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. Our analysis leverages the well-known 'culture of honor' hypothesis from social psychology, which posits that traditional herding practices tend to generate moral systems conducive to 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 (i) experience conflicts that are more frequent and more severe; (ii) are substantially more likely to be involved in conflicts that are motivated by retaliation; and (iii) report a higher emphasis on revenge-taking in global survey data. We also show that herding societies historically developed a culture in which revenge and punishment featured saliently. The evidence suggests that a society's traditional form of subsistence generated a functional morality that shapes conflict across the globe today.

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

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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 first-order determinants: 'grievance,' in addition to 'greed,' is hypothesized to play a key role in explaining the incidence of civil conflicts (e.g., Boehm, 1987; Scheff, 1994; Collier and Hoeffler, 2004). For example, retribution and revenge are cited as important factors in explaining whether a rebel group is able to recruit soldiers and gain the support of the local population (Marchais, Mugaruka, Sanchez de la Sierra and Wu, 2022). Similarly, acts of revenge and vengeance can escalate and, hence, result in sustained large-scale conflicts (Davie, 1929; Chagnon, 1988).

However, despite the prominence of the idea that norms of revenge and punishment contribute to conflict, there is no direct empirical evidence that pertains to larger-scale violence like civil wars. Instead, the extant empirical evidence for the importance of punishment and revenge has focused on smaller-scale elements of aggression, such as assaults and homicides. The primary difficulty in assessing the importance of norms of revenge for conflict is the fact that while vengeance may fuel conflict, conflict most likely induces vengeance, making identifying a causal effect difficult.

To circumvent this problem, we focus on a deeper economic determinant of the desire for vengeance and punishment, which is pre-determined relative to contemporary conflict and has been emphasized by psychologists, known as 'culture of honor.' The main idea, developed by Nisbett (1993) and Nisbett and Cohen (1996),[1] is that economic subsistence in the form of herding (pastoralism) generated a bundle of values, beliefs, and preferences that induce people to respond to threats and wrongdoings with revenge and

[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).

violence. Such a moral code is hypothesized to be especially pronounced among herders because they are particularly vulnerable to exploitation and theft as their livestock is a 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."[2]

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, or the homicides studied by Grosjean (2014). 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 larger-scale conflict, including that involving the state.

Our empirical strategy consists of five 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 with a tradition of herding have substantially more frequent and severe conflict today, including civil conflict. Fourth, we provide evidence suggesting that the link between ancestral herding and contemporary conflict is largely driven by retaliation. Fifth, to better identify psychological mechanisms, we use globally representative survey data to document that the descendants of herders have significantly more pronounced tendencies to seek revenge and punish.

Our measure of traditional pastoralism follows Becker (2019), who constructs an ethnicity-level measure of the pre-industrial reliance on pastoral production using in-

[2]Theoretical evidence from agent-based modeling provides some formal support for this presumption (Nowak, Gelfand, Borkowski, Cohen and Hernandez, 2016).

formation 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 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 motifs related to vengeance, punishment, retaliation, and ultimately violence.

We then examine whether a tradition of herding, and its associated culture of honor, shapes conflict, warfare, and revenge taking today. Our hypothesis that the culture of honor is relevant for larger-scale conflict events, including 'civil conflict' events that include state on one side, is motivated by a rich body of anecdotal and ethnographic evidence that has emphasized the role of vengeance in fueling conflict. For example, the case study in Marchais et al. (2022) shows how revenge-taking motives directly contribute to the conflict between the state and rebel groups in the Congo. Similar case studies have documented how revenge-taking motives contribute to the support for Jihadist rebel movements in Western Africa (Benjaminsen and Ba, 2019, 2021) and for the civil conflict in Somalia (Lewis, 1994).

To study the link between a tradition of herding and contemporaneous conflict, we leverage 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 ethnolinguistic groups that reside within the same country but potentially differ in their historical reliance on herding. We find that populations that relied on herding to a greater extent historically tend to have more conflicts today. Consistent with existing findings on homicides (Grosjean, 2014), we find that a tradition of herding is associated with a greater prevalence of smaller scale conflicts that are more localized. Yet, a tradition of herding is also strongly associated with larger-scale conflict events, both those that involve the state and those that do not. Historical herding is also predictive of measures of the *intensity* of conflict, including measures such as number of deaths and length of conflicts.

Given the nature of the 'culture of honor' hypothesis, one would like to provide evidence that a tradition of herding is not only linked to the presence of conflicts but with revenge-taking specifically. We do so in two ways. First, in the *UCDP* data, we show that the link between ancestral herding and contemporary conflict is largely driven by 'revenge conflicts.' For instance, herding significantly increases the probability that a previous conflict is followed by another one, but it does not increase the probability of conflict in the absence of previous conflicts.

Second, to provide even more direct evidence on the revenge-taking mechanism, we complement the *UCDP* analysis using *ACLED* data from the African continent. An important upside of the *ACLED* dataset is that it contains detailed descriptions of conflict events, which allow us to quantify whether a conflict event involves revenge motivations. We find that the link between a tradition of herding and the presence of conflicts is largely driven by those conflicts for which the database indicates a revenge or retaliation motive.

While this evidence suggests that the link between historical herding and conflict reflects the proclivity to seek revenge, we provide further complementary evidence for this mechanism by leveraging the recently-constructed *Global Preferences Survey*, or GPS (Falk, Becker, Dohmen, Enke, Huffman and Sunde, 2018). This globally representative dataset includes detailed information on respondents' willingness to take revenge and punish other people for unfair behavior. Because of their global scope and representativeness,

these data provide an ideal basis for an investigation of the global psychological variation in inclinations to seek revenge and punish others. An additional attractive feature is that the survey questions in the GPS were previously experimentally validated, meaning that they have been shown to be highly correlated with actual, financially incentivized punishment decisions in experiments.

Our analysis leverages within-country variation in the GPS. In our main specifications, we link respondents' revenge taking and punishment to historical variation in herding across subnational regions. 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 all, the evidence suggests that a culture of honor is an important determinant of global conflicts and associated psychological and cultural proclivities. Our findings contribute to the existing evidence on honor cultures, which has focused on smaller-scale violence, such as homicides (Black-Michaud, 1975; Nisbett and Cohen, 1996; Nisbett, Polly and Lang, 1995; Cohen, 1998; Hayes and Lee, 2004; Uskul, Cross, Günsoy and Gul, 2019), including in the U.S. South (Grosjean, 2014). Our findings extend our understanding of the effects of a culture of honor by considering its effects on economically important 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 can 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 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 focuses 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 as a result of 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).

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 relationship between herding and a culture of honor. Sections 4 and 5 investigate the link between historical herding and contemporary conflicts, with emphasis on the effects on retaliatory conflicts in particular. Section 6 studies the relationship between historical herding and people's attitudes toward punishment and revenge taking today. Section 7 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 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 tends to be following European contact and can be as late as the 19th or even early 20th centuries. The data capture, to the fullest extent possible, the indigenous 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, Giuliano and Nunn, 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 in independent survey data (Bahrami-Rad, Becker and Henrich, 2021).

Herding, also referred to as pastoralism, refers to the breeding, care, and use of herd animals. 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 in the *Ethnographic Atlas* 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. The spatial distribution of the dependence on herding measure across ethnic groups is shown in Figure 1 and the histogram of the distribution is reported in Appendix Figure A1. Societies vary substantially in their historical dependence on herding. About one-third of societies traditionally have very little or no herding production (less than 5%). Very 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%. Societies that depend more on pastoralism tend to be located in Northern Africa, Southern Africa, Northern Europe, the Middle East, and Central Asia.

2.2. Construction of Herding Index at the Ethnicity and District Levels

In our analyses where the dependent variable is a historical outcome (e.g., mentions of violence or punishment in traditional folklore), the unit of observation is a historical

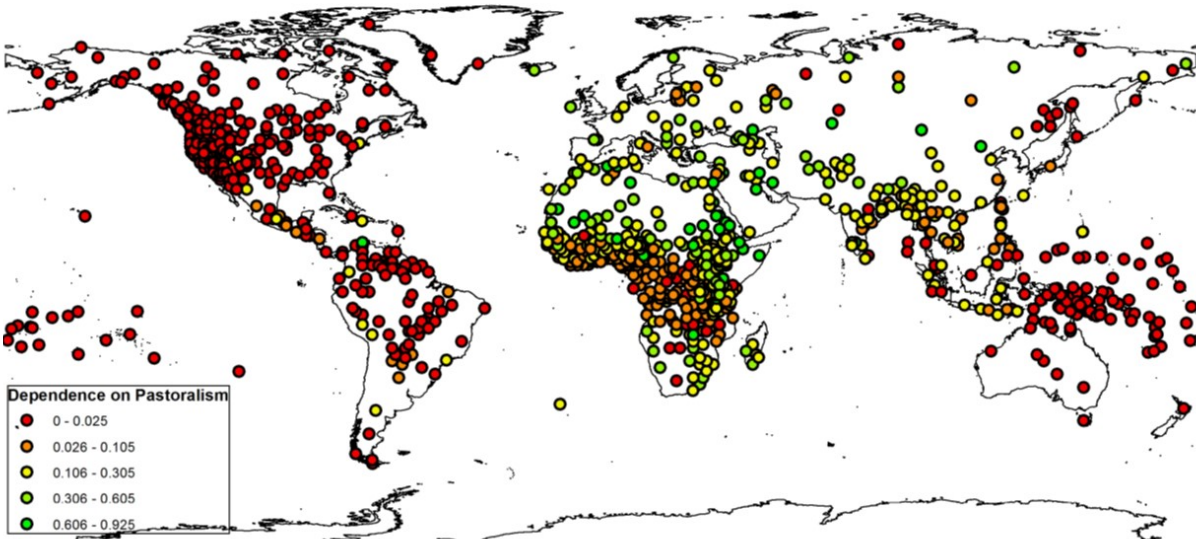


Figure 1: Global distribution of reliance on herding in the *Ethnographic Atlas*. The data apply to the pre-industrial period and capture the traditional subsistence mode of the local population. Source: Becker (2019).

ethnic group, which is the variation shown in Figure 1.

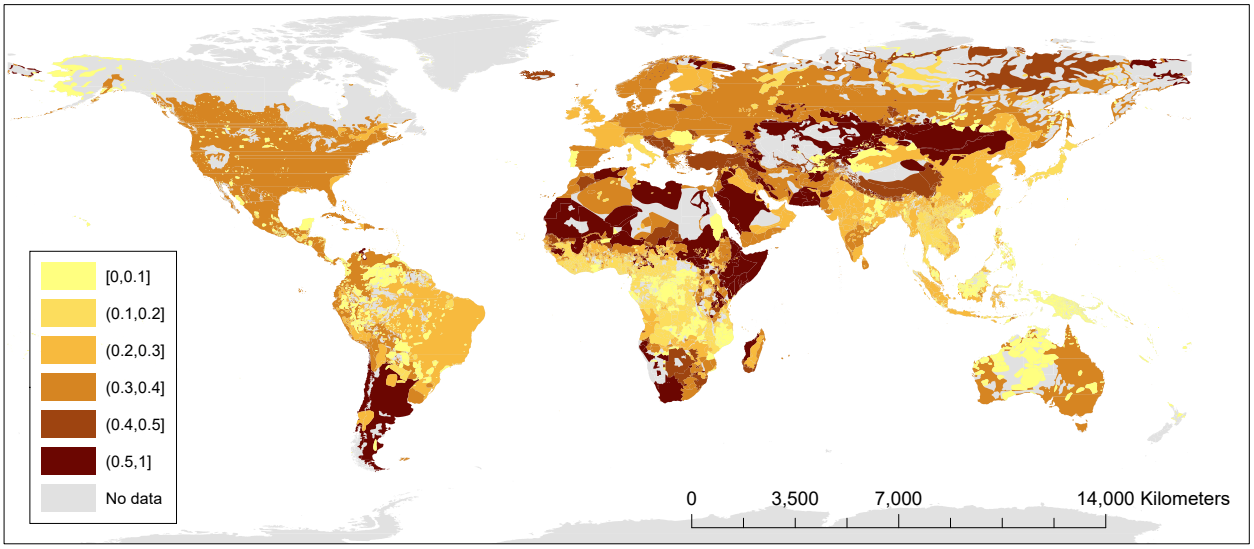
For analyses where the outcome variables are measured in the contemporary period, the historical data must be linked to the current data. The exact manner in which this is done depends on the outcome data.

