Herding, Warfare, and a Culture of Honor: Global Evidence*

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Abstract: We examine the importance of norms of revenge and punishment in perpetuating global conflicts. We focus on the well-known 'culture of honor' hypothesis from social psychology, which posits that traditional herding practices tend to generate moral systems conducive to punishment and revenge-taking. Using a combination of ethnographic and folklore data, global information on the frequency and intensity of conflicts, and multinational surveys, we find that the descendants of herders experience significantly more frequent and severe conflict today, and they report being more willing to take revenge and punish others in global surveys. These patterns are found across ethnolinguistic groups, subnational regions, and countries. The evidence suggests that a society's traditional form of subsistence generated a functional morality that plays an important role in shaping conflict across the globe today.

Keywords: Culture of honor, morality, conflict, punishment, revenge.

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1. Introduction

It is difficult to think of anything more inimical to economic growth than warfare. Within economics, the determinants of conflict and warfare have been extensively studied and a number of important determinants have been identified. These have predominantly been economic, institutional, political, and geographic in nature. Contrasting these factors, first-hand and ethnographic accounts of the determinants of conflict commonly identify revenge and vengeance as being first-order determinants (Boehm, 1987, Scheff, 1994, Marchais, Mugaruka, de la Sierra and Wu, 2022). These have long been studied by anthropologists, often under the label of 'revenge killings' or 'blood feuds' (Davie, 1929, Chagnon, 1988).

While anecdotal and qualitative evidence for the importance of punishment and revenge is abundant, systematic empirical evidence for its importance is limited. The primary difficulty in assessing the importance of such norms is the fact that while vengeance may fuel conflict, conflict most likely induces vengeance. Thus, we expect the two factors to feed off each other, making identifying a causal effect very difficult.

To circumvent these problems, we focus on a deeper determinant of vengeance and punishment, that is pre-determined relative to contemporary conflict and has been argued by psychologists to induce a propensity for revenge-seeking. We take as our starting point the relationship between a tradition of herding and a bundle of values, beliefs, and preferences that induce people to respond to threats and wrongdoings with revenge and violence. This bundle, which is commonly referred to as a 'culture of honor,' has been studied extensively in the social psychology literature. According to the widely-known hypothesis, which was most fully developed by Nisbett (1993) and Nisbett and Cohen (1996), this moral code is believed to have primarily arisen in populations that depended heavily on animal herding (pastoralism).[1] The argument is that herders are particularly vulnerable to exploitation and theft because their livestock is a valuable and mobile asset. In such an environment, it can be useful to develop a reputation for being violent and willing to take revenge on those who wrong you. As Nisbett and Cohen (1996, p. 5) put it: "a stance of aggressiveness and willingness to kill... is useful in announcing a herder's determination to defend his animals."

This theory has been influential across various different social sciences, partly because it speaks

[1] Components of the hypothesis were developed prior in a number of studies such as Peristiany (1965), Gastil (1971), Black-Michaud (1975), Ayers (1984), Wyatt-Brown (1982), and Fischer (1989).

to the seemingly puzzling fact that violence in response to prior wrongdoings is often perceived as morally virtuous by the offenders. For example, when people answer threats or insults with violence, they often claim to "do the morally right thing", to counter "humiliation", to "protect our honor and dignity" or to "restore respect."[2] Yet while the culture of honor theory has enjoyed great popularity across the social sciences, we still lack an understanding of whether it shapes meaningful and economically relevant conflict events across the globe, rather than the more small-scale elements of aggression that are typically studied by psychologists. To make progress, this paper studies the relationships between a tradition of pastoralism, cultural and psychological proclivities to seek revenge and punish unfair behavior, and the contemporary presence of conflict, including both civil conflict and interstate warfare.

Our empirical strategy consists of four steps. First, following prior literature, we construct a quantitative measure of the degree to which historical ethnic groups relied on herding practices for economic subsistence. Second, we document that, in historical data, herding societies were indeed more likely to develop a culture of honor and to deem violence morally appropriate. Third, in our main analyses, we show that, across the globe, contemporaneous ethnolinguistic groups that have a stronger ancestral tradition of herding have substantially more frequent and severe conflict today. Fourth, to illuminate the potential psychological mechanisms behind the link between ancestral herding and conflict today, we use globally representative survey data to document that the descendants of herders have significantly more pronounced tendencies to seek revenge and punish others for wrongdoing.

Our measure of traditional pastoralism follows Becker (2019), who constructs an ethnicity-level measure of the pre-industrial reliance on pastoral production using information contained in the *Ethnographic Atlas* (Murdock, 1967). The measure codes the fraction of subsistence that is obtained from animals that require herding. As documented by Becker (2019), an ethnic group's historical dependence on herding is strongly correlated with the geographic and climatic suitability of the group's territory for pastoralism. Thus, the vast majority of variation in herding has deep ecological origins, so that any relationship between herding and violence is unlikely to be driven by reverse causality.

We first study the link between traditional herding practices and the historical prevalence of a culture of honor. To this effect, we make use of the recently-released dataset on traditional folklore

[2]See Fiske and Rai (2014) for an overview on moralized violence.

that provides rich information on the beliefs, customs, and stories that were passed through the generations by word of mouth in the form of tales and narratives (Michalopoulos and Xue, 2021). Studying variation across approximately 1,100 ethnic groups, we find that groups that relied more strongly on animal herding are more likely to have traditional folklore that contains concepts that are related to a culture of honor, such as motifs related to vengeance, punishment, retaliation, and ultimately violence.

While these findings show that herding is associated with a higher salience of culture of honor-related themes, they are silent about the normative (moral) views of an ethnic group towards violence. To gain a deeper insight into this, we undertake a similar historical cross-group analysis but examine ethnographic information on the perceptions of violence within the society; namely, whether violence was disapproved of, tolerated, accepted, or valued. This information is available for a smaller set of sixty ethnic groups that are present in the *Standard Cross Cultural Sample* (*SCCS*), which is a subset of ethnic groups from the *Ethnographic Atlas* which were chosen to be independent and representative. We find that groups that engaged in traditional herding activities were also more likely to view violence as morally acceptable. Together, the results using information from traditional folktales and ethnographic accounts suggest that, historically, groups of herders were indeed more likely to develop a moral system conducive to punishment and revenge-taking.

We then examine whether a tradition of herding, and its associated culture of honor, shapes economically significant conflict, warfare, and revenge taking today. To study the link between a tradition of herding and contemporaneous conflict, we leverage the detailed information on the location and incidence of conflicts from the *Uppsala Conflict Data Program* (*UCDP*), the world's main provider of data on organized violence.

Our main analysis compares contemporaneous ethnolinguistic groups that reside within the same country but potentially differ in their historical reliance on herding. We find that populations that historically relied on herding to a greater extent tend to have more conflicts today. This is true for all types of conflict in the database, including state conflicts, non-state conflicts, and localized conflicts, which involve one-sided aggression by armed groups. We also find that historical herding is predictive of the *intensity* of conflict: ethnolinguistic groups whose ancestors relied more strongly on herding don't just have more conflict events, they also see more deaths and spend longer periods in conflict.

To delve deeper into the relationship between herding and a psychology of punishment, we leverage the recently-constructed *Global Preferences Survey*, or GPS (Falk, Becker, Dohmen, Enke, Huffman and Sunde, 2018), a globally representative survey dataset that includes rich information on respondents' willingness to take revenge and punish other people for unfair behavior. Because of their global scope, representativeness and tailored, experimentally validated survey measures, these data provide an ideal basis for an investigation of the global psychological variation in inclinations to seek revenge and punish others. Our analysis leverages both across- and within-country variation. In our main specifications, we link respondents' revenge taking and punishment to historical variation in herding across subnational regions, holding the country of residence fixed. In all analyses, we find that the degree of traditional herding is strongly predictive of individuals' willingness to take revenge and punish others for unfair behavior in the GPS. These results suggest that one of the specific mechanisms for why herding should induce conflict – an increased propensity to seek revenge and punish – is indeed borne out in the data, at a global level.

In all, the evidence indicates that a culture of honor is an important determinant of large-scale global conflicts and associated psychological and cultural proclivities. Our findings contribute to the existing evidence on honor cultures, which has been used to explain localized forms of violence – such as murders – in specific contexts and locations, often the U.S. South (Black-Michaud, 1975, Nisbett and Cohen, 1996, Nisbett, Polly and Lang, 1995, Cohen, 1998, Hayes and Lee, 2004, Uskul, Cross, Günsoy and Gul, 2019). An important study in this area is Grosjean (2014) who documents that the presence of former herders is associated with local homicides in the U.S. South but not the North. Our findings extend our understanding of the effects of a culture of honor by considering its effects on economically significant medium- and large-scale conflict events as well as the global distribution of tendencies for punishment and revenge-taking.

Our findings also contribute to a deeper understanding of traditionally pastoral groups. While other studies have highlighted the special impact that contemporary factors like climate change have on herding societies (McGuirk and Nunn, 2021) or how they restrict female sexuality (Becker, 2019), our findings highlight the particular cultural and psychological characteristics of former herders that are relevant for understanding conflict today.

By connecting a traditional mode of subsistence to contemporary conflict, our findings add to our existing understanding of how historical factors can shape contemporary large-scale conflict

and warfare (Jha, 2013, Besley and Reynol-Querol, 2014, Michalopoulos and Papaioannou, 2016). Earlier work on the impact of psychological or cultural factors on violence includes cultural determinants of violent behavior on professional soccer pitches (Miguel, Saiegh and Satyanath, 2011), conflict-related sexual violence (Guarnieri and Tur-Prats, 2022) and intimate partner violence (Tur-Prats, 2021). Related are also studies that have shown that social factors can affect the incidence of conflict, whether they arise due to expectations of help during conflict due to the lineage structure of society (Moscona, Nunn and Robinson, 2020), norms of punishment and cooperation (Fouka and Schlapfer, 2022), or status competition between individuals (Ager, Bursztyn, Leucht and Voth, forthcoming). Our main contribution to these literatures is to directly link a well-known psychological theory – the culture of honor – to the occurrence and severity of large-scale conflict as well as values related to revenge-taking, at a global scale.

More broadly, our work ties into a literature that argues that the structure of morality and culture is ultimately functional and shaped by historical forces (e.g., Tabellini, 2008, Alesina, Giuliano and Nunn, 2013, Galor and Ozak, 2016, Enke, 2019, Becker, 2019, Raz, 2020, Bazzi, Fiszbein and Gebresilasse, 2020, Buggle and Durante, 2021). A common thread that runs through this literature is that the relative costs and benefits of cultural and psychological traits in the past shape their evolution up until the present day. Because of the incremental nature of cultural and psychological evolution, the effects of the past persist and affect outcomes today even after the historical environment is no longer relevant (Nunn, 2022).

The remainder of the paper proceeds as follows. Section 2 describes the herding index and how we link it to contemporary data. Section 3 studies the historical link between herding and a culture of honor, while Sections 4 and 5 study contemporary conflicts and people's propensity to take revenge. Section 6 concludes.

2. Historical Measure of Economic Dependence on Herding

2.1. Data and Construction of Index

Our analysis uses information on pre-industrial reliance on herding from the *Ethnographic Atlas*, a worldwide ethnicity-level database constructed by George Peter Murdock that contains ethnographic information for 1,265 ethnic groups (Murdock, 1967). Information for societies in the sample has been coded for the earliest period for which satisfactory ethnographic data are

available or can be reconstructed. The earliest observation dates are for groups in the Old World where early written evidence is available. For the parts of the world without a written history, the first recorded information could be from the 20th century. The data capture as much as possible the characteristics of the group prior to industrialization and European contact.

The *Ethnographic Atlas* has recently seen widespread use in economic history, cultural economics, and cultural psychology (e.g. Alesina et al., 2013, Michalopoulos and Papaioannou, 2013, 2014, 2016, Giuliano and Nunn, 2018, Schulz, Bahrami-Rad, Beauchamp and Henrich, 2019, Enke, 2019). A large-scale validation study recently documented strong correlations between historical ethnic-group level characteristics in the *Ethnographic Atlas* and contemporaneous ethnic-group level measures of those same traits (Bahrami-Rad, Becker and Henrich, 2021).

Herding refers to the breeding, care, and use of herd animals such as sheep, goats, camels, cattle and horses (also referred to as pastoralism). Unlike tending animals such as pigs or chicken, herding involves taking the herds out to natural pasture, which increases the risk of theft. We follow Becker (2019) to define pre-industrial reliance on herding using information from the *Ethnographic Atlas*. The measure is defined as the product of two parts: (1) the degree to which a society depended on animal husbandry (0–100%), and (2) an indicator taking the value of 1 if the predominant animal in a society is a herding animal (sheep, cattle, horses, reindeer, alpacas, or camels). As a result, the measure codes the fraction of economic subsistence that is due to herding.

In total, we have herding data for 1,127 historical ethnic groups in the *Ethnographic Atlas*. The distribution of the dependence on herding measure across ethnic groups is shown in Appendix Figure A1. Figure 1 maps the spatial distribution. Societies vary substantially in their historical dependence on herding. About one-third of societies have very little or no herding production (less than 5%). Similarly, few societies depend on herding by more than 50% (about 5%). Most societies have intermediate shares of herding production, with an average dependence of 14%.

2.2. Construction of Herding Index at the Language, Country or District Level

In our historical analysis, we measure the culture of honor using data on folklore, which is available at the level of ethnicities. Thus, the herding index described above directly applies.

For the contemporaneous part of the analysis, we instead need to construct reliance on herding for the ancestors of all those individuals speaking a given language or living in a given country/

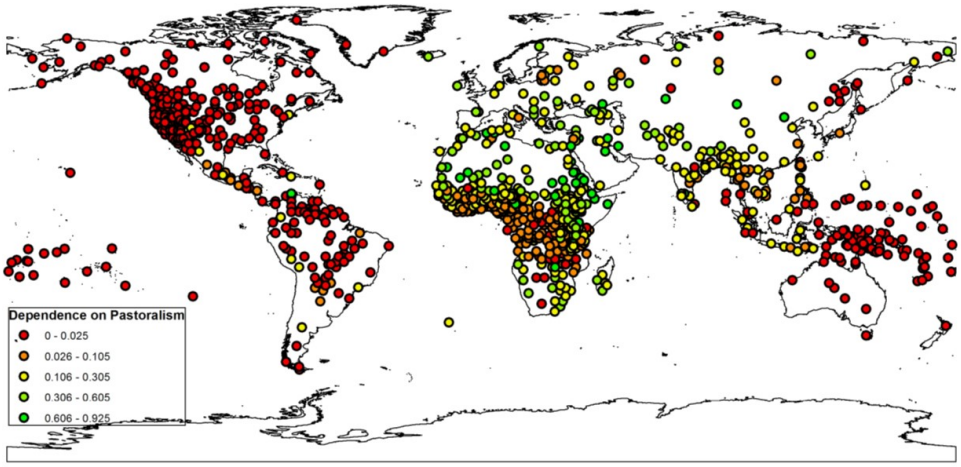


Figure 1: Global distribution of reliance on herding in the *Ethnographic Atlas*. The data apply to the pre-colonial period and therefore capture the subsistence mode of local natives. Source: Becker (2019).

subnational district today. We construct these measure using a procedure similar to Giuliano and Nunn (2018). We combine information on the location of over 7,000 language groups from the *Ethnologue 16* with information on the distribution of population from the *Landscan* database. This procedure allows us to produce an estimate of the mother tongue of all populations around the world, measured at a one-kilometer resolution. We then match each of the 7,000+ *Ethnologue* languages/dialects with one of the ethnicities from the *Ethnographic Atlas*. This allows us to construct a measure of ancestral reliance on herding at a one-kilometer resolution globally. We are then able to construct an average measure of ancestral reliance on herding across all individuals speaking a given language or living in a district/country today.

Overall, we always define herding at the finest possible levels for each of our analyses. For the country-level analyses, herding is defined at the country level. For the subnational analysis of modern conflicts, herding is defined at the dialect group level. For the individual-level analysis of the GPS survey data, herding is defined at the subnational district level. It is important to note that this procedure takes into account population movements, including the large-scale movements that occurred following the Columbian Exchange. Thus, the spatial historical distribution of dependence on herding illustrated in Figure 1 does not necessarily coincide with the spatial contemporary distribution of ancestral dependence on herding.

Figure 2 show the distribution of ancestral reliance on herding at the country, language and subnational district levels (Panels A-C). There are two main takeaways. First, we see a large amount of variation across the globe, with North Africa and the Middle East exhibiting particularly high ancestral dependence on herding. Second, there is substantial variation also across language groups and districts within the same country. This will allow for high-powered within-country analyses.

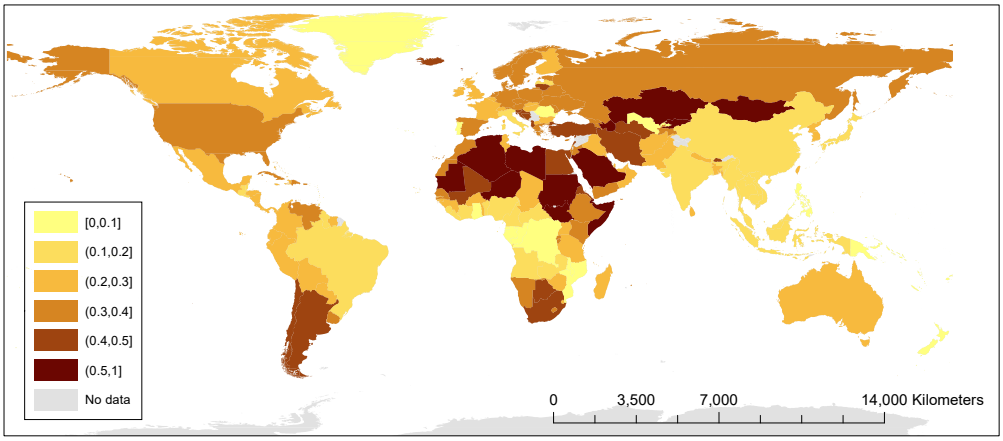
2.3. Historical controls

Many of our analyses control for a number of other characteristics of ethnic groups, including their economic development, degree of political and institutional sophistication, and geography. These are captured by measures of settlement complexity, the number of levels of jurisdictional hierarchy beyond the local community, distance from the equator, and longitude.

