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# Persistence of gender biases in Europe

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**Prior work suggests that modern gender bias might have historical roots but has not been able to demonstrate long-term persistence of this bias due to a lack of historical data. We follow archaeological research and employ skeletal records of women's and men's health from 139 archaeological sites in Europe dating back, on average, to about 1200 AD to construct a site-level indicator of historical bias in favor of one gender over the other using dental linear enamel hypoplasias. This historical measure of gender bias significantly predicts contemporary gender attitudes, despite the monumental socioeconomic and political changes that have taken place since. We also show that this persistence is most likely due to the intergenerational transmission of gender norms, which can be disrupted by significant population replacement. Our results demonstrate the resilience of gender norms and highlight the importance of cultural legacies in sustaining and perpetuating gender (in)equality today.**

gender equality | social attitudes | gender roles and stereotypes | historical persistence | bioarchaeology

## Significance

Gender bias is an important social problem that plagues some locations more than others. This might be because it has deep historical roots, extending back centuries. We explore this possibility by using skeletal records from archaeological sites in Europe to construct a historical indicator of gender bias based on a biological marker found in human teeth. We find that individuals who reside in places that historically favored men over women display more promale bias today than those who live in places where gender relations were more egalitarian centuries ago. This relationship disappears in locations that have suffered a large-scale population replacement, disrupting the transmission of values.

Gender equality varies significantly across modern societies (1, 2). Even within the relatively affluent and highly developed democracies, some locations are more equal than others. Gender inequities continue to persist in economic, social, and political domains (3–8) and go hand in hand with patriarchal beliefs, which privilege men over women (1, 7). One line of reasoning suggests that such promale bias has strong historical roots in cultural norms and beliefs (9–11). These norms are traced to social or agricultural practices such as religion or plow cultivation (7, 9). Other works show that gender norms are transmitted intergenerationally from parents to children (5, 12, 13).

While these explanations help us to understand how gender norms might persist, we know little about the temporal bounds of such persistence. Studies of intergenerational transmission demonstrate only that values are passed down across two or three generations, which leaves open the question of whether these norms can survive over multiple centuries or even millennia. In addition, studies of historical roots of contemporary gender attitudes are temporally confined by their measures of historical gender bias, with comprehensive cross-national measures reaching back only a few decades (14). While archaeological research uses linear enamel hypoplasias to analyze gender equality over the past two millennia (15), these measures have so far not been connected to contemporary attitudes. As a result, we still do not know how long gender bias persists over time and whether it is able to outlast significant social and structural changes. Uncovering this has important theoretical and practical relevance because it tells us about the relative power of cultural transmission in sustaining the longevity of sexist beliefs.

We explore whether historical gender bias durably predicts contemporary attitudes. Theoretically, we build on the argument about the intergenerational transfer of values according to which children observe and imitate the attitudes and actions of their parents (16–18), peers, and other role models (19–21), as an adaptive mechanism to negotiate novel and unfamiliar social settings. This process perpetuates gender-related values and norms across generations. The communal component of value transmission also suggests that certain norms become more entrenched and associated with those places in which the community resides (22). The automatic nature of the transmission process further implies that it likely continues in spite of major societal changes (16, 23, 24). Models of cultural economics and evolutionary anthropology substantiate these expectations by arguing that communal social norms and values around gender provide informative cues for decision-making (9, 25, 26) and are therefore helpful for navigating various situations without the need to acquire and process large amounts of new information (11). This provides an incentive for residents in a given place to adopt and internalize preexisting communal gender norms and values, contributing to their persistence over long periods of time. Taken together, the above argument suggests that locations that exhibited gender bias in favor of men centuries ago may also be less likely to express gender-equal beliefs today.

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Empirically, we follow research in bioarchaeology and use information on 10,000 individual teeth records from 139 archaeological sites in Europe from the Global History of Health Project (GHHP) (27). This allows us to construct a site-level measure of historical gender bias based on a biological marker of health found in human teeth (15). Large disparities in the condition of women's and men's teeth at the same site indicate that one group received better nutrition and health care than the other. The difference in the condition of their teeth therefore serves as an appropriate measure for the degree to which, at that time and at that location, women were valued over men (15, 28–33).