Linkage to conflict events. The basic logic is that we link each conflict event to a location, and then use the language of the predominant group in that location to determine the ancestral dependence on herding in that location. This provides a link between traditional dependence on herding in the *Ethnographic Atlas* and contemporary conflict events.

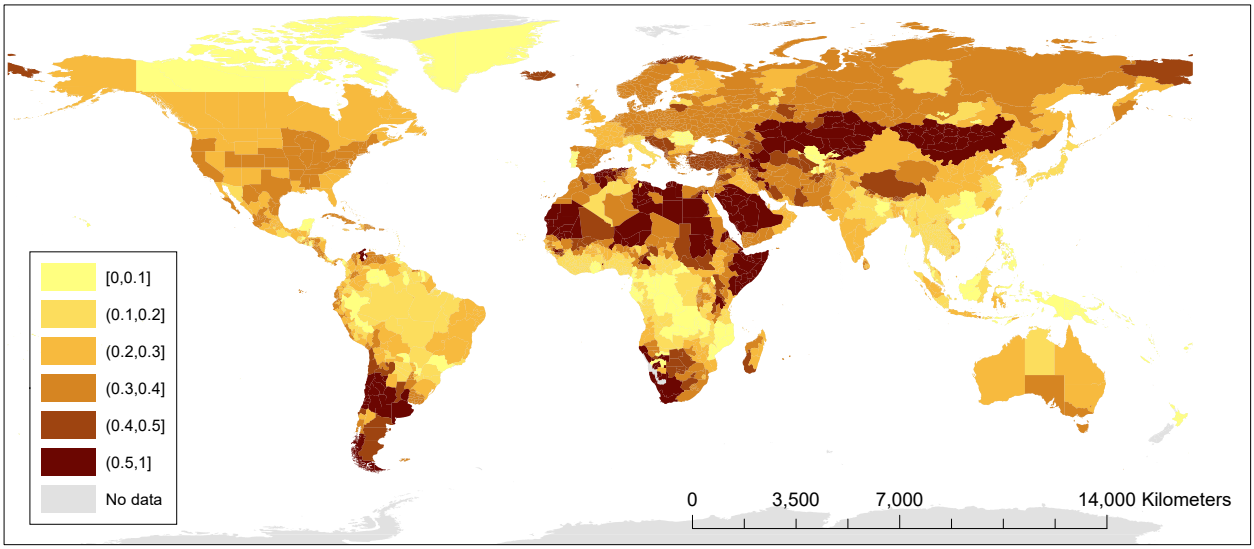
Conflict data provide information on the precise location of contemporary conflict events. We use latitude and longitude to determine the language of the group that currently lives in that location. The location of over 7,000 language groups is taken from the *Ethnologue 16*, a database reporting the dominant language group that is present in each location across the globe. We then match each of the 7,000+ *Ethnologue* languages/dialects with one of the ethnic groups in the *Ethnographic Atlas*. In nearly all cases, there is a one-to-one match between language and ethnicity.

The procedure works best in locations where there are many language and ethnic groups, where the language and ethnicity are synonymous, and where movements have been limited historically. This is particularly the case in Africa, which is the focus of our auxiliary analyses that use the ACLED data. The procedure is also valid when there have been significant population movements. In fact, by tracking ancestry through ethnicity and language, it takes into account the population movements, even large scale migrations, that have occurred around the world. As an example, individuals who speak Portuguese are connected to the Portuguese in the *Ethnographic Atlas*, even those who live in Brazil. If a population in Brazil speaks Caraja, they are linked to the Caraja, which is present in the *Ethnographic Atlas*. Because we know the language spoken for all inhabited land in the world, we can link a conflict event to an ethnic group in the *Ethnographic Atlas* and their traditional reliance on herding. This procedure follows the basic logic outlined in Giuliano and Nunn (2018). The variation across space in traditional reliance on herding at the language group level is shown visually in Figure 2a.

Linkage to GPS. For the analysis that uses the *GPS* survey data, we do not know the language or ethnicity of the respondents. We also do not know their exact geographic location but only know their district of residence. Therefore, to connect individuals to traditional herding practices, we construct measures of the average dependence on herding among the ancestors of all those who live in a given subnational district. To do this, we again use information from the *Ethnologue*, which tells us which language groups live in all locations around the world. By connecting *Ethnologue* languages to *Ethnographic Atlas* ethnic groups, we also know the traditional herding measure for all locations on earth. Finally, to average over locations, we need to know how many people live in different locations. We obtain this information from the *Landscan* database, which reports the estimated number of individuals living in every 30-arc-second (approximately 1km) grid cell globally. Using this information, we are able to produce an estimate of the average ancestral reliance on herding across all individuals living in a given district today. The district level measure of ancestral herding is shown in Figure 2b.



(a) Language group level



(b) Subnational district level

Figure 2: Global distribution of ancestral reliance on herding across language groups and subnational districts.

A number of patterns are apparent in both subfigures of Figure 2. 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 second fact will allow for fine-grained within-country analyses that hold constant all factors that vary at the country level, including national institutions and characteristics of the government,

which are particularly important when we examine civil conflicts where the arms of the national government, like the military or police, are one of the two participants in the conflict events.

2.3. Historical controls

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, the historical distance of an ethnic group from the equator, and their longitude.[3] For the GPS analysis that uses a district-level traditional herding measure, the ethnicity covariates are measured as district-level averages, constructed in exactly the same way as the herding measure. Descriptive statistics are reported in Appendix Table A1.

2.4. Ecological Determinants of Herding

In our empirical analysis, 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 reality, a society's subsistence mode is largely determined by deep ecological factors. Certain ecological conditions are highly favorable to 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)

[3]We measure settlement complexity using the variable *v30* in 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. 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.

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 suggest that the environment determined which societies herded and which did not.

3. Herding and a Historical Culture of Honor

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

3.1. Data

We follow Michalopoulos and Xue (2021) in quantifying ethnic groups' cultural beliefs and practices using textual data on folklore.[4] 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 from one generation to the next 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 analyses, a concept is said to appear in a motif if either the seed word itself or

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

one of the 50 most closely related terms – according to the knowledge representation project ConceptNet – is mentioned in the motif. 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 design 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: punish, retaliation, revenge

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 by Michalopoulos and Xue (2021) that appear in the top-50 list of our seed words. See Appendix C for the full list of words.

For each of the concepts, we generate a binary indicator that equals one if the concept appears in the folklore of an ethnic group and zero otherwise. We then average across all concepts within a given domain (violence/conflict and 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.

3.2. Results

For each folklore variable, we show two specifications. In the first, we control for the total number of motifs in a society and country fixed effects. In the second, we additionally control for historical ethnicity-level characteristics (settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude). 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 language phylum level (i.e., largest language family) as defined in the *Ethnographic Atlas*.

The estimates are reported in Table 1. We find that a history 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 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 9–11 percentage points. Standardized beta coefficients 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 8–9% of a standard deviation.

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, and how this depends on the social group the victim belongs to. To study this, we leverage information on the acceptability of violence in a small representative and independent subset of ethnic groups from 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

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	0.087***	0.107***	0.081***	0.105***	0.128**	0.117*
	(0.017)	(0.018)	(0.022)	(0.023)	(0.059)	(0.068)
	[0.023]	[0.027]	[0.026]	[0.028]	[0.053]	[0.065]
ln(number of motifs)	0.212***	0.211***	0.205***	0.204***	0.258***	0.258***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.017)	(0.018)
	[0.006]	[0.006]	[0.006]	[0.006]	[0.016]	[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	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.076	0.093	0.072	0.094	0.072	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	0.88	0.88	0.87	0.87	0.59	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 language phylum level (i.e., largest language family) as defined in the *Ethnographic Atlas*. *, **, and *** indicate significance at the 10, 5, and 1% levels.

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

	Dependent variable									
					Acceptability of violence against…					
	Principal component		Average effect		Other society		Own society		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) accepted and (3) valued. Coefficients are reported with robust standard errors in parentheses. *, **, and *** indicate significance at the 10, 5, and 1% levels.

towards three different groups: members of the local community, members of the same society, and people of other societies. The original variables code each group as falling into one of the four categories: violence is (0) disapproved of, (1) tolerated, (2) accepted, (3) valued. We code the variables 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 shown for five dependent variables: the first principal component of the three violence measures (columns 1–2), their average effect size (columns 3–4),[5] and the three measures separately (columns 5–10).

[5]We implement the procedure outlined in Kling, Liebman and Katz (2007) and used by Clingingsmith, Khwaja and Kremer (2009).

Despite the small sample size, we consistently find a positive relationship between traditional herding and the acceptability of violence. 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 26–29% of a standard deviation.

Interestingly, these results are largely driven by the acceptability of violence towards people that are not members of one's local community. This provides a first indication that the 'culture of honor' logic does not exclusively (or even primarily) apply to within-group violence but also to across-group violence. This is relevant because in our contemporary analysis below we will also be interested in between-group conflict events.

4. Traditional Herding and Contemporary Conflict

In its original form, the 'culture of honor' theory was written to explain relatively small-scale elements of aggression (Nisbett and Cohen, 1996), probably because psychologists tend to focus more on individual behavior than on group-level outcomes. Indeed, the vast majority of the available evidence for the validity of the 'culture of honor' theory focuses on within-group violence, such as assaults or homicides. Yet, there is also a considerable body of anecdotal evidence (historical, ethnographic and anthropological case studies) that attribute different types of between-group conflict to a tradition of herding and resulting norms of revenge. For example, between-group conflict among pastoralists has been documented in Northern Cameroon (Moritz, 2008), among the Turkana in East Africa (Mathew and Boyd, 2011), as well as among herders in Kenya and Ethiopia (Abbink, 2009; Galaty, 2016; Beyene, 2017). A common thread that runs through these anthropological, ethnographic and historical contributions is the importance that grievance and revenge play in the initiation and escalation of conflict, as well as for recruitment.

One question of our study is whether these patterns also extend to civil wars. There are numerous examples suggesting this possibility. For instance, the civil conflict in Somalia can be traced back to grievances and revenge-taking between competing clans

(Lewis, 1994). Direct evidence from the Congo similarly places grievance and revenge at the center, particularly in explaining why militant groups have been able to successfully recruit and win the support of the local populations by appealing to retaliation (Marchais et al., 2022). Among pastoral groups in Western Africa, revenge and retaliatory motives (stemming from land use conflicts) have been found to be important motives for their support of Jihadist rebel groups aiming to overthrow the government (Benjaminsen and Ba, 2019). For example, a recent study of the determinants of Fulani support for jihadist groups in central Mali, identifies the first causes as being past human rights violations and predatory behavior of the army and other state representatives (Benjaminsen and Ba, 2021).

