Ancestral origins of attention to environmental issues

César Barilla[*] ⓡ Palaash Bhargava[*]

This version: March 6, 2025

[Click here for latest version.]

Abstract

How does the climatic experience of previous generations affect today's attention to environmental questions? Using self-reported beliefs and environmental themes in folklore, we show empirically that the realized intensity of deviations from typical climate conditions in ancestral generations influences how much descendants care about the environment. The effect exhibits a U-shape where more stable and more unstable ancestral climates lead to higher attention today, with a dip for intermediate realizations. We propose a theoretical framework where the value of costly attention to environmental conditions depends on the perceived stability of the environment, prior beliefs about which are shaped through cultural transmission by the experience of ethnic ancestors. The U-shape is rationalized by a double purpose of learning about the environment: optimal utilization of typical conditions and protection against extreme events.

Keywords: Environment; Climate; Cultural Transmission; Economic History; Inattention; Learning; Individual Preferences.

JEL Classifications: Q50, Q54, D83, D91, Z10, N00

[*] Department of Economics, Columbia University.

We would like to thank Michael Best, Shivangi Bishnoi, Sandra Black, Laura Boudreau, Yeon-Koo Che, Mark Dean, Léa Dousset, Alex Eble, Duarte Gonçalves, Florian Grosset, Navin Kartik, Krzysztof Krakowski, Tushar Kundu, Elliot Lipnowski, Nicolas Longuet-Marx, Suresh Naidu, Cristian Pop-Eleches, Bernard Salanié, Matthias Schündeln, Matthias Sutter, Miguel Urquiola, Akanksha Vardani, Ebonya Washington, and Jack Willis for helpful comments and discussions. We are grateful to attendees of the Danish Historical Political Economy conference, Interdisciplinary PhD Workshop in Sustainable Development, Applied Microeconomics, Development and Theory colloquia at Columbia University for feedback. We thank Pari Bishen, Kevin Li Grant and Gina Nemade for research assistance. We acknowledge the support of Columbia's Program for Economic Research. ⓡ stands for random order author naming convention.

1 Introduction

Despite mounting evidence of the severe economic, social, and health implications of climate change, public opinion on the issue remains divided (Howe et al., 2015; Bell et al., 2021). Disagreement persists on, for instance, whether climate change is real, what needs to be done to protect the environment and how much attention environmental issues warrant. In order to explain the heterogeneity of beliefs about the importance of environmental issues, previous literature has highlighted the role of social factors such as education levels, political ideology, age and moral values in shaping "climate preferences" (Luo and Zhao, 2019; Bell et al., 2021; Andre et al., 2024). Instead, this paper focuses on the role of historical and cultural determinants.

Specifically, we study the effect of the climate experienced by an individual's ethnic ancestors on the importance they attach to environmental issues. We interpret the subjective importance attached to the environment through the lens of costly attention and posit that the value of attention depends on the *variability* of the climate. Acquiring knowledge about how to adapt to climate conditions and use natural resources is costly. Simultaneously, the value of adaptation depends on the overall conditions one expects to face. We assume that there are two broad motives for learning how to adapt to one's environment: optimally adjusting to typical conditions and protecting against extreme events. The former is most valuable in stable environments, where normal predictable conditions dominate. The latter is most valuable in volatile environments, where unpredictable extreme events are frequent.

The perceived value of caring about the environment is influenced by socialization and culture, the content of which reflects the accumulated experiences of successive ancestral generations. Ancestors who faced climate conditions where there is greater value to adaptation transmit greater awareness about environmental issues in their descendants. Putting everything together, this leads to the following two hypotheses. First, the realized variability of the climate in ancestral generations, understood as the intensity of deviations from normal conditions, influences their descendant's perception of the value of learning and caring about the environment, and hence their choice of attention. Second, this effect should be higher for more stable and more volatile climates faced by ancestors.

We test these hypotheses empirically by regressing two variables that capture the level of attention to climate issues on the average climate variability experienced by the corresponding ethnic ancestors. The first outcome variable is a proxy measure of individual attention to environmental issues from the 5th and 6th wave of World Value Surveys (WVS), carried out globally between 2005 and 2014. The second outcome variable is the prevalence of environment-related folklore at the ethnic group level, extracted from Michalopoulos and Xue (2021) using text analysis. We follow Giuliano and Nunn (2021) to match our outcome variables to ancestral experiences: both survey respondents from WVS and ethnic groups in the folklore database are matched to ethnic groups in Giuliano and Nunn's (2018) Ancestral Characteristics of Modern Population; the location of ethnic groups is linked to data on historical temperature anomalies from Mann et al. (2009). Our main measure of ancestral climate variability is the within-generation average intensity of deviations from (generation-specific) typical conditions, averaged across generations of ethnic ancestors over the period 1600-1920 A.D.

Our main result is that attention is U-shaped in the average variability experienced by ancestors. Descendants of populations that faced highly volatile or stable climate attach more value to environmental issues, whereas intermediate variability levels lead to lower attention. This result is robust to alternative specifications for the measure of variability, inclusion of higher moments of the temperature distribution, and the choice of sample from WVS. Using environment-related folklore as an outcome variable provides supporting evidence that this effect is mediated by cultural transmission. Interpreting folklore as a cumulative stock of knowledge and collective memory suggests that higher attention paid to environmental issues by successive generations should be reflected in a higher presence of environmental themes in a group's folklore. Therefore, the effect of ancestral climate variability on folklore should exhibit the same U-shape. This is indeed what we find.

We propose a simple and flexible model to formalize this effect. An individual's assessment of the importance of environmental issues is modeled as a costly attention problem, where information about adaptation to relevant features of the environment is costly to acquire precisely. Information may be relevant for either typical conditions or extreme events. Hence, prior beliefs about how variable a climate one might face determine the value of attention. Assuming that the empirical distribution of variability in ancestor's generations shapes the individual's prior beliefs, our main prediction is formalized as a comparative statics result: the level of attention is single-troughed in the scale of expected variability. Hence, the model provides a plausible mechanism for the empirical finding that individual attention is U-shaped in the empirical scale of climate variability experienced by ancestors.

RELATED LITERATURE This paper contributes to four strands of literature. First, our work adds to research on climate change perceptions and the determinants of environmental preferences, focusing on a novel historical factor: how ancestral climate experiences influence beliefs about climate risks. This complements existing studies on the factors shaping environmental concern, including imagery and emotion-based learning (Leiserowitz, 2006); personal experiences and morality (Weber, 2010, 1997; Hansen et al., 2004); behavioral traits, moral values, and misperceived norms (Andre et al., 2024); and political ideology and economic preferences (Luo and Zhao, 2019; Shi et al., 2016).

Second, our study speaks to the growing literature on the historical origins of preferences and norms. Many studies have examined how traditional practices, institutions, and historical events shape contemporary behavioral traits such as prosociality (Le Rossignol et al., 2022), cooperation (Lowes, 2018; Buggle and Durante, 2021), cultural evolution (Lowes et al., 2017; Giuliano and Nunn, 2021), gender norms (Alesina et al., 2013; Becker, 2024), and economic preferences (Becker et al., 2020). Most relevant to our approach are Giuliano and Nunn (2021) and Buggle and Durante (2021), who analyze the effect of dissimilarity of climate experiences *across* generations and inter-annual variation in weather conditions on traditional values and cooperative behavior, respectively. We extend this line of inquiry by exploring how historical climate variability within successive generations shapes current attention to environmental issues. Our study also contributes to theoretical discussions on cultural transmission and preference formation (see below, and Bisin and Verdier (2023) for a review). Closely related to our work, Dewitte (2024) shows that historical exposure to fossil fuel extraction leads to higher levels of climate change denial at the community level in the US, and that this is explained by the development of economic identities which influence belief formation. In a similar vein, Bhattacharya et al. (2025) highlight that interventions imparting environmental education can influence household behavior through intra-family transmission of environmental awareness and actions both from parents to children and also from children to parents.

Third, our paper engages with the literature on narrative economics. Shiller (2017) discusses how institutions and experiences shape narratives, which, in turn, influence individual preferences and decisions (see also Akerlof and Snower 2016; Anthony 2021). Stories passed down over generations preserve social memory and cultural values (Harari, 2014), and can reveal past societal characteristics (Michalopoulos and Xue, 2021). In African contexts, narratives, folklore, and songs have been employed to promote sustainable practices and raise awareness of environmental issues (Osemeobo, 1994; Amlor and Alidza, 2016; Sanganyado et al., 2018). Our paper adds a new perspective by examining how ancestral climate variability influences the environmental themes present in ethnic folklore.

Finally, we bridge the literature on (in)attention with cultural transmission theories. Our theoretical model draws from rational inattention, a concept pioneered by Sims (2003), which has since found broad applications across individual choice (Caplin and Dean, 2015; Caplin et al., 2022; Matějka and McKay, 2015), macroeconomics (Maćkowiak and Wiederholt, 2009), voting (Matějka and Tabellini, 2017), and bargaining (Ravid, 2020). For a review, see Maćkowiak et al. (2023). Our main contribution is to model cultural transmission as a mechanism that shapes prior beliefs in the attention problem, enabling a formal examination of cultural transmission through comparative statics. This approach also expands cultural transmission research (Bisin and Verdier, 2023, 2011). Our focus on a reduced-form modeling approach contrasts with literature that examines explicit transmission mechanisms (e.g., Bisin and Verdier 2001; Tabellini 2008; Panebianco and Verdier 2017; Adriani and Sonderegger 2009, 2018; Adriani et al. 2018), offering a flexible alternative framework to capture the influence of ancestral experiences on environmental attention.

The rest of the paper is structured as follows. Section 2 introduces the conceptual framework. Section 3 describes the data. Section 4 presents the empirical strategy and the results. Section 5 gives a formal model which rationalizes observed patterns. Section 6 concludes.

2 Conceptual framework

Our starting point is a stylized mechanism for how the climate experiences of previous generations impacts their descendants' choice of attention to climate issues. In this section, we provide an intuitive overview of the concepts that underpin our analysis. We introduce the variables and predictions that will be empirically tested in Section 4, and foreshadow the model structure and theoretical results which are formally introduced in Section 5.

The conceptual framework that we propose combines three ingredients: (1) modeling the subjective importance given to environmental questions as a costly attention problem, (2) assuming that the value of adaptation depends on the variability of climate conditions, and (3) capturing the influence of cultural transmission through the determination of prior beliefs in the attention problem. Figure 1 illustrates our theoretical approach and its relationship to the empirical analysis.

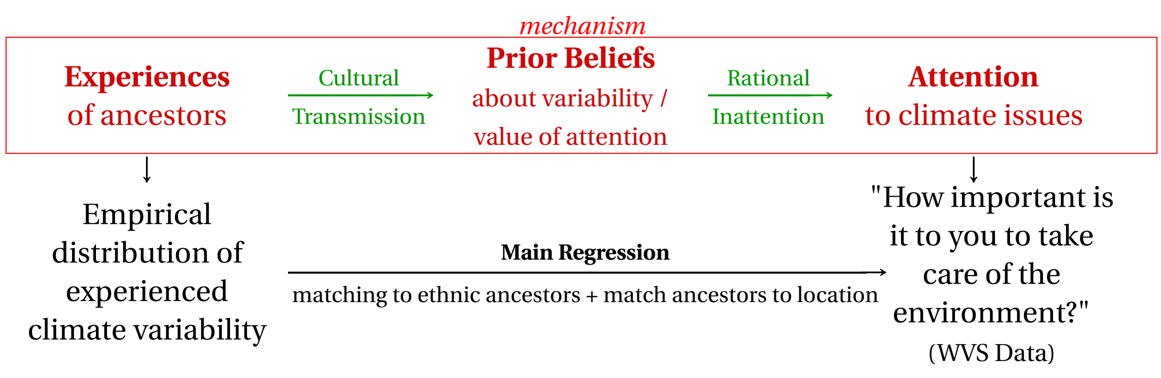


FIGURE 1: Conceptual Framework and Empirical Strategy

We interpret and represent the individually attributed importance to the environment as a costly attention problem. An agent has the possibility to learn, at a cost, about how to best adapt to some features of their environment. They may learn, for example, which crops to favor for which climates, the value of preserving underground water sources, which materials to choose for construction, how to use and protect specific natural resources, etc. Overall attention sparsely captures a broad notion of care given to issues related to the environment, which may translate into time spent, mental resources, or effort exerted in finding the optimal behavior in decisions which impact or are impacted by the specific environmental conditions the agent faces.

