Eastern Church exposure (of the mother's originating country). In addition, columns 2, 4, 6 and 8 control for the geographic baseline (absolute latitude, ruggedness, caloric suitability for agriculture, mean distance to waterways) of the mother's country of origin and the individual's income (indicator variables for below or above median and for whether information on income is missing). Note that in each column the total effect of W. Church exposure on Y (γ_1) is equal to the sum of the direct (θ_1) and indirect ($\theta_2' \beta_1$) effects of W. Church exposure on Y , i.e., $\gamma_1 = \theta_1 + \theta_2' \beta_1$. For ease of reference, the corresponding estimates, as well as estimates of the ratio of the indirect to the total effects of W. Church exposure have been bolded in the table. Robust (analytical) standard errors clustered at the level of the mother's originating country are reported in parentheses. 95% clustered bootstrapped confidence intervals are reported in square brackets for the estimates of the ratio. * $P \leq 0.1$, * $P \leq 0.05$, ** $P \leq 0.01$, *** $P \leq 0.001$.

S10. Linking the *Ethnographic Atlas* to current countries of the world

We developed a novel method for matching pre-industrial ethnographic data from the *Ethnographic Atlas* (EA) to current ethno-linguistic groups, which allows us to calculate population-weighted country indicators such as the country-level Kinship Intensity Index (KII). Our method is similar to that of Giuliano and Nunn (18). Unlike their manual matching of ethnicities to contemporary ethno-linguistic groups, however, our method uses language trees, which allows computational matching based on an algorithm.

The matching was done in three steps. In Step 1, we match the EA ethnicities from D-PLACE to Glottolog's language trees (115). In Step 2, we use the information contained in the language trees to impute, based on linguistic proximity, ethnographic information for ethno-linguistic groups where information in the EA is missing. In Step 3, we use information on ethno-linguistic groups' geographic locations from the Ethnologue and population density from Gridded Population of the World (GPWv4, (116)) to calculate population-weighted ethnographic indicators such as the KII for each country.

Step 1. Mapping the *Ethnographic Atlas*' languages to language trees.

In the first step, we match EA ethnicities to Glottolog's (115) language trees. We use data from the extended version of the EA (1–6) provided by the Database of Places, Language, Culture, and Environment (D-PLACE), which includes data on 1,291 pre-industrial ethnicities. We dropped 8 ethnicities for which the ethnographic information refers to a year before 1500 CE. EA ethnicities contain Glottolog IDs, allowing for a straightforward matching to Glottolog's language trees. Glottolog is a databank that contains information on language trees, i. e., genealogical hypotheses of how languages are nested in 242 families, 188 isolates (one-member families), 3,871 sub-families, and 8,209 languages with 10,414 dialects.

Ultimately, we are interested in information on ancestral ethnic characteristics at the level of languages (not dialects). Language-level information allows us to link EA characteristics to current ethno-linguistic groups based on Ethnologue (Step 3). Glottolog allows us to link dialects spoken by EA ethnicities to languages. We use 1,283 EA ethnicities associated with 1,105 unique languages. While most of the 1,105 languages (or dialects thereof) are spoken by only one EA ethnicity, in several cases multiple ethnicities speak different dialects of the same language. In these cases, we calculate the ancestral characteristic of interest x (such as *cousin marriage preference*) at the language level by taking the average over the ethnicities that speak different dialects of the same language. Since the number of current ethno-linguistic groups residing in today's countries considerably exceeds the 1,105 based on the EA, we fill in missing groups in Step 2.

Step 2. Constructing data within language-trees.

In Step 1, up to 1,105 (out of the 8,209) languages in Glottolog's language tree have been linked to information on an EA characteristic x . If a given Glottolog language does not contain data on x , we fill in the missing observation with an algorithm that uses information on the language with the smallest linguistic distance from the language of interest based on Glottolog's language tree. If there are multiple entries that have the same linguistic distance from the missing entry, the entry with the smallest geodesic distance²¹ from the missing entry is used. Therefore, all languages in Glottolog will pick values for variable x , except languages whose entire family (starting at top of the language tree) does not contain any EA information.

Step 3. Mapping language tree data to geographic boundaries.