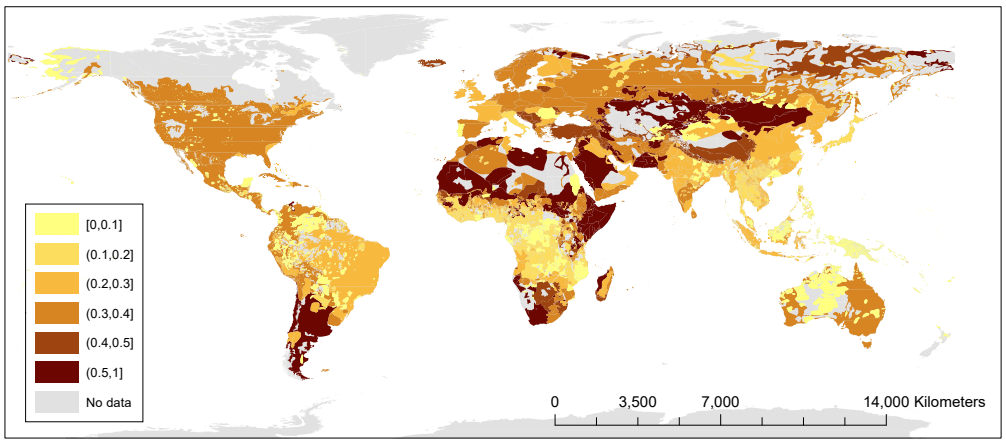
Settlement complexity. The measure is derived from the variable *v30* of the *Ethnographic Atlas*. Each ethnic group is categorized into one of the following categories describing their pattern of settlement: (1) nomadic or fully migratory, (2) semi-nomadic, (3) semi-sedentary, (4) compact but not permanent settlements, (5) neighborhoods of dispersed family homesteads, (6) separate hamlets forming a single community, (7) compact and relatively permanent settlements, and (8) complex settlements.

Jurisdictional hierarchy. We use the number of jurisdictional hierarchies beyond the local community to quantify the pre-industrial political sophistication of an ethnic group. The original measure, taken from the variable *v33* of the *Ethnographic Atlas*, takes on the values of 1 to 5, with 1 indicating no levels of hierarchy beyond the local community and 5 indicating four levels. Since the local community represents one level of authority, we interpret the variable as measuring the total number of jurisdictional hierarchies in the society.

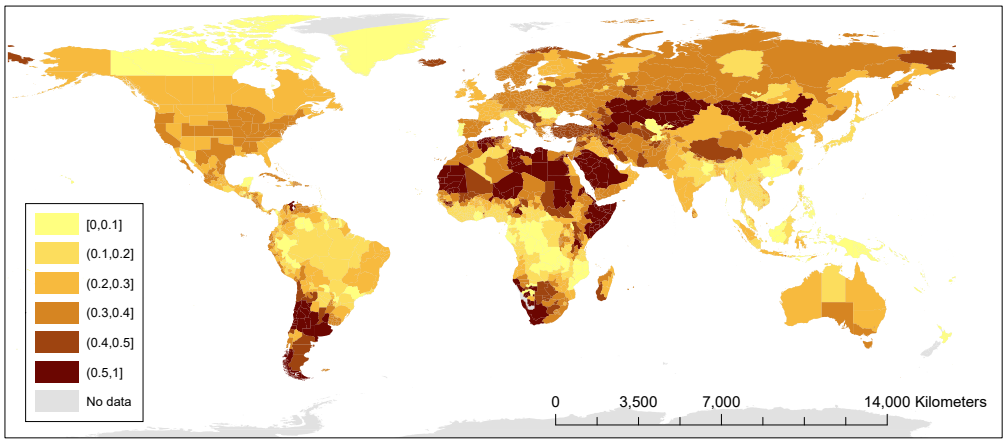
Distance from equator. We construct a measure indicating the average historical distance from the equator. This information is taken using the variable *v104* of the *Ethnographic Atlas*, which reports the latitude of the centroid of each ethnic group. We use the absolute value of the measure, which is the distance from the equator measured in decimal degrees.



(a) Country level



(b) Language group level



(c) Subnational district level

Figure 2: Global distribution of ancestral reliance on herding at different levels of aggregation

Longitude. We measure historical longitude using the variable *v106* of the *Ethnographic Atlas*, which reports the longitude of the centroid of each ethnic group.

All historical controls are defined at the ethnicity level for our historical analysis, at the country

level for our country level analyses, at the district level for our individual analysis of a psychology of punishment, and at the dialect group level for our analysis of modern conflict. Descriptive statistics are shown in Appendix Table A1.

2.4. Ecological Determinants of Herding

In our empirical analyses, historical dependence on herding is an explanatory variable. In principle, it is possible that groups that were more violent to begin with tended to pick up herding. This would create a reverse causality problem. However, in practice, a society's subsistence mode is largely determined by deep ecological factors. Indeed, certain ecological conditions are highly favorable for herding, whereas others make pastoralism impossible. To quantify this, we follow Becker (2019) and empirically investigate the relationship between observed dependence on herding and land suitability for herding (vs. agriculture). Building on suitability data constructed by Beck and Sieber (2010) through maximum entropy modeling, Becker (2019) documents that land suitability for herding and observed subsistence on herding are strongly correlated across ethnic groups ($\rho = 0.59$). In Appendix Figures A2 and A3, we replicate this analysis. It is worth pointing out that the data reveal such a high correlation between suitability and actual herding *despite* the random measurement error that is typically entailed in both ethnographic records and the construction of land suitability measures. Therefore, the data suggests that the environment determined which societies herded.

3. Herding and a Historical Culture of Honor

In a first step of the empirical analysis, we investigate whether in the past herding societies were more likely to develop a culture of honor. This is both of intrinsic interest and provides an important validation and plausibility check for our main contemporary analyses.

3.1. Data

We follow Michalopoulos and Xue (2021) in quantifying ethnic groups' cultural beliefs and practices using textual data on folklore.[3]

[3]Details on the dataset and procedure are provided in Appendix B.

Folklore is the collection of traditional beliefs, customs, and stories of a community, often in the form of oral traditions such as tales, proverbs and jokes, that get passed through the generations by word of mouth. The anthropologist and folklorist Yuri Berezkin assembled a dataset that codes the presence of 2,564 motifs, each of which is given by a short text that summarizes a story, image or lesson. Given that folklorists are interested in collecting stories that are untouched by modernization, this catalog should be thought of as capturing pre-industrial societies' culture. Based on Berezkin's catalog of motifs, Michalopoulos and Xue (2021) use text analyses to construct a dataset that codes the presence of a large number of economic, psychological and cultural concepts in a society's oral tradition. In these text analyses, a concept is said to appear in a motif if either the seed word itself or one of the 50 most closely related terms – according to the knowledge representation project ConceptNet – is mentioned. The data contain many concepts that are related to the culture of honor hypothesis. Michalopoulos and Xue (2019) study the association between herding and 'anger' and 'retaliation'. Following this logic, we desire a bag-of-words that proxies for the salience of a culture of honor in folklore. To discipline our construction of a bag-of-words, we first selected all seeds words that Nisbett and Cohen (1996) used to introduce the idea of a culture of honor in their book. These are:

1. Violence and conflict concepts: violence, perpetrator, strength, toughness, predation, predator, aggressiveness, affront, deterrence, defend, mayhem, guard

2. Punishment and revenge concepts: punishment, punish, penalty, revenge, retaliate, retaliation

Following the methodology proposed by Michalopoulos and Xue (2021), for each of these seed words, we retrieve the top-50 list of related terms from *ConceptNet*. We then select concepts from the folklore catalogue that appear in the top-50 list of our seed words, finding the following terms:

1. Violence and conflict concepts: power, strong, crime, tough, violence, victim, threat, conflict, strength, violent, aggressive, hunter, habitat, intensity, courage, weakness, chaos, aggression, offender, predator, insult, riot, thief, prey, offend, outrage, aggressively, grit, endurance, coyote, perpetrator, attacker, vitality, brutality, unrest, culprit, victimization, humiliate, robber, vigor, rapist, resilience, nonviolent, abuser, predatory, disgrace, defense, security, protect, guard, protection, defend, disorder, mess, strategic, defensive, assert, confusion, prevention, protective, discourage, defender, uphold, guardian, disturbance,

protected, madness, safeguard, turmoil, disruption, deter, preventive, frenzy, chaotic, bodyguard, lineman, warden, fend, upheaval, persuasion, havoc, protector, deterrent, militarily

2. Punishment and revenge concepts: retaliate, retaliation, discipline, penalty, punishment, punish, revenge, disciplinary, backlash, vengeance, grievance, punitive, scold

For each of the concepts, we finally generate a binary indicator that equals one if the concept appears in the folklore of an ethnic group. We then average across all concepts within a given domain (violence/conflict and psychology of punishment/revenge) to arrive at a summary measure that captures the fraction of concepts in the domain that are present in a society's folklore. We also compute an overall summary measure of a culture of honor by taking the average across all concepts. Thus, our variables capture the average probability that the culture-of-honor related concepts appear in a society's folklore.

Since the probability that a given concept is mentioned in a society's folklore will mechanically be higher in societies that have a larger folklore corpus, we always include a control for the natural log of the total number of motifs in a society in our regressions.[4]

3.2. Results

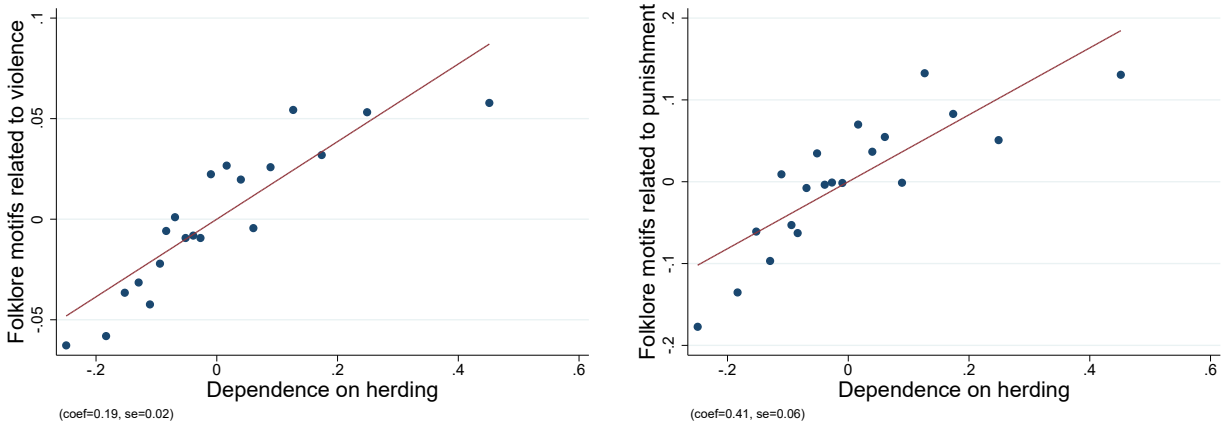
To illustrate the results, Figure 3 shows binscatter partial correlation plots between a dependence on herding and folklore motifs related to the culture of honor. The figure is constructed controlling for the natural log of the total number of motifs in a society, settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude. We see that the folklore proxies for the salience of culture-of-honor terms strongly increase in a society's dependence on herding.

We report full estimates in Table 1. For each folklore variable, we show two specifications: one in which we only control for the total number of motifs in a society, and a second one that additionally conditions on the controls discussed above as well as country fixed effects. We report two types of standard errors. Those in parentheses are clustered at the country level, while those in square bracket are clustered at the linguistic affiliation level of the *Ethnographic Atlas*.[5]

We find that a tradition of herding is associated with traditional folktales that are more likely to be about violence or punishment. The magnitude of the estimated effects are similar across

[4]As reported in Appendix Table A3, our results are very similar when we control for fixed effects for the total number of motifs.

[5]This is constructed from variables *v98* and *v99*. Appendix Table A4 also show the results when we cluster at the folklore group level.



(a) Violence and conflict measure

(b) Psychology of punishment measure

Figure 3: Binscatter partial correlation plots for the relationship between culture-of-honor related folklore motifs and dependence on herding. In each plot, a unit of observation is an ethnic group in the *Ethnographic Atlas*, $N = 1{,}107$. Each dot shows the average of the dependent variable for a given range of values of dependence of herding. Each binscatter is constructed controlling for ln(total number of motifs), settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude.

dependent variables. They suggest that an increase in dependence on herding from zero to one increases the average probability that a culture-of-honor concept appears in folklore by 10–20 percentage points. Standardized betas are reported at the bottom of the table and suggest that an increase in herding by one standard deviation increases culture-of-honor folklore by about 10–18% of a standard deviation.

Robustness. The Appendix reports two robustness checks. First, we study the sensitivity of the results to a smaller set of seed words. To this effect, Appendix Figure A4 reports the results from analyses in which we randomly sample subsets of words. The results are always very similar.

Second, to investigate robustness against outliers, Appendix Table A2 documents that our results are robust to winsorizing the top 5% herding societies.

3.3. Evidence on Moral Views from the Standard Cross Cultural Sample

While the analysis of folklore data shows an increased salience of punishment- and violence-related themes in the culture of herding societies, the results do not speak to the moral (normative) views of societies: whether people consider it morally right or wrong to engage in violent behavior. To study this, we leverage information on the acceptability of violence in a small

Table 1: Culture-of-honor related folklores in Ethnographic Atlas societies

	Dependent variable					
			Folklore motifs related to ...			
	Summary measure		Violence		Punishment	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependence on herding	0.204***	0.107***	0.175***	0.105***	0.395***	0.117*
	(0.021)	(0.018)	(0.023)	(0.023)	(0.049)	(0.068)
	[0.024]	[0.027]	[0.029]	[0.028]	[0.062]	[0.065]
ln(number of motifs)	0.217***	0.211***	0.213***	0.204***	0.245***	0.258***
	(0.005)	(0.007)	(0.005)	(0.007)	(0.013)	(0.018)
	[0.005]	[0.006]	[0.006]	[0.006]	[0.015]	[0.017]
Settlement complexity		0.004**		0.005***		-0.003
		(0.002)		(0.002)		(0.006)
		[0.002]		[0.002]		[0.007]
Jurisdictional hierarchy		-0.003		-0.003		-0.004
		(0.003)		(0.003)		(0.009)
		[0.004]		[0.004]		[0.007]
Distance from equator		0.001***		0.001*		0.003
		(0.000)		(0.001)		(0.002)
		[0.001]		[0.001]		[0.002]
Longitude		0.000*		0.001**		-0.001
		(0.000)		(0.000)		(0.001)
		[0.000]		[0.000]		[0.001]
Country FE	No	Yes	No	Yes	No	Yes
Beta coef. for Herding	0.18	0.093	0.16	0.094	0.22	0.065
Mean of dependent var	0.51	0.50	0.49	0.49	0.62	0.62
SD of dependent var	0.22	0.22	0.21	0.21	0.34	0.34
Adj. R-squared	0.84	0.88	0.83	0.87	0.48	0.58
Number of Obs.	1,135	1,107	1,135	1,107	1,135	1,107
Number of Countries	149	148	149	148	149	148
Number of Clusters	149	148	149	148	149	148

Note. The unit of observation is a society from the *Ethnographic Atlas*. The dependent variables are based on the motifs of folklores from Michalopoulos and Xue (2021), indicating whether any of the motifs in the society is tagged by terms related to the keywords. Standard errors in parentheses are clustered at the country level. Standard errors in square brackets are clustered at the linguistic affiliation level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

representative and independent subset of the groups in the *Ethnographic Atlas*, obtained from the *Standard Cross Cultural Sample (SCCS)* (Murdock and White, 1969). While this dataset has the advantage that it comprises a more representative set of independent ethnic groups, the sample size is relatively small. For a subset of societies (60 in total), the *SCCS* contains complete information on the acceptability of violence towards three different groups: members of the local community, members of the same society, and people of other societies. The original variables

Table 2: The acceptability of violence in pre-industrial societies using the SCCS

	Dependent variable									
					Acceptability of violence against ...					
	Summary measure		Average effect		Other society		Own society		Own local community	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependence on herding	1.49**	1.64*	0.81**	0.89**	1.05*	1.06*	1.15**	1.33**	0.37	0.41
	(0.69)	(0.84)	(0.35)	(0.41)	(0.53)	(0.54)	(0.57)	(0.65)	(0.38)	(0.42)
Settlement complexity		0.094		0.053		0.074		0.0059		0.062
		(0.095)		(0.046)		(0.062)		(0.083)		(0.048)
Jurisdictional hierarchy		-0.051		-0.023		0.33***		-0.23		-0.12
		(0.19)		(0.094)		(0.11)		(0.17)		(0.11)
Distance from equator		28.5*		0.016**		6.80		16.5		18.9**
		(14.6)		(0.0072)		(10.4)		(11.5)		(8.64)
Longitude		6.95		0.0038		6.64		7.23		-0.62
		(10.2)		(0.0050)		(6.86)		(7.58)		(5.50)
Continent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.26	0.29			0.26	0.27	0.24	0.28	0.13	0.14
Mean of dependent var	0.0035	0.0035			2.33	2.33	1.37	1.37	0.43	0.43
SD of dependent var	1.38	1.38			0.97	0.97	1.16	1.16	0.70	0.70
Adj. R-squared	-0.00076	-0.0080			-0.021	0.055	0.030	0.011	-0.048	0.012
Number of Obs.	60	60	60	60	60	60	60	60	60	60

Note. The unit of observation is a society from the *Standard Cross-Cultural Sample* (SCCS). The dependent variables are based on information from the SCCS about the acceptability of violence, quantified using the following scale: violence is (0) disapproved, (1) tolerated, (2) acceptable and (3) valued. Coefficients are reported with robust standard errors in parentheses. *, **, and *** indicate significance at the 10, 5, and 1% levels.

code each group as falling into one of the four categories: violence is (1) disapproved of, (2) tolerated, (3) accepted, (4) valued. We code the variables so that they take on the integer values reported in brackets so that a higher value indicates greater acceptability of violence.

Table 2 reports OLS estimates showing the relationship between a dependence on herding and the acceptability of violence. Estimates without our set of ethnicity-level covariates are reported in the odd- numbered columns while those with the covariates are reported in the even-numbered columns. Both specifications include continent fixed effects. Estimates are also shown for five dependent variables: the first principal component of the three violence measures (columns (1)–(2)), their average (columns (3)–(4)), and the three measures separately (columns (5)–(10)).

Despite the small sample size, we consistently find a positive relationship between traditional herding and the acceptability of violence. Somewhat unsurprisingly, these results are largely driven by the acceptability of violence towards people that are not members of one's local community. In terms of quantitative magnitude, the results suggest that a one standard deviation increase in dependence on herding increases the overall acceptability of violence in society by by 26–29% of a standard deviation. The link between herding and accetability of violence is further illustrated in Figure 4, which shows the relationship between the two variables, conditioning on

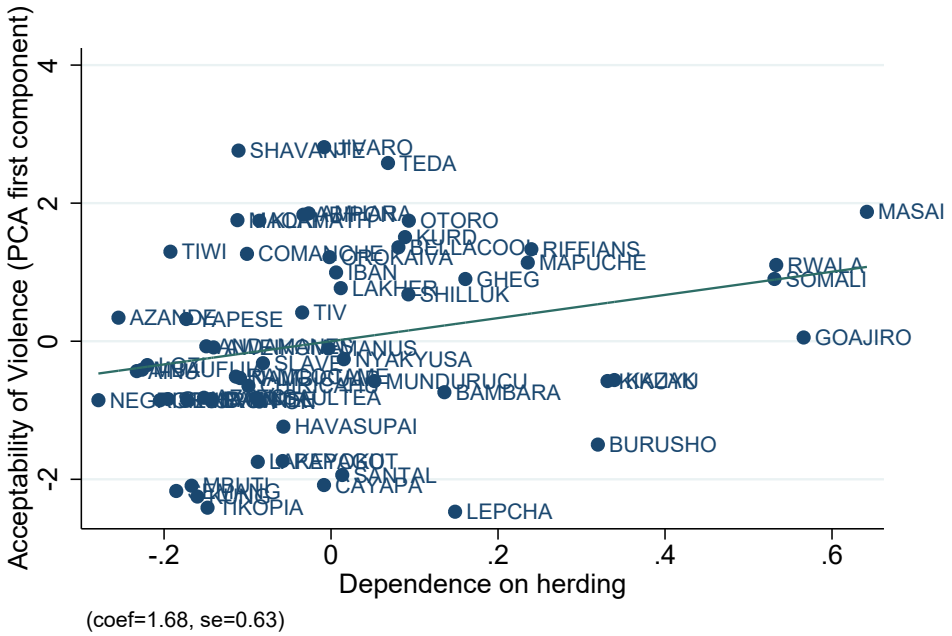


Figure 4: Acceptability of violence and herding in pre-industrial societies. The figure shows a partial correlation plot between acceptability of violence and dependence on herding, controlling for settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude. Each observation is an ethnic group in the SCCS. The partial correlation is $\rho = 0.257$, $p < 0.1$ and the raw correlation $\rho = 0.247$, $p < 0.1$.

settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude.