The value of learning about adaptation to environmental characteristics is driven by two motives: exploitation[1] of typical conditions and protection against extreme events. The overall value of learning about specific features for either motive is determined by the underlying variability of the climate. Accordingly, we make the following assumption: the value of accurate information is decreasing in variability for features that are relevant in exploiting typical conditions and increasing in variability for features that pertain to protection from extreme events. True environmental variability is not known by the agent, but they hold prior beliefs over it. The double motive for learning suggests that attention should be highest when the agent expects to face very stable or very variable conditions. Formally, attention choice should be *single-troughed* in the prior scale of volatility.[2]

The agent's prior belief about how volatile an environment they might face is influenced by the experiences of ancestors. We interpret this as a modeling device to capture how complex cultural transmission and socialization mechanisms shape an individual's primary perception. In practice, this entails that the climatic variability experienced by previous generation directly influences the expected value of attention in the descendant's problem. This gives a direct testable hypothesis: the attention to environmental issues of descendants should be non-monotonic and "U-shaped" in the realized scale of climate variability experienced by ancestral generations. This hypothesis has an intuitive interpretation: the perceived importance of attention to climate issues is highest for populations who have historically faced either more consistently stable climates (hence have learnt to rely on exploitation of typical conditions) or more consistently unstable climates (hence have learnt to value protection against unpredictable extreme events).

As shown in Figure 1, the conceptual framework directly outlines our empirical strategy. Section 3 concretely defines the variable of interest in the data. Our main regression in Section 4 tests the hypothesis of the existence of a transmission channel from ancestor experience to attention to climate issues. The model in Section 5 rigorously formalizes the conceptual framework and rationalizes the observed U-shaped relation between measures of attention to climate issue and estimates of the empirical scale of climate variability experienced by the corresponding ethnic ancestors.

[1]The word exploitation is used interchangeably with optimal utilization throughout and intended as morally neutral.

[2]Intuitively, the scale parameter controls how "stretched out" towards high intensities of climate variability the beliefs are. A higher scale entails both a higher expected level of variability and a thicker tail.

3 Data and definition of relevant variables

To empirically test our hypotheses, we need to construct: (1) a measure of attention paid to the environment at the individual or the group level; (2) the links between individuals and their ancestors from corresponding ethnic groups; (3) the links between ancestors' historical location and the climate conditions they faced.

To carry out this exercise, we combine data from four different sources. We use historical temperature data from Mann et al. (2009) to construct our measure of ancestral climate variability. We rely on Giuliano and Nunn (2018)'s Ancestral Characteristics of Modern Populations for data on ethnographic groups, and *World Value Survey* (WVS (2020)) for the variable capturing individual attention paid to environment (*level of care for the environment*). Michalopoulos and Xue (2021) provides data on ethnic environmental folklore, which gives our measure of attention paid to environment at the group level. In this section, we detail our methodology to merge all the datasets and construct the relevant variables.

HISTORICAL TEMPERATURE DATA Mann et al. (2009) provides information on global patterns of detrended surface temperature for a long historical period using a climate field reconstruction approach. The construction uses proxy data with global coverage comprising of 1036 tree-ring series, 32 ice core series, 15 marine coral series, 19 documentary series, 14 speleothon series, 19 lacustrine sediment series and 3 marine sediment series. The dataset reports the average annual temperature anomalies (deviations from the 1961-1995 reference-period average measured in degree celsius) at the 5degree-by-5degree (approximately 555km by 555km or $308,025km^2$) grid cell level since 500 AD. We restrict attention to the temperature data between 1600 AD and 1920 AD. This restriction improves reliability of the data (by restricting to years for which at least 2 types of proxies are available), and ensures that our measure of the empirical estimate of expectation of ancestral climatic volatility is independent from factors that might also influence an individual's own learning during their lifetime (by retaining a gap of at least 80 years with survey responses).

We construct a variable for the average climate variability faced by ethnic ancestors across several generations from the historical temperature data. We assume that each generation lives for 20 years and they do not overlap, as in Giuliano and Nunn (2021).[3] We also assume that all the historical generations associated to a particular ethnic group (details below) live within the same grid cell. Therefore,

[3]Our measure of ancestral climate variability should not be confused with Giuliano and Nunn (2021)'s measure of climate instability. They use across generation changes in average temperatures to capture the difference in life experiences of different generations, whereas we are interested in within-generation experiences of climate variability.

for our primary specification, each ethnic group has a total of 16 generations associated to them. The associated avg. variability measure is constructed as follows:

1. Fix a grid cell / ethnic group. Use g to denote its g^{th} generation between 1600-1920.

2. Let $z_{g,t}$ denote the temperature faced by generation g in year t of their lifetime (denote $\mathbb{T}_g$ the set of those years); denote by $\hat{F}_g$ the empirical CDF of $\{z_{g,t}\}_{t\in\mathbb{T}_g}$.

3. For each generation g compute $\hat{\eta}_g$ the average intensity of deviations from the "typical" range of temperatures. We define the typical range of temperatures to be between the α^{th} and the $(1-\alpha)^{\text{th}}$ percentile of the empirical distribution of temperature values within a generation's lifetime. Our main specification assumes $\alpha = .2$. Formally, we compute:

$$\hat{\eta}_g = \frac{1}{K_g}\sum_{t\in\mathbb{T}_g}\Big(\underbrace{\mathbb{1}_{z_{g,t}<\hat{F}_g^{-1}(\alpha)}}_{\text{if} z_{g,t}<\alpha\text{-qtile}}\underbrace{\left|z_{g,t}-\hat{F}_g^{-1}(\alpha)\right|}_{\text{dist. to }\alpha\text{-qtile}} + \underbrace{\mathbb{1}_{z_{g,t}>\hat{F}_g^{-1}(1-\alpha)}}_{\text{if} z_{g,t}>(1-\alpha)\text{-qtile}}\underbrace{\left|z_{g,t}-\hat{F}_g^{-1}(1-\alpha)\right|}_{\text{dist. to }(1-\alpha)\text{-qtile}}\Big)$$

   Where $\hat{F}_g^{-1}(\alpha), \hat{F}_g^{-1}(1-\alpha)$ denote respectively the α and $1-\alpha$ quantiles of the empirical distribution $\hat{F}_g$ and $K_g := \#\{z_{g,t} \mid z_{g,t} < \hat{F}_g^{-1}(\alpha) \text{ or } z_{g,t} > \hat{F}_g^{-1}(1-\alpha)\}$ is just the normalizing constant that counts the number of excursions outside the $(\alpha, 1-\alpha)$ percentile range. This formula has a very intuitive interpretation: for $y_{g,t}$ that falls outside the $(\alpha, 1-\alpha)$ quantile range we measure the distance to the corresponding quantile (intensity of the deviation) and then average over all such $z_{g,t}$.

4. Define the average ancestral climatic variability for an ethnic group as $\text{Avg. variability} = \frac{1}{G}\sum_{g=1}^{G}\hat{\eta}_g$. Where G is the number of generations (16 is our baseline specification).

Within each generation g, $\hat{\eta}_g$ captures the intensity deviations from typical climate conditions in the generation's lifetime, i.e how unpredictable and how extreme a climate generation g faced.[4] Averaging over generations captures the *overall scale* of climate variability experienced by one's ancestors. Variation in our variable of interest at the grid level is reported in Appendix Figure 5. In Section 4.3 our results are shown to be robust to, for instance, varying the time span of generations, modifying the thresholds for extreme events, or using alternative measures of variability.

[4] This approach is similar to the exercise carried out by climatologists in extreme weather attribution and anomaly analysis (Smith et al. (2008); National Academies of Sciences et al. (2016)). To keep the concept behind our variable intuitive and interpretable, we define intensity of deviations from a "typical range" of temperature distributions. We vary the definition of the typical range and our results are robust to different specifications.

ANCESTRAL ETHNIC GROUP DATA In order to obtain information on an individual's ancestors, we rely on Giuliano and Nunn's (2018) database on Ancestral Characteristics of Modern Populations. This dataset combines the pre-industrial characteristics[5] of ethnic groups available in Murdock's Ethnographic Atlas, Bondarenko et al.'s (2005) dataset on People of Easternmost Europe and Murdock's (1957) World Ethnographic sample.[6] Giuliano and Nunn (2018) manually match over 7,000 different dialects and languages from Gordon's (2009) Ethnologue: Languages of the World to the ethnic groups from the ethnographic data sources. The availability of the latitude and longitude of the ethnic groups location in the ethnographic datasets allows us to match the ethnographic groups to the surface grids in the Mann et al. (2009) temperature anomalies database. To see the distribution of ethnic groups from the original dataset and the ones we are able to use for our analysis, refer to Appendix Figure 6.

ATTENTION TO ENVIRONMENT - WORLD VALUE SURVEYS Our main dependent variable is the level of attention an individual pays to the environment. This level of importance to environment is captured by the individual's response to the question: *"How important is it to you to take care of the environment?"* from wave 5 and 6 of World Value Surveys. The broad phrasing of the question makes it a reasonable proxy for an individual's assessment of the importance of making efforts to adjust to the climate they face (and figure out how to optimally do so). Responses to this question are captured on a scale of 1 to 6 where 1 corresponds to not important at all and 6 corresponds to extremely important to me, which we normalize between 0 and 1.

World Value Surveys is a repeated cross section data comprising of respondents from over 100 countries over the time period 1981-2022. Individuals from participating countries are randomly sampled to construct a nationally representative sample and asked questions along the thematic categories related to perceptions of life, environment, work, family, politics, society, religion and national identity. Responses to our question of interest are only included in waves 5 and 6 between 2005 and 2014. We have a total of 157,142 respondents over a period of 2 waves (4 years each) from 78 countries.

The survey provides an array of demographic information on the respondents. Information on language spoken at home is used to link an individual to their ethnic ancestors, via the language or dialect

[5]For the purpose of our analysis, we restrict our attention to the following pre-industrial characteristics of ethnic groups: Primary mode of subsistence, Economic and political development indicators such as settlement and economic complexity, agricultural intensity, community size, and global and local jurisdictional hierarchy

[6]Information on the pre-industrial characteristics of the 1265 ethnic groups in the Ethnographic Atlas has been coded for the earliest period for which satisfactory ethnographic data is available or can be reconstructed. In total, 23 ethnicities are observed during the seventeenth century or earlier, 16 during the eighteenth century, 310 during the nineteenth century, 876 between 1900 and 1950 and 31 after 1950. See Bahrami-Rad et al. (2021) for the relevance of the *Ethnographic Atlas* in capturing traditional practices. The other two samples that Giuliano and Nunn (2018) use, Bondarenko et al. (2005) and Murdock's (1957) World Ethnographic Sample, add 27 more ethnic groups to the 1265 groups available from the Ethnographic Atlas.

associated to the ethnic groups available in the ancestral characteristics database.[7] Appendix Figure 7 provides a weighted word cloud representation of the distribution of languages in our sample. For control variables, we use information on age, education level, occupational category, income level (ten categories, standardized within the country), gender, language spoken at home and language of the interview (see Appendix Table 6 for summary statistics).

FOLKLORE Our second dependent variable which captures the level of attention to environment at the group level is constructed using the folklore data from Michalopoulos and Xue (2021). This folklore database builds on Berezkin's (2015) catalog of motifs and links the linguistic groups therein to the ethnic groups in Murdock's (1957) Ethnographic Atlas.[8] Michalopoulos and Xue (2021) link Berezkin's groups to the ethnographic groups present in the Ethnographic Atlas, thereby, providing a distribution of oral traditions and folktales associated to each ethnic group. Our conceptual framework suggests that if successive generations of an ethnic group face extremely stable or unstable environments, then each generation would pay a higher attention to climate issues. A greater focus on the environment is embedded in cultural discourse and retained in the collective memory, thereby adding to the stock of existing environmentally themed folklore.

To construct the relevant variable to test this, we first link the folklore data to the climatic variability data available from Mann et al. (2009) at the ethnic group level. Second, following the approach from Michalopoulos and Xue (2021), we use *ConceptNet* (Speer et al., 2017) to classify motifs associated to each ethnic group as an environment related or non-environment related motif.[9] Using this information, we construct our measure of environment focus in folklore as:

$$\mathfrak{F}_e := \log\left(1 + \frac{\text{No. of environment related motifs}}{\text{Total no. of motifs}}\right)$$

[7] In some marginal cases (7% of the total sample), where we do not have information on the language spoken at home, we exploit the language of the interview as a proxy for the language spoken at home. In cases where an individual reports multiple languages spoken at home or the same language is spoken by multiple ethnic groups, we link the individual to all the potential historical ethnic groups and assign equal weight to them. Our sample of interest from World Value Surveys contains 202 different language / ethnic groups. Less than 5% of the individuals in an main sample of consideration have multiple ethnic groups associated to them.