Once we have assigned ancestral characteristic x for all 8,209 Glottolog languages, we match the Glottolog languages to today's 7,651 live and geographically concentrated languages of the world in the Ethnologue (Languages of the World). This is done using ISO 639–3 codes provided by Glottolog. We used the Ethnologue data provided by World Language Mapping System (WLMS, (117)) 19th version (2017) which corresponds to the 16th Edition of the Ethnologue (118). WLMS also provides a shapefile that divides the world into polygons indicating the locations where 7,651 Ethnologue languages are spoken.

²¹ The coordinate often represents the geographical center-point of the area where the speakers live.

To create population weights, we estimate the population of the Ethnologue language groups using the population raster data from Gridded Population of the World (GPWv4, (116)) for the year 2010, which consists of estimates of human population density consistent with national censuses and population registers. The GPW uses approximately 12.5 million national and sub-national administrative units to assign population values to 30 arc-second ($\sim 1\text{km}$) grid cells. The population count grids contain estimates of the number of people per grid cell.

Then, we extract the number of people living within the boundaries of each language polygon. Recall that each language is assigned a value for variable x . For each country, our country-level estimate of variable x is the population-weighted average of x across the languages within the boundaries of the country. Using this method, there are a few Ethnologue languages with missing observations for variable x . We ignore these missing observations when taking the population-weighted average in a country.

S11. Data and variables description

In this section we list definitions and data sources of the variables used in the analyses.

S11.1. Dependent variables

Asch conformity: An experimental measure based on Asch (119, 120). Experimental subjects are asked to judge which line (out of a set of three) is of the same length as a comparison line. A majority of the other participants in the room are secretly confederates, all of whom point to the same wrong answer. Subsequently, the subjects make a choice. The measure is the percentage of subjects who follow the majority and pick the objectively wrong answer. The data is taken from a meta-study conducted by Bond and Smith (121), which is based on 133 studies in 17 countries.

Blood donation (country-level): Voluntary blood donations per 1,000 inhabitants is taken from the WHO Global Status on Blood Safety and Availability 2016. The report contains data for the years 2011, 2012, and 2013. We use the averages across these years. When data for a year is missing for a country, the indicator is based on the non-missing years. In about a third of the countries, not all blood centers are covered. In these cases, we did the following: The WHO report states the estimated percentage of blood donations covered; we calculated the total amount of blood donated based on those estimates. In the non-fully covered countries, the coverage is still reasonably high: 60% of those countries have a coverage above 75%. The WHO report gives further information on the types of donations: (i) voluntary non-remunerated donations, (ii) family/replacement donations, (iii) paid donations, or (iv) other. Our main variable of interest is voluntary non-remunerated donations per 1,000 inhabitants. To calculate per capita values, we divided the number of voluntary non-remunerated donations by the World Bank's population estimates (per 1000) for the year 2012. This variable is used in Section S4.1.

Blood donation (provincial): Taken from Guiso et al. (99), this variable is the number of 16-ounce blood bags collected per 1000 inhabitants in the year 1995 in Italy. The data is based on AVIS (Italian association of voluntary blood donors), which collects 90 percent of all blood donations and 100 percent of anonymous blood donations in Italy. This variable is used in Section S6.

Conformity-obedience (regional): This variable is based on answers to four of Schwarz's (122) human value questions in the European Social Survey (ESS) that fall in the dimension of conformity & obedience: "Please ... tell me how much each person is or is not like you. (i) It is important to her/him always to behave properly. She/he wants to avoid doing anything people would say is wrong. (ii) She/he believes that people should do what they are told. She/he thinks people should follow rules at all times, even when no-one is watching. (iii) It is important to her/him to be humble and modest. She/he tries not to draw attention to herself/himself. (iv) Tradition is important to her/him. She/he tries to follow the customs handed down by her/his religion or her/his family." People rated on a six-point scale and we took the average over the four questions. Since we do not want to capture closeness perceptions, we subtracted the mean answers a respondent gave to all 21 human value questions from the respondent's mean conformity-obedience answer following Schwarz's recommendation (123).

Creativity: This measure is based on a Schwarz (122) human values question asked in the WVS. People rate on a six-point scale how much they believe a person described as follows is like them: "It is important to this person to think up new ideas and be creative; to do things one's own way." Since we do not want to capture cultural differences in closeness perceptions, we subtracted the mean answers a respondent gave to all human value questions from the respondent's answer to the creativity question following Schwarz's recommendation (123). We took countries' means and standardizing the variable at the country level.