We match our historical measure of gender bias with data from the European Values Study (EVS, 34) on contemporary attitudes related to gender equality at that location. Overall, we show that the historical measure significantly predicts modern gender-unequal attitudes even when holding agricultural practices, religion, and other institutions constant. Within Europe, places that undervalued women relative to men in the past—sometimes a millennium or more ago—continue to be more biased in favor of men than places that have historically favored women. Furthermore, our findings are robust to different operationalizations of attitudinal gender equality: They hold regardless of whether we focus on an individual's a) stereotypical beliefs about gender roles or b) preference for males in public life.

We also investigate whether the persistence of gender norms can be attributed to the process of intergenerational transmission. Note that the above argument about the intergenerational transmission of values relies on one crucial condition: the absence of abrupt and large-scale population replacement. If the existing population in a given location was suddenly removed, the continuous transmission of gender norms at that location may be interrupted as values move or die together with the people holding and transmitting them (11). With the help of multiple empirical tests, we show that the persistence of gender bias diminishes as a result of significant population replacement at a given locality.

Overall, we demonstrate that the extent to which women are valued relative to men is incredibly stable over long periods of time. This finding is made possible by the introduction of archaeological data into the study of modern gender equality. Our finding is quite remarkable and implies that gender norms and values may be much more difficult to change than previously thought. After all, these norms persist through major institutional changes over hundreds, sometimes thousands, of years. Due to the inheritance and teaching of these norms and values across several generations, they are deeply entrenched and subject to change only when such a transmission is disrupted through significant population replacement. As such, our findings are potentially transformative and draw attention to a better understanding of how cultural forces can be channeled to undermine sexist beliefs and sustain equal ones.

## Research Design

Our main empirical analysis focuses on Europe. Studying gender norms in Europe is advantageous given the relative similarity of various institutional and environmental conditions across the region and the availability of data. This allows us to control for several factors that could affect modern gender attitudes, such as religion and political institutions. Limiting our analysis to Europe also provides a harder test for detecting significant associations between historical and contemporary gender biases because, when compared globally, differences in gender attitudes are fairly small across Europe (1, 2).

**Historical Measure of Gender Bias.** We measure historical gender bias by obtaining skeletal data from multiple archaeological sites in Europe. A sizeable portion of our dataset was compiled from the GHHP (27). We also supplemented the dataset with additional information on Scandinavia and other parts of Europe from other archaeological sources (*SI Appendix*, Table S1a.1 for the list of sources used to compile the site-level skeletal dataset for Europe). As part of the data-preprocessing stage, we removed observations in cases in which biological sex cannot be identified, teeth records were unavailable, or age less than 18 y at the time of death.

The resulting dataset contains about 10,000 female and male dental records that were observed across 139 archaeological sites in Europe (Fig. 1). In terms of its geographical coverage, our dataset spans over 25 modern-day European countries, with an average of more than 5 archaeological sites and 370 individual-level teeth records per country. A large majority of the sites also predate the onset of modern agricultural practices and the Black Death (1347 to 1351), with the median date of an archaeological site being around 1200 AD.

Our measure of historical gender bias stems from the established finding in bioarchaeology that the presence (or absence) of a biological marker found in teeth—or linear enamel hypoplasia (LEH)—reliably describes the state of a person's health (29, 35). LEHs are permanent lesions on the teeth caused by trauma, malnutrition, or disease during a person's lifetime. They are neither hereditary nor genetic phenotypes and instead form exclusively in cases of sustained bodily stress. Hence, anthropologists have tended to classify LEH as a general stress indicator because it can result from a variety of health problems such as deficiencies in vitamin A and D, diabetes, hypocalcemia, and others (36). Following the standard convention used in archaeological research, we compute the proportion of individuals with one or more LEHs at the site level (15, 27), where a larger proportion of LEH-afflicted individuals would reflect a lower quality of health at the site.