[8] Berezkin's original catalog consists of motifs related to the mythology, folklore and oral traditions for 958 groups worldwide. After parsing over 6,239 books and journal articles (documenting oral traditions) from 4,041 authors edited by 4,932 publishing houses in 32 different languages, Yuri Berezkin categorized 2,564 motifs and linked them to the ethnolinguistic groups. As per the original catalog, a motif reflected a combination of images, episodes, or structural elements found in two or more texts, including sacred and profane ones. The median group in Berezkin's catalog has 62 motifs. Each motif is accompanied with a title and a short description of an image or an episode in the group's oral tradition.

[9] We obtain a list of words related to weather, climate, temperature, environment and natural disaster from ConceptNet (Speer et al. (2017)) and then check the occurrence of the words from this list in the description of the motifs.

for each ethnic group in the Ethnographic Atlas sample. We will treat this measure as a proxy for total stock of attention paid to environmental issues over time at the group level. A relative word count across descriptions associated to the motifs in Berezkin's catalog can be found in Appendix Figure 8.

4 Empirical results

4.1 Self reported attention to environment – individual level analysis

We begin by examining the impact of average climatic variability on an individual's self reported attention to the environment. We run a simple OLS specification, controlling for individual demographic characteristics, historical ethnic group's social and political characteristics, historical ethnic group's geographical characteristics, and respondent's country-by-year fixed effects. Our empirical strategy is equivalent to a continuous treatment framework where the treatment is the average variability of ancestral climate conditions and treatment is assigned by lottery of birth, i.e. an individual does not choose which ethnicity they are born in. Our regression equation reads as:

$$y_{iect} = \beta_1 \text{Avg. Variability}_e + \beta_2 (\text{Avg. Variability}_e)^2 + \mathbf{X_{ict}}\Gamma + \mathbf{X_e}\Omega + \alpha_{ct} + \epsilon_{iect}, \quad (1)$$

where i indexes the individual, e indexes the historical ethnic group an individual belongs to, c indexes the country of the individual and t indexes year. Specifically:

- y_{iect} is our main dependent variable of interest, i.e. an individual's level of attention to environment captured by their normalized response to the question: *"How important is it to you to take care of the environment?"*;
- Avg. Variability is average climate variability across all ancestral generations, as in Section 3;
- $\mathbf{X_{it}}$ corresponds to the vector of individual level demographic characteristics which include Age, Gender, Income, Educational level and dummies for Occupation categories;
- $\mathbf{X_e}$ corresponds to the vector of historical ethnic group controls which include primary mode of subsistence[10], economic development indicators (complexity of settlement[11], size of local

[10]Fishing, Hunting, Gathering, Animal Husbandry and Pastoralism and Agriculture

[11]Values go from 1 to 8. 1: fully-nomadic, 2: semi-nomadic, 3: semisedentary, 4: compact but impermenant settlements, 5: neighborhoods of dispersed family homesteads, 6: separated hamlets forming a single community, 7: compact and relatively permanent, 8: complex settlements

community[12] and intensity of agriculture[13]) and level of local and global jurisdictional development[14]. It also includes ethnicity level geographical variables such as distance to closest coast and equator and Köppen climate classification of the spatial grid the ethnic group was historically located in;

- α_{ct} corresponds to country-year fixed effects which captures any contemporaneous variables such as level of economic development of the country (of residence), general population's level of schooling, awareness and perception of climate issues[15] and contemporary climate shocks faced by the country's population.

We cluster the standard errors at the ethnic group level. Our coefficients of interest are β_1 and β_2. Our conceptual framework suggests that the level of attention should initially decrease and then increase with the variability of the climate face by ancestral generations. As a result, the expected signs on β_1 and β_2 should be negative and positive respectively. This captures that the level of individual attention is (i) decreasing over the lower range of values of ancestral climatic variability because the diminution of benefits from exploitation dominates and (ii) increasing over higher values because the increase of the loss-protection motive for attention starts to dominate.

Table 1 below reports the results from Equation 1. Column 1 reports the results we obtain from regressing an individual's self reported measure of attention to environment on historical measures of ancestral climatic variability controlling for country-year fixed effects. Subsequent columns add individual level and historical controls. Across all specifications, our results corroborate the hypothesis. The results we find are all statistically significant at 1% level and consistent across different choice of sample or method of construction of our climate variability index.

For the purpose of a stylized illustration, assume that, on our index of climate variability, the most stable ancestral climates scored 0.01 and the most unstable ancestral climates scored 0.09.[16] In that case, the coefficients β_1 and β_2 suggest that a increase of 0.01 ($\sim$ 10%) in the average deviations from the typical climate conditions in the most stable ancestral environments would have led to a 9% *decrease* in attention to environment today relative to the sample mean and a increase of 0.01 in the average

[12]Ranging from 1 to 8 where 1: fewer than 50, 2: 50-99, 3: 100-199, 4: 200-399, 5: 400-1,000, 6: 1,000-4,999, 7: 5,000-50,000 and 8: $>50,000$

[13]Ranging from 1 to 6 where 1 corresponds to no agriculture, 2 to casual agriculture, ... , 6 to intensive irrigated agriculture

[14]Ranging from 1 to 5, denoting the number of levels within a jurisdiction.

[15]This can capture all sorts of general equilibrium factors and spillovers within the current generation that can emanate from the country of residence

[16]For the sample in consideration, the average variability in ancestral climate conditions captured by our constructed index ranges from 0.015 to 0.093. We restrict the sample to remove a small mass of outliers lying outside the 99th percentile of the distribution of our values of average variability.

Dependent variable: Self reported measure of attention to environment				
Avg. variability	-6.291***	-7.095***	-9.194***	-9.877***
	(1.587)	(1.902)	(2.087)	(2.003)
Avg. variability sq.	71.038***	78.984***	100.939***	111.767***
	(18.330)	(21.756)	(22.608)	(21.346)
Income		-0.001*	-0.001*	-0.001*
		(0.001)	(0.001)	(0.001)
Male		-0.013***	-0.013***	-0.013***
		(0.003)	(0.003)	(0.003)
Age		0.002***	0.002***	0.002***
		(0.000)	(0.000)	(0.000)
Education level		0.006***	0.006***	0.006***
		(0.001)	(0.001)	(0.001)
Occupation category Controls	N	Y	Y	Y
Historical ethnic group characteristics	N	N	Y	Y
Historical topographic characteristics	N	N	N	Y
Country-year Fixed effects	Y	Y	Y	Y
Mean of dep var	0.702	0.704	0.704	0.704
St. Dev. of dep var	0.252	0.250	0.250	0.250
Min value Avg. Variability	0.015	0.015	0.015	0.015
Max value Avg. Variability	0.093	0.093	0.093	0.093
R-sq	0.097	0.113	0.113	0.113
Adj. R-sq	0.097	0.112	0.112	0.113
N	157142	138067	138067	138067
*** p<0.01, **p<0.05, * p<0.1, + p<0.15				

TABLE 1: Coefficients for the impact of average variability of ancestral climatic conditions on individual's self-reported attention to the environment

Note: The unit of observation is an individual. The dependent variable is the individual's level of attention paid to environment. The dependent variable ranges between 0 and 1 and increases with the reported level of attention. The variable is constructed by rescaling the answer to the prompt: On a scale of 1 to 6, how important is it for this individual to take care of the environment. Average variability refers to the average intensity of deviations from the typical climate conditions (*specific to each ancestral generation*) across generations. Average variability sq. refers to the square of the average variability term. Average variability ranges between 0.015 and 0.093 within the sample. Historical ethnic group characteristics include measure of development such as agricultural intensity, complexity of settlement, level of political heirarchies, size of the local community and main source of subsistence. Historical topographic characteristics include controls for distance to the equator, distance to the closest coast and geographical Koppen climate classification for the location of the ethnic group obtained from Ethnographic Atlas. Standard errors are clustered at the ethnicity level.

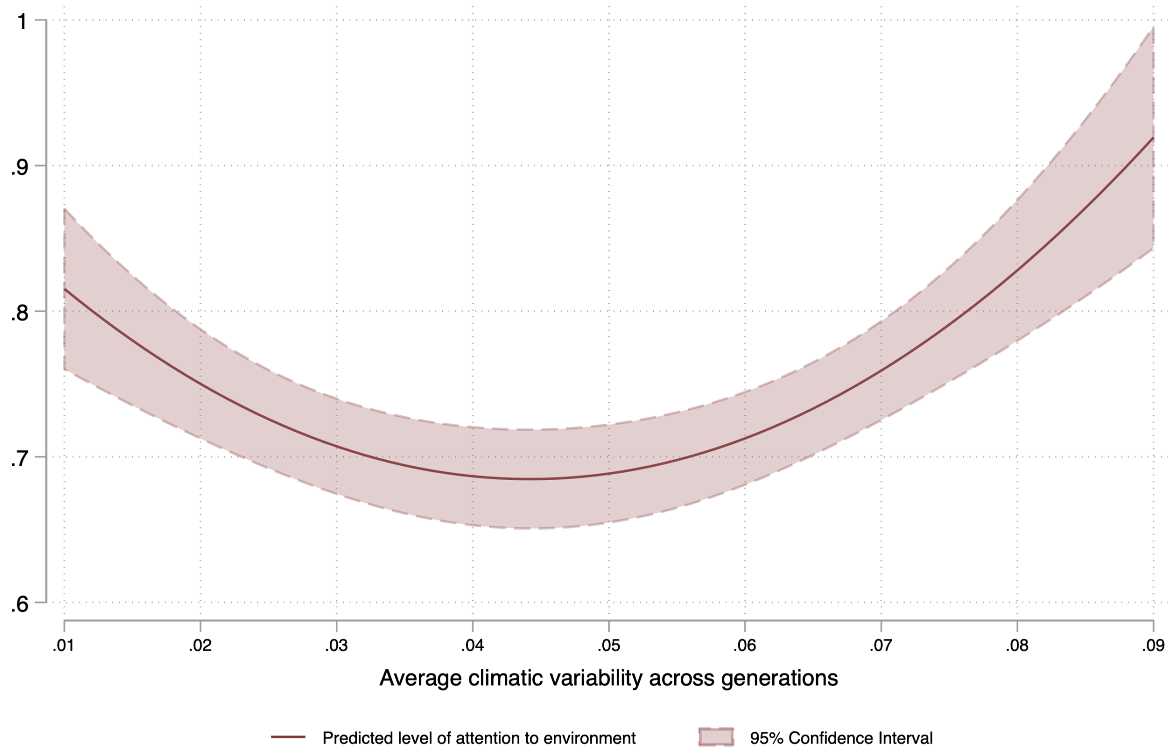


FIGURE 2: Margins plot - Individual's level of attention as a function of average ancestral climatic variability

Note: N = 138067. Margins plot corresponding to Equation 1. Average value of climate variability allowed to range from 0.01 to 0.09. The figure provides concrete evidence of an decreasing level of attention for increases in ancestral climate variability (empirical estimate of the scale parameter governing the prior) for values at the lower end (through reduced value of learning due to a lower possibility of exploitating the environment) and an increasing level of attention for increases in ancestral climate variability for values at the higher end (through increased value of learning due to an higher possibility of protection against extreme events). For the margins plot, continuous controls are fixed at their mean values. Discrete / categorical controls are fixed at Male = 1, Historically agrarian society = 1 and Köppen climate classification = D.

deviations in the most unstable ancestral environments would have led to a similar percentage point *increase* in attention to environment today.

4.2 Environmental folklore – group level analysis

Beyond individual level analysis, the impact of ancestral average climatic variability on the level of attention can be captured at the group level through the stock of knowledge and collective memory related to environmental themes. The stories, legends, songs, etc. which constitute folklore are transmitted within language groups but accross times and locations. Hence, our conceptual framework suggests that if successive generations of a particular ethnic group face climate conditions which increase each generation's level of attention paid to the environment, then this attention should result into a higher occurrence of environmental themes in folklore.