Dishonesty: Based on Gaechter and Schulz (124), who conducted a behavioral die-under-the-cup experiment following Fischbacher and Foellmi-Heusi (125), with student participants in 23 countries. In an experimental setting, each participant throws a die in private and reports the number rolled. The payout depends linearly on the number reported: reporting a '1', gives 1 money unit, reporting a '2' gives 2 money units, etc.—except reporting a '6' leads to no payment. An environment where reputational concerns are minimized creates an incentive to lie and report high-paying numbers. Our dependent variable, percent high claims, is defined as the percentage of the three high-paying numbers reported in each subject pool.

Embeddedness: Schwarz (126–128) has articulated a typology of seven cultural value orientations that aim to capture how national cultures differ from one another. Schwarz describes embeddedness (one of the seven cultural value orientations) as follows: "In cultures with an emphasis on embeddedness, people are viewed as entities embedded in the collectivity. Meaning in life comes largely through social relationships, through identifying with the group, participating in its shared way of life, and striving toward its shared goals. Embedded cultures emphasize maintaining the status quo and restraining actions that might disrupt in-group solidarity or the traditional order."

Important values in such cultures are social order, respect for tradition, security, obedience, and wisdom." The embeddedness measure is constructed based on 14 items in Schwarz's (122) value survey (specifically, with items regarding social order, politeness, national security, reciprocation of favors, respect for tradition, self-discipline, wisdom, being moderate, honoring of parents and elders, preserving public image, being obedient, being devout, being forgiving, and being clean).

Financial wealth in cash: Taken from Guiso et al. (99) based on the representative Survey of Households Income and Wealth (SHIW) conducted by Bank of Italy. It measures the financial wealth (in percent) that a household holds in cash. It is used in the Italian analysis of Section S6.

Generalized trust: At the cross-country level (Section S4.1), this measure is based on the World Value Survey (WVS) and the European Value Survey (EVS), while at the European regional level, it is based on the European Social Survey (Section S5). In both cases the question is the same: "*Generally speaking would you say that most people can be trusted or that you can't be too careful in dealing with people?*". In the WVS and EVS (Section S4) the respondents could choose one out of two answers: "*Cannot be too careful*" or "*People can be trusted*". In the ESS used in the regional analysis of Section S5, individuals answered on an 11-point scale ranging from '0' ("*You can't be too careful*") to '10' ("*Most people can be trusted*").

Generalized fairness: At the cross-country level, this measure is based on the European and the World Value Survey (Section S4.1), while at the European regional level, it is based on the European Social Survey (Section S5). The question and answers are identical for all three surveys: "*Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?*" Individuals answered on an 11-points scale ranging from '0' ("*Most people would try to take advantage of me*") to '10' ("*Most people would try to be fair*").

Individualism: Our measure for individualism is from Hofstede (retrieved from <http://geert-hofstede.com/>, accessed 28.10.2015). According to Hofstede: "*The high side of this dimension, called individualism, can be defined as a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families. Its opposite, collectivism, represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty. A society's position on this dimension is reflected in whether people's self-image is defined in terms of "I" or "we."*" The indicator is based on 30 questions. The data was mainly collected among IBM employees around the world.

Individualistic-Impersonal Psychology Scale: This is a composite psychology scale, which contains information on all 17 of our cross-country psychological dependent variables. To construct this scale, we standardized each of the 17 variables at the country level and reverse scaled when necessary so that higher values reflect higher individualism-independence, conformity-obedience or impersonal pro-sociality. We then took the weighted average over all variables. Since the sample size for each of the 17 variables varies widely, for some countries the Individualistic-Impersonal Psychology Scale rests on only a few variables. This indicator was only created to parsimoniously illustrate our findings in figure 1 of the main text.

Individualism-independence (regional): This variable is based on answers to two of Schwarz's (122) human value questions in the European Social Survey (ESS) that fall in the dimension of individualism & independence: "*Please ... tell me how much each person is or is not like you. (i) It is important to her/him to make her/his own decisions about what she/he does. She/he likes to be free and not depend on others. (ii) Thinking up new ideas and being creative is important to her/him. She/he likes to do things in her/his own original way.*" People rated on a six-point scale and we took the average over the two questions. Since we do not want to capture closeness perceptions, we subtracted the mean answers a respondent gave to all 21 human value questions from the respondent's mean individualism-independence answer following Schwarz's recommendation (123).