More generally, a desire for revenge plays a critical role in mobilizing non-state actors for violence agains the state. As the recent study by Souleimanov, Siroky and Colombo (2023) puts it, "non-material incentives may be far stronger in the recruitment of fighters in societies with a tradition of blood revenge... in many war zones, the custom of blood revenge features as the primary motive for violent mobilization."

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

Our primary data on conflict are taken 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.

Our analysis requires us to link the frequency of contemporary conflicts to historical economic dependence on herding. As discussed in Section 2, we do this by using UCDP's detailed geographic information to associate the conflict events to the traditional practices

of ethnic groups using the global distribution of languages and dialects mapped in the *Ethnologue*.[6]

For our analysis a 'language group' is one of the 7,000+ language/dialects of the *Ethnologue* and spoken in a given country. Therefore, Yoruba speakers in Nigeria is one language group and Yoruba speakers in Benin are another language group. This definition allows us to cleanly control for country fixed effects when looking at variation across language group variation.

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

1. Total conflicts: an aggregate measure that includes all conflicts described as 'civil' or 'non-civil' conflicts below.

2. Civil conflicts: conflict events that involve the agents of the government (such as the military or police officers) as one of the participants.

3. Non-civil conflicts: conflict events that do not involve government agents as one of the participants.

Our main measure of interest is the *number of conflict events* within each category.

Our baseline conflict measures omits interstate conflicts, where both actors involved are national governments. This is a form of conflict that is not relevant for our hypothesis because the location of military strikes in warfare is primarily determined by strategic objectives (the amount of land being controlled at that points, and the technologies available to both sides) rather than by revenge-taking motives of the local population. Indeed, the location of conflict events between two governments are often entirely unrelated to the local populations and, instead, imposed by geographically potentially distant governments.[7]

[6] Appendix D describes the procedure in full detail.

[7] There are 140,707 conflicts in our dataset. Of these, the majority (103,672) are civil conflicts, 30,726 are non-civil conflicts, whereas there are only 783 interstate events. There are 5,526 events for which the information on the two sides is missing and they are not used in any of our analysis.

4.2. Estimation Strategy and Covariates

Our analysis examines the relationship between a tradition of herding and conflict today by looking across language groups globally. Our estimating equation takes the following form:

$$\ln y_{ec} = \alpha_c + \beta \mathit{Herding}_e + X_e \Gamma + \varepsilon_{ec} \tag{1}$$

where the unit of observation is a language e located in country c. We refer to this as a language group. $\mathit{Herding}_e$ is our measure of ancestral dependence on herding. y_{ec} is one of our measures of the number of conflict events that occur in the territory of language group e located in country c. We measure these for all conflict types, civil conflicts only and non-civil conflicts only. To take into account that the conflict data have a very long right tail (large outliers), our baseline measure is the natural log of one plus the number of conflict events from 1989–2016 in the territory of a language group. α_c denotes country fixed effects, which account for country-level 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.

While the inclusion of country fixed effects captures most of the determinants of conflict that have been examined in the literature, there may be other factors vary subnationally and could potentially confound the estimated effects of herding. Thus, our specification also includes a vector of ethnicity-level covariates, which are denoted X_e. These include traditional settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude. Another potentially important characteristic is terrain ruggedness, which tends to be associated with suitability for herding (Buhaug and Gates, 2002) and also conflict. Thus, we include a control for the average terrain ruggedness of a language group's territory today using data from Nunn and Puga (2012). We also control for the contemporary population size and land area of a language group using data from Landscan 2006 (see Appendix D for details), both measured as the natural log of the underlying measures. These covariates capture the mechanical fact that conflict is more likely when there are more people and when the territory being considered is larger.

A question with this strategy is whether there is sufficient variation in a tradition of herding among groups within countries. To provide a sense of the within-country variation, in Appendix Table A2 we provide an overview of countries with variation and their 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.

4.3. Main Results

Estimates of equation (1) are reported in Table 3. For each type of conflict, we show the results from two specifications, one with country fixed effects only and another including, in addition, the set of covariates discussed above. We report two types of standard errors, either clustered at the *Ethnographic Atlas* ethnic group 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 historical 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 events. These relationships are always statistically highly significant, regardless of how we compute standard errors.

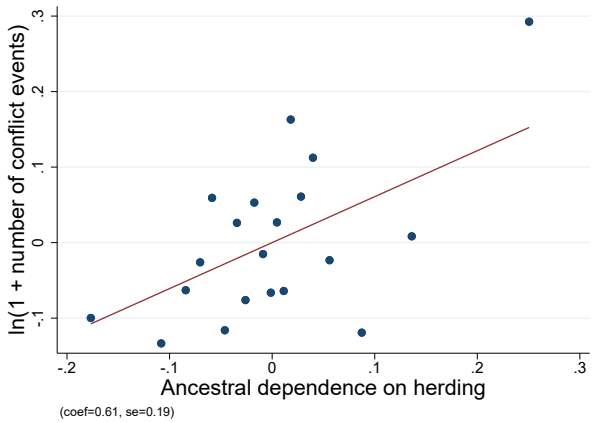
Figure 3 reports binned scatter plots of the frequency of each conflict type as a function of historical dependence on herding, controlling for country fixed effects and the other covariates (i.e., columns 2, 4, and 6). As shown, the relationships appear to be quite general and not driven by a small number of influential observations or outliers.

While the effect of a tradition of herding on localized (non-civil) conflicts is expected, especially given the prior evidence of a culture of honor being important for disputes between individuals including homicides, the effects on larger scale civil conflicts might be more surprising. An important point is that civil conflicts are not only large-scale civil wars. For example, if a police officer wrongs a family (perhaps through attempted extortion that escalates into violence) and a family member takes revenge by killing the police officer, then this is coded as a civil conflict incident because one of the two sides

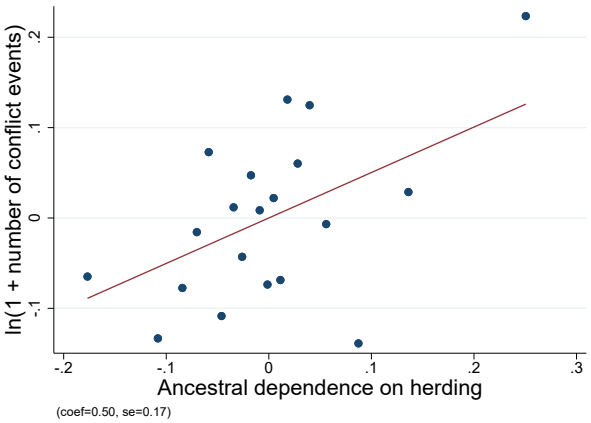
Table 3: Traditional herding and contemporary conflict

	Dependent variable (in log form)					
	All conflicts		Civil conflicts		Non-civil conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependence on herding	0.835***	0.609***	0.678***	0.503***	0.620***	0.497***
	(0.259)	(0.186)	(0.223)	(0.170)	(0.192)	(0.146)
	[0.334]	[0.257]	[0.279]	[0.214]	[0.247]	[0.198]
Settlement complexity		0.014		0.012		0.006
		(0.013)		(0.012)		(0.009)
		[0.016]		[0.014]		[0.012]
Jurisdictional hierarchy		-0.006		0.001		0.009
		(0.020)		(0.017)		(0.015)
		[0.029]		[0.021]		[0.019]
Distance from equator		0.487		0.342		0.520
		(4.724)		(4.251)		(3.320)
		[0.006]		[0.005]		[0.004]
Longitude		0.860		0.602		0.513
		(0.966)		(0.784)		(0.700)
		[0.001]		[0.001]		[0.001]
Population (ln)		0.118***		0.099***		0.068***
		(0.012)		(0.011)		(0.008)
		[0.022]		[0.021]		[0.014]
Land size (ln)		0.123***		0.101***		0.086***
		(0.014)		(0.012)		(0.010)
		[0.027]		[0.022]		[0.022]
Ruggedness		-0.034		-0.066		-0.130
		(0.157)		(0.143)		(0.112)
		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.10	0.075	0.094	0.069	0.11	0.086
Mean of dependent var	0.52	0.53	0.42	0.42	0.29	0.29
SD of dependent var	1.25	1.25	1.12	1.12	0.88	0.89
Adj. R-squared	0.28	0.44	0.28	0.42	0.23	0.35
Number of Obs.	7,036	6,240	7,036	6,240	7,036	6,240
Number of Countries	211	211	211	211	211	211
Number of Clusters	1,104	985	1,104	985	1,104	985

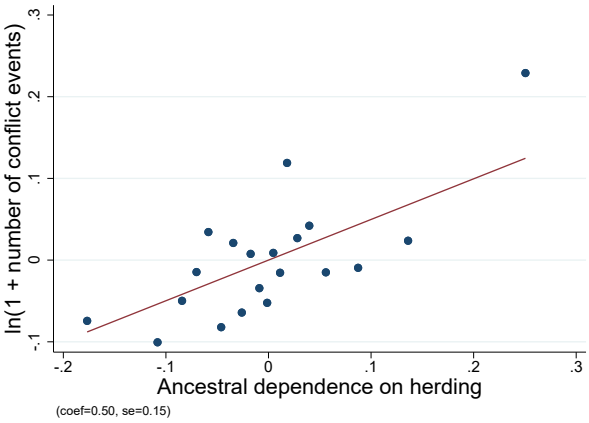
Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. They are measured as the natural log of one plus the 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. The coefficients for distance from equator, longitude, and ruggedness have been scaled up by 1000. *, **, and *** indicate significance at the 10, 5, and 1% levels.



(a) All conflicts



(b) Civil conflicts



(c) Non-civil conflicts

Figure 3: Binscatter partial correlation plots for the relationship between contemporary conflict and a tradition of herding. In each plot, a unit of observation is a language group, which is defined as a language from *Ethnologue* spoken in a country, $N = 6{,}240$. 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 partialling out country fixed effects, settlement complexity, jurisdictional hierarchy, distance from the equator, longitude, population (ln), land size (ln), and terrain ruggedness.

is an agent of the national government. Indeed, in our sample, 82 percent of the civic conflicts last for one day only (with an average duration of 3.8 days) and the median number of people killed equals to 2 (and the average is 14). While more small-scale in nature, these incidents of civil conflicts are important because they can escalate, generating tensions and grievances that can either instigate and/or fuel full scale civil wars.

4.4. Alternative Measures of Conflict and Robustness Checks

Number of deaths. We re-estimate equation (1), but with the natural log of total number of conflict deaths as the dependent variable. As shown in Appendix Table A3, for all conflict types, herding is associated with a greater number of conflict deaths.

Outliers. 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. As reported in Appendix Table A4, this does not meaningfully affect the results.

Nomadic lifestyle. A potential interpretation of the conflict estimates is that they are driven by the fact that herding societies tend to be less sedentary than agricultural societies, which could trigger more conflicts. Appendix Table A5 controls for the extent to which a pre-industrial society was sedentary or nomadic. We do this by controlling for an indicator of settlement pattern being normadic or semi-normadic ($v30$=1 or 2 in *Ethnographic Atlas*). This does not affect the results.

Historical marginalization. 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. We make use of the *Ethnic Power Relations (EPR)* dataset to define an indicator variable that equals one if an ethnic group was "powerless," "discriminated," or "self-excluded" at any point in the country from 1989 to 2016 and control for this variable. Being discriminated is positively correlated with conflicts, but the inclusion of this variable does not change the magnitude of our results (Appendix Table A6).