We test this implication by regressing the level of environmental focus in ethnic folklore on our variable of average ancestral climatic variability, using the data decribed in Section 3. We run the following specification at the ethnicity level:

$$\mathfrak{F}_{ec} = \beta_0 + \beta_1 \text{Avg. variability}_{ec} + \beta_2 (\text{Avg. variability})^2_{ec} + \mathbf{X_{ec}}\Omega + \alpha_c + \epsilon_{ec} \tag{2}$$

where e indexes an ethnic group, c indexes the country whose current geography would have historically included the ethnic group and $\mathfrak{F}_{ec}$ denotes the previously constructed outcome variable for prevalence of environmental motifs in folklore, i.e:

$$\mathfrak{F}_{ec} := \log\left(1 + \frac{\text{No. of related motifs}_{ec}}{\text{Total no. of motifs}_{ec}}\right)$$

$\mathbf{X_{ec}}$ captures historical ethnic group controls as before such as primary mode of subsistence, economic development indicators (complexity of settlement, size of local community and intensity of agriculture) and level of jurisdictional development (both locally and globally). It also includes ethnicity level geographical variables such as distance to closest coast and equator and Köppen climate classification of the spatial grid the ethnic group was historically located in. In line with Michalopoulos and Xue (2021), we additionally control for the first year of publication and the total number of publications, authors, publishers and languages of the text associated to each ethnic group. Country fixed effects are captured by α_c. We cluster the standard errors at the language group level as specified by Berezkin (2015). Results from this specification are reported in Table 2.

As before, the coefficient on Avg. variability is negative and statistically significant at 5% level and the coefficient on Avg. variability squared is positive and statistically significant at 5% level, thereby providing evidence that the climatic experiences of ancestors feed into the attention parameter in the same way and increase the stock of environmental folkore for either extremely stable or extremely unstable ancestral climates, with a dip in the intermediate range. An increase of 0.01 ($\sim$ 10 %) in average deviations from the typical climate conditions in the most stable environments leads to a $\sim$1% *decrease* in the proportion of environmentally related folklore and an increase of 0.01 in average deviations in the most unstable environments lead to a $\sim$1.7% increase in the proportion of environmentally related folklore.

Dependent variable: ln(1 + No. of environment related motifs/Total no. of motifs)				
Avg. variability	-3.233***	-3.172***	-2.493***	-1.548**
	(0.944)	(0.735)	(0.784)	(0.764)
Avg. variability sq.	33.930***	31.539***	25.341***	17.237**
	(9.526)	(7.684)	(8.047)	(7.112)
First year of publication		0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)
Number of authors		0.001	0.002**	0.002+
		(0.001)	(0.001)	(0.001)
Number of languages		-0.014***	-0.011***	-0.006
		(0.003)	(0.004)	(0.004)
Number of publishers		-0.001	-0.000	0.003
		(0.002)	(0.003)	(0.003)
Number of publications		-0.000	-0.002	-0.005**
		(0.002)	(0.002)	(0.002)
Historical ethnic group characteristics	N	N	Y	Y
Historical topographic characteristics	N	N	Y	Y
Country Fixed effects	N	N	N	Y
Mean of dep var	0.276	0.276	0.276	0.277
St. Dev. of dep var	0.097	0.097	0.097	0.096
Min value Avg. Variability	0.010	0.010	0.010	0.010
Max value Avg. Variability	0.097	0.097	0.097	0.097
R-sq	0.020	0.116	0.198	0.439
Adj. R-sq	0.018	0.110	0.180	0.366
N	1037	1037	1037	982
*** p<0.01, **p<0.05, * p<0.1, + p<0.15				

TABLE 2: Coefficients for the impact of climatic shocks on occurrences of environment related ethnic folklore

Note: The unit of observation is an ethnic group. Average variability refers to the average intensity of deviations from the typical climate conditions (*specific to each ancestral generation*) across generations. Average variability sq. refers to the square of the average variability term. Average variability ranges between 0.01 and 0.097 within the sample. Historical ethnic group characteristics include measure of development such as agricultural intensity, complexity of settlement, level of political heirarchies and main source of subsistence. They also include a dummy for whether the primary mode of subsistence is dominated by females of the society. Historical topographic characteristics include controls for distance to the equator, distance to the closest coast and geographical Koppen climate classification for the location of the ethnic group obtained from Ethnographic Atlas. Standard errors are clustered at language group level.

4.3 Robustness checks and heterogeneity analysis

We verify the robustness of the U-shaped relationship between average ancestral climate variability and the level of attention paid to the environment by an individual. We run multiple alternate specifications to establish that our findings are not driven by the idiosyncrasies of the sample, our choice of lifespan, range of typical conditions or misspecification of the functional form in the regression equation. We also shed light on the sensitivity of the pattern to historical ethnic group development indicators.

Choice of language sample Matching individuals to their corresponding ethnic ancestors through the use of spoken language could introduce systematic noise. First, even though our approach is agnostic on the channel of association apart from existence of a link between individuals and some of their ancestors through shared language, the mapping of descendants to their ancestors is inherently more imprecise for languages with a larger group of speakers (e.g., English, Spanish, Arabic). Further, if a large part of our sample is composed of individuals belonging to a particular language group, it is natural to test the sensitivity of our results to the inclusion of such groups. To tackle these issues, we consecutively remove three of the largest language groups from our sample. We initially exclude English and Spanish speakers from our sample (Appendix Table 3, column 2) and run Equation 1 again. In the next specification, in addition to English and Spanish speakers, we also remove Arabic speakers (Appendix Table 3, column 3). Our results and their significance stay consistent across all sample restrictions. Second, for approximately 7% of the sample in consideration, we had proxied for the language spoken at home with the language of the interview. Column 4 in Appendix Table 3 reports results from the specification where individuals whose language at home was proxied by the language of the interview are removed. The coefficients on average variability and average variability squared still retain their original signs and significance levels.

Contemporaneous region confounds Individuals belonging to a specific ethnic group within our sample of interest may have decided to migrate to specific regions whose characteristics might drive their attention to environment. Therefore, the coefficients on the average ancestral climatic variability might be picking up correlated contemporaneous effects of current location instead of ancestral experience. Firstly, our original empirical specification tackles this through the use of respondent's current country-year fixed effects. The inclusion of these fixed effects make the identification of coefficients β_1 and β_2 in our sample independent of any variation that would have jointly explained the responses of two individuals from the same ethnic group residing in the same country at the time of survey. One may still worry about the validity of our results if individuals from specific ethnic groups cluster in specific regions within the country and different regions face differential contemporaneous climatic shocks. To further robustly address this concern, we run a specification (Table 3, column 5) where we replace country-year fixed effects with region-year fixed effects.[17] That is, we increase the granularity of the contemporaneous spatial variable capturing the current location of the individual. In this case, the identification of coefficients β_1 and β_2 is independent of any variation that would have jointly explained the responses of two individuals from the same ethnic group residing in the same region of a country at the time of survey. The signs and the statistical significance of the coefficients of interest under this specification stay the same as before.

CONSTRUCTION OF ANCESTRAL CLIMATIC VARIABILITY We also test robustness of the results to our choice of measure of average climatic variability across ancestral generations. We vary our choice of lifespan for each generation from 20 to 50 years and we vary our definition of the range of typical conditions (pertinent to each ancestral generation) between $10^{\text{th}} - 90^{\text{th}}$ percentiles of temperatures within the lifetime, $20^{\text{th}} - 80^{\text{th}}$ percentiles of temperatures within the lifetime, $30^{\text{th}} - 70^{\text{th}}$ percentiles of temperatures within the lifetime. Our original specification assumed the lifespan of a generation to be 20 years (in line with Giuliano and Nunn (2021)) and the range of typical temperatures to be the $20^{\text{th}} - 80^{\text{th}}$ percentiles of temperatures within the lifetime. The first three blocks in Table 4 report the coefficients associated to average variability and average variability squared from the regression of attention to environment on these variables (with the choice of lifespan dictated by the column and the choice of typical range dictated by the row). We carry out two additional specification checks. In the first one, instead of taking the average deviations from the typical range cut points to construct the within generation climate variability index, we take the average of deviations squared. Across generation average structure still stays the same. In the second one, instead of taking deviations from typical range, we instead assume climate variability within the generation is just indexed by the standard deviation of temperatures faced by the generation. Across all cases, the signs and the significance of the coefficients seem to show that our findings are robust to alternate choices of variable construction.

OTHER CHARACTERISTICS OF TEMPERATURE DISTRIBUTIONS As a final robustness check, we test the sensitivity of results to the inclusion of other variables capturing either the overall characteristics of the historical temperature distribution associated to a particular ethnic group or variation across generations within an ethnic group. We run Equation 1 again with three modifications. In the first, we include higher order terms (such as the cube of average ancestral climate variability) in our specification. Although this runs the risk of overfitting the model, this allows us to test whether the signs

[17] Where the region is a sub-territory within the country. See WVS documentation for further details.

and statistical significance on the linear and the quadratic term is still preserved.[18] In the second, we include a term capturing the standard deviation across average temperature faced by each ethnic ancestral generation. This alleviates any concerns that our variables are acting as proxies of dissimilarities in experiences across ancestral experiences, as in the original approach of Giuliano and Nunn (2021). In the third, we include moments up to the 4$^{\text{th}}$ order (mean, standard deviation, skewness and kurtosis) of the overall temperature distribution associated to an ethnic group over a span of 320 years to assuage any concerns regarding the fact that our variables may capture some idiosyncratic geographical characteristics of the ethnic group's location beyond the topographic and climate region controls already included in the original specification. Results are reported in Appendix Table 5. As before, both the statistical significance and signs on our variables of interest are robust to the inclusion of these additional terms.

HETEROGENEOUS EFFECTS BY LEVEL OF DEVELOPMENT OF ANCESTRAL ETHNIC GROUPS As a final test of our results, we probe our claim of cultural transmission impacting an individual's level of attention to environment by exploiting the heterogeneity in ancestral experiences and characteristics at the ethnic group level. Recall that the climate experiences of the ancestors in our specifications is modelled by the average temperature deviations from normal conditions across generations. However, the temperature deviations can have differential impact on groups based on their level of development. That is, if an ethnic group was institutionally and economically developed then there is reason to believe that the variability in climate would have had a lesser bite, which in turn should affect the process of prior formation at the individual level. Theoretically, since the prior of the individual is empirically estimated through the expectation of variability distribution, the level of protection endowed by the historical economic and institutional development should reduce the value of this constant and mute the transmission.

We provide suggestive evidence of a muted effect by rerunning Equation 1 separately on sub-samples split by level of economic and institutional development at the ethnic group level. The sample is divided along four characteristics, depending on whether the ethnic ancestors of an individual (1) were hunter gatherers or non-hunter gatherers, (2) had high / low level of economic complexity, (3) had high / low level of local jurisdiction and (4) had high / low level of global jurisdiction.[19]

[18]We also run a specification which includes the 4$^{\text{th}}$ power term of ancestral climatic variability. Plotting the margins plot from the corresponding regression still exhibit a U-shaped relationship. We do not report the results here since the 3rd power and the 4th power terms show a significant level of collinearity with the linear and quadratic terms.

[19]Economic complexity is captured by the size of local communities (similar to Giuliano and Nunn (2021)). Communities of size above 400 are considered as those with high economic complexity. If a group had a local jurisdiction of atleast 4 levels or global jurisdiction of atleast one level, they are considered as communities with high local (global) jurisdiction. See WVS (2020) for more details.