Loans from friends and family: Taken from Guiso et al. (99) based on the representative Survey of Households Income and Wealth (SHIW) conducted by Bank of Italy. It is a binary variable indicating whether a household has loans from friends and family. It is used in the Italian analysis of Section S6.

Nepotism: Taken from Van de Vliert (53). A representative sample of top executives was interviewed by researchers from the World Economic Forum regarding the extent to which senior management positions in their country are held by relatives. They sampled 116 nations (covering 94% of the world population and 98% of the gross world product). Within each nation, a partner institute used a master list of organizations grouped by economic sector (agriculture, industry, services), type (domestic private, foreign private, government), and size to draw a nationally

representative sample, and then conducted one survey per institution. Data from a total of 10,932 respondents was collected. On average, 94 top executives per country responded to the questionnaire.

Obedience: In the WVS, respondents are asked to choose up to five qualities they consider important to instill in children. Based on responses to this question, we coded the percentage of people in a country who choose 'obedience' as an important child quality.

Out-ingroup trust: This measure is based on World Values Survey (WVS) trust questions that are specific about which group of people can or cannot be trusted. These questions can be classified into Outgroup and Ingroup trust. The questions are posed in the following way: *"I'd like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group completely, somewhat, not very much or not at all?"* The groups are (i) the respondent's family, (ii) the respondent's neighbors, (iii) people the respondent knows personally, (iv) people s/he meets for the first time, (v) people of another religion, and (vi) people of another nationality. While the three former questions all relate to people the respondent is relatively close to, the latter three questions refer to more unfamiliar people. Our out-ingroup trust measure is constructed by taking the difference between the average of the last three questions (which plausibly capture out-group trust) and the average of the first three questions (which plausibly capture in-group trust). We took country means and standardized the variable.

Particularism (passenger's dilemma): Taken from Hampden-Turner and Trompenaars (129). This measure captures the preference for helping kith and kin over following universally applicable rules of fairness. The authors describe the responses of multinational corporate managers to the following scenario: *"Consider for a moment this dilemma: You are a passenger in a car driven by a close friend, and your close friend's car hits a pedestrian. You know that your friend was going at least thirty-five miles an hour in an area where the maximum speed was twenty miles an hour. There are no witnesses. Your friend's lawyer says that if you testify under oath that the speed was only twenty miles an hour then you would save your friend from any serious consequences. What would you do? Would you lie to protect your friend? What right does your friend have to expect your help? On the other hand, what are your obligations to society to uphold the law?"* The variable reveals the percentage of a country's respondents who stated that either (i) the friend has a definite right to expect the respondent to lie for him or (ii) the respondent would lie under oath. We took the most recent data available for each country.

PGG Cooperation (with & without punishment): We use two experimental measures of cooperation taken from the Public Good Games (PGG) conducted by Herrmann et al. (105). Students played PGGs first without and then with punishment for 10 rounds each. During both conditions and in all rounds, individuals stayed in the same group of four randomly allocated individuals. In each round of the PGG without punishment, an individual received an endowment of 20 units and could decide how much to keep for him/herself and how much to contribute to a public good. All contributions to the public good were multiplied by 1.6 and distributed equally among the four individuals. That is, from each token an individual invests, s/he gets back 0.4 tokens. Our first measure is initial contribution (in the first period only) of the PGG without punishment. This measure captures how individuals initially approach cooperation in a setting where people do not know each other. Our second measure is based on the PGG with punishment. In this condition, individuals received information in each period on the cooperative behavior of their group members and could subsequently set punishment points. One punishment point costs the punisher 1 unit, while it would deduct 3 units from the recipient. Our second measure is average contribution to the PGG (in percent of the endowment) over all 10 periods in the PGG with punishment.

Proper behavior: This measure is based on a Schwarz human values question asked in the WVS. People rate on a six-point scale how much they believe the person described in the following sentence is like them: *"It is important to this person to always behave properly; to avoid doing anything people would say is wrong."* Since we do not want to capture cultural differences in closeness perceptions, we subtracted the mean answers a respondent gave to all human value questions from the respondent's answer to the creativity question following Schwarz's recommendation (123). We aggregated answers to the country level by taking the countries' means and standardizing the variable at the country level.