4.5. Within-Africa ACLED Estimates

For groups within the African continent, we are able to use the Armed Conflict Location and Event Data project (*ACLED*), which, although limited in geographic coverage, is much richer than the *UCDP* data. The criteria for a conflict's inclusion in the database is considerably lower for *ACLED* than for the *UCDP* dataset. Thus, we are able to estimate effects on smaller scale "localized" conflicts that only involve local actors and result in fewer deaths.[8] These conflicts, if they do not surpass the 25-death-in-a-calendar-year threshold, are not included in the *UCDP* data set. Most importantly, as we explain below, the *ACLED* data allow us to test explicitly for revenge-taking as a channel behind our finding of a relationship between herding and conflict.

We undertake our analysis in exactly the same manner as with the *UCDP* data. We connect the location of a conflict event provided in the *ACLED* data to a tradition of herding by location, using the distribution of languages and dialects from the *Ethnologue*, for which we know their ethnographic characteristics based on information to the linked *Ethnographic Atlas*. We then examine the relationship between a tradition of herding and conflict when looking across language groups in the *Ethnologue*. Figure 4 shows a map of all conflict events in the *ACLED* data, overlayed on top of color coding that shows the local degree of ancestral dependence on herding. The top right panel shows the raw correlation using a binned scatter plot, providing a first piece of evidence that the two variables are linked.[9]

More formally, as we did with the *UCDP* data, we estimate equation (1), which includes country fixed effects. The estimates are reported in Table 4. We report estimates for all conflicts, civil conflicts, and non-civil conflicts as outcomes and estimates without and with our baseline set of covariates. Consistent with the *UCDP* estimates, with the

[8]There are 139,467 conflicts in the *ACLED* dataset. Of these, 69,034 are civil conflicts, 62,479 are non-civil conflicts (among which 36,811 are "localized" conflicts). We exclude 7,954 events that involve international organizations or forces active outside of their main country of operation, of which 682 are interstate conflicts between military forces of two countries.

[9]Note that, to make the correlation between conflict events and dependence on herding more visible, in this map a darker area indicates lower dependence on herding.

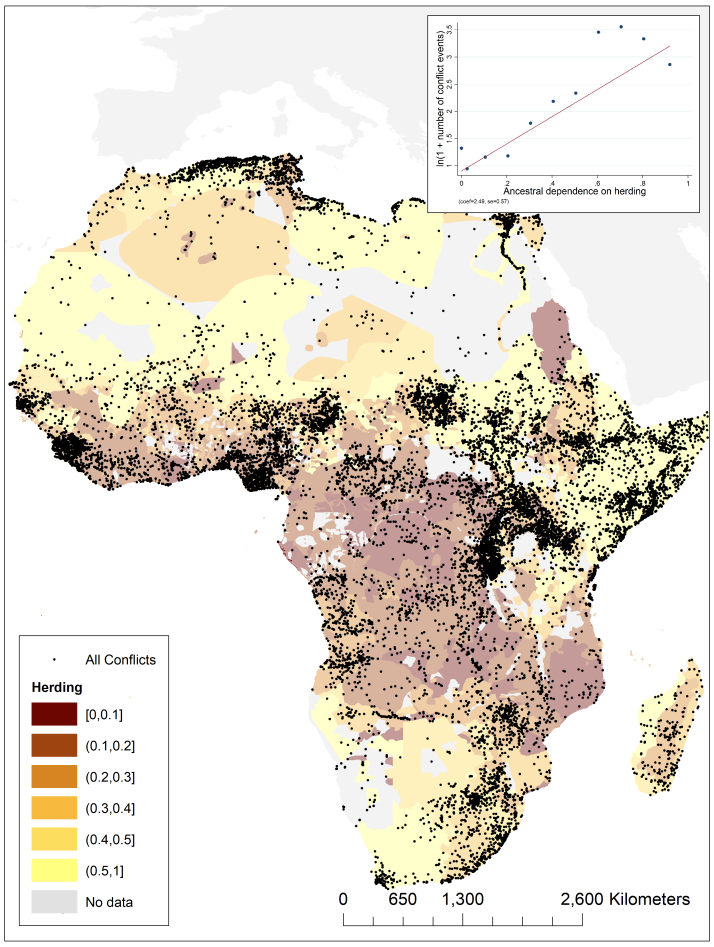


Figure 4: Map of conflict events in *ACLED* dataset, shown along with local ancestral dependence on herding. The figure in the top right shows a binned scatter plot of the number of conflict events in a location and ancestral dependence on herding.

ACLED data, we also find that a history of herding is associated with more conflict of all types.

As mentioned above, a benefit of the *ACLED* data is that they have a lower threshold for the inclusion of conflicts, which allows us to also measure 'localized conflicts,' smaller-scale conflicts within the same community. The effect of herding on localized conflicts is shown in the final two columns of Table 4.[10] We find that a history of herding is also associated with more localized conflicts. In comparing the magnitude of all conflicts, civil, non-civil, and localized, we find similar effects across all types of

[10]We identify these conflicts using the "Interaction" variable from *ACLED* when it takes a value between 40–47, 50–57, or 60–67.

Table 4: Traditional herding and contemporary conflict in Africa based on ACLED

	Dependent variable (in log form)							
	All conflicts		Civil conflicts		Non-civil conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependence on herding	1.553***	0.983***	1.506***	0.917***	1.229***	0.820***	0.985***	0.697***
	(0.453)	(0.316)	(0.402)	(0.325)	(0.377)	(0.262)	(0.330)	(0.247)
	[0.372]	[0.370]	[0.338]	[0.341]	[0.328]	[0.284]	[0.320]	[0.269]
Settlement complexity		0.051*		0.035		0.035		0.011
		(0.029)		(0.029)		(0.025)		(0.023)
		[0.021]		[0.024]		[0.022]		[0.021]
Jurisdictional hierarchy		0.084**		0.096***		0.083**		0.064**
		(0.037)		(0.035)		(0.032)		(0.029)
		[0.025]		[0.030]		[0.023]		[0.024]
Distance from equator		-0.229		5.218		-6.175		-9.406
		(9.962)		(10.098)		(8.508)		(7.692)
		[0.013]		[0.015]		[0.010]		[0.008]
Longitude		7.234		9.203		3.814		-0.294
		(7.263)		(7.099)		(6.094)		(5.482)
		[0.009]		[0.009]		[0.007]		[0.006]
Population (ln)		0.405***		0.298***		0.343***		0.296***
		(0.032)		(0.028)		(0.029)		(0.025)
		[0.051]		[0.045]		[0.046]		[0.039]
Land size (ln)		0.163***		0.154***		0.129***		0.097***
		(0.030)		(0.029)		(0.025)		(0.023)
		[0.041]		[0.039]		[0.032]		[0.031]
Ruggedness		1.586***		1.656***		1.192***		0.761**
		(0.468)		(0.425)		(0.391)		(0.324)
		[0.001]		[0.001]		[0.001]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.13	0.080	0.14	0.085	0.12	0.079	0.11	0.076
Mean of dependent var	1.37	1.38	1.02	1.03	0.99	1.00	0.76	0.76
SD of dependent var	1.81	1.82	1.58	1.59	1.52	1.53	1.34	1.35
Adj. R-squared	0.28	0.63	0.29	0.57	0.25	0.59	0.25	0.56
Number of Obs.	2,286	2,134	2,286	2,134	2,286	2,134	2,286	2,134
Number of Countries	57	57	57	57	57	57	57	57
Number of Clusters	498	450	498	450	498	450	498	450

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Armed Conflict Location and Event Data Project* (ACLED) about conflict events in sub-Sahara Africa for the period 1997-2016. 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. The coefficients for distance from equator, longitude, and ruggedness have been scaled up by 1000. *, **, and *** indicate significance at the 10, 5, and 1% levels.

conflicts: an increase in dependence on herding by one standard deviation increases the frequency of log armed conflict by about 8% of a standard deviation.

5. Evidence for Revenge-Taking in Conflicts

According to the culture of honor hypothesis, the primary reason for why a tradition of herding should be predictive of the occurrence of conflict is punishment and revenge-taking when one experiences wrong-doings from others. We proceed by examining whether the link between herding and conflict, established in the previous section, appears to reflect revenge-taking motives.

5.1. Interaction With Previous Conflicts

The first exercise that we undertake is to check whether the effect of herding on contemporary conflicts is greater when the situation is one of potential retaliation. In other words, does herding lead to more conflict when there is a recent history of conflict? In these settings, it is more likely that any future conflict is in retaliation or to avenge wrong-doings during past conflicts.

We examine this possibility with the following panel regression equation that varies by language-group and year:

$$\ln y_{e,c,t} = \alpha_c + \lambda_t + \theta\, \mathit{Herding}_e + \beta\, \mathit{Herding}_e \times \mathbb{I}^{y>0}_{e,c,t-1} + \eta \mathbb{I}^{y>0}_{e,c,t-1} + X_e \mathbf{\Gamma} + \varepsilon_{e,c,t} \qquad (2)$$

where e indexes language groups, c indexes the country in which the group is located, and t indexes the year. α_c denotes country fixed effects. λ_t denotes year fixed effects. X_e denotes a vector of ethnicity level covariates. y_{ec} is one of our measures of the number of conflict events (all conflicts, civil and non-civil conflicts) that occur in the territory of ethnic group e located in country c. $\mathit{Herding}_e$ is our measure of a traditional dependence on herding of group e. The variable $\mathbb{I}^{y>0}_{e,c,t-1}$ is an indicator that equals one if there was a conflict in ethnic group e's territory in the recent past.

The first measure of past conflict that we consider codes whether there was a conflict during the previous calendar year. The estimates are reported in Table 5. In each specification, the lagged conflict indicators are defined using the same definition of conflict as used for the dependent variable. We find that herding only affects the incidence of conflict when there was a conflict in the previous year. By contrast, the raw herding coefficient (which captures the estimated effect following a year of peace) is very small and not statistically different from zero.

To zoom into the precise timing that underlies these aggregate patterns, we estimate a variant of equation (2), where the time dimension varies at the month level and we allow the effect of herding to differ depending on whether there was conflict in each of the previous twelve months. Figure 5 summarizes the estimates. We find that a tradition of herding has a large positive effect on conflict immediately following previous episodes of conflict, but this effect gradually approaches zero as the time since the conflict episode is further in the past. For example, a tradition of herding strongly increases the probability of conflict when there was a conflict involving the respective language group in the previous month but not following a conflict that took place six months before. We view these results as consistent with herding increasing the probability of retaliatory conflicts.

In all, we interpret these results as providing a first piece of suggestive evidence that herding increases conflict incidence through the channel of avenging wrong-doings during past conflicts.

Replication in the ACLED dataset. We also undertake the same exercises using the *ACLED* data. The estimates, which are reported in Appendix Figure A4, show that we find the same patterns for the coefficients of the interaction between a tradition of herding and recent conflict.