In all, our analyses of the two historical datasets reveal that traditional herding societies were more likely to accept violence and emphasize notions related to revenge-taking in their folklore. We now turn to our main object of interest: whether the culture of honor is visible in conflict and revenge-taking data today.

4. Traditional Herding and Contemporary Conflict

4.1. Conflict Data and Linkage to Pre-Industrial Ethnic Groups

Our data on conflict stem from the *Uppsala Conflict Data Program* (UCDP), the world's main provider of data on organized violence. The dataset covers the whole world (with the exception of Syria) for the period 1989–2016. The unit of observation in the dataset is a conflict event, defined as an "incident where armed force was used by an organized actor against another organized

actor, or against civilians, resulting in at least one direct death at a specific location and a specific date." For each conflict event, the dataset reports the starting and ending dates, the conflict location's geographic coordinates, the conflict type, and the number of deaths. As an example, one entry in the dataset records that there was a conflict event between the Government of Iraq and Islamic State in Mosul town, starting and ending on September 24, 2016, which caused the death of 11 civilians.

Our research hypothesis requires us to link the frequency of contemporary conflicts to historical economic dependence on herding. Because the conflict data are tied to a specific location – rather than ethnic groups – we cannot directly match conflict events to the historical groups in the *Ethnographic Atlas*. As discussed in Section 2, we circumvent this problem by using UCDP's detailed geographic information to associate the conflict events with the global distribution of languages and dialects as mapped in the *Ethnologue: Languages of the World* (Gordon, 2009) database. To summarize, we take as the unit of observation a language group in the *Ethnologue*. We then match each group to two types of data. First, we link each language group to the most closely related historical ethnic group from the *Ethnographic Atlas* to gauge their ancestors' dependence on herding. Second, we assign to each language group the conflict events that took place in the language group's area of residence.[6] Through this procedure, historical dependence on herding and contemporary conflict are linked at the level of dialect groups.

For each language group, we aggregate the UCDP data into four types of conflict events, over the entire 1989–2016 period covered by the data:

1. Total conflicts: an aggregate measure that includes all conflict events in the database.
2. State-based conflicts: an aggregate of violence between two organized actors of which at least one is the government of a given state.
3. Non-state conflicts: an aggregate of violence between actors of which neither party is the government of a state.
4. Localized conflicts (or one-sided conflicts): an aggregate of violence against unarmed civilians perpetrated by organized non-state groups or governments.

Our main measure of interest consists of the *number of conflict events* within each of these categories.

[6] Appendix C describes this procedure in greater detail.

4.2. Estimation Strategy and Covariates

To take into account that the conflict data have a very long right tail (large outliers), we use as our main outcome variable the natural log of one plus the number of conflict events. We conduct two types of analyses. First, we report cross-country correlations between the frequency of conflict and ancestral dependence on herding.

Second, in our main analyses, we link the frequency of conflict to historical dependence on herding across language groups in the *Ethnologue*, controlling for country fixed effects.[7] We will present two types of empirical specifications. In the first one, we only control for country fixed effects. In a second one, we additionally control for the vector of historical ethnicity-level covariates described above (settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude). These controls serve to ensure that our results indeed reflect a tradition of herding rather than differences in economic development or institutional sophistication.

While the inclusion of country fixed effects captures most of the determinants of conflict that have been examined in the literature, other factors vary subnationally and could potentially confound the analysis of herding. One is terrain ruggedness, which tends to be associated with suitability for herding (Buhaug and Gates, 2002, Fearon and Laitin, 2003). Motivated by this, we also include a control for the average terrain ruggedness of a language group (Nunn and Puga, 2012). The other factor is the population size and land area of a language group. Population size tends to be negatively associated with herding and land area positively associated. Jointly, the two measures captured population density, which has been argued to be an important factor leading to conflicts in many settings. Thus, we include the natural log of a group's population and the natural log of its land area. This also captures the mechanical fact that conflict is more likely when there are more people.

4.3. Main Results

Cross-country correlation. The cross-country correlation between historical dependence on herding and frequency of conflict is $\rho = 0.26$, $p < 0.01$. To investigate whether this cross-country

[7]Country fixed effects allow to control for the determinants of conflict, including cross-country differences in real per capita GDP, the quality of domestic institutions, ethnic polarization, resource endowments, and international geo-political characteristics (e.g., Collier and Hoeffler, 1998, 2004, Fearon and Laitin, 2003, Ross, 2004, Esteban, Mayoral and Ray, 2012). Appendix Table A14 provides an overview of countries with variation and corresponding sample sizes. The table shows a list of countries with variation in herding, and in bold countries with variation in both herding and conflict.

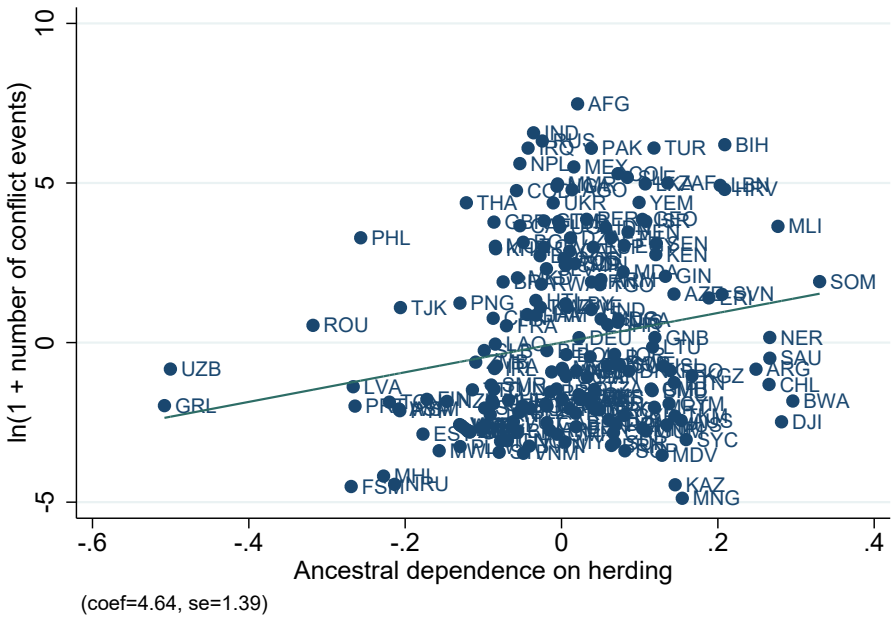
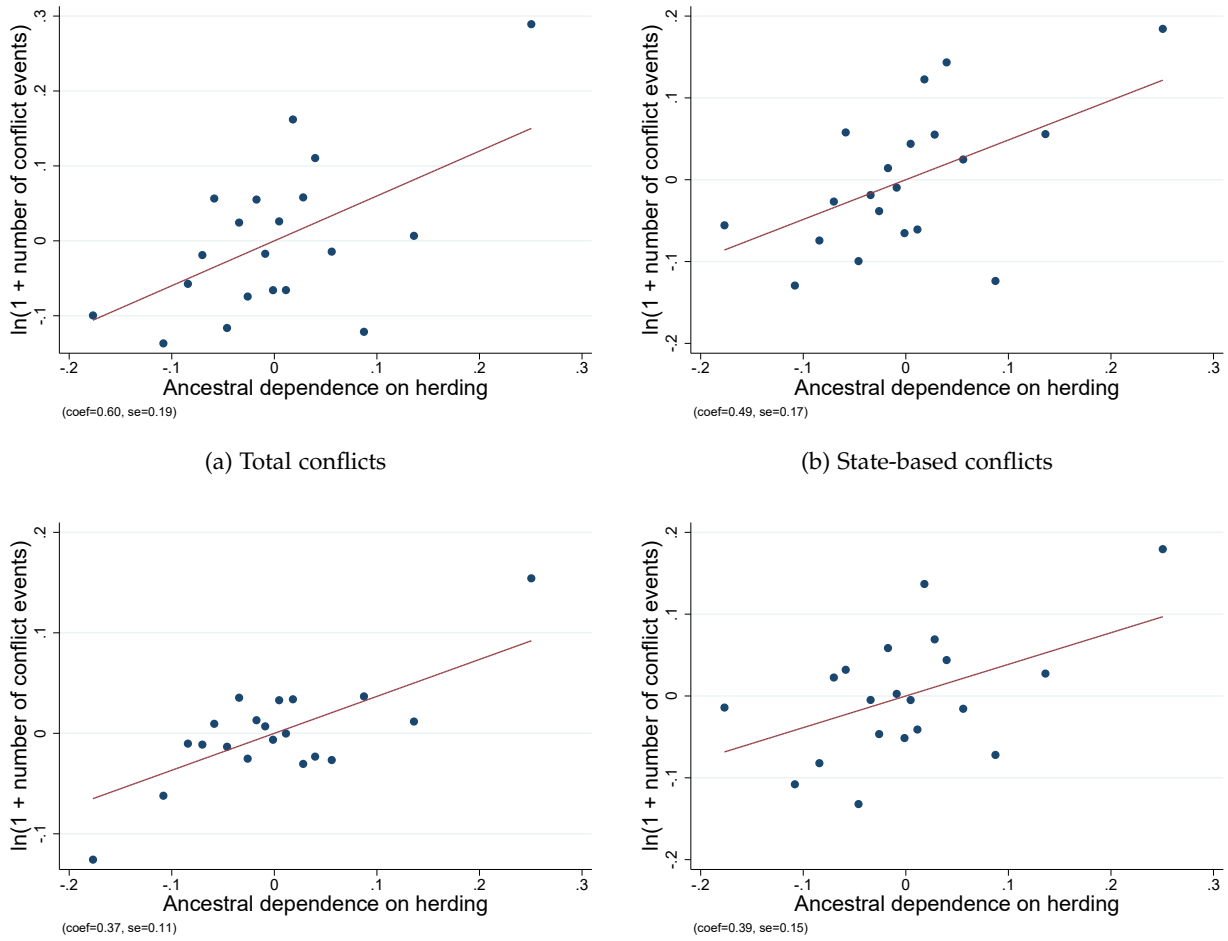


Figure 5: Country-level partial correlation scatter plot between frequency of conflict and ancestral dependence on herding. The figure is constructed based on 203 countries and controls for historical settlement complexity, jurisdictional hierarchy, distance from equator, and longitude. The partial correlation is $\rho = 0.21$, $p < 0.01$.

difference reflects differences in historical traits other than dependence on herding, we control for historical settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude. The partial correlation conditional on these covariates is $\rho = 0.21$ ($p < 0.01$), see Figure 5.[8] While we view this cross-country evidence merely as suggestive given the many factors that drive differences in conflict across countries, the patterns are prima facie consistent with the culture of honor hypothesis: countries whose populations descend from ancestors that relied more strongly on herding have more conflict.

Within-country estimates. To tighten this analysis, we turn to within-country estimates in which the unit of observation is a language group. Figure 6 summarizes the results by showing binned scatter plots of the frequency of each conflict type as a function of historical dependence on herding, controlling for country fixed effects and the other covariates discussed above. We find strong positive relationships for state-based conflicts, non-state conflicts and localized conflicts.

[8] Appendix Figure A5 shows the raw correlation plot.



(a) Total conflicts

(b) State-based conflicts

(c) Non-state conflicts

(d) Localized conflicts

Figure 6: Binscatter partial correlation plots for the relationship between contemporary conflict and a tradition of herding. In each plot, a unit of observation is a country-language group in the *Ethnologue*, $N = 6{,}240$. Each dot shows the average of (the natural log) conflict events for a given range of values of dependence of herding. Each binscatter is constructed after first partialing out country fixed effects, settlement complexity, jurisdictional hierarchy, distance from the equator, longitude, population (ln), land size (ln), and terrain ruggedness.

To assess quantitative magnitudes and probe the statistical significance of these results, Table 3 reports the full set of regression coefficients. For each type of conflict category, we show the results from two specifications, one with country fixed effects and one with the additional controls discussed above. We report two types of standard errors, either clustered at the ethnicity level (in parentheses) or at the country level (in square brackets).

The estimated effects are very similar for the different types of conflict. They suggest that an increase in dependence on herding by one standard deviation increases the frequency of log armed conflict by about 10% of a standard deviation. This corresponds to about 0.13 conflict

Table 3: Traditional herding and frequency of contemporary conflict

	Dependent variable (in log form)							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	0.834***	0.599***	0.630***	0.486***	0.467***	0.368***	0.508***	0.387***
	(0.258)	(0.186)	(0.210)	(0.165)	(0.131)	(0.106)	(0.186)	(0.146)
	[0.329]	[0.256]	[0.268]	[0.206]	[0.165]	[0.158]	[0.230]	[0.177]
Settlement complexity		0.014		0.011		-0.006		0.010
		(0.013)		(0.012)		(0.007)		(0.009)
		[0.016]		[0.014]		[0.009]		[0.011]
Jurisdictional hierarchy		-0.005		-0.001		0.007		0.018
		(0.020)		(0.017)		(0.012)		(0.015)
		[0.028]		[0.020]		[0.013]		[0.014]
Distance from equator		0.000		-0.001		0.000		0.001
		(0.005)		(0.004)		(0.002)		(0.003)
		[0.006]		[0.005]		[0.003]		[0.004]
Longitude		0.001		0.000		0.000		0.001
		(0.001)		(0.001)		(0.001)		(0.001)
		[0.001]		[0.001]		[0.001]		[0.001]
Population (ln)		0.119***		0.078***		0.034***		0.080***
		(0.012)		(0.010)		(0.005)		(0.009)
		[0.022]		[0.019]		[0.009]		[0.017]
Land size (ln)		0.125***		0.096***		0.053***		0.071***
		(0.014)		(0.012)		(0.008)		(0.010)
		[0.027]		[0.021]		[0.015]		[0.017]
Ruggedness		-0.000		-0.000		-0.000		-0.000
		(0.000)		(0.000)		(0.000)		(0.000)
		[0.000]		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.10	0.074	0.092	0.071	0.12	0.095	0.090	0.067
Mean of dependent var	0.53	0.53	0.36	0.36	0.14	0.15	0.29	0.29
SD of dependent var	1.25	1.26	1.06	1.06	0.58	0.60	0.88	0.88
Adj. R-squared	0.28	0.45	0.29	0.41	0.19	0.28	0.22	0.35
Number of Obs.	7,036	6,240	7,036	6,240	7,036	6,240	7,036	6,240
Number of Countries	211	211	211	211	211	211	211	211
Number of Clusters	1,104	985	1,104	985	1,104	985	1,104	985

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of one plus the value. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

events. These relationships are always statistically highly significant, regardless of how we compute standard errors.

4.4. Conflict Intensity

Thus far, all analyses were based on the *frequency* of conflict. In the Appendix, we analyze the link between a tradition of herding and the *intensity* of conflict. For this purpose, we leverage

Table 4: Traditional herding and contemporary conflict: number of deaths

	Dependent variable (in log form): Number of deaths in...							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	1.319***	0.935***	1.016***	0.810***	0.914***	0.730***	0.930***	0.747***
	(0.382)	(0.289)	(0.324)	(0.264)	(0.254)	(0.216)	(0.287)	(0.236)
	[0.470]	[0.386]	[0.413]	[0.322]	[0.311]	[0.304]	[0.349]	[0.287]
Settlement complexity		0.023		0.020		-0.020		0.018
		(0.019)		(0.018)		(0.014)		(0.015)
		[0.020]		[0.019]		[0.016]		[0.017]
Jurisdictional hierarchy		-0.017		-0.018		0.013		0.021
		(0.030)		(0.027)		(0.022)		(0.022)
		[0.038]		[0.029]		[0.020]		[0.021]
Distance from equator		0.002		-0.000		-0.002		0.000
		(0.006)		(0.006)		(0.004)		(0.004)
		[0.008]		[0.007]		[0.005]		[0.006]
Longitude		0.002		0.001		0.000		0.001
		(0.001)		(0.001)		(0.001)		(0.001)
		[0.002]		[0.001]		[0.001]		[0.001]
Population (ln)		0.182***		0.128***		0.071***		0.118***
		(0.018)		(0.016)		(0.010)		(0.013)
		[0.033]		[0.032]		[0.018]		[0.026]
Land size (ln)		0.192***		0.139***		0.095***		0.116***
		(0.021)		(0.018)		(0.014)		(0.015)
		[0.041]		[0.031]		[0.028]		[0.026]
Ruggedness		0.000		0.000		-0.000		-0.000
		(0.000)		(0.000)		(0.000)		(0.000)
		[0.000]		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.10	0.073	0.095	0.075	0.13	0.098	0.10	0.081
Mean of dependent var	0.87	0.89	0.60	0.60	0.29	0.30	0.48	0.48
SD of dependent var	1.97	1.99	1.66	1.68	1.12	1.15	1.41	1.42
Adj. R-squared	0.30	0.44	0.30	0.41	0.16	0.25	0.25	0.36
Number of Obs.	7,036	6,240	7,036	6,240	7,036	6,240	7,036	6,240
Number of Countries	211	211	211	211	211	211	211	211
Number of Clusters	1,104	985	1,104	985	1,104	985	1,104	985

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of one plus the value. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

UCDP data onthe number of deaths. Tables 4 reports the results. For all conflict types, we find that the descendants of herders are involved in conflicts with more deaths. Appendix Table A5) shows that similar results hold when we consider the number of conflict months as additional measure of conflict intensity. These results suggest that a culture of honor – as induced through herding practices – manifests in both more frequent and more intensive conflict.

4.5. Extensions and Robustness

We next summarize the results of several additional checks of the robustness of our findings. First, because the dependence-on-herding variable has a skewed distribution, one might be worried about the extent to which our results are driven by a few language groups with extremely high dependence on herding. To alleviate this concern, we winsorize the herding variable at the 95th percentile (0.405). Thus, any values of the variable greater than 0.405 are recoded as being 0.405. This does not meaningfully affect the results, see Appendix Table A6.

Second, to take into account potential non-independence of the ethnic groups in the *Ethnographic Atlas*, we present estimates in which we cluster the standard errors at the linguistic affiliation level (Appendix Table A7).