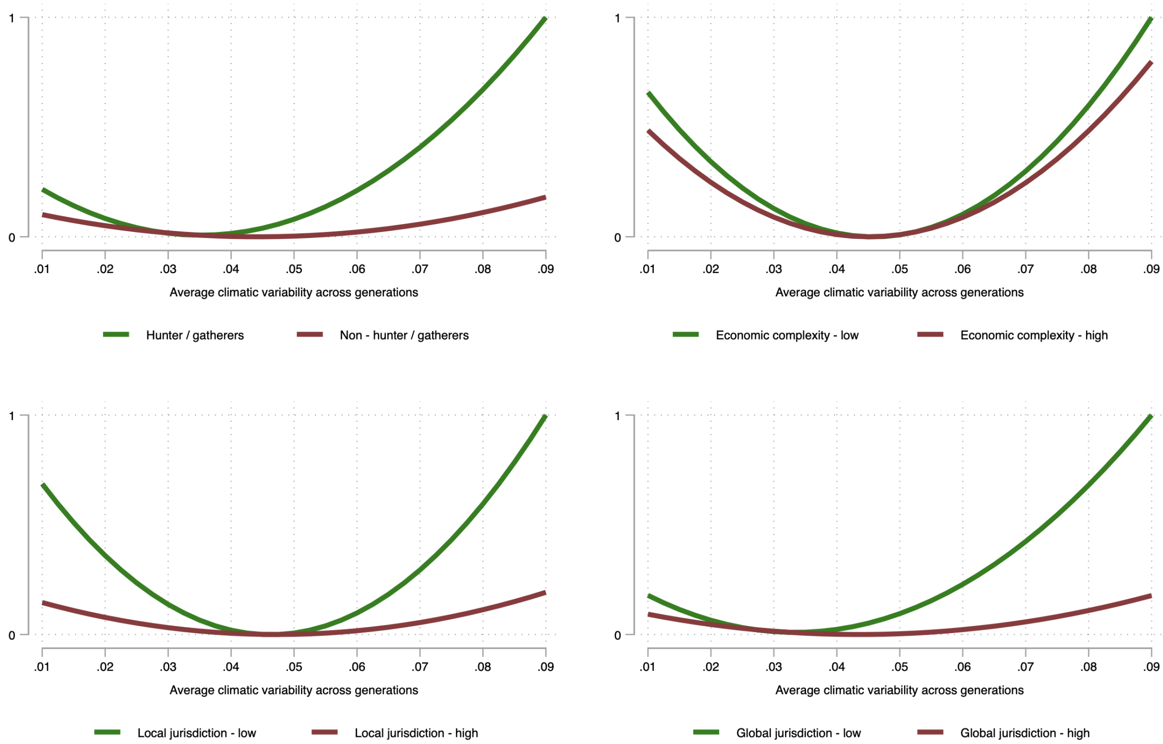


FIGURE 3: Margins plots - Relative slopes of individual level of attention function categorized by the development level of the ethnic group

Note: Margins (corresponding to Equation 1) plotted for samples split by the level of ethnic group's historical development. All values are normalized to facilitate comparison of slopes, i.e. the minimum point of margin plots across the sample split are made equal to each other and all other margin values are normalized to lie between 0 and 1. Controls are fixed at their mean values from the original sample. Top left sub-figure corresponds to margins obtained from hunter / gatherers vs non-hunter / gatherers. Top right (Bottom left / Bottom right) figure corresponds to margins obtained from low vs high level of economic complexity (local / global jurisdiction) respectively.

The main purpose of this exercise is to compare the slopes across the two samples, not the levels. Indeed, historical economic development may independently impact other factors such as the level of education or awareness towards climate issues in general. We analyze how transmission through the climatic variability at the ancestral level gets muted or amplified in the presence or absence of historical economic protection. If ancestors had a higher stock of economic and institutional protection then the actual temperature variability would result in a less than one to one transition into climate related ancestral experiences. Therefore, to facilitate comparison, we normalize the margin plots we obtain from our separate regressions, so that the minimum point of the predicted level of attention function from both the sub-samples are equalized and values are normalized to be in $[0, 1]$.

Figure 3 plots predicted attention functions for each sub-sample under the four different types of sample splits. In all cases, we see that the U-shape of the attention function is more pronounced when the ancestral level of economic and institutional development is low. This suggests that the experience of ancestors (and not the historical temperature distribution itself) is indeed the key variable which feeds into cultural transmission to shape an individual's prior today.

5 Model

We propose and solve a simple model which rationalizes the findings of the previous section. The key conceptual novelty of this model is the formalization of importance attached to climate issue as a rational inattention problem, combined with cultural transmission acting through prior beliefs. The model provides a tractable reduced-form approach to studying the effect of ancestral experiences, while remaining agnostic on the precise transmission mechanisms.

Environment and payoffs An agent is deciding how much attention to allocate to figuring out how to best adapt to some feature of the environment (e.g. which kind of crops is it best to cultivate in a given climate, how can constructions be made resistant to floods or hurricanes and to what extent should they be, how and how much water should be conserved, to what extent is it optimal to exploit forests for wood). Denote by $x \in \mathbb{R}$ the unknown optimal action in that problem, and $a \in \mathbb{R}$ the action that the agent chooses. Knowledge about x may be relevant either for exploitation of typical climate conditions or for protection against extreme events. There is a fixed probability $q \in (0, 1)$ that knowledge pertains to exploitation.

The agent bears a disutility proportional to the squared distance between their action and the true optimal action $(a - x)^2$. Intuitively: losses are proportional to mean-square prediction error, i.e posterior uncertainty about the optimal course of action. These losses are scaled by a stakes parameter γ which depends on both the purpose of information (exploitation/protection) and the (unknown) variability $\eta \in \mathbb{R}_+$ in the distribution of climate conditions that the agent will face. Intuitively, a lower η captures a very stable climate, in which typical conditions dominate and unpredictable events that deviate from those conditions are rare and mild; a higher η corresponds to a highly volatile climate where extreme deviations are frequent.

There is more scope for exploitation in stable conditions and more scope for protection in unstable conditions. Hence, if information is relevant for exploitation, stakes of learning are highest when facing a stable environment. Formally, $\gamma = w(\eta)$, where w is a decreasing, convex, $\mathscr{C}^2$ function such that $w' \underset{\infty}{\longrightarrow} 0$, i.e. the benefits of acquiring information about exploitation-type features are higher in more stable environments (which have more exploitation opportunities) and decrease at an increasing rate when moving towards more unstable environmental conditions. Conversely, if information is relevant for protection, stakes of learning are highest when facing a volatile environment. Formally, $\gamma = l(\eta)$, where l is an increasing, convex, $\mathscr{C}^2$ function such that $l'(0) = 0$, i.e. the benefits of acquiring information about protection-type features are higher in more unstable environments (which feature more deviations that require protection) and increase at an increasing rate when moving towards more unstable environmental conditions.

Given expectations about the nature of information, this leads to the following expected utility function from action a, when the true optimum is x, and under environmental variabilty η:

$$u(a|x,\eta) := -\big(q \cdot w(\eta) + (1-q) \cdot l(\eta)\big) \times |a - x|^2$$

Information acquisition The agent chooses to acquire some signal structure s which is informative about x, before they learn whether the problem is relevant for exploitation or protection.[20] The agent holds mutually *independent* prior beliefs about η, x and the nature of the problem.[21] Denote $p_0 \in \Delta(\mathbb{R}_+)$ the prior over η. Prior belief about the optimal action x is Gaussian : $x \sim \mathscr{N}(0, \sigma^2)$.

Following the large literature on rational inattention (see the recent survey Maćkowiak et al. (2023)), we assume that costs of acquiring signal structure s (i.e distribution of signals conditional on x) are linear in the Shannon mutual information between s and x. Details of the full form of the problem are provided in appendix.

Optimal attention The attention problem reduces to a simple representation by expanding expressions for expected payoffs and using classical results from the rational inattention literature (see appendix for details). Eventually, payoffs and costs can be expressed in terms of the choice of induced

[20]The assumption that the nature of the problem is not known before attention to x is chosen captures the idea that learning opportunities arise exogenously and allocation of attention to environmental issues is decided *before* knowing if the information pertains to exploitation or protection, but that fact becomes transparent once some learning occurs.

[21]This is a simplifying assumptions which is partly made for tractability but can be justified and interpreted as such: independence between x and ι means that the nature of the problem doesn't affect the ex ante belief about the content of its solution; independence between x, ι and η is justified by the fact that x, ι capture local unconditional knowledge about some particular problem and η only impacts payoffs by determining the relevance of that knowledge in context.

posterior variance $\sigma^2_{x|s}$ about x from signal s. A final relabeling recasts the problem in terms of the *attention level* $\xi := 1 - \frac{\sigma^2_{x|s}}{\sigma^2} \in [0,1]$ (where σ^2 is prior variance). This gives the following problem:

$$\max_{\xi \in [0,1]} \xi \times \int_{\mathbb{R}_+} \big(W(\eta) + L(\eta)\big) d p_0(\eta) - c(\xi), \tag{$\bigstar$}$$

where:

$$W(\eta) := \sigma^2 q w(\eta), \quad L(\eta) = \sigma^2 (1-q) l(\eta), \quad c(\xi) := \frac{\kappa}{2} \log\Big(\frac{1}{1-\xi}\Big).$$

The solution for the optimal attention level is given by:

$$\xi^* = \max\left\{0, 1 - \frac{\kappa}{2\int_{\mathbb{R}_+}\big(W(\eta)+L(\eta)\big) d p_0(\eta)}\right\}$$

We interpret ξ as the main outcome variable of interest from our empirical analysis: ξ captures the agent's level of attention to climate issues, which we equate to a measure of how much one cares about environmental questions. $\xi = 0$ represents no information being acquired and $\xi = 1$ represents acquisition of perfect information, which is theoretically possible but precluded by costs.

The reduced problem $\bigstar$ highlights the minimal structure and assumptions (about W,L,c and the structure of problem) that are needed to derive our main result below. Given that we interpret this model as a heuristic representation, we adopt a cautiously minimal stance which reinforces the generality of the "U-shape" prediction. Hence, any alternative primitive specification that can be mapped to $\bigstar$ would be equivalent.

CULTURAL TRANSMISSION VIA PRIORS AND COMPARATIVE STATICS We hypothesize that ancestral climate experiences shape an individual's prior beliefs about climate variability. Specifically, the agent's prior belief p_0 about the variability parameter η (which determines stakes in the attention problem) is formed through mechanisms of cultural transmission, which aggregates experiences of ethnic ancestors.

The concrete interpretation of transmission mechanisms is flexible. Cultural transmission could be interpreted as literally influencing prior belief about future climate variability. Alternatively, the prior can be treated as a mere convenient modeling device: what ancestral experiences determine is the perceived value of learning about environmental adaptation; populations exposed to persistently stable or unstable climates attribute greater importance to learning about adaptation and pass this perception on to descendants. Either way, the model provides a tractable reduced form for capturing the role of ancestral history on current attention.

Assume that the prior belongs to a *scale family* of distributions, parametrized by a one-dimensional scale parameter $\theta > 0$ and a reference probability distribution $\overline{p} \in \Delta(\mathbb{R}_+)$ absolutely continuous and with full support, such that:

$$p_0(\eta) = \frac{1}{\theta}\overline{p}\Big(\frac{\eta}{\theta}\Big)$$

This specification captures the idea that increasing the scale θ stretches the distribution, raising the perceived likelihood of high climate variability. Assume that $\overline{p}$ has expectation μ and variance ν^2. Scale θ determines both the expectation and variance of p_0:

$$\mathbb{E}_{p_0}[\eta] = \mu\theta \quad \text{and} \quad \mathbb{V}_{p_0}(\eta) = \nu^2\theta^2.$$

With η as a measure of intensity, this scale parameterization naturally links comparative statics in θ to perceived stakes in learning about adaptation through functions $W(\eta)$ and $L(\eta)$.

To explicitly introduce cultural transmission and align the model with our empirical strategy, we assume that θ is a function of ancestral climate variability $\hat{\eta}$. In general, transmission can be formalized via some function Φ that compounds intergenerational transmission. Formally, the prior scale parameter of the current generation is given by $\theta = \Phi(\hat{\eta}_1, ..., \hat{\eta}_G)$, where $\{\hat{\eta}_g\}_{g=1,...,G}$ is the sample of experienced climate variability for the previous G generations of direct ancestors (indexed backwards). A minimal assumption would be that Φ is increasing in each of its components. We will test an even simpler specification where Φ is the sample average:

$$\theta = \frac{1}{G}\sum_{g=1}^{G}\hat{\eta}_g \tag{CT}$$

This formulation implies that the empirical distribution of ancestral experiences shapes an individual's belief about climate variability and hence the stakes of environmental adaptation. Proposition 1 below states the theoretical comparative statics result of attention on scale of prior variability θ.