5.2. Text Analysis of Revenge-Taking in ACLED

To test more directly for revenge-taking motives, we leverage the description of conflict events that is provided in the *ACLED* data. A typical example of a description is:

Table 5: Traditional herding and contemporary conflict: Heterogeneity by prior conflicts

	Dependent variable (in log form)					
	All conflicts		Civil conflicts		Non-civil conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependence on herding	-0.004	-0.027	-0.010	-0.023	0.016	-0.002
	(0.029)	(0.023)	(0.024)	(0.019)	(0.016)	(0.012)
	[0.031]	[0.030]	[0.027]	[0.025]	[0.015]	[0.016]
Herding × Previous Conflict (1y)	1.310***	1.379***	1.435***	1.483***	0.640***	0.752***
	(0.198)	(0.208)	(0.203)	(0.216)	(0.160)	(0.159)
	[0.198]	[0.231]	[0.193]	[0.233]	[0.241]	[0.244]
Previous conflict indicator (1y)	0.848***	0.756***	0.776***	0.702***	0.749***	0.693***
	(0.056)	(0.058)	(0.058)	(0.063)	(0.060)	(0.062)
	[0.068]	[0.062]	[0.071]	[0.071]	[0.087]	[0.076]
Settlement complexity		0.004		0.004*		0.002*
		(0.002)		(0.002)		(0.001)
		[0.003]		[0.002]		[0.001]
Jurisdictional hierarchy		0.009***		0.007**		0.005**
		(0.003)		(0.003)		(0.002)
		[0.003]		[0.003]		[0.002]
Distance from equator		1.020		0.652		0.850
		(1.179)		(1.006)		(0.580)
		[0.001]		[0.001]		[0.001]
Longitude		0.157		0.086		0.111
		(0.209)		(0.137)		(0.125)
		[0.000]		[0.000]		[0.000]
Population (ln)		0.009***		0.007***		0.004***
		(0.001)		(0.001)		(0.001)
		[0.002]		[0.002]		[0.001]
Land size (ln)		0.014***		0.011***		0.006***
		(0.002)		(0.002)		(0.001)
		[0.004]		[0.003]		[0.002]
Ruggedness		-0.031		-0.025		-0.014
		(0.024)		(0.022)		(0.012)
		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent var	0.074	0.074	0.058	0.058	0.031	0.032
SD of dependent var	0.42	0.42	0.37	0.37	0.25	0.25
Adj. R-squared	0.41	0.42	0.40	0.41	0.33	0.34
Number of Obs.	197,008	174,720	197,008	174,720	197,008	174,720
Number of Countries	211	211	211	211	211	211
Number of Clusters	1,104	985	1,104	985	1,104	985

Note. The unit of observation is a within-country language group from the *Ethnologue* and a year. The dependent variables are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for each year during 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. The coefficients for distance from equator, longitude, and ruggedness have been scaled up by 1000. *, **, and *** indicate significance at the 10, 5, and 1% levels.

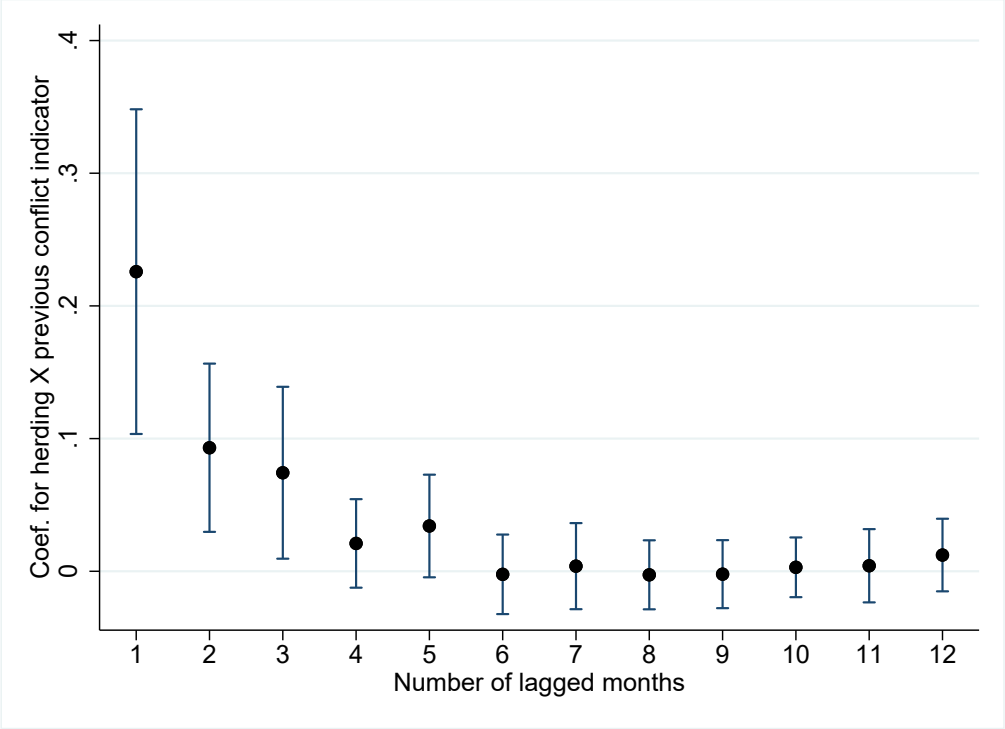


Figure 5: Coefficient plot for the interaction terms between herding and conflict indicators for the past 12 months. A unit of observation is a country-language group in the *Ethnologue* and a year-month, N=2,096,640. The dependent variable is the number of conflicts from *UCDP*, computed as $\ln(1+x)$. Control variables include country fixed effects, year-month fixed effects, historical settlement complexity, jurisdictional hierarchy beyond the local community, distance from the equator, longitude, ln (population), ln (land area), and terrain ruggedness. Error bars show 95% confidence intervals, computed based on clustering at the ethnic-group level.

> *Clashes between military and pastoralist youth group in Akot when 1 youth was killed by military forces for looting in the area. Youth group then killed 6 policeman and 4 soldiers in retaliation. 2 civilians also killed.*

We investigate whether traditional economic dependence on herding predicts the frequency of revenge-taking actions. More specifically, we study whether the link between ancestral herding and conflicts established above primarily reflects (i) that herding is linked to revenge-motivated conflict or (ii) that herding is linked to non-revenge motivated conflict.

To this effect, we classify conflict events as being revenge-related using an analogous procedure as for the historical folklore analysis. We retrieve from *ConceptNet* the top-50

list of terms relevant for each seed of the following words: *punish, retaliation, revenge*.[11] We then classify a conflict as revenge-related if at least one of the terms in this bag-of-words appears in the textual description. Among the 129,940 events in the *ACLED* database for which descriptions are available, 1,955 events involved revenge-taking actions.[12] Thus, mentioning of revenge motives in the short*ACLED* descriptions is fairly rare and most likely an under-estimate of the true importance of revenge in conflict.

We jointly estimate the effect of herding on both revenge-motivated and non-revenge motivated conflict events within a multinomial logit framework. We augment our *ACLED* dataset by constructing a categorical variable *Incidence* that – separately for each language group – takes the value of 0 if no conflicts occurred during 1989 to 2016, 1 if at least one conflict occurred but none of them were described as revenge-motivated, and 2 if at least one event occurred during this time that was described as revenge-motivated. We then use a multinomial logistic regression to investigate the effect of traditional economic dependence on herding on this variable.

The estimating equation is given by:

$$\begin{cases} \ln\left(\frac{Pr(Incidence_{ec}=1)}{Pr(Incidence_{ec}=0)}\right) & = \alpha_c^1 + \beta^1 Herding_e + X_e\mathbf{\Gamma}^1 + \varepsilon_{ec}^1 \\ \ln\left(\frac{Pr(Incidence_{ec}=2)}{Pr(Incidence_{ec}=0)}\right) & = \alpha_c^2 + \beta^2 Herding_e + X_e\mathbf{\Gamma}^2 + \varepsilon_{ec}^2 \end{cases} \tag{3}$$

where e indexes ethnic/language groups and c indexes the country in which the group is located. α_c denotes country fixed effects. X_e denotes a vector of ethnicity level covariates. $Incidence_{ec}$ is the categorical variable that indicates the incidence of no conflict, non-revenge conflict, or revenge taking conflict.

We report the estimated coefficients for the latent variables and the elasticities of herding on each of the conflict categories in Table 6, with "no conflict" as the omitted category. The estimates indicate that traditional economic dependence on herding increases the incidence of revenge-related conflicts, but not of non-revenge conflicts. The pattern holds for all types of conflicts and with or without control variables. Therefore,

[11] See Appendix E for the complete lists of the bags-of-words retrieved from *ConceptNet*.

[12] Of these, 640 are civil conflicts, and 1,218 are noncivil conflicts (of which 932 are "localized" ones). The other 104 conflicts involve international actors, of which 7 are interstate conflicts.

our findings suggest that traditional herding primarily affects contemporary conflicts that reflect revenge-taking actions.

Special case: contemporary herding. Our research hypothesis of cultural persistence does not require that formerly pastoral societies are still herders today. However, in the spirit of the 'culture of honor' theory, one may ask whether contemporary herders are more likely to be involved in conflicts with a revenge-taking motive. At the language-group level, we do not know to what degree the respective group depends on herding today. However, an added benefit of the *ACLED* data is that – as illustrated by the example above – the textual descriptions of conflict events sometimes allow an inference about the subsistence mode of the involved parties. We retrieve from *ConceptNet* the top-50 list of terms relevant for each seed of *herding* and *herder* and then classify a conflict event as having herders involved if at least one term in this bag-of-words appears in the description.

We analyze the relationship between the mention of herders and revenge-taking actions at the conflict event level. The dependent variable is an indicator that equals one if the conflict event description mentions a revenge-related term. The independent variable is an indicator variable that equals one if the description includes a herding-related term. The regression accounts for the length of the description (ln), fixed effects for country, year, and article source.

Consistent with the 'culture of honor' (and herding) being particularly relevant for revenge-taking, Appendix Table A8 shows that in descriptions that mention herding, the conflict is more likely to be described as an act of revenge or retaliation.

Table 6: Traditional herding and contemporary conflict in Africa: Multinomial logit analysis

	Dependent variable (in log form)							
	All conflicts		Civil conflicts		Non-civil conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cat. 1 (omitted): no incidence								
Cat. 2: no revenge-taking								
Dependence on herding	0.203	0.447	0.661	0.363	0.377	0.628	0.325	0.291
	(0.567)	(0.683)	(0.494)	(0.713)	(0.538)	(0.669)	(0.511)	(0.632)
Settlement complexity		0.168**		0.132**		0.188***		0.144**
		(0.0652)		(0.0644)		(0.0651)		(0.0646)
Jurisdictional hierarchy		0.0294		0.108		-0.00853		-0.0940
		(0.0848)		(0.0783)		(0.0829)		(0.0882)
Distance from equator		2.534		31.34		-20.84		-17.20
		(23.12)		(21.62)		(22.69)		(23.95)
Longitude		8.409		14.54		15.08		23.26**
		(11.15)		(12.38)		(9.786)		(10.69)
Population (ln)		0.952***		0.834***		0.965***		1.092***
		(0.0902)		(0.0751)		(0.0816)		(0.0852)
Land size (ln)		0.138		0.163**		0.222***		0.141*
		(0.0875)		(0.0722)		(0.0807)		(0.0806)
Ruggedness		2.193*		2.590*		1.718		1.689
		(1.282)		(1.371)		(1.585)		(1.512)
Cat. 3: revenge-taking								
Dependence on herding	2.591***	2.037**	3.346***	2.258*	2.830***	1.932*	2.620***	1.112
	(0.720)	(0.998)	(0.807)	(1.206)	(0.735)	(1.046)	(0.734)	(1.004)
Settlement complexity		0.247**		0.234**		0.221*		0.0811
		(0.111)		(0.119)		(0.115)		(0.112)
Jurisdictional hierarchy		0.170		0.273*		0.127		-0.0961
		(0.139)		(0.145)		(0.141)		(0.146)
Distance from equator		14.51		72.22**		-16.46		-22.34
		(33.60)		(35.14)		(34.96)		(37.49)
Longitude		36.12**		41.74**		39.19**		34.00**
		(17.03)		(20.08)		(16.19)		(16.99)
Population (ln)		1.632***		1.580***		1.576***		1.651***
		(0.142)		(0.137)		(0.152)		(0.165)
Land size (ln)		0.361***		0.337***		0.432***		0.348***
		(0.119)		(0.122)		(0.122)		(0.129)
Ruggedness		3.714*		6.119***		1.154		0.536
		(2.162)		(2.033)		(2.502)		(2.553)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Elasticity of herding on:								
Cat. 1	-0.096	-0.100	-0.12	-0.075	-0.091	-0.089	-0.070	-0.040
Cat. 2	-0.059	-0.015	0.0068	-0.0060	-0.021	0.030	-0.010	0.015
Cat. 3	0.38	0.29	0.50	0.35	0.43	0.28	0.41	0.17
Pseudo R-squared	0.14	0.41	0.16	0.41	0.14	0.42	0.14	0.44
Number of Obs.	2,286	2,134	2,286	2,134	2,286	2,134	2,286	2,134
Number of Countries	57	57	57	57	57	57	57	57
Number of Clusters	498	450	498	450	498	450	498	450

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables are based on information from the *Armed Conflict Location and Event Data Project* (ACLED) about conflict events in sub-Sahara Africa for the period 1997-2016. 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. The coefficients for distance from equator, longitude, and ruggedness have been scaled up by 1000. *, **, and *** indicate significance at the 10, 5, and 1% levels.