Third, a potential concern with the conflicts analysis is that it reflects that herding societies are often less sedentary than agricultural societies, which could trigger more conflicts. Appendix Table A8 controls for whether a pre-industrial society was (semi-) sedentary or nomadic. This does not affect the results.

Fourth, since the number of conflicts is a count variable, we test the robustness of our results using a negative binomonial specification (Appendix Table A9), leaving our main interpretation unchanged. We also examine the relationship between herding and conflict at thr extensive margin (the probability of having any conflict) and intensive margin (the frequency of conflict conditional on having any conflict) and find a positive effect at both margins (Appendix Tables A10 and Table A11.)

Our main hypothesis is that a culture of honor plays an important role in explaining the correlation between historical reliance on herding and modern conflict today. An alternative interpretation could be related to the possibility that pastoralist societies have been marginalized in recent history.[9] We make use of the *Ethnic Power Relations (EPR)* dataset[10] to define a dummy if the ethnic group was "powerless," "discriminated," or "self-excluded" in the country during the 1989–2016 period, and control for this variable together with an interaction term with the his-

[9]According to Manger (2001) "States have also tried to control pastoralists, condemning their lifestyles, forcing them into rigid administrative structures and imposing national identities upon them. Such notions have led to harmful interventions by governments and donors alike... Pastoralists themselves have indeed, often responded to such developments with distrust, resistance and violence."

[10]The EPR dataset provides data on ethnic groups' access to state power, their settlement patterns, links to rebel organizations, transborder ethnic kin relations, and intraethnic cleavages. The dataset also identifies all politically relevant ethnic groups and their access to state power in every country of the world. See `https://icr.ethz.ch/data/epr/`.

torical reliance on herding. Being discriminated is positively correlated with conflicts (especially non-state and localized ones), but the inclusion of this variable does not change the magnitude of our results. In addition, the interaction term is not significant, suggesting that our results are not driven by discrimination against herding societies (Appendix Table A12.)

To the extent that the culture of honor may be more prevalent in societies with weak states, it is important to understand if our results are predominantly generated by a heterogeneous effect between reliance on herding and state capacity. Appendix Table A13 tests for this possibility by interacting our herding measure with a dummy if the state is historically not present.[11] We find no heterogeneity based on this channel, an indication that our results are not driven by weak states.

5. Traditional Herding and a Contemporary Psychology of Punishment

5.1. Punishment and Revenge-Taking Data

We next turn to the psychological and cultural factors that have been hypothesized to be associated with a culture of honor and conflict. This is helpful in the present context because while data on conflicts allow us to document the economic relevance of a culture of honor, direct data on people's preferences allows for a sharper and more direct test of the logic of a culture of honor.

Our data are from the *Global Preferences Survey* (GPS), which is a recently constructed global dataset, measuring the economic preferences of a representative sample of 80,000 people from 76 countries. The generally high quality of the GPS data have been confirmed by various studies that have linked responses to the GPS questions to various economic and social behaviors, both at the individual and at the country level (e.g. Falk et al., 2018, Becker, Enke and Falk, 2020, Sunde, Dohmen, Enke, Falk, Huffman and Meyerheim, 2020).

The survey measured attitudes toward punishment and revenge-taking using three questions:

1. How much do you agree with the following statement: If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so. (0–10)

2. How willing are you to punish someone who treats you unfairly, even if there may be costs for you? (0–10)

[11] The dummy is constructed using the variable *v33* of the *Ethnographic Atlas*, where a state is absent if the jurisdictional hierarchy does not indicate the presence of a large chiefdom, state or large state.

3. How willing are you to punish someone who treats others unfairly, even if there may be costs for you? (0–10)

We view this set of questions as ideal for our purposes because they directly get at the key psychological mechanism that underlies the culture of honor hypothesis: revenge taking and punishing behavior that is perceived as unfair.[12] In our analysis, we use the summary measure constructed by Falk et al. (2018) as a weighted average of the three survey questions, normalized to have mean 0 and standard deviation 1. We also consider each survey question separately. At the individual level, the correlations among the three survey items range between 0.45 and 0.71.

5.2. Linkage to Historical Herding Data

Similar to the global conflict analysis, we need to link individual-level responses in the GPS to historical ethnic groups to get an estimate of how much an individual's ancestors practiced herding. Naturally, this needs to take into account population movements: for example, in computing the average ancestral reliance on herding of contemporary U.S. Americans, the herding practices of historical European populations are more relevant than those of Native Americans.

Because the GPS does not contain information on respondents' ethnic backgrounds, we link the data using geographic subnational region identifiers in the GPS, which are usually states or provinces. We follow Giuliano and Nunn (2018) and created a population-weighted measure of the ancestral reliance on herding of the inhabitants of any country or district. We were able to assign 73,949 respondents from the GPS, living in 951 subnational regions and 75 countries, to a measure of the ancestral herding index of their region or country.[13] Appendix Table A18 provides a list of countries that exhibit meaningful within-country variation in the herding index.

5.3. Estimation Strategy and Covariates

As for the case of conflict, we present two types of analyses. First, we report simple cross-country correlations. Second, in our main within-country analyses, we compare GPS respondents that live in different subnational regions within the same country.

[12] A potential conjecture is that a culture of honor also pertains to *positive* reciprocity as opposed to negative reciprocity (punishment). However, it is well-known in the behavioral economics literature that while positive and negative reciprocity appear related theoretically, they are empirically almost orthogonal concepts. For example, Falk et al. (2018) find that, in the global GPS sample, positive and negative reciprocity are uncorrelated. We therefore focus on the main emphasis of a culture of honor on negative reciprocity.

[13] See Appendix D and Giuliano and Nunn (2018) for details.

We again present an additional within-country specification that includes further controls. Here, we control for two sets of variables. First, as in the conflicts analysis, we control for historical measures of settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude, all of which are assigned to respondents using the same procedure as for the herding index. Second, we control for observable characteristics of the respondent, including age, age squared, and gender.

Finally, we again need to take into account the non-independence of observations in computing standard errors. Here, there are potentially multiple respondents in each subnational region. Because they are all assigned the same herding index, they are not independent observations. We therefore always cluster the standard errors at the level of the 951 subnational regions in our data. Furthermore, to document the robustness of our results, we additionally report standard errors that are clustered at the country level.

5.4. Main Results

Cross-country correlation. Figure 7 shows a partial correlation scatter plot at the country level for the relationship between ancestral herding and the GPS summary index of punishment / negative reciprocity. The plot controls for historical settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude. The partial correlation is $\rho = 0.32$, $p < 0.01$. The raw correlation is $\rho = 0.24$, $p < 0.05$, see Appendix Figure A6. These correlations provide a first piece of evidence that a tradition of herding affects basic psychological tendencies related to reciprocating unkind actions.

Within-country estimates. Figure 8 summarizes the results of the within-country analyses using binscatter plots. For each of the GPS punishment indices, the figure shows the individual-level link with ancestral dependence on herding, controlling for country fixed effects and the controls discussed above. The large mass of dots that is concentrated around the center of each plot mechanically corresponds to individuals that reside in countries that do not have much within-country variation in the herding index. That is, these observations do not all have the same level of dependence on herding, but the inclusion of country fixed effects implicitly transforms them into observations with an average herding index. Therefore, all dots to the left and right of the

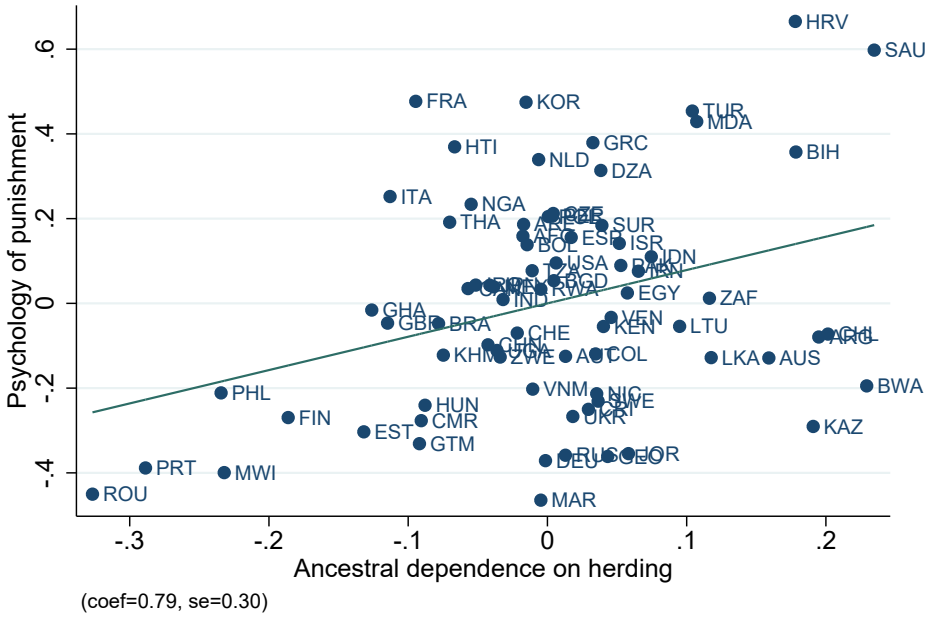


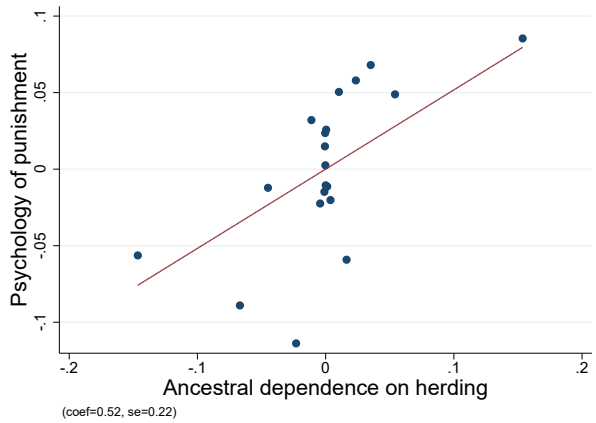
Figure 7: Country-level partial correlation scatter plot between a country's average psychology of punishment in the GPS and its ancestral dependence on herding. The figure is constructed based on 75 countries and controls for historical settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude. The partial correlation is $\rho = 0.32$, $p < 0.01$.

mass around 0 correspond to individuals that live in countries in which the herding index is not approximately the same across all individuals.

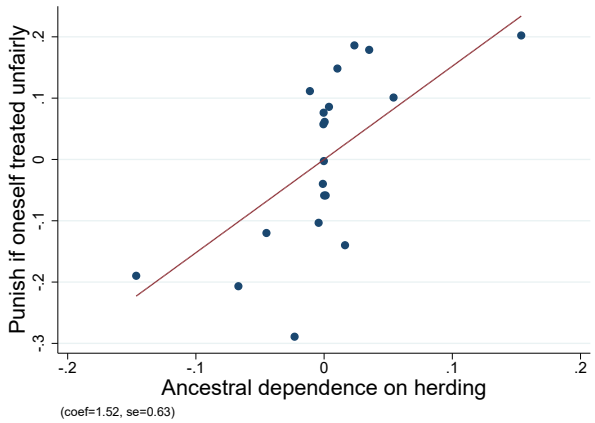
For all components of the GPS punishment data, we see a positive within-country relationship with dependence on herding. To quantify these results, Table 5 turns to regression analyes. Across all survey questions, our results show that a tradition of herding is linked to a higher willingness to punish unfair behavior and willingness to take revenge. A one-standard-deviation increase in reliance on herding increases a psychology of punishment by about 8% of a standard deviation. This quantitative magnitude appears to be very stable across regression specifications and outcome variables.

5.5. Robustness Checks

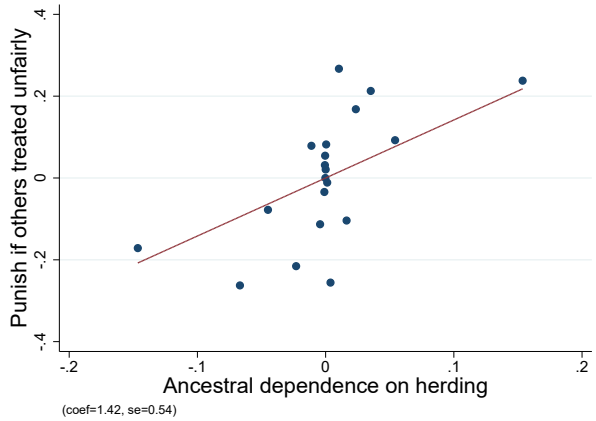
First, we examine whether the estimates are driven by individuals residing in regions with extremely high dependence on herding. We follow our previous strategy by winsorizing the herding variable at the 95th percentile (0.505), meaning that values of the variable greater than



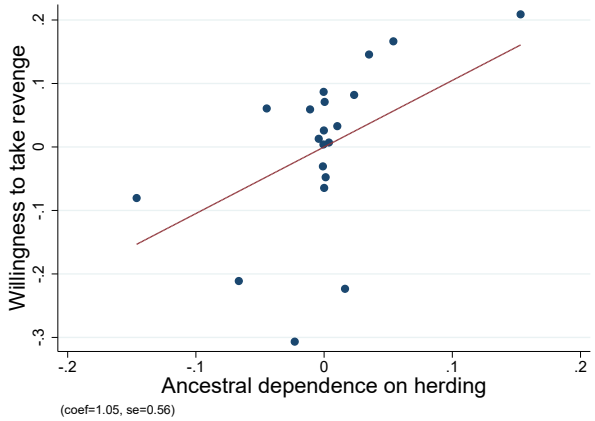
(a) Summary measure of psychology of punishment



(b) Punish if treated unfairly



(c) Punish if others treated unfairly



(d) Willingness to take revenge

Figure 8: Binscatter partial correlation plots for the relationship between a contemporary psychology of punishment in the GPS and a tradition of herding. In each plot, a unit of observation is a respondent in the GPS, $N = 73{,}949$. Each dot shows the average of the dependent variable for a given range of values of dependence of herding. Each binscatter is constructed after first partialing out country fixed effects, settlement complexity, jurisdictional hierarchy, distance from equator, longitude, age, age squared, and female indicator.

0.505 are recoded as 0.505. The estimates, which are reported in Appendix Table A15, show that our results are not driven by extreme values.

Finally, we include additional individual controls that could be potentially correlated with a psychology of punishment: education, income and cognitive skills. The significance and magnitude of our results stay the same (Appendix Table A17.)

Table 5: The historical origins of a psychology of punishment: Individual-level analysis (GPS)

	Dependent variable							
			Punish if ... treated unfairly				Willingness to	
	Summary measure		Self		Others		take revenge	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	0.453**	0.518**	1.337**	1.521**	1.366***	1.418***	0.813*	1.049*
	(0.185)	(0.216)	(0.520)	(0.627)	(0.483)	(0.540)	(0.492)	(0.561)
	[0.246]	[0.263]	[0.640]	[0.721]	[0.677]	[0.646]	[0.605]	[0.685]
Settlement complexity		0.013		0.035		0.016		0.044
		(0.019)		(0.057)		(0.049)		(0.049)
		[0.019]		[0.057]		[0.046]		[0.050]
Jurisdictional hierarchy		0.024		0.069		0.027		0.080
		(0.024)		(0.067)		(0.067)		(0.062)
		[0.030]		[0.083]		[0.081]		[0.076]
Distance from equator		-0.002		-0.002		-0.015		0.001
		(0.005)		(0.012)		(0.014)		(0.013)
		[0.007]		[0.015]		[0.028]		[0.014]
Longitude		-0.002		-0.005		-0.002		-0.004
		(0.001)		(0.003)		(0.004)		(0.004)
		[0.002]		[0.004]		[0.005]		[0.004]
Age		-0.428***		-0.557		-0.251		-2.203***
		(0.131)		(0.394)		(0.378)		(0.376)
		[0.192]		[0.570]		[0.519]		[0.545]
Age squared		-0.426***		-1.864***		-2.013***		0.287
		(0.139)		(0.414)		(0.402)		(0.398)
		[0.189]		[0.539]		[0.524]		[0.568]
Female indicator		-0.159***		-0.425***		-0.376***		-0.415***
		(0.009)		(0.028)		(0.025)		(0.026)
		[0.012]		[0.038]		[0.030]		[0.036]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.067	0.076	0.065	0.074	0.066	0.069	0.040	0.052
Mean of dependent var	-0.0031	-0.0031	4.20	4.20	4.35	4.35	3.63	3.63
SD of dependent var	1.00	1.00	3.04	3.04	3.04	3.04	3.00	3.00
Adj. R-squared	0.071	0.095	0.050	0.070	0.061	0.078	0.080	0.096
Number of Obs.	74,182	73,949	74,264	74,030	74,252	74,018	75,024	74,781
Number of Countries	75	75	75	75	75	75	75	75
Number of Clusters	951	951	951	951	951	951	951	951

Note. The unit of observation is an individual from the *Global Preference Survey* (GPS). The dependent variables are based on information from the GPS, elicited through three self-assessments to measure people's propensity for altruistic punishment and for second-party punishment. Coefficients are reported with standard errors in parentheses clustered at the district level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

6. Conclusions

Our study has examined the importance of norms of punishment and revenge-taking for explaining the prevalence of conflicts across the world today. Given the endogeneity of revenge to conflict incidence, we focused on a determinant of revenge-taking that has been widely studied in the social psychology literature; namely, the importance of traditional herding activities for

shaping a 'culture of honor.'

Our analysis combined information from ethnographic sources with contemporary data on incidence and intensity of conflicts, as well contemporary survey data on individuals values and beliefs associated with punishment, reciprocity, and revenge. Linking these data, either through ethnic groups, subnational regions, or countries, we were able to test for associations between herding, revenge-taking, and conflict.

We found that a tradition of herding is associated with violence, vengeance, punishment and retaliation as measured by traditional folktales. It is also associated with a greater traditional acceptance of violence. Looking at contemporary outcomes, we find that a tradition of herding is associated with a greater incidence and intensity of conflict and warfare and that this is true for all types of conflicts. Turning to psychological mechanisms, using survey experiments from the recently-developed *Global Preferences Survey*, we show that a history of herding is associated with participants willingness to take revenge and punish other people for unfair behavior.

Our results have implications for both the economics literature on conflict and the literature on morality and culture. First, our insight that the culture of honor hypothesis sheds light on the emergence, duration, and severity of economically meaningful armed conflicts is relevant because the occurrence of civil war has traditionally been viewed as a puzzle among scholars in the social sciences that take a rational perspective (e.g., Fearon, 1995, Powell, 2006). Our results provide evidence that cultural values are important factors in explaining the incidence and severity of conflict.

Second, our paper highlights the complicated interactions and feedback effects between economic incentives and outcomes on the one hand and morality or culture on the other hand. In a nutshell, our results show that economic incentives shape people's moral and cultural traits, and that these in turn feed back into economic outcomes such as conflict. We believe that this perspective of an economically-functional psychology that is shaped by material incentives is a promising path to advance the literatures on morality and culture in moving beyond its traditional focus on documenting historical persistence per se. For example, recent research has documented large spatial variation in morality and culture also within (developed) nations such as the U.S. (e.g., Harrington and Gelfand, 2014, Enke, 2020), yet the economic incentives that undergird this heterogeneity are not fully understood.