Proposition 1. *Denote $\xi^*(\theta)$ the optimal level of attention in ★ for a given prior scale parameter θ. There exists two thresholds $\underline{\theta} \leq \overline{\theta}$ such that: ξ^* is strictly decreasing over $(0, \underline{\theta}]$, $\xi^*(\theta) = 0$ in $(\underline{\theta}, \overline{\theta})$ and ξ^* is strictly increasing over $[\overline{\theta}, \infty)$.*

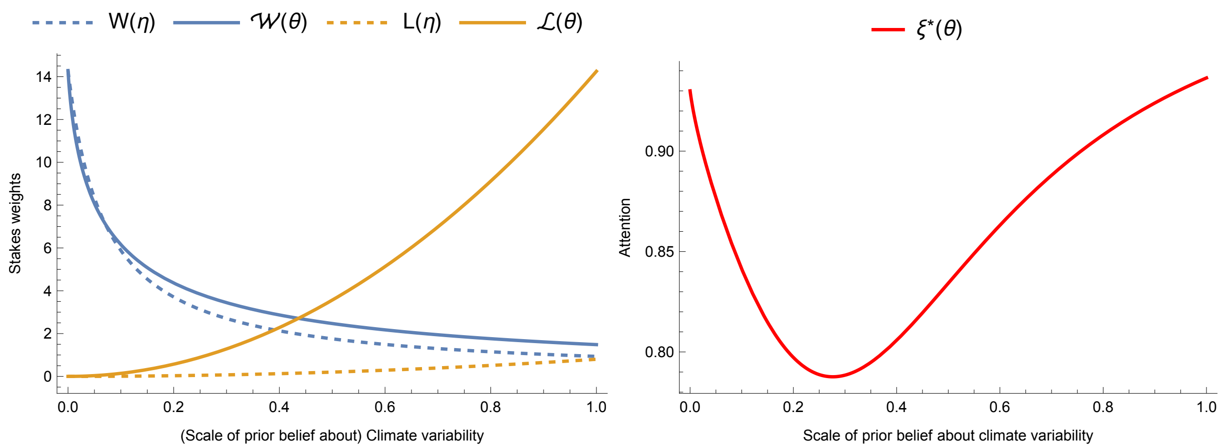


FIGURE 4: Illustration of payoff structure and optimal attention strategy

Note: To construct this example, we assume that the exploitation-motive weighting function W takes an inverse form $W(\eta) = \frac{1}{a+\eta}$ with $a > 0$ a constant and the protection-motive weighting function L is quadratic $L(\eta) = b\eta^2$ for a constant $b > 0$. We further assume that the prior p_0 about η belongs to a log-normal family parametrized by scale $\theta > 0$.[22] This allows us to compute expected weights as a function of scale $\mathscr{W}(\theta) = \mathbb{E}[W(\eta)]$ and $\mathscr{L}(\theta) = \mathbb{E}[L(\eta)]$ (also plotted in Figure 4). Lastly, we assume that the attention cost is obtained from the underlying Shannon cost specification previously introduced i.e $c(\xi) = \frac{\kappa}{2}\log(\frac{1}{1-\xi})$. The right panel plots the resulting optimal attention strategy and illustrates the key "U-Shape" prediction.

Figure 4 illustrates the result. The proof is in appendix. The model predicts that attention should be single-troughed in the scale of expected variability, hence in the average variability experienced by ethnic ancestors.

Because information about adaptation to environmental conditions (*caring about the environment*) is more valuable when climate is either more stable or more unstable and because perceptions of climate instability and/or the value of information are determined by the experiences of successive generations through cultural transmissions, individuals whose ancestors have faced more consistently stable/moderate or unstable/extreme climates are led to pay more attention to climate issues, whereas attention dips for intermediate level of experienced ancestral climate variability. The model thus provides a formal basis for our empirical specification and rationalizes the empirical finding that ancestral variability leads to high attention levels at both extremes of climate stability and volatility.

6 Conclusion

The starting point of this paper is a simple intuition: attention to climate-related issues is influenced by ancestors' climatic experiences through cultural transmission. We formalize this idea into an empirically testable hypothesis and, using four data sources, examine how ancestral climate variability affects individual and group attention to environmental issues. Our results show a significant impact: attention follows a robust U-shaped pattern, with individuals whose ancestors faced consistently stable or volatile climates showing the highest concern for environmental issues, and a dip for intermediate conditions.

We propose a flexible theoretical framework to explain this pattern, rooted in a dual purpose of learning—exploiting typical conditions and protecting against extremes. Our model captures the effect of cultural transmission by assuming that perceived stakes are influenced by prior beliefs, which aggregate ancestral experiences via a scale parameter. The framework predicts the U-shaped pattern of attention under mild assumptions, underscoring that the dual purpose of learning drives the result. To further support the cultural transmission mechanism, we analyze environmental themes in folklore, which displays the same U-shape, suggesting that folklore retains attention given to environmental issues over generations. Additional heterogeneity analysis reveals a differential sensitivity to ancestral experiences based on characteristics like economic development.

Beliefs about environmental issues are of critical importance in the age of climate change. By highlighting the role of culture and socialization, our work contributes to the broader study of cultural transmission and its impact on climate preferences. We hope that this project provides clear evidence and a simple analytical framework, laying groundwork for further research on the cultural and ancestral roots of environmental concerns.

References

Fabrizio Adriani and Silvia Sonderegger. Why do parents socialize their children to behave prosocially? an information-based theory. *Journal of Public Economics*, 93(11-12):1119–1124, 2009. 4

Fabrizio Adriani and Silvia Sonderegger. Signaling about norms: Socialization under strategic uncertainty. *The Scandinavian Journal of Economics*, 120(3):685–716, 2018. 4

Fabrizio Adriani, Jesse A Matheson, and Silvia Sonderegger. Teaching by example and induced beliefs in a model of cultural transmission. *Journal of Economic Behavior & Organization*, 145:511–529, 2018. 4

George A Akerlof and Dennis J Snower. Bread and bullets. *Journal of Economic Behavior & Organization*, 126:58–71, 2016. 3

Alberto Alesina, Paola Giuliano, and Nathan Nunn. On the origins of gender roles: Women and the plough. *The quarterly journal of economics*, 128(2):469–530, 2013. 3

Martin Q. Amlor and Matthew Q. Alidza. Indigenous Education in Environmental Management and Conservation in Ghana: The Role of Folklore. *Journal of Environment and Ecology*, 7(1), 2016. 3

Peter Andre, Teodora Boneva, Felix Chopra, and Armin Falk. Peter andre and teodora boneva and felix chopra and armin falk. *Review of Economics and Statistics*, pages 1–46, 2024. 1, 2

Patrick Anthony. Labour, folklore, and environmental politics in german mining around 1800. *The Historical Journal*, 64(3):583–605, 2021. 3

Duman Bahrami-Rad, Anke Becker, and Joseph Henrich. Tabulated nonsense? testing the validity of the ethnographic atlas. *Economics Letters*, 204:109880, 2021. 8

Anke Becker. On the economic origins of restrictions on women's sexuality. *The Review of Economic Studies*, 2024. 3

Anke Becker, Benjamin Enke, and Armin Falk. Ancient origins of the global variation in economic preferences. In *AEA Papers and Proceedings*, volume 110, pages 319–23, 2020. 3

James Bell, Jacob Poushter, Moira Fagan, and Christine Huang. In response to climate change, citizens in advanced economies are willing to alter how they live and work. Technical report, September 2021. 1

Yuri Berezkin. Folklore and mythology catalogue: Its lay-out and potential for research. *The Retrospective Methods Network Newsletter*, 10:58–70, 2015. 9, 14

Shubhro Bhattacharya, Sara M. Constantino, Niranjana Mishra, Nishith Prakash, Shwetlana Sabarwal, Dighbijoy Samaddar, and Raisa Sherif. Do kids teach parents: Impact of environmental education on household behaviors. *Working Paper*, 2025. 3

Alberto Bisin and Thierry Verdier. The economics of cultural transmission and the dynamics of preferences. *Journal of Economic theory*, 97(2):298–319, 2001. 4

Alberto Bisin and Thierry Verdier. The economics of cultural transmission and socialization. In *Handbook of social economics*, volume 1, pages 339–416. Elsevier, 2011. 3

Alberto Bisin and Thierry Verdier. Advances in the economic theory of cultural transmission. *Annual Review of Economics*, 15, 2023. 3

Dmitri Bondarenko, Alexander Kazankov, Daria Khaltourina, and Andrey Korotayev. Ethnographic Atlas XXXI: Peoples of Easternmost Europe. *Ethnology*, 44(3):261–289, 2005. 8

Johannes C Buggle and Ruben Durante. Climate risk, cooperation and the co-evolution of culture and institutions. *The Economic Journal*, 131(637):1947–1987, 2021. 3

Andrew Caplin and Mark Dean. Revealed preference, rational inattention, and costly information acquisition. *American Economic Review*, 105(7):2183–2203, 2015. 3

Andrew Caplin, Mark Dean, and John Leahy. Rationally inattentive behavior: Characterizing and generalizing shannon entropy. *Journal of Political Economy*, 130(6):1676–1715, 2022. 3

Thomas M. Cover and Joy A. Thomas. *Elements of Information Theory 2nd Edition (Wiley Series in Telecommunications and Signal Processing)*. Wiley-Interscience, July 2006. ISBN 0471241954. 34

Edgard Dewitte. Economic identities and the historical roots of climate change attitudes in the u.s. *Working Paper*, 2024. 3

Paola Giuliano and Nathan Nunn. Ancestral Characteristics of Modern Populations. *Economic History of Developing Regions*, 33(1):1–17, January 2018. 2, 6, 8, 38

Paola Giuliano and Nathan Nunn. Understanding cultural persistence and change. *The Review of Economic Studies*, 88(4):1541–1581, 2021. 1, 3, 6, 17, 18

RG Gordon. Ethnologue: Languages of the world, 16th ed. *SIL International, Dallas*, 2009. 8

James W Hansen, Sabine M Marx, and Elke U Weber. The role of climate perceptions, expectations, and forecasts in farmer decision making: the argentine pampas and south florida: Final report of an iri seed grant project. 2004. 2

Yuval Noah Harari. Sapiens: A brief history of humankind. *Publish in agreement with The Deborah Harris Agency and the Grayhawk Agency*, 2014. 3

Peter D. Howe, Matto Mildenberger, Jennifer R. Marlon, and Anthony Leiserowitz. Geographic variation in opinions on climate change at state and local scales in the USA. *Nature Climate Change*, 5 (6):596–603, June 2015. 1

Etienne Le Rossignol, Sara Lowes, and Nathan Nunn. Traditional supernatural beliefs and prosocial behavior. Technical report, National Bureau of Economic Research, 2022. 3

Anthony Leiserowitz. Climate Change Risk Perception and Policy Preferences: The Role of Affect, Imagery, and Values. *Climate Change*, 77:45–72, 2006. 2

Sara Lowes. Matrilineal kinship and spousal cooperation: Evidence from the matrilineal belt. Technical report, UCSD, 2018. 3

Sara Lowes, Nathan Nunn, James A Robinson, and Jonathan L Weigel. The evolution of culture and institutions: Evidence from the kuba kingdom. *Econometrica*, 85(4):1065–1091, 2017. 3

Yu Luo and Jiaying Zhao. Motivated attention in climate change perception and action. *Frontiers in Psychology*, 10, 2019. 1, 2

Bartosz Maćkowiak and Mirko Wiederholt. Optimal sticky prices under rational inattention. *American Economic Review*, 99(3):769–803, 2009. 3, 34

Bartosz Maćkowiak, Filip Matějka, and Mirko Wiederholt. Rational inattention: A review. *Journal of Economic Literature*, 61(1):226–273, 2023. 3, 21, 33, 34

Michael E. Mann, Zhihua Zhang, Scott Rutherford, Raymond S. Bradley, Malcolm K. Hughes, Drew Shindell, Caspar Ammann, Greg Faluvegi, and Fenbiao Ni. Global signatures and dynamical origins of the little ice age and medieval climate anomaly. *Science*, 326(5957):1256–1260, 2009. 2, 6, 8, 9, 37

Filip Matějka and Alisdair McKay. Rational inattention to discrete choices: A new foundation for the multinomial logit model. *American Economic Review*, 105(1):272–298, 2015. 3

Filip Matějka and Guido Tabellini. Electoral competition with rationally inattentive voters. *Available at SSRN*, 2017. 3

Stelios Michalopoulos and Melanie Meng Xue. Folklore*. *The Quarterly Journal of Economics*, 136(4): 1993–2046, 01 2021. 1, 3, 6, 9, 14, 38

George Peter Murdock. World ethnographic sample. *American Anthropologist*, 59:664–687, 1957. 8, 9