Tightness: Based on Gelfand et al. (130). Tightness captures the degree to which social norms are pervasive, clearly defined, and reliably imposed in a country. On a six-item Likert scale (ranging from strongly agree to strongly disagree) respondents rated six statements: *"1. There are many social norms that people are supposed to abide by in this country. 2. In this country, there are very clear expectations for how people should act in most situations. 3. People agree upon what behaviors are appropriate versus inappropriate in most situations this country. 4. People in this country have a great deal of freedom in deciding how they want to behave in most situations. (Reverse coded) 5. In this country, if someone acts in an inappropriate way, others will strongly disapprove. 6. People in this country almost always comply with social norms."* Data is available for 33 countries.

Tradition: This measure is based on a Schwarz human values question asked in the WVS. People rate on a six-point scale how much they believe a person described as follows is like them: “*Tradition is important to this person; to follow the customs handed down by one’s religion or family*”. Since we do not want to capture cultural differences in closeness perceptions, we subtracted the mean answers a respondent gave to all human value questions from the respondent’s answer to the tradition question following Schwarz’s recommendation (123). We aggregated answers to the country level by taking the countries’ means and standardizing the variable at the country level.

UN diplomatic parking ticket violations: Based on Fisman and Miguel (131). This data is based on unpaid parking tickets of United Nations diplomats in New York City. Individuals have 30 days to pay a ticket before it goes into default, at which point an additional penalty is levied (generally 110% of the initial fine). Individuals then receive an additional 70 days to pay the ticket plus this penalty before it is recorded as an unpaid violation in the dataset. Fisman and Miguel calculated the total number of unpaid diplomatic parking violations per diplomat for each country. The total period of coverage is November 24, 1997, to October 2002, when the State Department gave New York City permission to revoke the official diplomatic plates of vehicles with three or more outstanding unpaid violations. Before 2002, diplomats did not face sanctions when they failed to pay a parking tickets due to diplomatic immunity.

Use of checks: Taken from Guiso et al. (99) based on the representative Survey of Households Income and Wealth (SHIW) conducted by Bank of Italy. It is a binary variable indicating whether a household uses checks. It is used in the Italian analysis of Section S6.

S11.2. Country-level covariates

Adherence to major religions: Taken from Barro and McCleary (80) for the year 2000. Retrieved on March 14, 2016 from https://scholar.harvard.edu/barro/data_sets. Adherents in a country to Catholicism, Protestantism, Orthodox Christianity, other Christian denominations, Islam, Hinduism and Buddhism, as fractions of the country’s population.

Absolute latitude: Taken from Ashraf and Galor (58). The absolute latitude of a country’s approximate geodesic centroid, as reported by the CIA’s World Factbook.

Caloric suitability: Using data from Galor and Özak (66), the Caloric Suitability Index captures the average potential agricultural output (measured in calories) based on crops that were available for cultivation after 1500 CE. Caloric Suitability therefore captures the variation in potential crop yield across the globe, as accounted for by calories per hectare per year. The Caloric Suitability Index is constructed based on data from the Global AgroEcological Zones (GAEZ) project of the Food and Agriculture Organization (FAO). The GAEZ project supplies global estimates of crop yield for 48 crops in grids with cell sizes of 5-degree cells. We use the medium level rain-fed potential output.

Caloric suitability for oat: Using data from Galor and Özak (66), the Caloric Suitability Index for oats captures the medium level rain-fed potential agricultural outputs (measured in calories) of oat.

Caloric suitability for rye: Using data from Galor and Özak (66), the Caloric Suitability Index for rye captures the medium level rain-fed potential agricultural outputs (measured in calories) of rye.

Genetic heterogeneity (ancestor adjusted): Taken from Ashraf and Galor (58). The expected heterozygosity (genetic diversity) of a country’s population, predicted by migratory distances from East Africa (i.e., Addis Ababa, Ethiopia). It is a prediction based on the worldwide sample of 53 ethnic groups from the HGDP-CEPH Human Genome Diversity Cell Line Panel. The measure is ancestor adjusted using the World Migration Matrix, 1500-2000 CE, from Putterman and Weil (34).

Irrigation potential: Taken from Bentzen et al. (70). Irrigation potential measures the fraction of land that would have experienced at least a doubling of yields if irrigation were to be introduced into an area where agriculture was previously rainfed. The measure is in relation to all land suitable for agriculture. The measure is based on data from the global Agro-Ecological Zones (GAEZ) 2002 database of the Food and Agriculture Organization (FAO).