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Online Appendix

A. Supplementary figures and tables

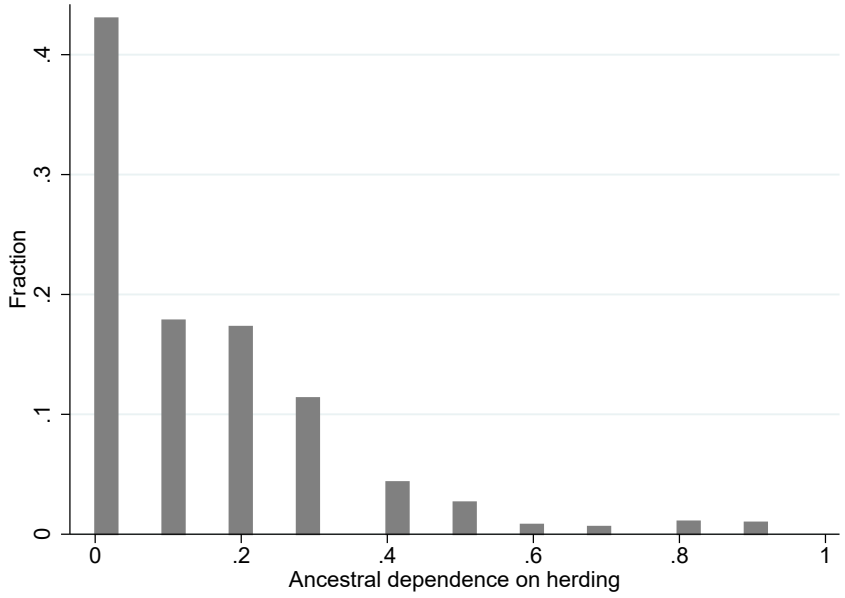

Figure A1: Distribution of herding in the *Ethnographic Atlas*.

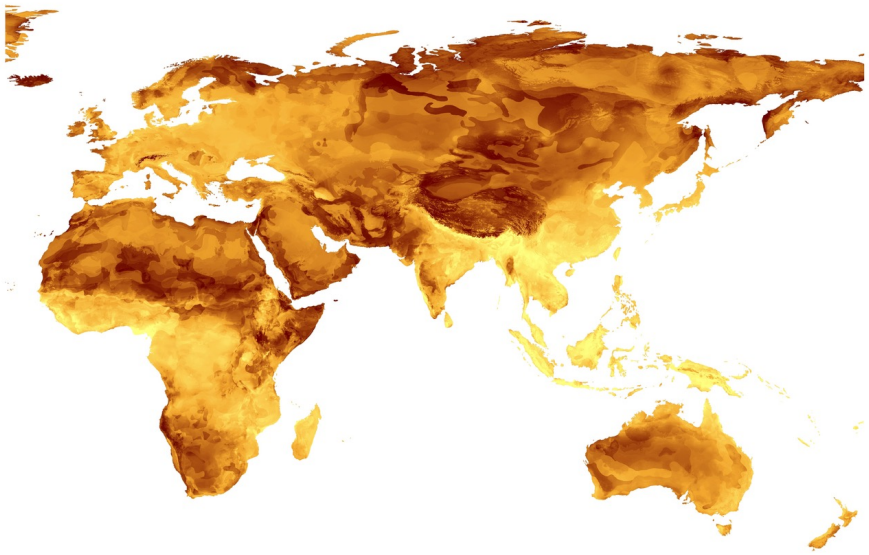

Figure A2: Land suitability for herding vs. agriculture, constructed by Becker (2019) based on data from Beck and Sieber (2010). Darker areas indicate higher suitability for herding relative to agriculture. Data are available only for Africa, Europe, Asia, and Australia.

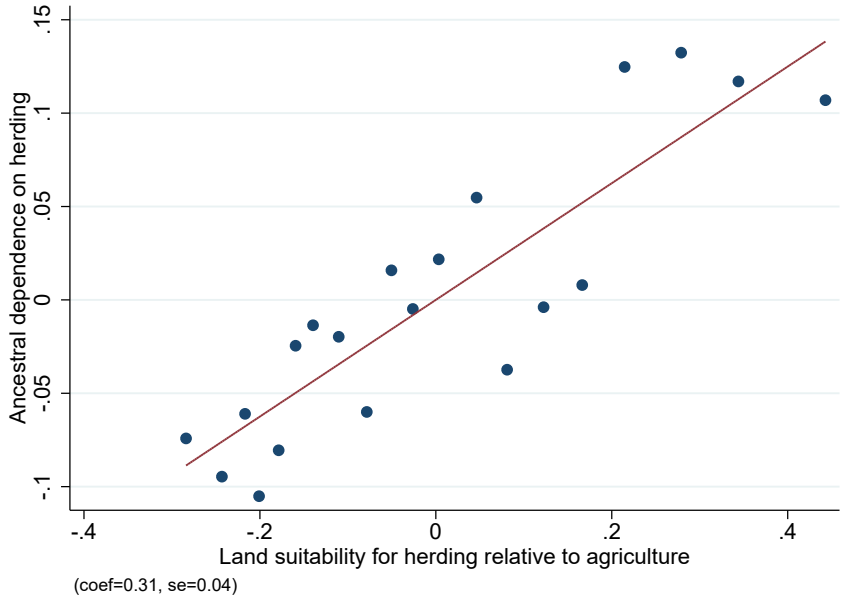

Figure A3: Binscatter plot: dependence on herding and land suitability for herding relative to agriculture for 637 societies in the *Ethnographic Atlas*. The plot controls for continent fixed effects.

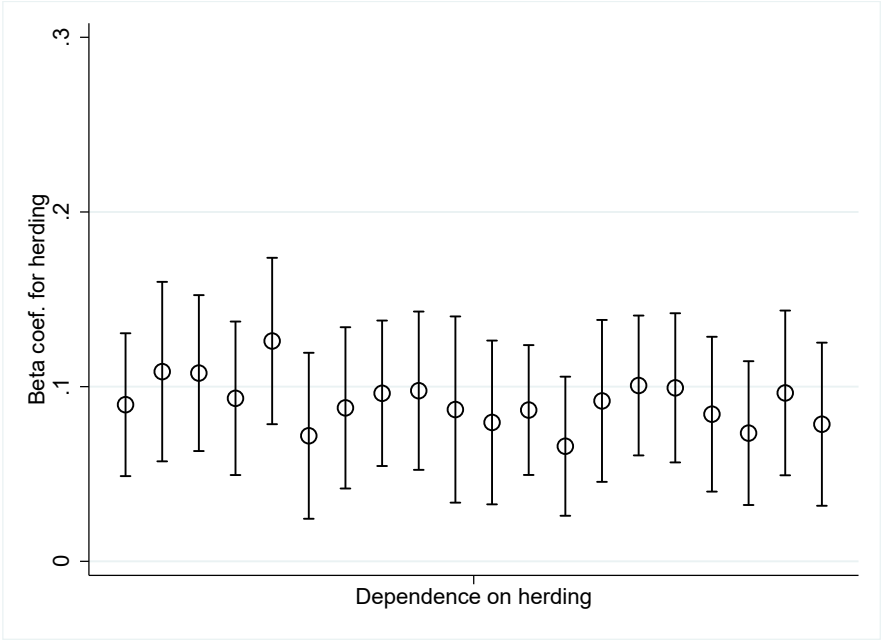

Figure A4: Culture-of-honor related folklores in Ethnographic Atlas societies: robustness to the choice of words. The figure shows the standardized beta coefficient from society-level regressions of the summary measure of culture-of-honor related folklores on historical dependence on herding, controlling for country fixed effects. The summary measure in each regression is constructed from a random subset of the culture-of-honor related terms used in the main analysis. Error bars show 95% confidence intervals, computed based on clustering at the country level. The additional controls include the log number of motifs, settlement complexity, jurisdictional hierarchy, distance from equator, and longitude.

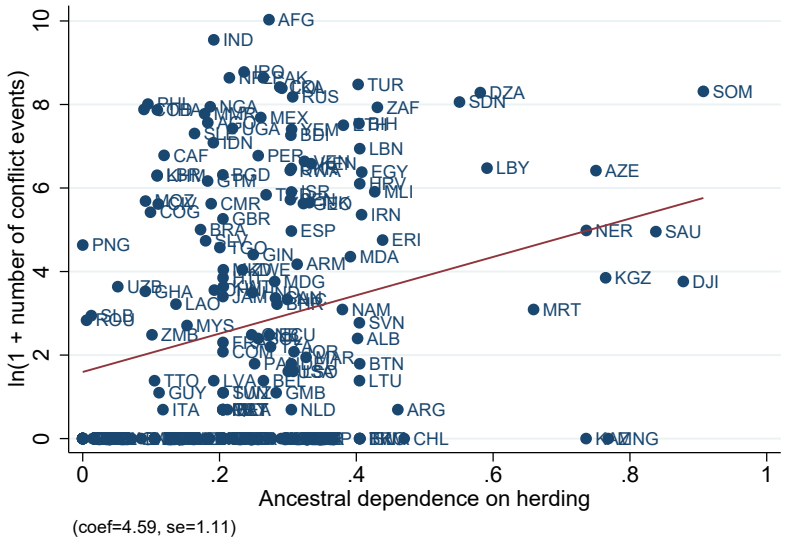

Figure A5: Country-level scatter plot between frequency of conflict and ancestral dependence on herding. The figure is constructed based on 203 countries.

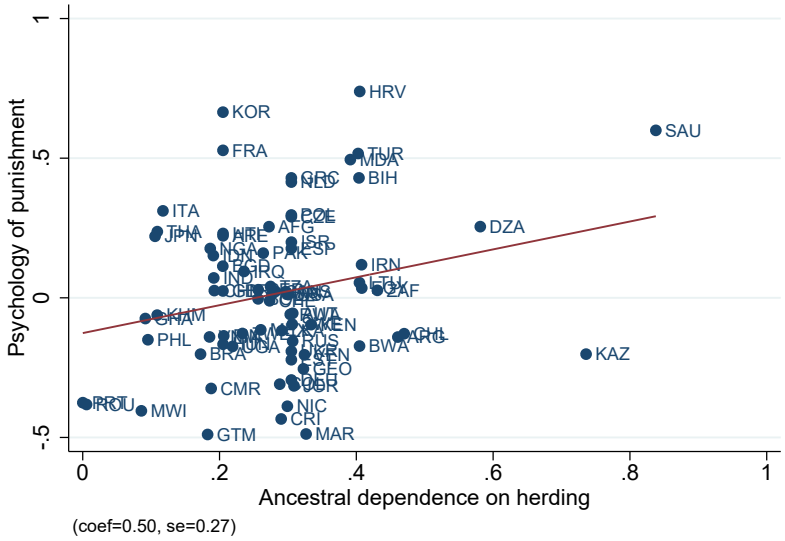

Figure A6: Country-level bivariate scatter plot between psychology of punishment and ancestral dependence on herding. Psychology of punishment is computed as a weighted average of the three survey questions in the GPS. The figure is constructed based on 75 countries.

Table A1: Descriptive statistics

	Obs.	Mean	S.D.	Max.	Min.
Panel A: the *Standard Cross Cultural Sample* (SCCS)					
Acceptability of violence (summary measure)	60	0.0035	1.38	2.57	-2.35
Acceptability of Violence against:					
Other society	63	2.37	0.96	3	0
Same society	76	1.33	1.12	3	0
Same local comm.	85	0.38	0.64	2	0
Dependence on herding	86	0.16	0.23	0.92	0
Settlement complexity	86	4.43	2.45	7	1
Jurisdictional hierarchy	85	1.93	1.08	5	1
Distance from equator	86	22.6	17.9	71	0.064
Longitude	86	9.99	91.2	178.6	-171.8
Panel B: the ethnic group level sample from *Ethnographic Atlas*					
Folklore motifs (summary measure)	1,135	0.51	0.22	0.96	0
Folklore motifs related to:					
Violence	1,135	0.49	0.21	0.95	0
Punishment	1,135	0.62	0.34	1	0
Dependence on herding	1,135	0.15	0.19	0.92	0
Settlement complexity	1,135	5.11	2.21	8	1
Jurisdictional hierarchy	1,107	1.90	1.04	5	1
Distance from equator	1,135	20.8	17.2	78	0
Longitude	1,135	-0.17	84.6	179.5	-178.1
Panel C: the country-level sample					
Number of conflict events	203	640.3	2148.8	22722	0
Psychology of punishment (summary measure)	75	0.014	0.28	0.74	-0.49
Punish if ... treated unfairly:					
Self	75	4.26	0.74	6.80	2.85
Others	75	4.39	0.78	6.78	3.11
Willingness to take revenge	75	3.67	0.85	6.18	2.15
Dependence on herding	203	0.25	0.17	0.91	0
Settlement (1-Nomadic 8-Complex)	203	6.45	1.40	8	1.09
Jurisdictional Hierarchy	203	3.48	0.91	5	1
Distance to equator	203	25.1	17.3	74.7	0.45
Longitude	203	17.3	70.5	178.1	-174.8
Population (ln)	186	12.8	2.08	18.4	7.70
Land size (ln)	203	8.68	2.92	14.3	0.69
Panel D: The within-country sample from *Ethnologue*					
Number of events, all conflicts	7,038	18.5	234.7	14877	0
Number of deaths, all conflicts	7,038	272.9	6649.8	520610	0
Number of months, all conflicts	7,038	4.24	19.9	323	0
Number of events, state-based conflicts	7,038	13.0	208.3	14178	0
Number of deaths, state-based conflicts	7,038	143.6	2190.3	112025	0
Number of months, state-based conflicts	7,038	2.96	16.8	319	0
Number of events, non-state conflicts	7,038	1.59	31.3	1931	0
Number of deaths, non-state conflicts	7,038	19.7	295.8	17956	0
Number of months, non-state conflicts	7,038	0.57	4.77	165	0
Number of events, localized conflicts	7,038	3.89	34.4	1339	0
Number of deaths, localized conflicts	7,038	109.6	6136.8	514038	0
Number of months, localized conflicts	7,038	1.69	9.85	216	0
Dependence on herding	7,036	0.13	0.16	0.92	0
Settlement complexity	6,502	5.93	1.78	8	1
Jurisdictional hierarchy	6,319	2.01	1.23	5	1
Distance from equator	7,038	14.4	12.9	72	0
Longitude	7,038	50.5	78.7	179	-178
Population (ln)	6,952	9.50	2.96	20.4	0
Land size (ln)	6,995	20.4	2.27	29.7	13.1
Ruggedness	6,995	153.0	181.2	1485.1	0
Panel E: The individual-level sample from the *Global Preference Survey* (GPS)					
Psychology of punishment (summary measure)	74,182	-0.0031	1.00	2.33	-1.59
Punish if ... treated unfairly:					
Self	74,264	4.20	3.04	10	0
Others	74,252	4.35	3.04	10	0
Willingness to take revenge	75,024	3.63	3.00	10	0
Dependence on herding	75,176	0.28	0.15	0.92	0
Settlement complexity	75,176	6.34	1.73	8	0
Jurisdictional hierarchy	75,176	3.67	1.06	5	0
Distance from equator	75,176	31.9	15.5	64.0	0.050
Longitude	75,176	27.3	51.1	137.8	-156
Age	74,931	0.42	0.17	0.99	0.15
Age squared	74,931	0.20	0.16	0.98	0.023
Female indicator	75,176	0.54	0.50	1	0
Subj. cognitive skills	74,401	5.15	2.82	10	0
Log [Household income p/c]	74,701	7.89	1.52	14.8	-4.44
Education level (1-3)	74,847	1.86	0.67	3	1

Table A2: Culture-of-honor related folklores in Ethnographic Atlas societies: winsorizing top 5% herding

	Dependent variable					
			Folklore motifs related to ...			
	Summary measure		Violence		Punishment	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependence on herding	0.262***	0.135***	0.224***	0.135***	0.506***	0.139*
	(0.029)	(0.024)	(0.034)	(0.028)	(0.067)	(0.077)
	[0.029]	[0.042]	[0.035]	[0.042]	[0.084]	[0.091]
ln(number of motifs)	0.217***	0.211***	0.213***	0.204***	0.245***	0.258***
	(0.005)	(0.007)	(0.005)	(0.007)	(0.013)	(0.018)
	[0.005]	[0.006]	[0.006]	[0.006]	[0.015]	[0.017]
Settlement complexity		0.003*		0.004***		-0.004
		(0.002)		(0.001)		(0.006)
		[0.002]		[0.002]		[0.006]
Jurisdictional hierarchy		-0.003		-0.003		-0.004
		(0.003)		(0.003)		(0.009)
		[0.004]		[0.004]		[0.007]
Distance from equator		0.001***		0.001*		0.003
		(0.000)		(0.001)		(0.002)
		[0.001]		[0.001]		[0.002]
Longitude		0.000*		0.001**		-0.001
		(0.000)		(0.000)		(0.001)
		[0.000]		[0.000]		[0.001]
Country FE	No	Yes	No	Yes	No	Yes
Beta coef. for Herding	0.19	0.097	0.16	0.099	0.23	0.064
Mean of dependent var	0.51	0.50	0.49	0.49	0.62	0.62
SD of dependent var	0.22	0.22	0.21	0.21	0.34	0.34
Adj. R-squared	0.84	0.88	0.83	0.87	0.49	0.58
Number of Obs.	1,135	1,107	1,135	1,107	1,135	1,107
Number of Countries	149	148	149	148	149	148
Number of Clusters	149	148	149	148	149	148

Note. The unit of observation is a society from the *Ethnographic Atlas*. The dependent variables are based on the motifs of folklores from Michalopoulos and Xue (2021), indicating whether any of the motifs in the society is tagged by terms related to the keywords. Standard errors in parentheses are clustered at the country level. Standard errors in square brackets are clustered at the linguistic affiliation level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A3: Culture-of-honor related folklores in Ethnographic Atlas societies: number of motifs FE

	Dependent variable					
			Folklore motifs related to ...			
	Summary measure		Violence		Punishment	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependence on herding	0.194***	0.069**	0.155***	0.060*	0.442***	0.125
	(0.024)	(0.031)	(0.025)	(0.033)	(0.049)	(0.085)
	[0.034]	[0.030]	[0.035]	[0.031]	[0.064]	[0.065]
Settlement complexity		0.003*		0.004***		-0.002
		(0.002)		(0.002)		(0.007)
		[0.002]		[0.002]		[0.006]
Jurisdictional hierarchy		0.005*		0.003		0.017**
		(0.003)		(0.003)		(0.007)
		[0.003]		[0.003]		[0.007]
Distance from equator		0.002***		0.002***		0.003
		(0.001)		(0.000)		(0.002)
		[0.001]		[0.001]		[0.002]
Longitude		0.001***		0.001***		0.000
		(0.000)		(0.000)		(0.001)
		[0.000]		[0.000]		[0.001]
Number of motifs FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	Yes	No	Yes	No	Yes
Beta coef. for Herding	0.17	0.060	0.14	0.054	0.25	0.067
Mean of dependent var	0.51	0.49	0.49	0.47	0.62	0.61
SD of dependent var	0.22	0.20	0.21	0.20	0.34	0.34
Adj. R-squared	0.89	0.92	0.88	0.91	0.63	0.70
Number of Obs.	1,135	997	1,135	997	1,135	997
Number of Countries	149	89	149	89	149	89
Number of Clusters	149	89	149	89	149	89