If the proportion of LEH-afflicted skeletons can generate an overall impression of the living condition at the site, then differences in LEH frequency between female and male teeth at the same location can also provide us with valuable information about which gender received preferential treatment in terms of health care and dietary resources at the time (15, 28–33).[*] As such, our historical measure of gender bias (labeled historical profemale bias) captures the proportion of male skeletons with LEH minus the proportion of females with LEH at a site. This measure ranges between −1 and 1, with a larger and positive value corresponding to better treatment of women relative to men at the site. We provide more information on the descriptive statistics of our historical measure and the method of computing the number of LEH-afflicted individuals in *SI Appendix*, section S1*A*.

**Contemporary Measures of Attitudinal Gender Bias.** To test whether there are any long-term effects of past gender norms on contemporary attitudes, we merge our historical measure of gender inequality with the two most recent iterations of the EVS data collection [Wave 4 (2008) and Wave 5 (2017)]. Specifically, we matched the coordinates of our archaeological sites with the Nomenclature of Territorial Units for Statistics (NUTS) labels

[*]While all of these studies have validated this measure, such validation is a challenging task given that social factors (e.g., religion, urbanization) also influence gender preferences (37) and female bodies may have a general mortality advantage (38).

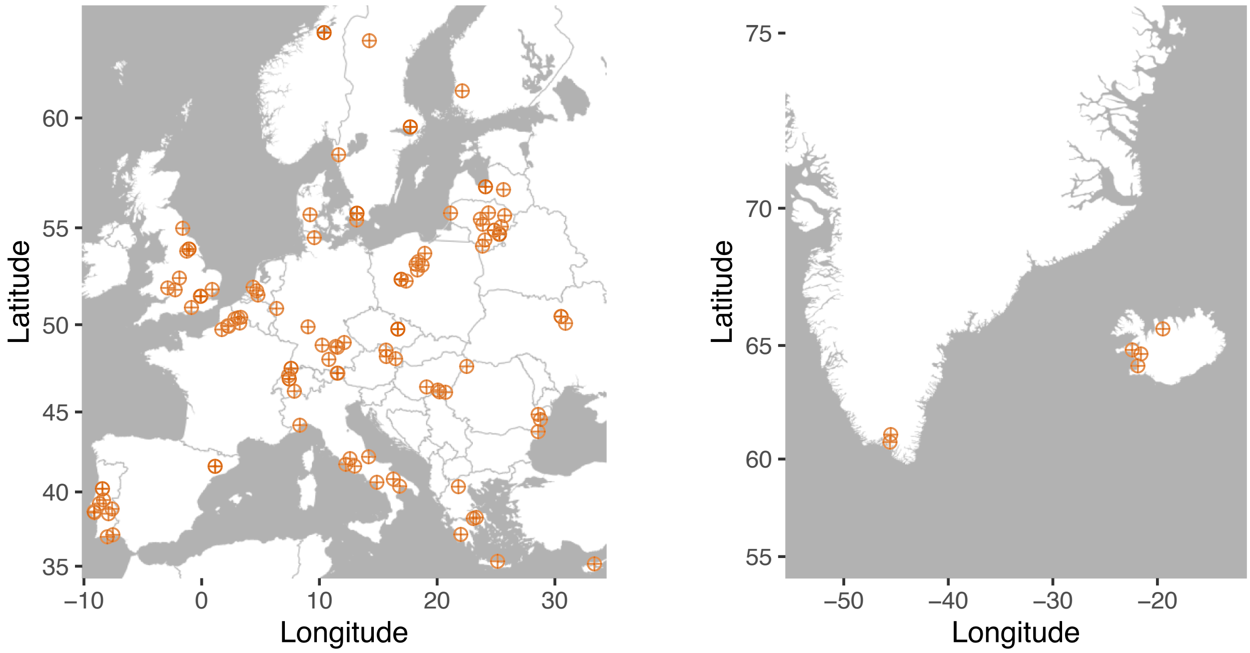


**Fig. 1.** Locations of skeletal records in mainland Europe (*Left*) and Iceland and Greenland (*Right*). Each point in the plots reflects the location of an archaeological site found in our dataset. *SI Appendix*, Table S1a.1 provides a detailed description of the locations of the sites as well as the number of dental records observed at each site.

found in waves 4 and 5 of the EVS. *SI Appendix*, section S1*B* describes the merging process in detail.