Engineering National Academies of Sciences, Medicine, et al. Committee on extreme weather events and climate change attribution, board on atmospheric sciences and climate, division on earth and life studies (2016) attribution of extreme weather events in the context of climate change. 2016. 7

Gbadebo J Osemeobo. The role of folklore in environmental conservation: evidence from edo state, nigeria. *The International Journal of Sustainable Development & World Ecology*, 1(1):48–55, 1994. 3

Fabrizio Panebianco and Thierry Verdier. Paternalism, homophily and cultural transmission in random networks. *Games and Economic Behavior*, 105:155–176, 2017. 4

Doron Ravid. Ultimatum bargaining with rational inattention. *American Economic Review*, 110(9): 2948–2963, 2020. 3

Edmond Sanganyado, Charles Teta, and Busani Masiri. Impact of african traditional worldviews on climate change adaptation. *Integrated Environmental Assessment and Management*, 14(2):189–193, 2018. 3

Jing Shi, Vivianne HM Visschers, Michael Siegrist, and Joseph Arvai. Knowledge as a driver of public perceptions about climate change reassessed. *Nature Climate Change*, 6(8):759–762, 2016. 2

Robert J Shiller. Narrative economics. *American economic review*, 107(4):967–1004, 2017. 3

Christopher A Sims. Implications of rational inattention. *Journal of monetary Economics*, 50(3):665–690, 2003. 3

Thomas M Smith, Richard W Reynolds, Thomas C Peterson, and Jay Lawrimore. Improvements to noaa's historical merged land–ocean surface temperature analysis (1880–2006). *Journal of climate*, 21(10):2283–2296, 2008. 7

Robyn Speer, Joshua Chin, and Catherine Havasi. Conceptnet 5.5: An open multilingual graph of general knowledge. In *Thirty-first AAAI conference on artificial intelligence*, 2017. 9

Guido Tabellini. The scope of cooperation: Values and incentives. *The Quarterly Journal of Economics*, 123(3):905–950, 2008. 4

Elke U. Weber. What shapes perceptions of climate change? *Advanced Review*, 1(3):332–342, 2010. 2

EU Weber. Perception and expectation of climate change: Precondition for economic and technological adaptation in bazerman m., messick d., tenbrunsel a., and wade-benzoni k.(eds.) psychological perspectives to environmental and ethical issues in management (314–341), 1997. 2

WVS. European values study and world values survey: Joint evs/wvs 2017-2021 dataset (joint evs/wvs). 2020. 6, 18, 38

Appendix

A Robustness Checks Results

The following section presents detailed results for the robustness checks in Section 4.

A.1 Choice of language sample

Notes on Table 3: The unit of observation is an individual. The dependent variable is the individual's level of attention paid to environment. The dependent variable ranges between 0 and 1 and increases with the reported level of attention. The variable is constructed by rescaling the answer to the prompt: On a scale of 1 to 6, how important is it for this individual to take care of the environment. Average variability refers to the average intensity of deviations from the typical climate conditions (*specific to each ancestral generation*) across generations. Average variability sq. refers to the square of the average variability term. Average variability ranges between 0.015 and 0.093 within the sample. Region-year fixed effects control for geography specific year fixed effects at a more granular level than the country. Historical ethnic group characteristics include measure of development such as agricultural intensity, complexity of settlement, level of political heirarchies, size of the local community and main source of subsistence. Historical topographic characteristics include controls for distance to the equator, distance to the closest coast and geographical Koppen climate classification for the location of the ethnic group obtained from Ethnographic Atlas. Lang. at home only refers to the case where we remove all individuals for whom we proxied the language spoken at home by the language of interview. Standard errors are clustered at the ethnicity level.

A.2 Contemporaneous region confounds

Notes on Table 4: The unit of observation is an individual. The dependent variable is the individual's level of attention paid to environment. The dependent variable ranges between 0 and 1 and increases with the reported level of attention. The variable is constructed by rescaling the answer to the prompt: On a scale of 1 to 6, how important is it for this individual to take care of the environment. Avg. refers to the average intensity of deviations from the typical climate conditions (*specific to each ancestral generation*) across generations. Avg. sq. refers to the square of the average variability term. Every regression includes controls for demographic characterstics, ethnicity level group and topographic characteristics and country-year fixed effects. Each column varies the lifespan of ancestral generation in our method of construction of the average variability term. Each row varies the choice of the typical range. Dev. from 20-80 (our main specification) refers to the deviations from the cut points of the range of typical temperatures for each generation, where typical temperatures lie between 20^{th} and 80^{th} percentile of generation specific temperatures. Dev. from 10-90 and 30-70 are defined analogously. Dev. (sq.) from 20-80 instead squares the deviations from the cut points before taking the average. Std. Dev. instead of

TABLE 3: Robustness checks: Coefficients for the impact of average variability of ancestral climatic conditions on individual's self-reported attention to the environment

Dependent variable: Self reported measure of attention to environment					
Avg. variability	-9.877***	-9.243***	-8.903***	-9.897***	-6.649***
	(2.003)	(1.988)	(2.206)	(2.011)	(2.023)
Avg. variability sq.	111.767***	107.503***	103.956***	111.862***	71.929***
	(21.346)	(21.557)	(25.184)	(21.505)	(22.402)
Income	-0.001*	-0.001+	-0.002+	-0.001+	-0.001+
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Male	-0.013***	-0.012***	-0.014***	-0.013***	-0.014***
	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)
Age	0.002***	0.002***	0.002***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education level	0.006***	0.006***	0.007***	0.006***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Occupation category Controls	Y	Y	Y	Y	Y
Historical ethnic group characteristics	Y	Y	Y	Y	Y
Historical topographic characteristics	Y	Y	Y	Y	Y
Country-year Fixed effects	Y	Y	Y	Y	N
Region-year Fixed effects	N	N	N	N	Y
Sample restrictions					
English speakers excluded	N	Y	Y	N	N
Spanish speakers excluded	N	Y	Y	N	N
Arabic speakers excluded	N	N	Y	N	N
Lang. at home only	N	N	N	Y	N
Mean of dep var	0.704	0.700	0.689	0.703	0.705
St. Dev. of dep var	0.250	0.251	0.249	0.251	0.250
Min value Avg. Variability	0.015	0.015	0.015	0.015	0.015
Max value Avg. Variability	0.093	0.093	0.093	0.093	0.093
R-sq	0.113	0.122	0.118	0.114	0.160
Adj. R-sq	0.113	0.121	0.117	0.113	0.151
N	138067	110484	93184	128532	135228
*** p<0.01, **p<0.05, * p<0.1, + p<0.15					

defining the deviations from the typical range just takes takes the Standard deviation of temperatures within a generation as a measure of climatic shocks. ***p<0.01, **p<0.05, * p<0.1, + p<0.15

TABLE 4: Coefficient on average variability of ancestral climatic conditions - Robustness by method of variable construction

Dependent variable: Self reported measure of attention to environment					
Lifespan of generation:		20 years	30 years	40 years	50 years
Dev. from 10-90	Avg.	-14.742***	-13.926***	-10.453***	-5.884***
		(4.739)	(2.433)	(2.067)	(1.770)
	Avg. sq.	316.651***	235.773***	143.257***	64.708***
		(103.216)	(40.585)	(25.865)	(18.135)
Dev. from 20-80	Avg.	-9.877***	-5.064***	-5.618***	-4.423***
		(2.003)	(1.770)	(1.159)	(1.256)
	Avg. sq.	111.767***	44.420***	44.969***	31.565***
		(21.346)	(16.391)	(8.496)	(8.888)
Dev. from 30-70	Avg.	-7.082***	-2.055+	-3.529***	-3.402***
		(1.602)	(1.399)	(1.095)	(1.132)
	Avg. sq.	57.857***	12.856	23.773***	19.033***
		(12.367)	(9.672)	(6.999)	(6.150)
Dev. (sq.) from 20-80	Avg.	-9.064*	-13.880***	-7.059**	-5.105**
		(4.686)	(4.641)	(2.750)	(2.144)
	Avg. sq.	1076.265***	1016.342***	400.162***	238.084***
		(377.298)	(342.086)	(127.251)	(74.105)
Standard Deviation	Avg.	-4.131***	-1.675*	-1.529*	-1.707**
		(0.993)	(0.993)	(0.922)	(0.799)
	Avg. sq.	21.710***	6.709+	6.903+	6.353**
		(5.015)	(4.347)	(4.316)	(3.039)

A.3 Other characteristics of temperature distribution

Notes on Table 5: The unit of observation is an individual. The dependent variable is the individual's level of attention paid to environment. The dependent variable ranges between 0 and 1 and increases with the reported level of attention. The variable is constructed by rescaling the answer to the prompt: On a scale of 1 to 6, how important is it for this individual to take care of the environment. Average variability refers to the average intensity of deviations from the typical climate conditions (*specific to each ancestral generation*) across generations. Average variability sq. (cub.) refers to the square (cube) of the average variability term. Variability across generations capture the standard deviations in the average temperatures across generations, i.e. how distinct were the overall climate conditions between generations. Moments of the full temperature distribution include the mean, standard deviation, skewness and kurtosis of the whole temeprature distribution associated to an ethnic group in the 320 years (1600-1920) used to construct the per-generation variability index. Average variability ranges between 0.015 and 0.093 within the sample. Historical ethnic group characteristics include measure of development such as agricultural intensity, complexity of settlement, level of political heirarchies, size of the local community and main source of subsistence. Historical topographic characteristics include controls for distance to the equator, distance to the closest coast and geographical Koppen climate classification for the location of the ethnic group obtained from Ethnographic Atlas. Standard errors are clustered at the ethnicity level.

TABLE 5: Coefficients for the impact of average variability of ancestral climatic conditions on individual's self-reported attention to the environment

Dependent variable: Self reported measure of attention to environment				
Avg. variability	-9.877***	-17.402**	-9.055***	-9.677***
	(2.003)	(7.035)	(2.108)	(2.135)
Avg. variability sq.	111.767***	276.862*	105.537***	109.681***
	(21.346)	(145.560)	(21.700)	(21.829)
Avg. variability cub.		-1130.897		
		(951.849)		
Variability across generations			-0.166	
			(0.123)	
Occupation category Controls	Y	Y	Y	Y
Historical ethnic group characteristics	Y	Y	Y	Y
Historical topographic characteristics	Y	Y	Y	Y
Moments of full temp. distribution	N	N	N	Y
Country-year Fixed effects	Y	Y	Y	Y
Mean of dep var	0.704	0.704	0.704	0.704
St. Dev. of dep var	0.250	0.250	0.250	0.250
Min value Avg. Variability	0.015	0.015	0.015	0.015
Max value Avg. Variability	0.093	0.093	0.093	0.093
R-sq	0.113	0.114	0.114	0.114
Adj. R-sq	0.113	0.113	0.113	0.113
N	138067	138067	138067	138067
*** p<0.01, **p<0.05, * p<0.1, + p<0.15				

B Model: additional details and ommitted proofs

Most of the derivations of Section 5 are either fairly straightforward or standard in the rational inattention literature, therefore we do not provide very detailed proofs; the reader can refer to the survey by Maćkowiak et al. (2023) for a review of the literature and techniques used.

The cost of information is formally given by:

$$I(p_s, p_x) := H(p_x) - \mathbb{E}[H(p_x|p_s)]$$

where p_s and p_x denote the respective distributions of s and x and H denotes the (relative) entropy – see the classical reference Cover and Thomas (2006) for details. It is usual to justify the rational inattention framework and its canonical entropy cost specification as a heuristic model for situations where attention can be flexibly allocated and there is enough time for attention to adapt and focus on relevant features of the environment. In their recent survey of the literature, Maćkowiak et al. (2023) provide the following general intuition which captures well our context of analysis: *"We consider RI to be an "as-if model" or a benchmark that applies well in repeated choice situations, or in choices over the long term. In these cases, the agent thinks about the optimal strategy once, and then applies it many times with little additional effort. Alternatively, it can be a strategy that the agent gradually learned through experience or stumbled upon it due to some evolutionary reasons."*

Formally, we can then write the agent's choice problem over signal structure s :

$$\max_{p_s} \mathbb{E}\Big[\max_a \mathbb{E}\big[u(a;x,\eta) \bigm| s\big]\Big] - \kappa I(p_s, p_x)$$

We can substantially simplify the problem above, and appeal to classical techniques in the rational inattention literature to obtain a closed form solution. First, making u explicit, exchanging integrals and observing that quadratic loss entails the optimal action for a given signal structure to be simply the conditional expectation, we get a representation in the form of a canonical Gaussian-Quadratic RI problem. Gaussian signals are optimal under a Gaussian prior and quadratic loss (Maćkowiak and Wiederholt, 2009) which thanks to simplifications of the Shannon mutual information for Gaussian distributions allows us to recast both payoffs and costs first in terms of the induced posterior variance $\sigma^2_{x|s}$, then in terms of the *attention level* $\xi := 1 - \frac{\sigma^2_{x|s}}{\sigma^2} \in [0,1]$ (where recall that σ^2 is the prior variance). This gives the form (★) of the problem:

$$\max_{\xi \in [0,1]} \int_{\mathbb{R}_+} \xi(W(\eta) + L(\eta))\, dp_0(\eta) - c(\xi) \tag{★}$$

where W,L,c are as defined in Section 5.