Log GDP per capita: Real GDP per capita in 2000 CE, in international dollars (adjusted for Purchasing Power Parity), as reported by the Penn World Table, version 6.2. Natural logs are taken.

Mean distance to navigable waterways: Taken from Gallup, Sachs and Mellinger (62). The distance, in thousands of km, from a GIS grid cell to the nearest ice-free coastline or sea-navigable river, averaged across the grid cells of a country. It is part of Harvard University’s CID Research Datasets on General Measures of Geography.

Parasite stress: The measure is Fincher and Thornhill (57)'s combined parasite-stress indicator (both non-zoonotic and zoonotic parasites). It is based on the GIDEON database (Global Infectious Disease & Epidemiology Network; www.gideononline.com).

Population density in 1 CE: Taken from Ashraf and Galor (58), who take the data from McEvedy and Jones (139)

Ruggedness: Taken from Nunn and Puga (61), it is based on (132). The terrain ruggedness index at one (grid-cell level) point is given by the square root of the sum of the squared differences in elevation between the central point and the eight adjacent points. Formally, it is defined as follows. Let $e_{r,c}$ denote elevation at the point located in row r and column c of a grid of elevation points. Then the Terrain Ruggedness Index for this point is calculated as $\sqrt{\sum_{j=c-1}^{c+1} \sum_{i=r-1}^{r+1} (e_{i,j} - e_{r,c})^2}$. The country-level indicator is the average across all the grid cells within a country.

Timing of Neolithic Transformation (Ancestor adjusted): The number of years elapsed, up to the year 2000 CE, since the majority of the population residing within a country's modern national borders began practicing sedentary agriculture as the primary mode of subsistence. This measure is based on Putterman (74). It is compiled using a wide variety of both region- and country-specific archaeological studies as well as more general encyclopedic works on the transition from hunting and gathering to agriculture during the Neolithic Revolution. We use the ancestry adjusted indicator to take account of migration post-1500 CE. The ancestry weights are obtained from the World Migration Matrix of Putterman and Weil (34).

Tropical area: Taken from Nunn and Puga (61). It is based on Kottek et al. (133), who classify each cell on a 30 arc-minute grid covering the entire land area of the Earth into one of 31 climates in the widely used Köppen-Geiger climate classification (these categories are formed using temperature and precipitation data from the Climatic Research Unit of the University of East Anglia and the Global Precipitation Climatology Centre of the German Weather Service). Based on these data, Nunn and Puga (61) calculated the percentage of the land surface area of each country that has any of the four Köppen-Geiger tropical climates.

S11.3. Regional-level covariates

All indicators exist for the ESS regions used in Section S5 and the Italian provinces used in Section S6.

Absolute latitude: Absolute latitude of the centroid of a region.

Bishopric density: This variable is defined as the average number of medieval bishoprics that existed between the year 500CE and 1500CE per km² in a given contemporary ESS-region. (Averages are taken based on counts every 50 years). Section S2.2 provides more details on the bishoprics data set we used to construct this variable.

Caloric suitability: Taken from Galor and Özak (66), the Caloric Suitability Index captures the average potential agricultural output (measured in calories) based on crops that were available for cultivation after 1500 CE. Caloric Suitability therefore captures the variation in potential crop yield across the globe, as accounted for by calories per hectare per year. The Caloric Suitability Index is constructed based on data from the Global AgroEcological Zones (GAEZ) project of the Food and Agriculture Organization (FAO). The GAEZ project supplies global estimates of crop yield for 48 crops in grids with cell sizes of 5-degree cells, which allowed us to construct regional indicators. We use the medium level rain-fed potential output.

Caloric suitability for oat: Using data from Galor and Özak (66), the Caloric Suitability Index captures the medium level rain-fed potential agricultural outputs (measured in calories) of oat.

Caloric suitability for rye: Using data from Galor and Özak (66), the Caloric Suitability Index captures the medium level rain-fed potential agricultural outputs (measured in calories) of rye.

Carolingian Empire: Based on Shepherd's map (134), this variable indicates the areal fraction of a region that fell within the boundaries of the Carolingian Empire in the year 814 CE.

Distance to the coast: Distance of the centroid of a region from the coast, constructed based on a coastline physical vector map in 1:10m resolution. Source: Natural Earth (<http://www.naturalearthdata.com/>).