Our primary outcome measure of contemporary gender attitudes is modern profemale bias. We identified a total of 13 gender-related attitudinal questions in waves 4 and 5 of the EVS (*SI Appendix*, Table S1c.1 for the full question wording of all 13 questions). Next, we recoded individual responses so that larger values reflect more profemale attitudes. We then normalized and averaged these responses to create an overall index of a respondent's gender outlook—i.e., modern profemale bias.

The questions related to gender equality vary between waves 4 and 5 of the EVS, and they overlap only partially. For instance, a large proportion of gender-related questions in wave 4 sought to elicit respondents' opinions about the roles of women and men within the family unit (e.g., whether fathers are equally capable of raising their children as mothers). On the other hand, most questions in wave 5 solicited individual views about women's capabilities—relative to men's—in business and politics (e.g., whether men make better business executives than women).

This feature of the EVS offers a good opportunity to test whether the persistence of historical gender norms is robust to different measurements of contemporary gender attitudes. We construct two mutually exclusive subindices that capture different dimensions of gender attitudes. The first is gender roles, which reflects the degree to which a respondent expresses stereotypical beliefs about the roles of women and men in modern societies (e.g., "A job is alright but what most women really want is a home and children"). A smaller value indicates more traditional gender-role attitudes. The second subindex, profemale preference, measures respondents' views about the relative capabilities of women (e.g., "Men make better political leaders than women do") and whether men should receive preferential treatment over women in areas such as education and employment (e.g., "A university education is more important for a boy than for a girl"). We recode such that a larger value means that women are viewed in a more favorable light than men. EVS questions that are classified under each subindex are normalized and averaged to create the respective subindex score. *SI Appendix*, Table S1c.2 lists the gender-related questions that are classified under each subindex.

**Modeling Strategy.** We implement the sequential g-estimator (39), a two-stage regression model which allows us to estimate the controlled direct effect of our historical predictor on contemporary gender attitudes without inducing posttreatment bias (40) in our model estimates. In the first stage, we fit a linear model regressing pretreatment and posttreatment covariates on modern gender attitudes. The second stage is a subsequent linear model where the "demediated" outcome variable is regressed on the main predictor and the pretreatment covariates. Specifically, the "demediated" outcome variable that appears in the second stage is recalculated by removing the effects of the posttreatment variables (*SI Appendix*, section S2*A* for more information on this estimator).

The pretreatment covariates include low elevation, a binary indicator that equals one if the skeletal records were observed at a site that was less than 300 m high, and zero otherwise. Topography, in turn, indicates the terrain of the archaeological site, with flatter locations being assigned a value of one (e.g., valleys or plains) and zero for mountainous lands. These covariates allow us to account for the extent to which an area is suitable for crop cultivation (i.e., flatter terrains at lower elevations), which has been related to gender inequality in prior work (9).[†] We also include an indicator of whether Christianity had arrived at the settlement (post-Christian) since prior work suggests that Christianity might be related to more gender-unequal attitudes (7). Next, we control for the estimated age of the site by including two binary variables, Medieval (i.e., between 500 and 1500 AD) and Postmedieval (i.e., after 1500 AD), thereby allowing us to capture differences in the quality of the skeletal records that stem

[†] As a robustness test, we also reran our analyses with the crop suitability measure in ref. 9 and did not observe significant deviations from our main findings.

from wear over time.[‡] Finally, urban is a categorical measure of the type of settlement observed at the archaeological site, given that attitudes about gender roles and stereotypes at the time might have been different in urban and rural areas. We present the full list of pretreatment and posttreatment covariates and their descriptive statistics in *SI Appendix*, section S1*D*.