6. Traditional Herding and a Psychology of Punishment: Global Survey Evidence

6.1. Punishment and Revenge-Taking Data

To present additional direct evidence on the link between a tradition of herding and the desire to seek revenge, we leverage self-reports of the importance of punishment and revenge in survey data. Our data are from the *Global Preferences Survey* (*GPS*), 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; Enke, 2019; 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 willing are you to punish someone who treats you unfairly, even if there may be costs for you? (0–10)

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

3. 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)

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. 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 from 0.45 to 0.71.

An attractive feature of these survey questions is that they were selected to be deployed as part of the GPS after they underwent an extensive ex-ante experimental validation procedure. In this validation procedure, items highly correlated with actual punishment and revenge-taking decisions in financially incentivized experiments were selected among a large set of potential survey questions. As a result, it is plausible to expect that responses to the survey questions capture both people's psychological motivations and their actual willingness to act. See Falk, Becker, Dohmen, Huffman and Sunde (2016) for details.

6.2. Linkage to Historical Herding Data

Our analysis requires that we 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. Because the *GPS* does not contain information on respondents' ethnic or linguistic backgrounds, we link the data using geographic subnational region identifiers in the *GPS*, which are usually states or provinces. As noted, 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.[13] For nearly all of the 73,949 respondents from the *GPS*, living in 951 subnational regions and 75 countries, we are able to assign them a regional-level measure of the average ancestral herding index. For a subset of the observations (9,679 individuals from 12 small countries) we are only able to link respondents to the ancestral herding measure of their country.

6.3. Estimation Strategy and Covariates

The individual-level within-country estimates connect individuals to ancestral herding using the subnational region in which they live. Specifically, we estimate the following

[13]See Appendix F for full details.

equation:

$$y_{i,r} = \alpha_{c(r)} + \beta \textit{Herding}_r + X_i \Gamma + X_r \Omega + \varepsilon_{i,r} \quad (4)$$

where i indexes individuals in the GPS survey, r indexes their subnational region of residence, and c the country this region lies within. $\alpha_{c(r)}$ denotes country fixed effects. $y_{i,r}$ is one of our measures of a psychology of punishment (either an aggregate summary measure or one of the underlying components) for individual i residing in subnational region r. $\textit{Herding}_r$ is subnational region k's average ancestral dependence on herding. X_i and X_r denote the vector of covariates at the individual and region level, described above. The vector X_r includes a region's average ancestral measures of settlement complexity, jurisdictional hierarchy, distance from the equator, and longitude. X_i includes controls for age, age squared, and the gender of the respondent.

To take into account the non-independence of the observations, we calculate standard errors clustered at the level of 951 subnational regions, which is the level at which the herding index varies. To further document the robustness of the statistical significance of our findings, and to account for within-country non-independence, we also report standard errors that are clustered at the country level.

6.4. Results

The estimates of equation (4) are reported in Table 7. We report estimates for the summary measure, as well as all components, with and without our baseline set of individual and regional historical covariates. All specifications always include country fixed effects. We find a positive relationship between a tradition of herding and a psychology of revenge-taking. Beyond being statistically significant, the estimates are also sizeable. According to the estimates of column 2, 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 quite stable across regression specifications and outcome variables. Appendix Figure A5 visualizes these results using binscatter plots.

Table 7: 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.

Robustness Checks. To assess the sensitivity of the findings to outliers, we follow our previous strategy of winsorizing the herding variable at the 95th percentile. The estimates, which are reported in Appendix Table A9, show that our results are not driven by extreme values.

7. 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 emphasized 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 as contemporary survey data on individual values and preferences. Linking these data, we were able to test for associations between herding, revenge-taking, and conflict. We found 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, including civil conflicts where citizens are fighting against government agents. We found that this link between herding and conflict appears to largely reflect revenge-taking motives. Consistent with this, we also found, using the recently-developed *Global Preferences Survey*, 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.

References

Abbink, Jon, "Conflict and Social Change on the South-west Ethiopian Frontier: An Analysis of Suri Society," *Journal of Eastern African Studies*, 2009, *3* (1), 22–41.

Ager, Philipp, Leo Bursztyn, Lukas Leucht, and Hans Joachim Voth, "Killer Incentives: Status Competition and Pilot Performance during World War II," *Review of Economic Studies*, forthcoming.

Alesina, Alberto, Paola Giuliano, and Nathan Nunn, "On the Origins of Gender Roles: Women and the Plough," *Quarterly Journal of Economics*, 2013, *128* (2), 469–530.

Ayers, Edward L., *Vengeance and Justice: Crime and Punishment in the 19th Century American South*, New York: Oxford University Press, 1984.

Bahrami-Rad, Duman, Anke Becker, and Joseph Henrich, "Tabulated Nonsense? Testing the Validity of the Ethnographic Atlas," *Economics Letters*, 2021, *204*, 109880.

Beck, Jan and Andrea Sieber, "Is the Spatial Distribution of Mankind's Most Basic Economic Traits Determined by Climate and Soil Alone?," *PloS one*, 2010, *5* (5), e10416.

Becker, Anke, "On the Economic Origins of Restricting Women's Promiscuity," 2019. Working Paper, Harvard University.

_ , Benjamin Enke, and Armin Falk, "Ancient Origins of the Global Variation in Economic Preferences," in "AEA Papers and Proceedings," Vol. 110 2020, pp. 319–23.

Benjaminsen, Tor A. and Boubacar Ba, "Why Do Pastoralists in Mali Join Jihadist Groups? A Political Ecology Explanation," *Journal of Peasant Studies*, 2019, *46* (1), 1–20.

_ and _ , "Fulani-Dogon Killings in Mali: Farmer-Herder Conflicts as Insurgency and Counterinsurgency," *African Security*, 2021, *14* (1), 4–26.

Besley, Timothy and Marta Reynol-Querol, "The Legacy of Historical Conflict: Evidence from Africa," *American Political Science Review*, 2014, *108* (2), 319–336.

Beyene, Fekadu, "Natural resource conflict analysis among pastoralists in Southern Ethiopia," *Journal of Peacebuilding & Development*, 2017, *12* (1), 19–33.

Black-Michaud, Jacob, *Cohesive Force: Feud in the Mediterranean and the Middle East*, New York: St. Martin's Press, 1975.

Boehm, Christopher, *Blood Revenge: The Enactment and Management of Conflict in Montenegro and Other Tribal Societies*, New York: University of Pennsylvania Press, 1987.

Buhaug, Halvard and Scott Gates, "The Geography of Civil War," *Journal of Peace Research*, 2002, *39* (4), 417–433.

Chagnon, Napoleon A., "Life Histories, Blood Revenge, and Warfare in a Tribal Population," *Science*, 1988, *239* (4843), 985–992.

Clingingsmith, David, Asim Ijaz Khwaja, and Michael Kremer, "Estimating the Impact of The Hajj Religion and Tolerance in Islam's Global Gathering," *Quarterly Journal of Economics*, 2009, *124* (3), 1133–1170.

Cohen, Dov, "Culture, Social Organization and Patterns of Violence," *Journal of Personality and Social Psychology*, 1998, *75* (2), 408–419.

Collier, Paul and Anke Hoeffler, "Greed and Grievance in Civil War," *Oxford Economic Papers*, 2004, *56* (4), 563–595.

Davie, Maurice R., *The Evolution of War: A Study of Its Role in Early Societies*, New Haven: Yale University Press, 1929.

Enke, Benjamin, "Kinship, Cooperation, and the Evolution of Moral Systems," *Quarterly Journal of Economics*, 2019, *134* (2), 953–1019.

Falk, Armin, Anke Becker, Thomas Dohmen, Benjamin Enke, David Huffman, and Uwe Sunde, "Global Evidence on Economic Preferences," *Quarterly Journal of Economics*, 2018, *133* (4), 1645–1692.

_ , _ , _ , David Huffman, and Uwe Sunde, "The Preference Survey Module: A Validated Instrument for Measuring Risk, Time, and Social Preferences," 2016. IZA Discussion Paper No. 9504.

Fearon, James D., "Rationalists Explanations for War," *International Organization*, 1995, *49* (3), 379–414.

Fischer, David Hackett, *Albion's Seed: Four British Folkways in America*, New York: Oxford University Press, 1989.

Fouka, Vasiliki and Alain Schlapfer, "Culture Clash: Incompatible Reputation Systems and Intergroup Conflict," 2022. Working paper, Stanford University.

Galaty, John, "Boundary-making and Pastoral Conflict along the Kenyan–Ethiopian Borderlands," *African Studies Review*, 2016, *59* (1), 97–122.

Gastil, Raymond D., "Homicide and a Regional Culture of Violence," *American Sociological Review*, 1971, *36* (3), 412–427.

Giuliano, Paola and Nathan Nunn, "Ancestral Characteristics of Modern Populations," *Economic History of Developing Regions*, 2018, *33* (1), 1–17.

Grosjean, Pauline, "A History of Violence: The Culture of Honor as a Determinant of Homicide in the US South," *Journal of the European Economic Association*, 2014, *12* (5), 1285–1316.

Guarnieri, Eleonora and Ana Tur-Prats, "Cultural Distance and Conflict-Related Sexual Violence," 2022. Working paper, University of Exeter.

Hayes, Timothy C. and Matthew R. Lee, "The Southern Culture of Honor and Violent Attitudes," *Sociological Spectrum*, 2004, *25* (5), 593–617.

Jha, Saumitra, "Trade, Institutions and Ethnic Tolerance: Evidence from South Asia," *American Political Science Review*, 2013, *107* (4), 806–832.

Kling, Jeffrey R., Jeffrey B. Liebman, and Lawrence F. Katz, "Experimental Analysis of Neighborhood Effects," *Econometrica*, 2007, *75* (1), 83–119.

Lewis, Ioan M., *Blood and Bone: The Call of Kinship in Somali Society*, Trenton: The Red Sea Press, 1994.

Marchais, Gauthier, Christina Mastaki Mugaruka, Raul Sanchez de la Sierra, and David Qihang Wu, "Armed Conflict Beyond Methodological Individualism: Bringing the Social Context Back in: Evidence from Eastern Congo," 2022. Working paper, University of Chicago.