Note. The unit of observation is a society from the *Ethnographic Atlas*. The dependent variables are based on the motifs of folklores from Michalopoulos and Xue (2021), indicating whether any of the motifs in the society is tagged by terms related to the keywords. Standard errors in parentheses are clustered at the country level. Standard errors in square brackets are clustered at the linguistic affiliation level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A4: Culture-of-honor related folklores in Ethnographic Atlas societies: folklore group clusters

	Dependent variable					
			Folklore motifs related to ...			
	Summary measure		Violence		Punishment	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependence on herding	0.204***	0.107***	0.175***	0.105***	0.395***	0.117
	(0.0205)	(0.0260)	(0.0230)	(0.0293)	(0.0568)	(0.0791)
ln(number of motifs)	0.217***	0.211***	0.213***	0.204***	0.245***	0.258***
	(0.00529)	(0.00660)	(0.00566)	(0.00684)	(0.0130)	(0.0158)
Settlement complexity		0.00407**		0.00512***		-0.00274
		(0.00203)		(0.00193)		(0.00627)
Jurisdictional hierarchy		-0.00305		-0.00290		-0.00405
		(0.00362)		(0.00353)		(0.00917)
Distance from equator		1.340		1.102		2.875
		(0.880)		(0.910)		(1.976)
Longitude		0.406		0.606**		-0.888
		(0.300)		(0.300)		(0.988)
Country FE	No	Yes	No	Yes	No	Yes
Beta coef. for Herding	0.18	0.093	0.16	0.094	0.22	0.065
Mean of dependent var	0.51	0.50	0.49	0.49	0.62	0.62
SD of dependent var	0.22	0.22	0.21	0.21	0.34	0.34
Adj. R-squared	0.84	0.88	0.83	0.87	0.48	0.58
Number of Obs.	1,135	1,107	1,135	1,107	1,135	1,107
Number of Countries	149	148	149	148	149	148
Number of Clusters	584	575	584	575	584	575

Note. The unit of observation is a society from the *Ethnographic Atlas*. The dependent variables are based on the motifs of folklores from Michalopoulos and Xue (2021), indicating whether any of the motifs in the society is tagged by terms related to the keywords. Coefficients are reported with standard errors in parentheses clustered at the folklore group level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A5: Traditional herding and contemporary conflict: number of months

	Dependent variable (in log form)							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	0.688***	0.486***	0.524***	0.393***	0.396***	0.312***	0.440***	0.343***
	(0.212)	(0.157)	(0.174)	(0.140)	(0.114)	(0.094)	(0.161)	(0.126)
	[0.289]	[0.215]	[0.237]	[0.174]	[0.143]	[0.138]	[0.206]	[0.152]
Settlement complexity		0.010		0.008		-0.005		0.008
		(0.010)		(0.010)		(0.006)		(0.008)
		[0.014]		[0.012]		[0.008]		[0.010]
Jurisdictional hierarchy		-0.007		-0.003		0.005		0.016
		(0.017)		(0.014)		(0.010)		(0.012)
		[0.027]		[0.018]		[0.012]		[0.013]
Distance from equator		-0.000		-0.001		0.000		0.000
		(0.004)		(0.003)		(0.002)		(0.003)
		[0.005]		[0.004]		[0.002]		[0.003]
Longitude		0.001		0.000		0.000		0.000
		(0.001)		(0.001)		(0.000)		(0.001)
		[0.001]		[0.001]		[0.000]		[0.001]
Population (ln)		0.099***		0.067***		0.028***		0.069***
		(0.010)		(0.008)		(0.004)		(0.007)
		[0.019]		[0.017]		[0.008]		[0.015]
Land size (ln)		0.098***		0.077***		0.044***		0.060***
		(0.011)		(0.010)		(0.006)		(0.008)
		[0.022]		[0.017]		[0.013]		[0.015]
Ruggedness		-0.000		-0.000		-0.000		-0.000
		(0.000)		(0.000)		(0.000)		(0.000)
		[0.000]		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.10	0.073	0.092	0.069	0.13	0.098	0.092	0.071
Mean of dependent var	0.45	0.45	0.31	0.31	0.12	0.12	0.25	0.25
SD of dependent var	1.03	1.03	0.89	0.88	0.48	0.49	0.75	0.75
Adj. R-squared	0.29	0.45	0.29	0.42	0.18	0.27	0.22	0.35
Number of Obs.	7,036	6,240	7,036	6,240	7,036	6,240	7,036	6,240
Number of Countries	211	211	211	211	211	211	211	211
Number of Clusters	1,104	985	1,104	985	1,104	985	1,104	985

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of one plus the value. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A6: Traditional herding and contemporary conflict: winsorizing top 5% herding

	Dependent variable (in log form)							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	0.882***	0.643***	0.634**	0.493**	0.445***	0.358***	0.528**	0.427**
	(0.335)	(0.235)	(0.260)	(0.195)	(0.169)	(0.135)	(0.238)	(0.179)
	[0.426]	[0.352]	[0.338]	[0.263]	[0.202]	[0.221]	[0.293]	[0.248]
Settlement complexity		0.007		0.005		-0.011		0.005
		(0.013)		(0.012)		(0.007)		(0.009)
		[0.017]		[0.014]		[0.010]		[0.011]
Jurisdictional hierarchy		-0.003		0.001		0.009		0.019
		(0.020)		(0.017)		(0.012)		(0.015)
		[0.028]		[0.020]		[0.013]		[0.014]
Distance from equator		0.000		-0.001		0.001		0.001
		(0.005)		(0.004)		(0.002)		(0.003)
		[0.006]		[0.005]		[0.003]		[0.004]
Longitude		0.001		0.000		0.000		0.001
		(0.001)		(0.001)		(0.001)		(0.001)
		[0.001]		[0.001]		[0.001]		[0.001]
Population (ln)		0.118***		0.078***		0.034***		0.080***
		(0.012)		(0.010)		(0.005)		(0.009)
		[0.022]		[0.019]		[0.009]		[0.017]
Land size (ln)		0.125***		0.097***		0.053***		0.072***
		(0.014)		(0.012)		(0.008)		(0.010)
		[0.027]		[0.022]		[0.015]		[0.017]
Ruggedness		-0.000		-0.000		-0.000		-0.000
		(0.000)		(0.000)		(0.000)		(0.000)
		[0.000]		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.091	0.066	0.077	0.059	0.099	0.077	0.078	0.062
Mean of dependent var	0.53	0.53	0.36	0.36	0.14	0.15	0.29	0.29
SD of dependent var	1.25	1.26	1.06	1.06	0.58	0.60	0.88	0.88
Adj. R-squared	0.28	0.45	0.29	0.41	0.18	0.28	0.22	0.35
Number of Obs.	7,036	6,240	7,036	6,240	7,036	6,240	7,036	6,240
Number of Countries	211	211	211	211	211	211	211	211
Number of Clusters	1,104	985	1,104	985	1,104	985	1,104	985

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of one plus the value. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A7: Traditional herding and contemporary conflict: alternative clustering

	Dependent variable (in log form)							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	1.04***	0.60**	0.79***	0.48**	0.55***	0.37**	0.65***	0.39**
	(0.32)	(0.26)	(0.25)	(0.21)	(0.17)	(0.16)	(0.22)	(0.18)
Settlement complexity		0.014		0.011		-0.0060		0.0094
		(0.014)		(0.013)		(0.0089)		(0.0100)
Jurisdictional hierarchy		-0.0041		0.00020		0.0065		0.018
		(0.028)		(0.023)		(0.017)		(0.016)
Distance from equator		0.42		-0.99		0.47		0.68
		(5.22)		(3.98)		(3.05)		(3.77)
Longitude		0.89		0.49		0.46		0.56
		(0.86)		(0.54)		(0.65)		(0.57)
Population (ln)		0.12***		0.078***		0.035***		0.081***
		(0.019)		(0.014)		(0.0081)		(0.016)
Land size (ln)		0.12***		0.096***		0.053***		0.071***
		(0.026)		(0.022)		(0.014)		(0.017)
Ruggedness		-0.000028		-0.00011		-0.000056		-0.00012
		(0.00020)		(0.00016)		(0.000075)		(0.00014)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.13	0.073	0.12	0.071	0.15	0.095	0.12	0.068
Mean of dependent var	0.53	0.53	0.36	0.36	0.14	0.15	0.30	0.30
SD of dependent var	1.26	1.26	1.06	1.06	0.59	0.60	0.88	0.89
Adj. R-squared	0.28	0.45	0.29	0.41	0.19	0.28	0.22	0.35
Number of Obs.	6,590	6,216	6,590	6,216	6,590	6,216	6,590	6,216
Number of Countries	211	211	211	211	211	211	211	211
Number of Clusters	110	107	110	107	110	107	110	107

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of one plus the value. Coefficients are reported with standard errors in parentheses clustered at the linguistic affiliation level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A8: Traditional herding and contemporary conflict: Nomadic controls

	Dependent variable (in log form)			
	All conflicts	State conflicts	Non-state conflicts	Localized conflicts
	(1)	(2)	(3)	(4)
Dependence on herding	0.572***	0.457***	0.359***	0.369**
	(0.185)	(0.164)	(0.106)	(0.146)
	[0.250]	[0.198]	[0.154]	[0.175]
Settlement complexity	0.046	0.047*	0.008	0.029
	(0.031)	(0.027)	(0.014)	(0.022)
	[0.045]	[0.037]	[0.017]	[0.029]
Jurisdictional hierarchy	-0.007	-0.004	0.006	0.017
	(0.020)	(0.017)	(0.012)	(0.015)
	[0.029]	[0.020]	[0.013]	[0.014]
Distance from equator	-0.000	-0.001	0.000	0.000
	(0.005)	(0.004)	(0.002)	(0.003)
	[0.006]	[0.005]	[0.003]	[0.004]
Longitude	0.001	0.000	0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
	[0.001]	[0.001]	[0.001]	[0.001]
Population (ln)	0.120***	0.079***	0.035***	0.081***
	(0.012)	(0.010)	(0.005)	(0.009)
	[0.022]	[0.019]	[0.009]	[0.018]
Land size (ln)	0.124***	0.095***	0.052***	0.071***
	(0.014)	(0.012)	(0.008)	(0.010)
	[0.026]	[0.021]	[0.015]	[0.017]
Ruggedness	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
	[0.000]	[0.000]	[0.000]	[0.000]
Nomadic indicator	0.236	0.266*	0.096	0.150
	(0.176)	(0.156)	(0.093)	(0.123)
	[0.236]	[0.191]	[0.125]	[0.146]
Sedentary indicator	0.085	0.109	0.050	0.054
	(0.131)	(0.114)	(0.065)	(0.093)
	[0.168]	[0.134]	[0.078]	[0.109]
Country FE	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.070	0.067	0.093	0.064
Mean of dependent var	0.53	0.36	0.15	0.29
SD of dependent var	1.26	1.06	0.60	0.88
Adj. R-squared	0.45	0.41	0.28	0.35
Number of Obs.	6,240	6,240	6,240	6,240
Number of Countries	211	211	211	211
Number of Clusters	985	985	985	985

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of one plus the value. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A9: Traditional herding and contemporary conflict: negative binomial estimates

	Dependent variable							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	6.14***	1.44**	5.43***	2.03***	5.30***	0.40	5.14***	1.65***
	(1.03)	(0.59)	(1.01)	(0.68)	(1.10)	(0.94)	(0.93)	(0.64)
Settlement complexity		0.081*		0.11*		-0.061		0.11**
		(0.048)		(0.061)		(0.067)		(0.050)
Jurisdictional hierarchy		-0.083		-0.12		-0.32***		-0.0042
		(0.072)		(0.086)		(0.10)		(0.069)
Distance from equator		26.3		51.8*		38.1		2.60
		(19.3)		(26.9)		(24.6)		(19.1)
Longitude		8.93		7.26		15.5*		11.3*
		(5.74)		(6.93)		(8.53)		(6.00)
Population (ln)		0.71***		0.68***		0.85***		0.75***
		(0.048)		(0.061)		(0.085)		(0.060)
Land size (ln)		0.24***		0.29***		0.11		0.23***
		(0.056)		(0.065)		(0.10)		(0.068)
Ruggedness		0.0024***		0.0025***		0.0026***		0.0020***
		(0.00052)		(0.00060)		(0.00084)		(0.00061)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent var	18.5	19.4	13.0	13.6	1.59	1.74	3.89	4.10
SD of dependent var	234.7	246.3	208.4	218.6	31.3	33.2	34.4	36.2
Pseudo R-squared	0.10	0.21	0.13	0.23	0.14	0.26	0.13	0.25
Number of Obs.	7,036	6,240	7,036	6,240	7,036	6,240	7,036	6,240
Number of Countries	211	211	211	211	211	211	211	211
Number of Clusters	1,104	985	1,104	985	1,104	985	1,104	985

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A10: Traditional herding and contemporary conflict: Extensive margin

	Dependent variable (binary)							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	0.176***	0.087	0.161***	0.100*	0.153***	0.119**	0.133**	0.088*
	(0.065)	(0.056)	(0.062)	(0.053)	(0.057)	(0.049)	(0.057)	(0.051)
	[0.098]	[0.076]	[0.098]	[0.068]	[0.068]	[0.057]	[0.081]	[0.060]
Settlement complexity		0.006*		0.005		-0.002		0.002
		(0.004)		(0.004)		(0.003)		(0.004)
		[0.004]		[0.004]		[0.004]		[0.004]
Jurisdictional hierarchy		-0.013**		-0.011*		-0.007		0.000
		(0.007)		(0.006)		(0.005)		(0.005)
		[0.014]		[0.011]		[0.007]		[0.008]
Distance from equator		0.001		0.001		-0.000		-0.001
		(0.001)		(0.001)		(0.001)		(0.001)
		[0.002]		[0.002]		[0.001]		[0.001]
Longitude		0.000		0.000		0.000		0.000
		(0.000)		(0.000)		(0.000)		(0.000)
		[0.000]		[0.000]		[0.000]		[0.000]
Population (ln)		0.039***		0.025***		0.018***		0.035***
		(0.003)		(0.003)		(0.002)		(0.003)
		[0.006]		[0.006]		[0.004]		[0.006]
Land size (ln)		0.031***		0.027***		0.020***		0.021***
		(0.004)		(0.004)		(0.003)		(0.004)
		[0.007]		[0.006]		[0.006]		[0.005]
Ruggedness		0.000		0.000		-0.000		0.000
		(0.000)		(0.000)		(0.000)		(0.000)
		[0.000]		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.066	0.032	0.069	0.042	0.087	0.067	0.058	0.038
Mean of dependent var	0.22	0.22	0.16	0.16	0.081	0.082	0.15	0.15
SD of dependent var	0.42	0.42	0.36	0.36	0.27	0.27	0.35	0.35
Adj. R-squared	0.30	0.42	0.31	0.40	0.16	0.25	0.24	0.35
Number of Obs.	7,036	6,240	7,036	6,240	7,036	6,240	7,036	6,240
Number of Countries	211	211	211	211	211	211	211	211
Number of Clusters	1,104	985	1,104	985	1,104	985	1,104	985

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A11: Traditional herding and contemporary conflict: Intensive margin

	Dependent variable (in log form)							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	1.753***	0.719*	1.596***	0.865	1.367***	0.224	1.647***	0.759*
	(0.464)	(0.420)	(0.539)	(0.530)	(0.442)	(0.522)	(0.445)	(0.432)
	[0.429]	[0.460]	[0.511]	[0.545]	[0.519]	[0.761]	[0.480]	[0.486]
Settlement complexity		0.008		0.024		-0.017		0.031
		(0.035)		(0.040)		(0.050)		(0.037)
		[0.038]		[0.045]		[0.048]		[0.040]
Jurisdictional hierarchy		-0.002		0.001		-0.044		-0.006
		(0.049)		(0.055)		(0.068)		(0.053)
		[0.048]		[0.063]		[0.067]		[0.047]
Distance from equator		0.006		0.007		0.016		0.011
		(0.013)		(0.016)		(0.020)		(0.017)
		[0.020]		[0.025]		[0.020]		[0.022]
Longitude		0.005		0.004		0.004		0.008
		(0.006)		(0.005)		(0.011)		(0.006)
		[0.007]		[0.007]		[0.011]		[0.007]
Population (ln)		0.390***		0.377***		0.281***		0.342***
		(0.036)		(0.043)		(0.050)		(0.043)
		[0.048]		[0.056]		[0.087]		[0.062]
Land size (ln)		0.171***		0.165***		0.110*		0.125***
		(0.042)		(0.049)		(0.056)		(0.048)
		[0.052]		[0.065]		[0.081]		[0.058]
Ruggedness		0.001**		0.001***		0.001**		0.000
		(0.000)		(0.000)		(0.001)		(0.000)
		[0.000]		[0.000]		[0.001]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.17	0.067	0.16	0.083	0.19	0.030	0.19	0.083
Mean of dependent var	2.11	2.11	2.04	2.02	1.41	1.45	1.69	1.71
SD of dependent var	1.85	1.86	1.85	1.87	1.40	1.42	1.58	1.60
Adj. R-squared	0.17	0.47	0.19	0.48	0.16	0.38	0.11	0.39
Number of Obs.	1,558	1,393	1,103	976	568	513	1,031	914
Number of Countries	122	122	105	105	71	68	96	94
Number of Clusters	561	496	409	361	314	279	465	408

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of the value. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A12: Traditional herding and contemporary conflict

	Dependent variable (in log form)							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	0.864***	0.652***	0.624**	0.465**	0.458***	0.336***	0.678***	0.549***
	(0.312)	(0.222)	(0.245)	(0.196)	(0.161)	(0.125)	(0.225)	(0.183)
	[0.348]	[0.285]	[0.288]	[0.247]	[0.182]	[0.171]	[0.262]	[0.211]
Herding × Excluded	0.025	-0.215	0.085	-0.019	0.112	0.076	-0.312	-0.434**
	(0.362)	(0.300)	(0.329)	(0.296)	(0.145)	(0.135)	(0.246)	(0.207)
	[0.434]	[0.339]	[0.391]	[0.330]	[0.173]	[0.160]	[0.305]	[0.253]
Excluded	0.117	0.161***	0.079	0.082	0.041	0.057**	0.113**	0.145***
	(0.071)	(0.061)	(0.061)	(0.057)	(0.030)	(0.027)	(0.049)	(0.042)
	[0.089]	[0.065]	[0.059]	[0.062]	[0.062]	[0.046]	[0.055]	[0.047]
Settlement complexity		0.015		0.011		-0.005		0.009
		(0.013)		(0.012)		(0.008)		(0.010)
		[0.017]		[0.015]		[0.009]		[0.012]
Jurisdictional hierarchy		-0.009		-0.005		0.006		0.019
		(0.020)		(0.018)		(0.012)		(0.015)
		[0.031]		[0.022]		[0.013]		[0.015]
Distance from equator		0.002		-0.000		0.001		0.002
		(0.005)		(0.004)		(0.002)		(0.003)
		[0.006]		[0.006]		[0.003]		[0.004]
Longitude		0.002		0.001		0.001		0.001
		(0.002)		(0.001)		(0.001)		(0.001)
		[0.002]		[0.002]		[0.001]		[0.001]
Population (ln)		0.127***		0.083***		0.035***		0.087***
		(0.012)		(0.010)		(0.006)		(0.009)
		[0.023]		[0.020]		[0.009]		[0.018]
Land size (ln)		0.140***		0.110***		0.061***		0.080***
		(0.016)		(0.014)		(0.009)		(0.011)
		[0.030]		[0.025]		[0.017]		[0.020]
Ruggedness		0.000		-0.000		-0.000		-0.000
		(0.000)		(0.000)		(0.000)		(0.000)
		[0.000]		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.10	0.077	0.088	0.065	0.12	0.084	0.12	0.092
Mean of dependent var	0.60	0.60	0.42	0.41	0.16	0.16	0.33	0.34
SD of dependent var	1.33	1.34	1.13	1.14	0.62	0.64	0.93	0.94
Adj. R-squared	0.30	0.46	0.30	0.43	0.20	0.30	0.23	0.37
Number of Obs.	6,009	5,318	6,009	5,318	6,009	5,318	6,009	5,318
Number of Countries	163	163	163	163	163	163	163	163
Number of Clusters	1,056	947	1,056	947	1,056	947	1,056	947