The models include country fixed effects in the first-stage regression, weights for the number of respondents observed in each EVS region, and bootstrapped standard errors to account for added uncertainty of the two-step procedure (41). Additionally, we include the results from OLS estimation in *SI Appendix*, Table S2d.1.

## Results

Fig. 2 reports the estimated effects of our historical measure of gender bias on modern gender attitudes, separately for waves 4 and 5 of the EVS (*SI Appendix*, Table S2a.1 for full regression results). In general, the findings demonstrate that there is a remarkable level of persistence in gender bias over time. Respondents who reside in places that had a higher profemale bias in the past, which most likely captures preferential treatment of women, tend to display more profemale attitudes today.

Focusing on the overall outcome index of modern profemale bias, the average effect of the historical measure of gender bias on contemporary attitudes across the two waves is about 0.2. To put this into context, moving from maximum historical promale bias (i.e., historical profemale bias $= -1$) to gender equality (i.e., historical profemale bias $= 0$) corresponds to a 20% increase in favorable attitudes toward women today.

The effect sizes are similar for the two subindices, gender roles and profemale preference. Recall that the latter outcome variable measures the extent to which the respondent believes that men should not receive preferential treatment over women. This is conceptually similar to our measure of historical gender bias, which also captures the extent to which men were (or were not) prioritized over women in the past. The statistically significant coefficient on profemale preference thus provides the most direct evidence of long-term persistence in favoring one gender over the other. But the effect of historical profemale bias also extends to other dimensions of modern gender bias, such as attitudes about gender roles (Fig. 2). These reflect the degree to which a respondent expresses stereotypical beliefs about the roles of women and men in modern societies and are less prevalent in areas that did not discriminate women in terms of nutrition and health care centuries ago.

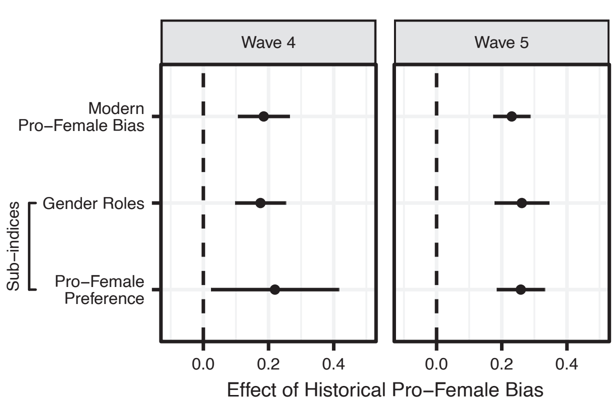


**Fig. 2.** Effect of historical gender bias on modern gender attitudes. The dots are the estimated effects of historical profemale bias on contemporary measures of gender equality, and the horizontal lines represent the 95% bootstrapped confidence intervals. Effect sizes and confidence intervals are estimated using the sequential-g estimator. Full results are presented in *SI Appendix*, Table S2a.1

[‡]Hence, the baseline category corresponds to those archaeological sites, where the skeletons can be traced back to the premedieval age (i.e., before 500 AD).

It is worth stressing that the median age of the skeletons is about 1,000 y, dating back to the medieval era (i.e., between 500 and 1500 AD). It is therefore remarkable that the patterns of gender bias that existed during those times and earlier are still replicated in contemporary attitudes. Given the enormous social, economic, and political changes that have taken place in Europe over the time frame of our data, our main findings speak to the power of cultural transmission of gender norms. We provide further qualitative evidence in *SI Appendix*, section S2*B* by zeroing in on two of our archaeological sites to illustrate how the contrasting fortunes for women and men in the past are reflected in current gender relations and attitudes.

**Robustness Checks.** We also performed a number of robustness tests and present the results in *SI Appendix*, section S2*C*. First, we assessed the possibility that our conclusions may be driven by a small minority of gender-related questions, thereby upward-biasing the model estimates. We regressed each of the 13 gender-related questions on the same set of predictor variables, pretreatment and posttreatment covariates, and country fixed effects using the sequential-g estimator. A majority of these estimates are positive and statistically significant, thereby highlighting the robustness of our findings to different operationalizations of contemporary gender attitudes.