Mathew, Sarah and Robert Boyd, "Punishment Sustains Large-scale Cooperation in Prestate Warfare," *Proceedings of the National Academy of Sciences*, 2011, *108* (28), 11375–11380.

McGuirk, Eoin and Nathan Nunn, "Transhumant Pastoralism, Climate Change, and Conflict in Africa," 2021. Working paper, Harvard University.

Michalopoulos, Stelios and Elias Papaioannou, "Precolonial Ethnic Institutions and Contemporary African Development," *Econometrica*, 2013, *81* (1), 113–152.

__ **and** __ , "National Institutions and Subnational Development in Africa," *Quarterly Journal of Economics*, 2014, *129* (1), 151–213.

__ **and** __ , "The Long-Run Effects of the Scramble in Africa," *American Economic Review*, 2016, *106* (7), 1802–1848.

__ **and Melanie Meng Xue**, "Folklore," 2019. CEPR Discussion Paper No. DP13425.

__ **and** __ , "Folklore," *Quarterly Journal of Economics*, 2021, *forthcoming.*

Miguel, Edward, Sebastian Saiegh, and Shanker Satyanath, "Civil War Exposure and Violence," *Economic and Politics*, 2011, *23* (1), 59–73.

Moritz, Mark, "A Critical Examination of Honor Cultures and Herding Societies in Africa," *African Studies Review*, 2008, *51* (2), 99–117.

Moscona, Jacob, Nathan Nunn, and James A. Robinson, "Segmentary Lineage Organization and Conflict in Sub-Saharan Africa," *Econometrica*, 2020, *88* (5), 1999–2036.

Murdock, George Peter, *Ethnographic Atlas*, Pittsburgh: University of Pittsburgh Press, 1967.

__ **and Douglas R. White**, "Standard Cross-Cultural Sample," *Ethnology*, 1969, *8* (4), 329–369.

Nisbett, Richard E., "Violence and U.S. Regional Culture," *American Psychologist*, 1993, *48* (4), 441–449.

__ **and Dov Cohen**, *Culture of Honor: The Psychology of Violence in the South*, Boulder: Westview Press, 1996.

Nisbett, Richard, Gregory Polly, and Silvia Lang, "Homicide and U.S. Regional Culture," in R. Barry Ruback and Neil Alan Weiner, eds., *Social and Cultural aspects of Interpersonal Violent Behavior*, New York: Springer Verlag, 1995, pp. 135–151.

Nowak, Andrzej, Michele J. Gelfand, Wojciech Borkowski, Dov Cohen, and Ivan Hernandez, "The Evolutionary Basis of Honor Cultures," *Psychological Science*, 2016, *27* (1), 12–24.

Nunn, Nathan and Diego Puga, "Ruggedness: The Blessing of Bad Geography in Africa," *Review of Economics and Statistics*, February 2012, *94* (1), 20–36.

Peristiany, J.G., *Honor and Shame: The Values of Mediterranean Society*, London: Weidenfeld and Nicolson, 1965.

Powell, Robert, "War as a Commitment Problem," *International Organization*, 2006, *60* (1), 169–203.

Riley, Shawn J., Stephen D. DeGloria, and Robert Elliot, "A Terrain Ruggedness Index that Quantifies Topographic Heterogeneity," *Intermountain Journal of Sciences*, 1999, *5* (1–4), 23–27.

Scheff, Thomas J., *Boody Revenge*, New York: Routledge, 1994.

Schulz, Jonathan, Duman Bahrami-Rad, Jonathan Beauchamp, and Joseph Henrich, "The Church, Intensive Kinship, and Global Psychological Variation," *Science*, 2019, *366* (6466), eaau5141.

Souleimanov, Emil Aslan, David S. Siroky, and Roberto Colombo, "Blood Revenge in Civil War: Proof of Concept," *Security Studies*, 2023, *32* (1), 101–136.

Sunde, Uwe, Thomas Dohmen, Benjamin Enke, Armin Falk, David Huffman, and Gerrit Meyerheim, "Patience and Comparative Development," Technical Report, ECONtribute Discussion Paper 2020.

Tur-Prats, Ana, "Unemployment and Intimate Partner Violence: A Cultural Approach," *Journal of Economic Behavior & Organizatino*, 2021, *185* (1), 27–49.

Uskul, Ayse K., Susan E. Cross, Ceren Günsoy, and Pelin Gul, "Culture of Honor," in Shinobu Kitayama and Dov Cohen, eds., *Handbook of Cultural Psychology*, New York: The Guilford Press, 2019, pp. 793–821.

Wyatt-Brown, Bertram, *Southern Honor: Ethics and Behavior in the Deep South*, Oxford: Oxford University Press, 1982.

Online Appendix

A. Supplementary figures and tables

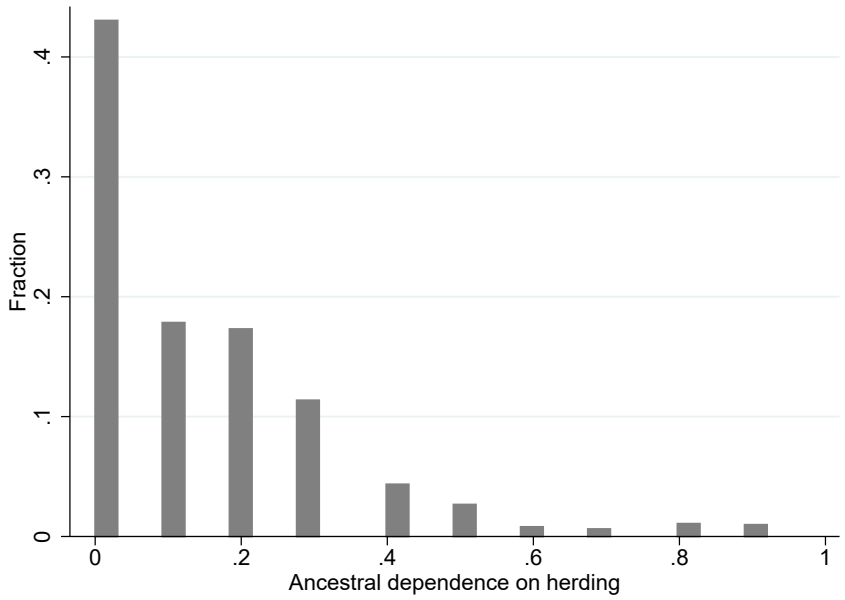


Figure A1: Distribution of herding in the *Ethnographic Atlas*.

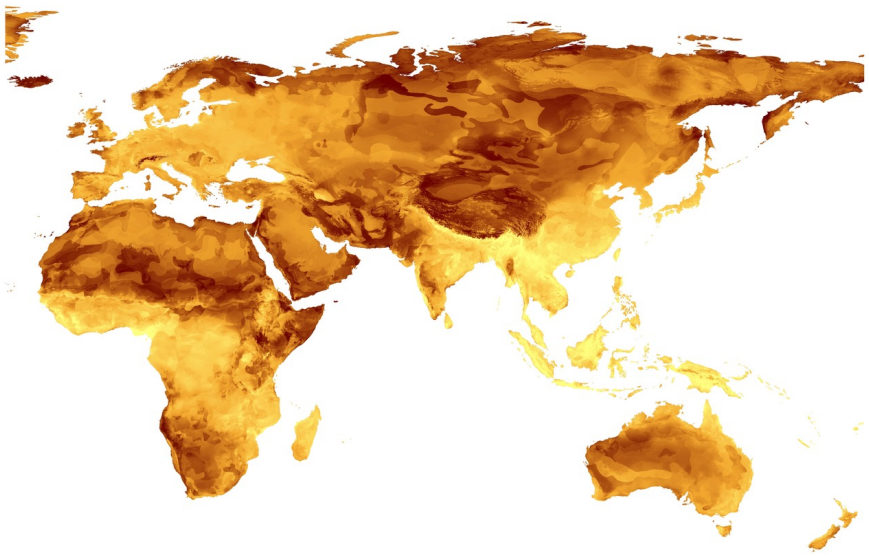


Figure A2: Land suitability for herding vs. agriculture, constructed by Becker (2019) based on data from Beck and Sieber (2010). Darker areas indicate higher suitability for herding relative to agriculture. Data are available only for Africa, Europe, Asia, and Australia.

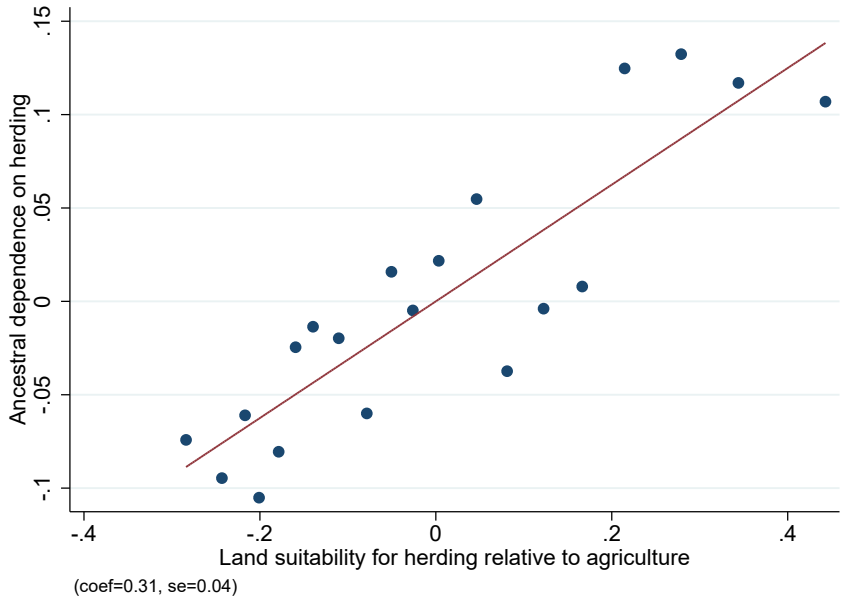


Figure A3: Binscatter plot: dependence on herding and land suitability for herding relative to agriculture for 637 societies in the *Ethnographic Atlas*. The plot controls for continent fixed effects.