The only result that still warrants a detailed proof for completeness is Proposition 1. Recall that we assume that the prior p_0 over η belongs to a parametrized scale family of absolutely continuous distributions, i.e there is a reference absolutely continuous distribution $p \in \Delta(\mathbb{R}_+)$, identified with its density, and a scale parameter $\theta \in \mathbb{R}_+$ such that $p_0(\eta) = \frac{1}{\theta} p\left(\frac{\eta}{\theta}\right)$.

This asssumption allows us to rewrite the problem as:

$$\max_{\xi\in[0,1]} (\mathscr{W}(\theta)+\mathscr{L}(\theta))\xi - c(\xi)$$

Where we have defined:

$$\mathscr{W}(\theta) := \int_{\mathbb{R}_+} W(\eta)\, dp_0(\eta)$$
$$\mathscr{L}(\theta) := \int_{\mathbb{R}_+} L(\eta)\, dp_0(\eta)$$

It is straightforward to observe that $\mathscr{W}$ and $\mathscr{L}$ inherit the properties of W and L. Indeed, taking for instance W, observe that by performing a simple change of variable:

$$\mathscr{W}(\theta) := \int_{\mathbb{R}_+} W(\eta)\frac{1}{\theta}\, dp\left(\frac{\eta}{\theta}\right) = \int_{\mathbb{R}_+} W(\theta\eta)\, dp(\eta)$$

Hence $\mathscr{W}$ is $\mathscr{C}^2$ and:

$$\mathscr{W}'(\theta) = \int_{\mathbb{R}_+} \eta w'(\theta\eta)\, dp(\eta) \leq 0$$
$$\mathscr{W}''(\theta) = \int_{\mathbb{R}_+} \eta^2 w''(\theta\eta)\, dp(\eta) \geq 0$$

and $\mathscr{W}' \underset{\infty}{\longrightarrow} 0$ follows from dominated convergence. Similarly, we get $\mathscr{L} \geq 0$, $\mathscr{L}$ is $\mathscr{C}^2$ and $\mathscr{L}' \geq 0$, $\mathscr{L}'' \geq 0$ and $\mathscr{L}'(0) = 0$.

Given our assumptions on c, it is clear that the optimal level of attention as a function of the scale parameter θ is 0 if $W(\theta)+L(\theta) < c'(0)$ and given by a first-order condition otherwise, hence:

$$\xi^*(\theta) = \begin{cases} 0 & \text{if } \mathscr{W}(\theta)+\mathscr{L}(\theta) < c'(0) \\ (c')^{-1}\Big(\mathscr{W}(\theta)+\mathscr{L}(\theta)\Big) & \text{otherwise} \end{cases}$$

Where $(c')^{-1}$ denotes the inverse of the marginal cost function. Recall that by assumption c' is an increasing nonnegative function therefore its inverse is an increasing nonnegative function. Furthermore, the function $F : \theta \mapsto \mathscr{W}(\theta)+\mathscr{L}(\theta)$ is also convex (this is immediate since $\mathscr{W}'', \mathscr{L}'' \geq 0$) and single-throughed. Indeed, observe that $(\mathscr{W}'+\mathscr{L}')(0) = \mathscr{W}'(0) \leq 0$ and since $\mathscr{W}'$ goes to zero at infinity and L' is positive and strictly increasing, there must exist some smallest $\tilde{\theta}$ such that for all $\theta \geq \tilde{\theta}$, $(\mathscr{W}'+\mathscr{L}')(\theta) \geq 0$. By continuity and monotonicity for all $\theta \leq \tilde{\theta}$, $(\mathscr{W}'+\mathscr{L}')(\theta) \leq 0$.

Consider now the level set $\mathscr{S} := \{\theta | F(\theta) < c'(0)\}$. Because of the convexity of F, this set must be an interval (potentially empty): we denote $(\underline{\theta}, \overline{\theta}) = \mathscr{S}$ where $\underline{\theta} < \overline{\theta}$ iff $\mathscr{S} \neq \emptyset$. We extend our notation to the case $\mathscr{S} = \emptyset$ by setting $\underline{\theta} = \overline{\theta} = \tilde{\theta}$ in this case. Furthermore, because of the monotonicity of F and our notational convention for the case $\mathscr{S} = \emptyset$ it is clear that we must have $\underline{\theta} \leq \tilde{\theta} \leq \overline{\theta}$

Now observe the following

- Over $[0, \underline{\theta})$ ξ^* is differentiable and we have:

$$(\xi^*)'(\theta) = \underbrace{(\mathscr{W}'(\theta) + \mathscr{L}'(\theta))}_{\leq 0 \text{ because } \theta < \underline{\theta} \leq \tilde{\theta}} \times \underbrace{((c')^{-1})'(\mathscr{W}(\theta) + \mathscr{L}(\theta))}_{\geq 0}$$

- Over $(\underline{\theta}, \overline{\theta})$, $\xi^* \equiv 0$ is constant.
- Over $(\overline{\theta}, \infty)$ ξ^* is differentiable and we have:

$$(\xi^*)'(\theta) = \underbrace{(\mathscr{W}'(\theta) + \mathscr{L}'(\theta))}_{\geq 0 \text{ because } \theta > \overline{\theta} \geq \tilde{\theta}} \times \underbrace{((c')^{-1})'(\mathscr{W}(\theta) + \mathscr{L}(\theta))}_{\geq 0}$$

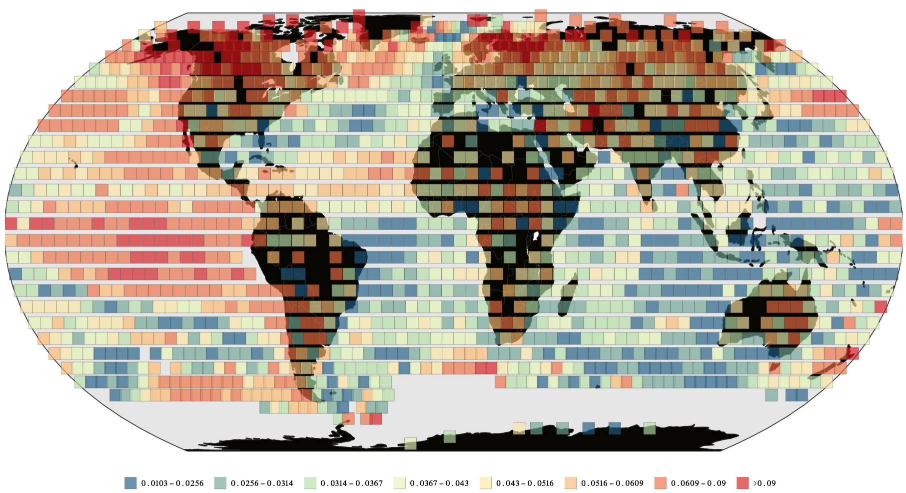
Hence putting it all together since ξ^* is clearly continuous, we obtain the result of Proposition 1.

C Data Descriptions

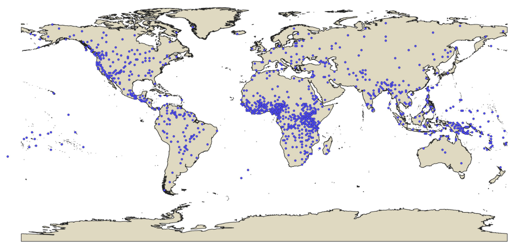
TABLE 6: Summary statistics - demographic characteristics (World Value Surveys)

Variable	Mean	Std. Dev.	Min.	Max.	N
Income Category	4.782	2.176	1	10	148620
Male	0.479	0.5	0	1	157010
Age	41.659	16.52	15	102	156800
Education level	4.815	2.202	1	8	145688
Agriculture	0.037	0.19	0	1	157142
Armed Forces	0.005	0.071	0	1	157142
Employer / Manager	0.025	0.155	0	1	157142
Manual	0.117	0.321	0	1	157142
Non-Manual	0.099	0.298	0	1	157142
Never had a job	0.017	0.13	0	1	157142
Other	0.002	0.05	0	1	157142

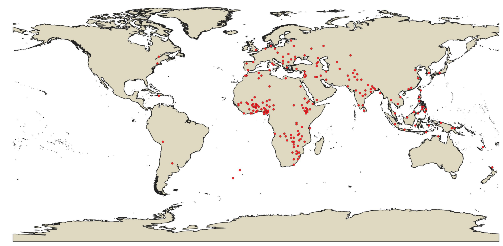
FIGURE 5: Spatial distribution of Average Ancestral Climatic Variability



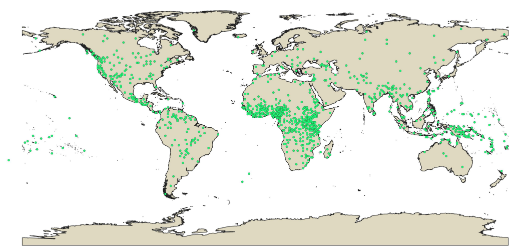
Note: Distribution of average ancestral climatic variability constructed from Mann et al. (2009). The variable reports the average intensity of deviations from a defined range of normal temperatures specific to a generation. Generation lifespan is assumed to be 20 years and the normal range of temperature are the temperatures within the 20th and 80th percentile of temperatures within the lifespan of a generation. Variable is constructed at the 5 by 5 degree grid level. For more details refer to Section 3.



(A) Ethnic groups available in Giuliano and Nunn (2018)



(B) Ethnic groups matched to the WVS (2020) question in consideration



(C) Ethnic groups matched to the Michalopoulos and Xue (2021) database

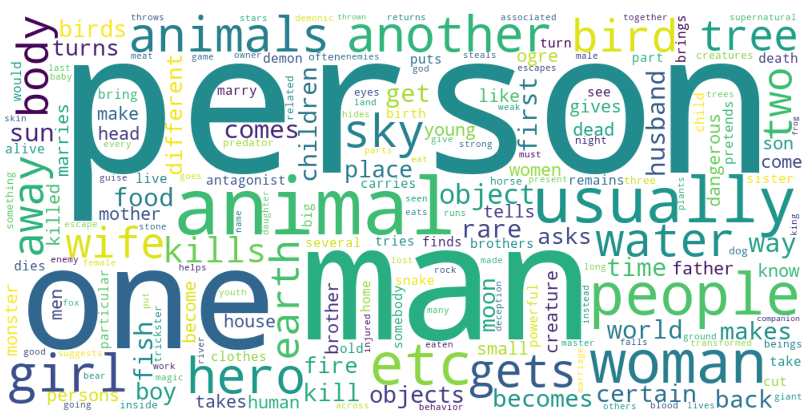
FIGURE 6: Geographic location of ethnic groups in our sample of analysis

Note: Approximate centroid of the location of ethnic groups in our sample. Subfigure [A] provides the location of all ethnic groups in the Giuliano and Nunn (2018). Subfigure [B] provides the location of the ethnic groups whose individuals answered the environmental question of interest (*"How important is it for you to take care of the environment?"*) in wave 5 and 6 of World Value Surveys. Subfigure [C] provides the location of ethnic groups that could be matched to Michalopoulos and Xue (2021).

FIGURE 7: Self-reported mother tongue (language spoken at home)

Note: Word cloud of self-reported languages spoken at home which allow us to match individuals to the historical ethnic groups. Word size is weighted by the proportion of individuals in the sample of WVS that reported the language as their primary language and answered the environmental question of interest.

FIGURE 8: Non-Tokenized words from the description of motifs available in Berezkin's catalog



Note: Word cloud of non-tokenized words from the descriptions of motifs available in Berezkin's catalog. Russian motifs are translated into English and stop words are removed.