Next, we exclude recent archaeological sites from the regression models to ameliorate the concern that our main findings may be a reflection of contemporary—and not historical—gender patterns. The substantive results do not change. Finally, we verify our findings by undertaking a number of placebo tests. We replaced the contemporary measures of gender attitudes with individual opinions on 1) the European Union (EU) and 2) government intervention in the economy and replicated the sequential-g estimation. Our historical measure of profemale bias fails to predict both sets of placebo outcomes.

## Disrupting Intergenerational Transfer: Additional Tests

We design three sets of additional tests to examine whether the persistence of gender norms is weaker or absent when the process of intergenerational transmission is disrupted. Such disruptions can occur as a result of calamitous events such as natural disasters or pandemics, which often cause an extensive removal or replacement of the native population. The bubonic plague epidemic in Europe and the replacement of the indigenous population in the Americas are examples of such events. Less dramatically, our argument also implies that the historical gender preference in any given location in Europe cannot predict the attitudes of nonnatives with no intergenerational ties to those locations. These implications become the basis of our additional tests, which we discuss in turn.

**Norm Persistence Among Immigrants vs. Nonimmigrants.** We start with the simplest empirical implication of our argument: We should detect persistence of medieval (or earlier) gender norms only among individuals who are native to the region. By contrast, the effect of historical gender bias on contemporary attitudes should be weaker or absent among recent immigrants. To perform this test, we split the EVS sample based on whether respondents were born in a different country than the one in which they are being surveyed. Across both waves 4 and 5 of the EVS, self-reported immigrants constitute a significant portion of the survey samples ($N \approx 600$ per wave), thereby alleviating the concern that the detection of null effects may be a consequence of running an underpowered test. All other specifications are identical to the main analysis.

Fig. 3 presents the estimated effects of historical profemale bias on modern gender attitudes for immigrants and nonimmigrants (*SI Appendix*, section S3A for full results). Our measure of historical gender bias fails to predict modern gender attitudes for the immigrant population but is strongly linked to contemporary gender attitudes among nonimmigrant respondents. This result underscores the argument that the persistence of gender bias follows a theoretically predictable pattern and shows up only within the population where the intergenerational transmission of values in a given location has been possible, and it is absent within the population that has been transplanted to this location only recently.

**Black Death Severity and Norm Persistence.** Next, we examine the impact of the bubonic plague epidemic (i.e., the "Black Death") of the 14th century and how it mitigates the intergenerational transmission of historical gender bias. Locations that were more severely hit by the plague should have less symmetry between historical and modern gender norms because the previous population that was transmitting these norms would have been (almost) wiped out by the plague.

Given the scarcity of reliable mortality data from the Black Death, we use pollen data as an indicator of plague severity across different regions in Europe (42). The underlying intuition is that areas that were decimated by the Black Death should experience a significant drop in the supply of agricultural labor and the demand for food crops, thereby resulting in an overall decline in the proportion of food-related pollen in the air. We track changes