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of one plus the value. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A13: Traditional herding and contemporary conflict

	Dependent variable (in log form)							
	All conflicts		State conflicts		Non-state conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	0.896***	0.657***	0.711***	0.569***	0.548***	0.401***	0.595***	0.458***
	(0.293)	(0.212)	(0.247)	(0.192)	(0.168)	(0.133)	(0.208)	(0.158)
	[0.342]	[0.303]	[0.264]	[0.240]	[0.217]	[0.187]	[0.217]	[0.194]
No political authority	-0.093	0.053	-0.044	0.054	0.002	0.072*	-0.069	0.091
	(0.066)	(0.082)	(0.051)	(0.068)	(0.031)	(0.042)	(0.049)	(0.060)
	[0.072]	[0.089]	[0.055]	[0.070]	[0.034]	[0.044]	[0.055]	[0.065]
Herding × No authority	0.128	-0.191	-0.087	-0.296	-0.036	-0.061	0.006	-0.205
	(0.441)	(0.388)	(0.351)	(0.313)	(0.235)	(0.216)	(0.333)	(0.305)
	[0.474]	[0.385]	[0.376]	[0.318]	[0.210]	[0.188]	[0.283]	[0.230]
Settlement complexity		0.015		0.013		-0.006		0.011
		(0.013)		(0.012)		(0.007)		(0.010)
		[0.016]		[0.014]		[0.008]		[0.011]
Jurisdictional hierarchy		0.003		0.003		0.026		0.037
		(0.031)		(0.028)		(0.017)		(0.023)
		[0.041]		[0.032]		[0.017]		[0.024]
Distance from equator		0.000		-0.001		0.000		0.001
		(0.005)		(0.004)		(0.002)		(0.003)
		[0.006]		[0.005]		[0.003]		[0.004]
Longitude		0.001		0.000		0.000		0.001
		(0.001)		(0.001)		(0.001)		(0.001)
		[0.001]		[0.001]		[0.001]		[0.001]
Population (ln)		0.120***		0.079***		0.035***		0.082***
		(0.012)		(0.010)		(0.005)		(0.009)
		[0.022]		[0.019]		[0.009]		[0.017]
Land size (ln)		0.123***		0.095***		0.051***		0.069***
		(0.014)		(0.012)		(0.008)		(0.010)
		[0.027]		[0.022]		[0.015]		[0.017]
Ruggedness		-0.000		-0.000		-0.000		-0.000
		(0.000)		(0.000)		(0.000)		(0.000)
		[0.000]		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.11	0.081	0.10	0.083	0.14	0.10	0.10	0.080
Mean of dependent var	0.52	0.53	0.36	0.36	0.14	0.15	0.29	0.29
SD of dependent var	1.25	1.26	1.05	1.06	0.59	0.60	0.88	0.88
Adj. R-squared	0.29	0.45	0.30	0.41	0.20	0.28	0.23	0.35
Number of Obs.	6,319	6,240	6,319	6,240	6,319	6,240	6,319	6,240
Number of Countries	211	211	211	211	211	211	211	211
Number of Clusters	990	985	990	985	990	985	990	985

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of one plus the value. Coefficients are reported with standard errors in parentheses clustered at the ethnicity level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A14: Countries and territories in *Ethnologue* that provide within-country variations in herding

Country	Obs.	Avg.	S.D.	C.V.	Country	Obs.	Avg.	S.D.	C.V.
Australia	151	0.005	0.034	7.186	**Guinea**	28	0.180	0.108	0.598
New Caledonia	35	0.006	0.035	5.916	**Saudi Arabia**	3	0.643	0.384	0.597
Canada	72	0.011	0.043	4.105	**Algeria**	15	0.285	0.170	0.596
Venezuela	29	0.035	0.141	4.042	**Iraq**	9	0.338	0.200	0.591
Solomon Islands	67	0.015	0.054	3.548	Benin	46	0.160	0.095	0.590
Colombia	74	0.030	0.102	3.350	**Niger**	12	0.431	0.249	0.578
Suriname	11	0.028	0.092	3.317	**Nigeria**	466	0.156	0.090	0.576
Brazil	166	0.017	0.046	2.715	**Sudan**	120	0.263	0.149	0.566
Guyana	12	0.034	0.090	2.648	Gabon	38	0.080	0.045	0.565
Panama	11	0.037	0.094	2.528	**Eritrea**	8	0.530	0.296	0.559
United States	144	0.022	0.055	2.523	Oman	10	0.325	0.175	0.539
Paraguay	18	0.040	0.100	2.508	**Libya**	5	0.365	0.195	0.534
Cook Islands	5	0.061	0.136	2.236	**Thailand**	55	0.137	0.073	0.532
Costa Rica	8	0.051	0.109	2.125	**Armenia**	3	0.505	0.265	0.524
Mexico	286	0.042	0.082	1.946	**Ethiopia**	83	0.303	0.154	0.508
Brunei	8	0.051	0.095	1.852	**Mauritania**	6	0.472	0.234	0.496
El Salvador	3	0.102	0.176	1.732	**Italy**	18	0.222	0.110	0.495
Bolivia	32	0.055	0.094	1.711	**Congo**	57	0.081	0.039	0.477
Indonesia	696	0.058	0.093	1.617	**Iran**	38	0.421	0.197	0.467
Malaysia	110	0.066	0.094	1.427	**Bosnia and Herzegovina**	2	0.305	0.141	0.464
Honduras	9	0.091	0.129	1.417	**Ireland**	2	0.305	0.141	0.464
Spain	2	0.153	0.216	1.414	**Tajikistan**	11	0.405	0.185	0.458
Portugal	2	0.153	0.216	1.414	**Latvia**	2	0.155	0.071	0.456
French Guiana	10	0.052	0.073	1.405	**Somalia**	9	0.750	0.338	0.451
Taiwan	12	0.060	0.082	1.351	**Myanmar**	87	0.145	0.064	0.444
Mozambique	39	0.093	0.116	1.238	**Syria**	10	0.385	0.169	0.438
Philippines	160	0.061	0.075	1.233	**South Africa**	13	0.359	0.156	0.435
Argentina	20	0.109	0.128	1.175	**Nepal**	102	0.306	0.130	0.426
Peru	88	0.094	0.108	1.142	Hungary	3	0.272	0.115	0.425
Guatemala	52	0.056	0.063	1.121	**Sierra Leone**	14	0.155	0.065	0.420
Ghana	67	0.183	0.205	1.118	Finland	5	0.465	0.195	0.419
Kazakhstan	3	0.370	0.406	1.098	**Turkey**	15	0.378	0.158	0.418
Ecuador	22	0.107	0.112	1.042	**Burkina Faso**	58	0.198	0.079	0.400
Macedonia	3	0.203	0.203	0.996	**Uganda**	36	0.255	0.100	0.394
Togo	33	0.231	0.229	0.989	**Cote dIvoire**	67	0.120	0.047	0.393
Sri Lanka	5	0.143	0.137	0.956	**Senegal**	29	0.198	0.076	0.385
Namibia	18	0.259	0.247	0.955	**Gambia**	8	0.243	0.092	0.378
Romania	5	0.324	0.296	0.915	Switzerland	5	0.225	0.084	0.372
Nicaragua	5	0.124	0.111	0.895	Viet Nam	88	0.167	0.059	0.355
Belize	7	0.161	0.142	0.881	**Afghanistan**	34	0.355	0.124	0.350
Chile	7	0.204	0.175	0.860	**Western Sahara**	2	0.405	0.141	0.349
Kuwait	2	0.505	0.424	0.840	**Egypt**	6	0.355	0.122	0.345
Lithuania	2	0.255	0.212	0.832	**United Kingdom**	6	0.238	0.082	0.343
Uzbekistan	7	0.446	0.367	0.821	Botswana	4	0.380	0.126	0.331
Cameroon	257	0.141	0.116	0.818	**Moldova**	3	0.305	0.100	0.328
Equatorial Guinea	11	0.067	0.053	0.793	**Madagascar**	10	0.325	0.103	0.318
Central African Republic	59	0.116	0.091	0.786	**Cambodia**	19	0.221	0.069	0.312
Democratic Republic of the Congo	186	0.097	0.075	0.771	**Azerbaijan**	14	0.455	0.140	0.308
Mongolia	10	0.454	0.349	0.768	**Pakistan**	47	0.314	0.095	0.304
Chad	119	0.195	0.149	0.762	Austria	4	0.330	0.096	0.290
Kyrgyzstan	3	0.438	0.321	0.733	**Georgia**	7	0.419	0.121	0.290
Angola	36	0.175	0.126	0.720	**Laos**	72	0.183	0.051	0.279
Malawi	12	0.120	0.085	0.709	United Arab Emirates	2	0.255	0.071	0.277
Kenya	55	0.331	0.230	0.692	**Bahrain**	2	0.255	0.071	0.277
Guadeloupe	2	0.205	0.141	0.690	**Israel**	4	0.305	0.082	0.268
Albania	4	0.279	0.192	0.688	Slovakia	6	0.288	0.075	0.261
Guinea-Bissau	16	0.198	0.135	0.685	Norway	5	0.545	0.134	0.246
China	198	0.214	0.146	0.684	**Liberia**	26	0.113	0.027	0.241
Tanzania	107	0.251	0.168	0.671	Sweden	6	0.555	0.122	0.221
India	300	0.204	0.137	0.671	Denmark	2	0.355	0.071	0.199
East Timor	17	0.215	0.143	0.665	Cyprus	2	0.355	0.071	0.199
Bulgaria	6	0.355	0.235	0.661	**Belgium**	4	0.280	0.050	0.179
Russian Federation	87	0.331	0.216	0.652	**Lesotho**	4	0.355	0.058	0.163
Zambia	35	0.130	0.085	0.651	**Morocco**	5	0.325	0.045	0.138
Zimbabwe	13	0.200	0.128	0.640	Turkmenistan	3	0.438	0.058	0.132
Jordan	2	0.555	0.354	0.637	**Yemen**	7	0.291	0.038	0.130
Japan	12	0.145	0.092	0.634	**Djibouti**	2	0.863	0.081	0.094
Bangladesh	8	0.154	0.095	0.617	**Bhutan**	23	0.401	0.021	0.052
Mali	30	0.275	0.168	0.611					

Invariant countries: Comoros, Dominican Republic, Dominica, **Germany**, Czech Republic, Netherlands Antilles, Liechtenstein, **Netherlands**, **Trinidad and Tobago**, Singapore, **Serbia**, Sao Tome e Principe, **Tunisia**, Poland, **Ukraine**, **Papua New Guinea**, Vanuatu, Fiji
Singleton countries: Cape Verde Islands, Greece, Estonia, Jamaica, Lebanon, San Marino, Malta, United States Virgin Islands, Rwanda, Croatia, Uruguay, Slovenia, Korea, North, France, Montserrat, Swaziland, Mayotte, Mauritius, Reunion, Greenland, Bahamas, Bermuda, British Virgin Islands, Martinique, Korea, South, Antigua and Barbuda, Cuba, Grenada, Saint Lucia, Turks and Caicos Islands, Cayman Islands, New Zealand, Belarus, Saint Pierre and Miquelon, Montenegro, Norfolk Island, Maldives, Luxembourg, Aruba, Puerto Rico, Saint Kitts and Nevis, Falkland Islands, Barbados, Qatar, Andorra, Haiti, Burundi, Saint Vincent and the Grenadines, Iceland, Anguilla, Seychelles
The countries in bold are those that provide within-country variations in conflict.

Table A15: The historical origins of a psychology of punishment: Individual-level analysis, winsorizing top 5% herding

	Dependent variable							
			Punish if ... treated unfairly				Willingness to	
	Summary measure		Self		Others		take revenge	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	0.560**	0.590**	1.674**	1.750**	1.813***	1.869***	0.884	0.979
	(0.251)	(0.260)	(0.724)	(0.758)	(0.640)	(0.665)	(0.667)	(0.674)
	[0.347]	[0.352]	[0.912]	[0.937]	[0.969]	[0.949]	[0.828]	[0.862]
Settlement complexity		0.006		0.015		-0.001		0.028
		(0.017)		(0.051)		(0.045)		(0.045)
		[0.018]		[0.054]		[0.045]		[0.048]
Jurisdictional hierarchy		0.027		0.078		0.033		0.088
		(0.024)		(0.067)		(0.067)		(0.063)
		[0.031]		[0.085]		[0.081]		[0.078]
Distance from equator		-0.002		-0.004		-0.016		-0.001
		(0.005)		(0.012)		(0.014)		(0.013)
		[0.007]		[0.015]		[0.028]		[0.015]
Longitude		-0.002		-0.005		-0.003		-0.004
		(0.001)		(0.003)		(0.004)		(0.004)
		[0.002]		[0.004]		[0.005]		[0.005]
Age		-0.427***		-0.555		-0.249		-2.200***
		(0.131)		(0.394)		(0.378)		(0.377)
		[0.192]		[0.570]		[0.519]		[0.545]
Age squared		-0.427***		-1.868***		-2.015***		0.283
		(0.139)		(0.414)		(0.402)		(0.399)
		[0.189]		[0.538]		[0.524]		[0.568]
Female indicator		-0.159***		-0.425***		-0.376***		-0.414***
		(0.009)		(0.028)		(0.025)		(0.026)
		[0.012]		[0.038]		[0.030]		[0.036]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.065	0.069	0.064	0.067	0.069	0.071	0.034	0.038
Mean of dependent var	-0.0031	-0.0031	4.20	4.20	4.35	4.35	3.63	3.63
SD of dependent var	1.00	1.00	3.04	3.04	3.04	3.04	3.00	3.00
Adj. R-squared	0.071	0.095	0.050	0.070	0.061	0.078	0.080	0.096
Number of Obs.	74,182	73,949	74,264	74,030	74,252	74,018	75,024	74,781
Number of Countries	75	75	75	75	75	75	75	75
Number of Clusters	951	951	951	951	951	951	951	951

Note. The unit of observation is an individual from the *Global Preference Survey* (GPS). The dependent variables are based on information from the GPS, elicited through three self-assessments to measure people's propensity for altruistic punishment and for second-party punishment. Coefficients are reported with standard errors in parentheses clustered at the district level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A16: The historical origins of a psychology of punishment: Individual-level analysis, alternative clustering

	Dependent variable							
			Punish if ... treated unfairly				Willingness to	
	Summary measure		Self		Others		take revenge	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	0.45*	0.52*	1.34**	1.52**	1.37**	1.42**	0.81	1.05
	(0.25)	(0.26)	(0.64)	(0.72)	(0.68)	(0.65)	(0.60)	(0.69)
Settlement complexity		0.013		0.035		0.016		0.044
		(0.019)		(0.057)		(0.046)		(0.050)
Jurisdictional hierarchy		0.024		0.069		0.027		0.080
		(0.030)		(0.083)		(0.081)		(0.076)
Distance from equator		-1.76		-2.27		-14.6		0.88
		(6.76)		(14.8)		(27.9)		(14.2)
Longitude		-1.58		-4.73		-2.49		-4.35
		(1.60)		(3.96)		(5.40)		(4.47)
Age		-0.43**		-0.56		-0.25		-2.20***
		(0.19)		(0.57)		(0.52)		(0.54)
Age squared		-0.43**		-1.86***		-2.01***		0.29
		(0.19)		(0.54)		(0.52)		(0.57)
Female indicator		-0.16***		-0.43***		-0.38***		-0.41***
		(0.012)		(0.038)		(0.030)		(0.036)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.067	0.076	0.065	0.074	0.066	0.069	0.040	0.052
Mean of dependent var	-0.0031	-0.0031	4.20	4.20	4.35	4.35	3.63	3.63
SD of dependent var	1.00	1.00	3.04	3.04	3.04	3.04	3.00	3.00
Adj. R-squared	0.071	0.095	0.050	0.070	0.061	0.078	0.080	0.096
Number of Obs.	74,182	73,949	74,264	74,030	74,252	74,018	75,024	74,781
Number of Countries	75	75	75	75	75	75	75	75
Number of Clusters	75	75	75	75	75	75	75	75

Note. The unit of observation is an individual from the *Global Preference Survey* (GPS). The dependent variables are based on information from the GPS, elicited through three self-assessments to measure people's propensity for altruistic punishment and for second-party punishment. Coefficients are reported with standard errors in parentheses clustered at the district level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A17: The historical origins of a psychology of punishment: additional individual-level controls

	Dependent variable			
		Punish if ... treated unfairly		Willingness to
	Summary measure	Self	Others	take revenge
	(1)	(2)	(3)	(4)
Dependence on herding	0.471**	1.418**	1.298**	0.932*
	(0.215)	(0.626)	(0.534)	(0.563)
	[0.257]	[0.702]	[0.621]	[0.679]
Settlement complexity	0.009	0.026	0.003	0.035
	(0.019)	(0.056)	(0.048)	(0.049)
	[0.019]	[0.056]	[0.044]	[0.050]
Jurisdictional hierarchy	0.021	0.061	0.019	0.076
	(0.024)	(0.066)	(0.066)	(0.062)
	[0.029]	[0.079]	[0.077]	[0.074]
Distance from equator	-0.001	0.002	-0.011	0.003
	(0.004)	(0.011)	(0.014)	(0.013)
	[0.006]	[0.014]	[0.026]	[0.013]
Longitude	-0.002*	-0.006**	-0.004	-0.006
	(0.001)	(0.003)	(0.004)	(0.004)
	[0.002]	[0.004]	[0.005]	[0.004]
Age	-0.384***	-0.524	-0.256	-1.942***
	(0.131)	(0.398)	(0.381)	(0.375)
	[0.196]	[0.587]	[0.535]	[0.545]
Age squared	-0.404***	-1.683***	-1.721***	0.067
	(0.137)	(0.418)	(0.399)	(0.392)
	[0.190]	[0.557]	[0.524]	[0.565]
Female indicator	-0.131***	-0.351***	-0.294***	-0.351***
	(0.009)	(0.028)	(0.026)	(0.026)
	[0.012]	[0.038]	[0.032]	[0.036]
Subj. cognitive skills	0.040***	0.097***	0.101***	0.106***
	(0.003)	(0.007)	(0.008)	(0.008)
	[0.004]	[0.010]	[0.011]	[0.012]
Log [Household income p/c]	0.014**	0.039**	0.049***	0.023
	(0.007)	(0.019)	(0.018)	(0.018)
	[0.009]	[0.025]	[0.024]	[0.024]
Education level (1-3)	-0.005	0.046*	0.111***	-0.160***
	(0.008)	(0.023)	(0.024)	(0.024)
	[0.010]	[0.035]	[0.034]	[0.024]
Country FE	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.070	0.069	0.063	0.046
Mean of dependent var	-0.00053	4.21	4.36	3.64
SD of dependent var	1.00	3.04	3.04	3.00
Adj. R-squared	0.11	0.078	0.088	0.11
Number of Obs.	72,538	72,601	72,596	73,300
Number of Countries	75	75	75	75
Number of Clusters	951	951	951	951