Elevation: Mean elevation is constructed based on the global map (30 by 30 arcsecond cells) obtained from Global 30 Arc-Second Elevation dataset. Source: GTOPO30 dataset (<https://ita.cr.usgs.gov/GTOPO30>).

Irrigation potential: Constructed following Bentzen et al. (70). Irrigation potential measures the fraction of land that would have experienced at least a doubling of yields if irrigation were to be introduced into an area where agriculture was previously rainfed. The measure is in relation to all land suitable for agriculture. It is based on data from the global Agro-Ecological Zones (GAEZ) 2002 database of the Food and Agriculture Organization.

Lake or rivers (presence of): A dummy variable indicating whether there is a river or lake within a region. Rivers primarily derive from World Data Bank 2. Data of Europe primarily derives from Catchment Characterization and Modelling (CCM) Database 2.1 by the European Commission, Joint Research Centre, Institute for Environment and Sustainability. Data for North America derives the North American Environmental Atlas, a collaboration of government agencies in Canada, Mexico and the United States and the trilateral Commission for Environmental Cooperation (CEC). Source: Natural Earth (<http://www.naturalearthdata.com/>).

Monastic presence (five indicators): We created a monastic presence indicator for each of five different monastic orders: Cluniac, Cistercians, Premonstratensians, Franciscans, and Dominicans. For each indicator we drew 50km radii around all the monastic houses of the corresponding order. Based on the pixels that fall within the 50km radii we calculated for each indicator the percentage of each region that was exposed to the corresponding order at some point in time (for details regarding the pixels' size, see our description of how we constructed the regional Church exposure variable in Section S2). The underlying geo-located data on Cluniac (existing between before 998 to 1109 or later), Dominican (existing between 1216 to 1500), Franciscan (existing around 1300), and Premonstratensians Houses (existing between 1120 to 1500) are based on the Atlas zur Kirchengeschichte (135) and are taken from the Digital Atlas of Roman and Medieval Civilization (DARM, (136)). Cistercian Houses (existing between 1095 and 1675) are based on Donkin (137) and are taken from Andersen et al. (135). Unlike the Church exposure variable, this indicator does not take the duration of exposure into account.

Roman roads: Using data from McCormick et. al. (138), this measure captures the length of Roman roads within a region (as identified in the Barrington Atlas) per area of the region.

Ruggedness: The regional measure is constructed based on the global map (30 by 30 arc-second cells) obtained from the grid-cell-level data on ruggedness based on Nunn and Puga (61). For details, see the country-level indicator.

Socialist history: Indicator variable capturing whether a European region has a socialist history (see map in Figure 1 in the main text). Regions that belonged to Yugoslavia are coded as having a socialist history, even though they were not part of the Warsaw pact. (This follows Churchill's original (1948) statement on the 'Iron curtain'.)

Temperature: The means of the entire annual cycles of temperature is constructed for the period between 1901 and 2014 CE based on monthly global maps (0.5 by 0.5 degree cells) obtained from the CRU-TS 3.1 Climate Database. Source: Harris et al. (2014).

Population density estimate in 500 CE: Taken from Klein Goldewijk et al. (42, 43), this measures population density of a region in the year 500 CE. These estimates are based on the country estimates by McEvedy and Jones (139), broken down to the pixel level according to geographic factors that relate to the probability of settlement (e.g., proximity to waterways, temperature).

Precipitation: The means of the entire annual cycles of precipitation constructed for the time period between 1901 and 2014 CE. Based on monthly global maps (0.5 by 0.5 degree cells) obtained from the CRU-TS 3.1 Climate Database. Source: Harris et al. (140).

University exposure (medieval): Our measure of medieval university exposure was constructed analogously to our measure of regional medieval Church exposure (see Section S2.2). First, we divided Europe into pixels (0.125 x 0.125 decimal degrees or around 14km x 7km at the latitude of Stockholm). For each pixel in each half-century from the year 550 to the year 1500, we assigned the value of '1' if there was a university within 100km of the pixel's centroid (and '0' otherwise). Subsequently, we summed each pixel's exposure over all half-centuries (and multiplied it by 1/2, to get a measure expressed in centuries), yielding an approximate measure of the duration of the pixel's exposure to universities. Next, for each ESS region, we calculated the region's Church exposure by taking the mean across all the pixels whose centroids fall into the region.

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