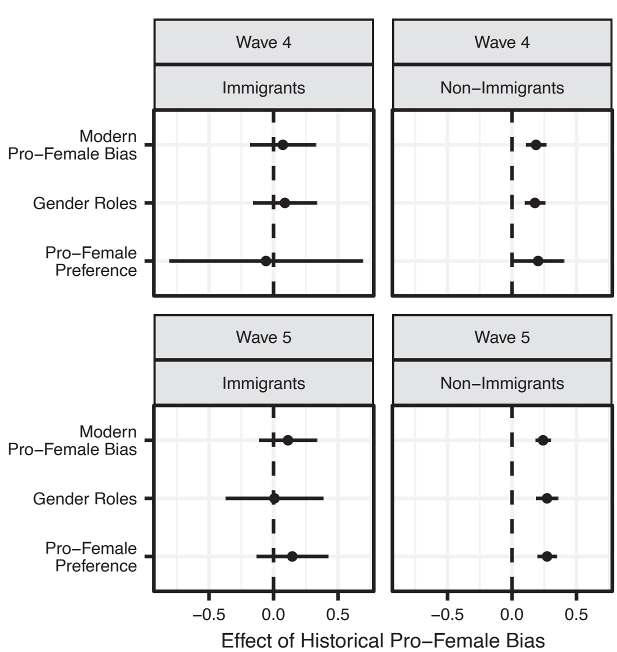


**Fig. 3.** Comparing the effect of historical gender bias on modern gender attitudes between immigrants (*Left* two plots) and nonimmigrants (*Right* two plots). Full results are presented in *SI Appendix*, Tables S3a.1 and S3a.2.

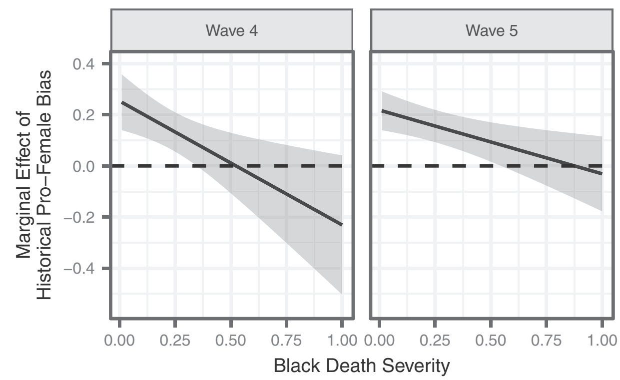


**Fig. 4.** Marginal effects of historical profemale bias, conditional on Black Death severity. The shaded regions represent the 95% bootstrapped confidence intervals of the marginal effects of historical profemale bias on modern profemale bias at various levels of Black Death severity. Full results are reported in *SI Appendix*, Table S3b.1.

in the proportion of cereal pollen in a given locality before and after the Black Death and recode this measure (i.e., black death severity) so that a larger value indicates that the Black Death had a more severe impact on the residents living in a given settlement. Next, we match each archaeological site in our skeletal dataset to the closest pollen site. Finally, we interact our historical measure of gender bias (i.e., historical profemale bias) with Black Death severity in our models, together with the same set of pretreatment and posttreatment covariates.

Fig. 4 presents the marginal effects of historical profemale bias on contemporary gender attitudes, conditional on the severity of the Black Death. Among EVS respondents who reside in locations that were left relatively unscathed by the plague (i.e., Black Death severity = 0), the marginal effects are positive and statistically significant across both EVS waves, which are consistent with the patterns observed earlier in Fig. 2. However, the effect of historical gender bias on contemporary gender attitudes eventually disappears at very high levels of plague severity. Overall, this finding affirms the argument of norm persistence through the process of intergenerational transmission, whereby preexisting gender norms cannot be passed down to later generations in cases of massive population replacement.

**Norm Persistence in the Americas.** Finally, we consider the case of Native American depopulation in the Americas as another test of the intergenerational transmission mechanism. The arrival of European settlers in the 16th century ushered in a period of violence, pandemics, and natural catastrophes across Native American settlements in the region (43, 44). Given this high level of population replacement, the level of profemale bias measured centuries ago should fail to predict modern gender attitudes in the Americas.

In terms of measurement and modeling, we follow the same procedures as the European analysis. Specifically, we collect skeletal data from the GHHP's Western Hemisphere module (35). The list of archaeological sites in the Americas is shown in *SI Appendix*, Table S3c.1. We then construct the predictor variable, historical profemale bias, using the same method as described previously. This variable should provide a good reflection of the degree to which women were valued relative to men among Native American populations as 1) we had removed sites that contained only the bones of European settlers and 2) a majority of the sites were traced to inhabitants who died before the arrival of European settlers in the late 15th century.