Note. The unit of observation is an individual from the *Global Preference Survey* (GPS). The dependent variables are based on information from the GPS, elicited through three self-assessments to measure people's propensity for altruistic punishment and for second-party punishment. Coefficients are reported with standard errors in parentheses clustered at the district level. Standard errors in square brackets are clustered at the country level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A18: Countries and territories in GPS that provide within-country variations in herding

Country	Obs.	Avg.	S.D.	C.V.	Country	Obs.	Avg.	S.D.	C.V.
Romania	994	0.007	0.024	3.335	Vietnam	1,000	0.186	0.027	0.143
Cameroon	1,000	0.134	0.133	0.986	Chile	1,003	0.471	0.066	0.140
Ghana	1,000	0.070	0.054	0.769	Algeria	1,022	0.657	0.075	0.115
Philippines	1,000	0.100	0.070	0.705	Sri Lanka	1,000	0.291	0.027	0.091
Nigeria	992	0.160	0.085	0.532	Morocco	1,000	0.326	0.027	0.082
Tanzania	1,000	0.280	0.147	0.524	Costa Rica	1,000	0.289	0.023	0.081
Guatemala	1,000	0.180	0.087	0.482	Canada	1,001	0.282	0.023	0.081
Afghanistan	1,000	0.255	0.106	0.415	Saudi Arabia	1,035	0.832	0.067	0.080
China	2,574	0.178	0.071	0.396	Thailand	1,000	0.106	0.006	0.056
Iran	2,507	0.405	0.155	0.383	Nicaragua	1,000	0.299	0.015	0.051
India	2,539	0.191	0.063	0.328	Turkey	1,000	0.401	0.017	0.044
Egypt	1,020	0.405	0.125	0.308	United States	1,072	0.301	0.012	0.040
Uganda	1,000	0.228	0.065	0.282	Australia	1,002	0.297	0.011	0.039
Iraq	1,000	0.238	0.067	0.282	Austria	1,001	0.307	0.005	0.016
Russia	1,498	0.324	0.089	0.275	Sweden	1,000	0.306	0.005	0.016
Venezuela	999	0.328	0.088	0.269	Finland	248	0.208	0.003	0.016
Kenya	1,000	0.341	0.091	0.266	Rwanda	848	0.303	0.003	0.010
Indonesia	1,000	0.191	0.051	0.266	Georgia	1,000	0.312	0.002	0.007
South Africa	1,000	0.408	0.107	0.263	United Arab Emirates	1,000	0.205	0.001	0.002
Malawi	1,000	0.092	0.024	0.258	Hungary	1,004	0.205	0.000	0.002
Mexico	1,000	0.256	0.065	0.254	Japan	1,000	0.105	0.000	0.002
Brazil	1,003	0.173	0.044	0.252	Bangladesh	999	0.205	0.000	0.002
Italy	1,004	0.116	0.029	0.252	Haiti	504	0.205	0.000	0.002
Zimbabwe	1,000	0.225	0.052	0.229	Botswana	1,000	0.405	0.000	0.001
Pakistan	1,004	0.272	0.056	0.206	Ukraine	1,000	0.305	0.000	0.001
Kazakhstan	801	0.737	0.146	0.198	Israel	999	0.305	0.000	0.001
Suriname	504	0.290	0.056	0.192	Jordan	1,000	0.305	0.000	0.000
Switzerland	1,000	0.271	0.050	0.185	France	990	0.205	0.000	0.000
Argentina	1,000	0.474	0.076	0.160	Spain	1,000	0.305	0.000	0.000
Colombia	1,000	0.292	0.045	0.153	Germany	996	0.305	0.000	0.000
Cambodia	984	0.110	0.016	0.149	Greece	872	0.305	0.000	0.000
Bolivia	998	0.256	0.038	0.148					

Invariant countries: South Korea, Czech Republic, United Kingdom, Serbia, Estonia, Lithuania, Moldova, Netherlands, Bosnia Herzegovina, Peru, Poland, Portugal

B. Data description for Folklore analysis

a. Data construction

We follow Michalopoulos and Xue (2019, 2021) in quantifying ethnic groups' cultural beliefs and practices using textual data on folklore. The anthropologist and folklorist Yuri Berezkin assembled a dataset that codes the presence of 2,564 motifs across nearly 1,000 ethnolinguistic groups. A motif reflects a combination of images, episodes, or structural elements found in two or more texts.[14] The data are designed to capture a society's traditional beliefs, customs and culture as they are transmitted from generation to generation through word-of-mouth, often in the form of folktales and narratives.[15] Based on this catalog of motifs, Michalopoulos and Xue (2019, 2021) use text analyses to construct a folklore dataset. For a large number of economic, psychological, and cultural concepts, this dataset codes whether a given concept appears in a given motif.[16] In these text analyses, a concept is said to appear in a motif if the text mentions either the seed word itself or one of the 50 most closely related terms according to the knowledge representation project ConceptNet.[17] Based on this approach, the authors construct the intensity of each concept in the folklore of a given group.

Most importantly for our purposes, the data contain many concepts that are related to the culture of honor hypothesis. Michalopoulos and Xue (2019) study the association between herding and a culture of honor by examining words associated with 'anger' and 'retaliation'. Following the same basic logic, we first selected all seeds words that Nisbett and Cohen (1996) used to introduce the idea of a culture of honor. These are:

1. Violence and conflict concepts: violence, perpetrator, strength, toughness, predation, predator, aggressiveness, affront, deterrence, defend, mayhem, guard

[14] As described in detail in Michalopoulos and Xue (2019, 2021), Berezkin constructed this dataset by consulting a large number of books and journal articles. These primary sources were written by anthropologists, adventurers and missionaries who had visited an ethnolinguistic group. Berezkin systematized these accounts into a consistent catalog. Each motif in Berezkin's catalogue is associated with a title and a short description of an image or an episode. These can be analyzed using text analyses. The median group in Berezkin's data has 62 motifs, and there is large variation across groups in which types of motifs appear in the records.

[15] A potential concern that the data are more reflective of the biases of the individual who coded the primary sources rather than of the genuine folklore of a group. To address this concern, Michalopoulos and Xue (2019, 2021) extensively validate the catalog by documenting that the presence of objectively verifiable motifs is strongly correlated with real circumstances. For example, the presence of earthquake-related motifs is significantly higher in earthquake regions. Similar associations are found for other environmentally-determined variables such the presence of storms and lightnings, or information about different modes of economic production.

[16] The data are available at: `https://sites.google.com/site/steliosecon/folklore-catalogue?authuser=0`

[17] ConceptNet originated from the MIT Media Lab. To costruct a ConcenpNet-based list of related terms Michalopoulos and Xue (2019, 2021) retrive the top-50 list for each seed word.

2. Punishment and revenge concepts: punishment, punish, penalty, revenge, retaliate, retaliation

For each seed word, we retrieve the top-50 list of related terms from ConceptNet. We then select concepts from the folklore catalogue that appear in the top-50 list of our seed words, finding the following terms:

1. Violence and conflict concepts: power, strong, crime, tough, violence, victim, threat, conflict, strength, violent, aggressive, hunter, habitat, intensity, courage, weakness, chaos, aggression, offender, predator, insult, riot, thief, prey, offend, outrage, aggressively, grit, endurance, coyote, perpetrator, attacker, vitality, brutality, unrest, culprit, victimization, humiliate, robber, vigor, rapist, resilience, nonviolent, abuser, predatory, disgrace, defense, security, protect, guard, protection, defend, disorder, mess, strategic, defensive, assert, confusion, prevention, protective, discourage, defender, uphold, guardian, disturbance, protected, madness, safeguard, turmoil, disruption, deter, preventive, frenzy, chaotic, bodyguard, lineman, warden, fend, upheaval, persuasion, havoc, protector, deterrent, militarily

2. Punishment and revenge concepts: retaliate, retaliation, discipline, penalty, punishment, punish, revenge, disciplinary, backlash, vengeance, grievance, punitive, scold

For each of the concepts, we generate a binary indicator that equals one if the concept appears in the folklore of an ethnic group. We then average across all concepts within a given domain (violence/ conflict and psychology of punishment/ revenge) to arrive at a summary measure that captures the fraction of concepts in the domain that are present in a society's folklore. In addition to measures for both domains, we also compute an overall summary measure of a culture of honor by taking the average across all concepts.

C. Data description for UCDP analysis

a. Data construction

We use data from the *Uppsala Conflict Data Program* (UCDP) to construct measures of contemporary conflict at the *Ethnologue* language group level. We use the *UCDP Georeferenced Event Dataset (GED) Global version 17.1*, which covers the whole world (with the exception of Syria) for the period 1989–2016. This dataset is UCDP's most disaggregated dataset, covering individual

events of organized violence (phenomena of lethal violence occurring at a given time and place). These events are sufficiently fine-grained to be geo-coded down to the level of individual villages, with temporal durations disaggregated to single, individual days. The dataset also encodes each individual conflict event into one of the three types (variable *type_of_violence*): (*i*) state-based conflict, (*ii*) non-state conflict, and (*iii*) one-sided violence.

In order to construct language group level measures of contemporary conflict, we first use a spatial join algorithm to match the geographic location (using the latitude and longitude) of each conflict event to shapefile polygons of the language groups in *Ethnologue*. In the second step, we aggregate all conflict events matched to each language group to calculate the total number of conflict events that took place within the boundary of a language group during the period 1989–2016. We also aggregate the total number of conflict events separately for each of the three types of conflicts.

In addition to the number of conflict events, we also construct two additional measures of the intensity or severity of the conflict: (*i*) the number of conflict deaths and (*ii*) the number of months during which a conflict took place.

The number of conflict deaths is reported in the variable *best_est*, which gives the best (most likely) estimate of total fatalities resulting from an event. It is calculated as the sum of deaths sustained by each side of the conflict, dead civilians in the event, and deaths of persons of unknown status. We aggregate the number of deaths at the ethnic group level for all conflict events as well as for each of the three types.

We also leverage the disaggregated temporal duration of conflict events in the dataset to construct the number of months during which a conflict took place. We start by extracting the year-month in which the conflict event started (variable *date_start*). In the next step, we again aggregate the conflict events at the ethnic group level, but this time considering only the first observed event in each year-month. We use similar procedures to construct this intensity measure for each of the three conflict types.

b. Definitions of variables

Number of conflict events, all conflicts. The total number of all conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Log number of events is computed as ln(1+number of events).

Number of deaths, all conflicts. The total number of deaths from all conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Log number of deaths is computed as ln(1+number of deaths).

Number of months, all conflicts. The total number of months during the sample period that experienced a conflict incidence, aggregated at the dialect group level over the 1989–2016 period. Log number of months is computed as ln(1+number of months).

Number of conflict events, state-based conflicts. The total number of state based conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. State-based conflict refers to violence between two organized actors of which at least one is the government of a given state. Log number of events is computed as ln(1+number of events).

Number of deaths, state-based conflicts. The total number of deaths from all state-based conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. State based conflict refers to violence between two organized actors of which at least one is the government of a given state. Log number of deaths is computed as ln(1+number of deaths).

Number of months, state-based conflicts. The total number of months during the sample period that experienced a state-based conflict incidence, aggregated at the dialect group level over the 1989–2016 period. State-based conflict refers to violence between two organized actors of which at least one is the government of a given state. Log number of months is computed as ln(1+number of months).

Number of conflict events, non-state conflicts. The total number of non-state conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Non-state conflict refers to violence between actors of which neither party is the government of a state. Log number of events is computed as ln(1+number of events).

Number of deaths, non-state conflicts. The total number of deaths from all non-state conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Non-state conflict refers to violence between actors of which neither party is the government of a state. Log number of deaths is computed as ln(1+number of deaths).

Number of months, non-state conflicts. The total number of months during the sample period that experienced a non-state conflict incidence, aggregated at the dialect group level over the 1989–2016 period. Non-state conflict refers to violence between actors of which neither party is the government of a state. Log number of months is computed as ln(1+number of months).

Number of conflict events, localized conflicts. The total number of localized (or one-sided) conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Localized conflict refers to violence against unarmed civilians perpetrated by organized non-state groups or governments. Log number of events is computed as ln(1+number of events).

Number of deaths, localized conflicts. The total number of deaths from all localized (or one-sided) conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Localized conflict refers to violence against unarmed civilians perpetrated by organized non-state groups or governments. Log number of deaths is computed as ln(1+number of deaths).

Number of months, localized conflicts. The total number of months during the sample period that experienced a localized (or one-sided) conflict incidence, aggregated at the dialect group level over the 1989–2016 period. Localized conflict refers to violence against unarmed civilians perpetrated by organized non-state groups or governments. Log number of months is computed as ln(1+number of months).

Historical controls. Historical controls are defined in the main text and include settlement complexicity, jurisdictional hierarchy, distance from the equator and longitude. We construct them at the country and dialect group level for our analysis of modern conflict.

Population We construct a population measure at the country-language group level using the raster file from Landscan 2006, which is "the finest resolution ($30'' \times 30''$ grid cells) global population distribution data available and represents an ambient population (average over 24 hours)". We take the grid-cell level estimates and aggregate the total population size within each of the country-language group polygons in the *Ethnologue* shapefile. This variable is included as a control in our analysis of modern conflict at the country-language group level.

Land size We construct a measure of land size at the country-language group level using the raster file from Landscan 2006, which provides the global cell areas in kilometers at the $30'' \times 30''$ resolution. We take the grid-cell level land area and aggregate the total land size within each of the country-language group polygons in the *Ethnologue* shapefile. This variable is included as a control in our analysis of modern conflict at the country-language group level.

Ruggedness We construct a measure of average land ruggedness at the country-language group level following the procedure suggested by Nunn and Puga (2012). We first compute the ruggedness index at the grid cell level, which is defined as "the square root of the sum of the squared differences in elevation between one central grid cell and the eight adjacent cells" (Riley, DeGloria and Elliot, 1999). The data for elevation (meters) are from GTOPO30, a "global digital elevation model (DEM) with a horizontal grid spacing of 30 arc seconds", which can be accessed at: `https://lta.cr.usgs.gov/GTOPO30`. We then take the grid-cell level ruggedness index and aggregate the average land ruggedness within each of the country-language group polygons in the *Ethnologue* shapefile. This variable is included as a control in our analysis of modern conflict at the country-language group level.

D. Data description for GPS analysis

a. Data construction

For the analysis, we link the contemporary individual-level GPS data to the historical ethnographic data using the region of residence of the respondent in the GPS and district-level measures of the ethnographic data which are taken from the *Ancestral Characteristics Database* (ACD) (Giuliano and Nunn, 2018).[18] To construct the ACD, Giuliano and Nunn (2018) first combine the grid-cell level population estimates from *Landscan* and the shapefile of the language groups in *Ethnologue* to associate each grid cell to a specific language group in *Ethnologue*. Next, they calculate the average ancestral characteristics of populations in each subnational region using the shapefile of global administrative boundaries provided by ESRI. The ancestral traits are taken from *Ethnographic Atlas*, and Giuliano and Nunn (2018) manually matched them to the language groups in *Ethnologue*.

However, the regions reported in ACD do not overlap exactly with the regions in the GPS data. Because the GPS does not include shapefiles at the subnational level, we manually link regions in the GPS data to regions in the ACD by combining various sources of information, taking into account potential name changes and merges and splits. The GPS data report 1,146 distinct regions. Of these, 823 regions in the ACD (72%) match exactly. For 246 GPS regions (21%), the GPS regions are smaller than the ACD regions. For these, the measures from the larger ACD region are used. For 44 of the GPS regions (3.8%), the GPS region is larger than the ACD region. For these, we use the same methodology as in Giuliano and Nunn (2018) to construct ethnographic measures at the larger GPS region level. Lastly, for 33 GPS regions (2.9%), the GPS regions did not nest the ACD regions or vice versa, so that a clean match was not possible. We omit these regions from the analysis. In doing so, we obtain 951 subnational regions over which the dependence on herding are cleanly defined.

b. Definitions of variables

Psychology of punishment. We use data from the Global Preference Survey (GPS) — both the country-level and individual-level versions — to measure psychology of punishment. The measure is constructed by Falk et al. (2018) as a weighted average of three questions that elicits

[18]The version we use is the extension that includes Easternmost Europe, Siberia and the World Ethnographic Sample. The results are similar using any other version of their data.

people's propensity for altruistic punishment and for second-party punishment, each rated on a scale of 1 to 10. The questions are: (i) how willing are you to punish someone who treats others unfairly, even if there may be costs for you? (ii) how willing are you to punish someone who treats you unfairly, even if there may be costs for you? (iii) if I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so. The measure is normalized to have mean 0 and standard deviation 1. For robustness, we also use the responses to these three questions separately.

Age. The age of the respondent is measured in years and is from the GPS individual level dataset. This variable is included as a control in our individual level analysis of psychology of punishment.

Female indicator. An indicator for female respondent is included in the GPS individual level dataset. This variable is included as a control in our individual level analysis of psychology of punishment.

Subjective cognitive skills. We measure subjective cognitive skills using the respondent's self-assessment of math skills, which is included in the GPS individual-level dataset. The question is: *"How well do the following statement describe you as a person? — I am good at math."* The measure takes values from 0 to 10, with 0 means *"does not describe me at all"* and 10 means *"describes me perfectly"*. This variable is included as a control in our individual level analysis of psychology of punishment.

Education level. The measure of the respondent's education level is taken from *Gallup World Poll 2012*, which can be linked to the GPS individual level dataset using the personal identifiers contained in both data. The measure takes four values: (1) completed elementary education or less (up to 8 years of basic education), (2) Secondary - 3 year tertiary education and some education beyond secondary education (9–15 years of education), and (3) completed four years of education beyond high school and / or received a 4-year college degree. This variable is included as a control in our individual level analysis of psychology of punishment.

Household income. The measure of household income per capita is taken from *Gallup World Poll 2012*, which can be linked to the GPS individual level dataset using the personal identifiers contained in both data. The respondents are asked to report their household income in local currency. The measure is constructed by converting local currency to international Dollars (ID) using purchasing power parity (PPP) ratios. Log household income is computed as ln(1+household income). This variable is included as a control in our individual level analysis of psychology of punishment.