Our contemporary measures of gender attitudes were derived from wave 6 of the World Values Survey (WVS, 45) as there was a greater number of gender-related questions asked in this wave, and it sampled respondents from 6 out of the 8 countries found in our site-level skeletal dataset. In addition, a large majority of the gender-related questions in the WVS were expressed in the same way as those asked by the EVS, thereby ensuring consistency in the operationalization of our outcome indices i.e., modern profemale bias, gender roles, and profemale preference (*SI Appendix*, section S3*C*).

We follow the same estimation strategy as the European analysis and report the results of the analysis for the Americans in *SI Appendix*, Table S3c.4. As expected, our historical measure of gender bias fails to predict gender attitudes among WVS respondents, most of whose ancestors had, in all likelihood, migrated to the Americas only relatively recently. The null finding bolsters the argument that the persistence of gender norms follows a predictable pattern and occurs only when the transmission of these norms across generations is not interrupted.

## Discussion

Our results underscore the resilience and longevity of gender norms in spite of the monumental changes in social, economic, and political domains. With a bioarchaeological measure of historical gender bias, our main analysis reveals that European respondents who live in areas where women most likely received preferential treatment relative to men in the past continue to exhibit less promale bias today, even after holding agricultural practices and other institutional features constant. These results remain robust across two EVS waves, different operationalizations of our outcome variable, and various model specifications. We also show that this persistence may be attributed to the intergenerational transmission of gender norms.

Previous studies on gender attitudes have relied largely on contemporary survey data and consequently confined to relatively recent periods. We introduce bioarchaeological information into the study of gender bias, offering a way to capture whether and how long one gender was valued over the other. This innovation allowed us to document that the roots of modern gender attitudes in Europe extend deep into the Middle Ages and beyond. In addition, we speak to the growing literature on the historical legacies of contemporary attitudes and behavior (16, 23, 24). Our findings enrich that literature by 1) showing more directly that historical preferences predict current ones and 2) demonstrating that such persistence extends to the realm of gender as well.

Our findings are also remarkable. They suggest that the foundations of gender (in)equality are not rooted (solely) in social institutions like religion or differences in agricultural practices, but such (in)equality is also a relic of gender norms that largely predate the onset of these modern institutions. Theoretically, our findings highlight the importance of noninstitutional forces in undermining sexist beliefs and sustaining equal ones. This is in line with other recent works that study the long-term impact of various agents of political socialization (such as parents, peers, and role models) on the perpetuation of gender inequities (5).

Finally, introducing the bioarchaeological measure of historical gender equality (15, 27) to the study of contemporary gender equality opens up possible avenues for future transdisciplinary research. For example, it would be fruitful for future research to explore circumstances under which gender norms do and do not survive—aside from population replacement. This may provide further inspiration for policy interventions that seek to preserve equitable values while eradicating misogynistic beliefs from one generation to the next. These archaeological data also make it possible to explore the long-term consequences of gender bias on other socially and politically relevant outcomes, such as violence, social stability, and more. We hope future works take advantage of the possibilities afforded by these archaeological data to the study of gender equality.

## Materials and Methods

We construct a historical measure of gender bias by compiling skeletal records of women's and men's health from 139 archaeological sites in Europe. The measure takes the difference between the proportion of male and female skeletons with linear enamel hypoplasia (LEH), with larger values corresponding to better treatment of women relative to men at a given site. We use the coordinates of the archaeological sites and merge our site-level dataset with contemporary attitudinal data from the European Values Study (EVS). We then estimate the direct effect of our historical predictor on contemporary gender attitudes using the sequential g-estimator. *SI Appendix* for a detailed description of all materials and methods used within this study. The replication dataset, code, and reproduction instructions have been deposited in Harvard Dataverse (https://doi.org/10.7910/DVN/6DRYIJ).

**Data, Materials, and Software Availability.** Replication files data have been deposited in Harvard Dataverse (https://doi.org/10.7910/DVN/6DRYIJ). Previously published data were used for this work (The main data sources are as follows: (27, 34, 35, 45). Additional data sources will be listed in the replication materials posted on Harvard Dataverse upon publication.).

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