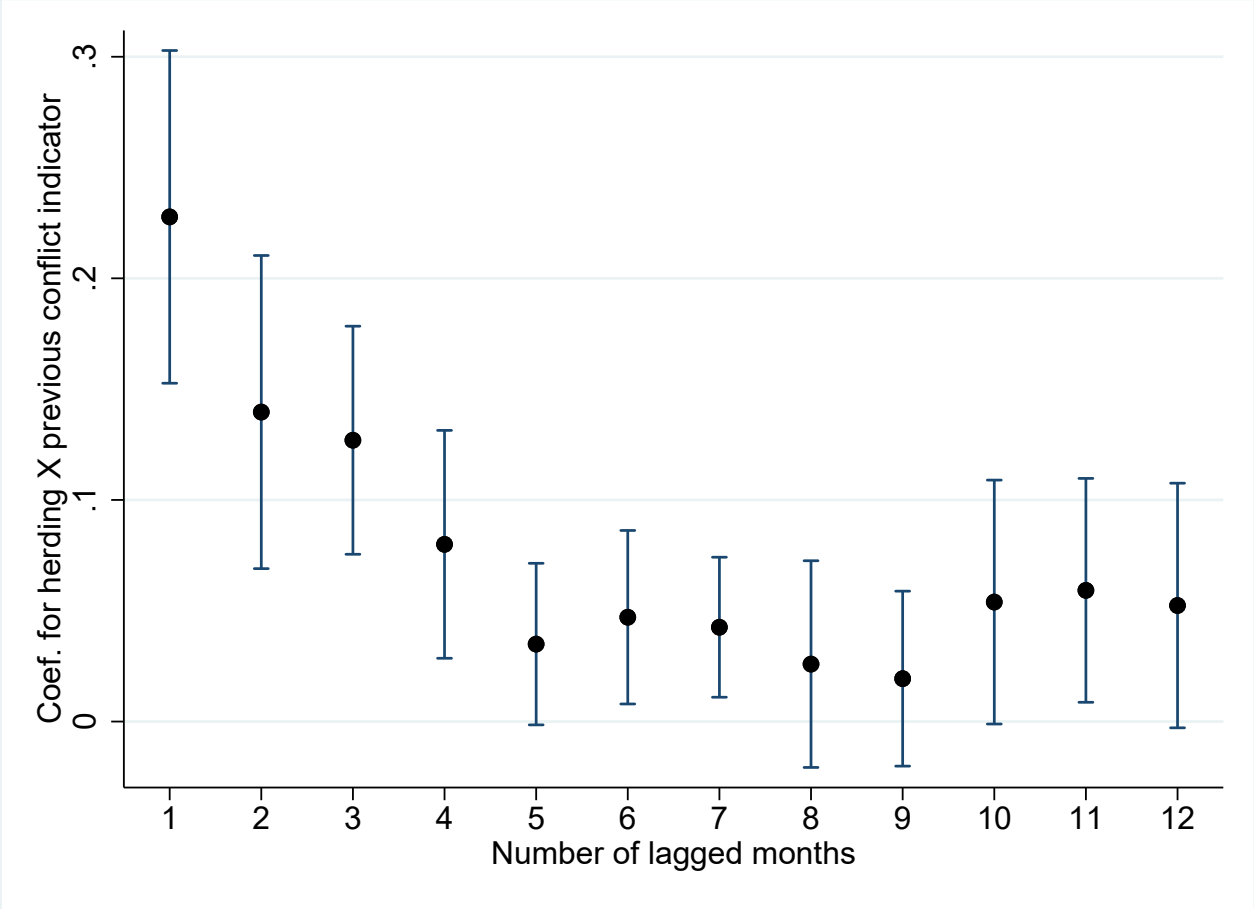
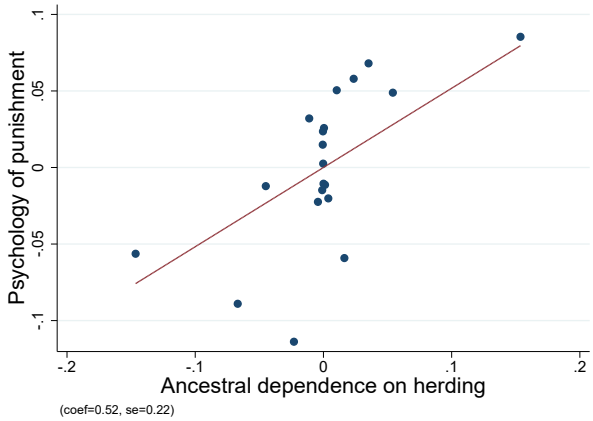
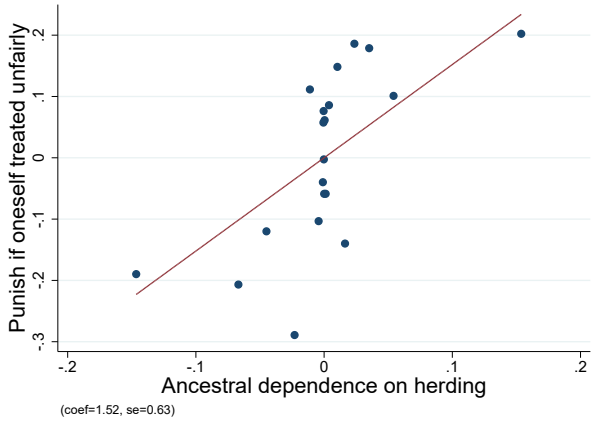


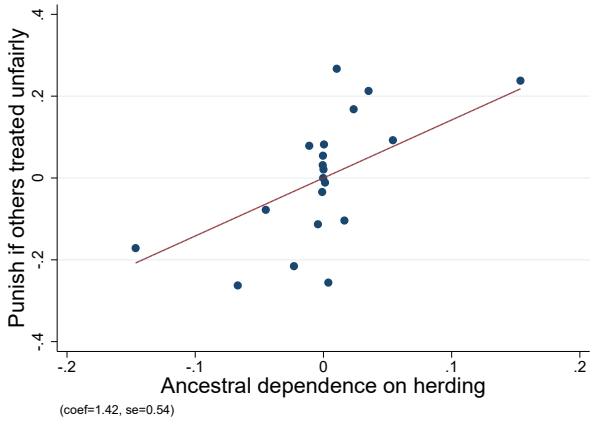
Figure A4: Coefficient plot for the interaction terms between herding and conflict indicators for the past 12 months. A unit of observation is a country-language group in the *Ethnologue* and a year-month, N=512,160. The dependent variable is the number of conflict from ACLED (computed as ln(1+x)). Control variables include country fixed effects, year-month fixed effects, historical settlement complexity, jurisdictional hierarchy beyond the local community, distance from the equator, longitude, ln(population), ln(land area), and terrain ruggedness. Error bars show 95% confidence intervals, computed based on clustering at the ethnic-group level.



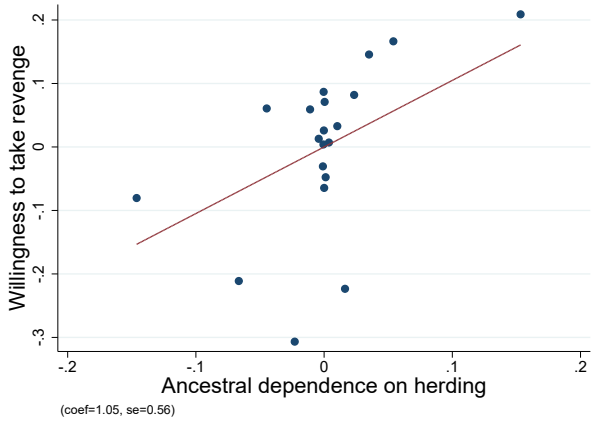
(a) Summary measure of psychology of punishment



(b) Punish if treated unfairly



(c) Punish if others treated unfairly



(d) Willingness to take revenge

Figure A5: 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. 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.

Table A1: Descriptive statistics

	Obs.	Mean	S.D.	Max.	Min.
Panel A: 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 B: the ethnic group level sample from *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 C: The language group level sample based on *UCDP*					
Number of events, all conflicts	7,038	18.4	233.8	14811	0
Number of deaths, all conflicts	7,038	254.1	6498.3	520610	0
Number of months, all conflicts	7,038	4.21	19.8	323	0
Number of events, civil conflicts	7,038	14.2	210.0	14150	0
Number of deaths, civil conflicts	7,038	208.2	6409.5	517783	0
Number of months, civil conflicts	7,038	3.33	17.7	320	0
Number of events, non-civil conflicts	7,038	4.26	45.0	1953	0
Number of deaths, non-civil conflicts	7,038	45.9	445.0	18353	0
Number of months, non-civil conflicts	7,038	1.67	9.77	215	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 D: The language group level sample based on *ACLED*					
Number of events, all conflicts	2,286	57.3	438.3	15294	0
Number of events, civil conflicts	2,286	29.8	237.7	8441	0
Number of events, noncivil conflicts	2,286	27.6	216.5	6852	0
number of events, localized conflicts	2,286	15.7	117.6	2599	0
Dependence on herding	2,286	0.18	0.15	0.92	0
Settlement complexity	2,200	6.10	1.45	8	1
Jurisdictional hierarchy	2,144	2.04	0.94	5	1
Distance from equator	2,286	8.88	5.78	42	0
Longitude	2,286	15.4	14.6	121	-73
Population (ln)	2,277	10.5	2.28	17.7	0
Land size (ln)	2,280	20.9	2.16	27.9	13.6
Ruggedness	2,280	70.6	87.4	1006.2	0
Panel E: The individual level sample from the *Global Preference Survey*					
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

Table A2: 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	**Bahrain**	2	0.255	0.071	0.277
Kenya	55	0.331	0.230	0.692	United Arab Emirates	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, Netherlands Antilles, Dominican Republic, Liechtenstein, Dominica, **Germany**, Sao Tome e Principe, **Serbia**, **Tunisia**, Poland, Czech Republic, Singapore, **Trinidad and Tobago**, **Netherlands**, **Ukraine**, Vanuatu, Fiji, **Papua New Guinea**
Singleton countries: Saint Kitts and Nevis, Luxembourg, Slovenia, Korea, South, Norfolk Island, San Marino, Saint Pierre and Miquelon, Seychelles, Greenland, Aruba, Montenegro, Swaziland, New Zealand, Mayotte, Belarus, Bahamas, Barbados, Antigua and Barbuda, Estonia, Saint Vincent and the Grenadines, Mauritius, Malta, British Virgin Islands, Reunion, Andorra, Qatar, Maldives, Croatia, Saint Lucia, Burundi, Turks and Caicos Islands, Puerto Rico, Uruguay, Iceland, France, Falkland Islands, Korea, North, Cape Verde Islands, Cayman Islands, Anguilla, Martinique, Grenada, Jamaica, Lebanon, Montserrat, Bermuda, Cuba, Rwanda, Greece, Haiti, United States Virgin Islands
The countries in bold are those that provide within-country variations in conflict.

Table A3: Traditional herding and contemporary conflict: Number of deaths

	Dependent variable (in log form)					
	All conflicts		Civil conflicts		Non-civil conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependence on herding	1.333***	0.966***	1.074***	0.803***	1.182***	0.991***
	(0.384)	(0.288)	(0.330)	(0.261)	(0.319)	(0.258)
	[0.477]	[0.384]	[0.415]	[0.311]	[0.386]	[0.356]
Settlement complexity		0.021		0.019		0.009
		(0.019)		(0.018)		(0.016)
		[0.020]		[0.019]		[0.020]
Jurisdictional hierarchy		-0.018		-0.013		0.011
		(0.030)		(0.026)		(0.025)
		[0.039]		[0.030]		[0.029]
Distance from equator		1.493		1.952		-2.037
		(6.170)		(5.565)		(4.778)
		[0.008]		[0.007]		[0.007]
Longitude		1.425		1.420		0.613
		(1.367)		(1.143)		(0.992)
		[0.002]		[0.002]		[0.001]
Population (ln)		0.182***		0.147***		0.116***
		(0.018)		(0.016)		(0.013)
		[0.033]		[0.033]		[0.024]
Land size (ln)		0.191***		0.156***		0.140***
		(0.021)		(0.019)		(0.017)
		[0.041]		[0.032]		[0.035]
Ruggedness		0.120		0.056		-0.126
		(0.223)		(0.207)		(0.165)
		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.11	0.075	0.096	0.071	0.12	0.10
Mean of dependent var	0.87	0.88	0.68	0.69	0.51	0.52
SD of dependent var	1.96	1.98	1.74	1.76	1.48	1.51
Adj. R-squared	0.29	0.44	0.29	0.42	0.23	0.35
Number of Obs.	7,036	6,240	7,036	6,240	7,036	6,240
Number of Countries	211	211	211	211	211	211
Number of Clusters	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. The coefficients for distance from equator, longitude, and ruggedness have been scaled up by 1000. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A4: Traditional herding and contemporary conflict: Winsorizing top 5% herding

	Dependent variable (in log form)					
	All conflicts		Civil conflicts		Non-civil conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependence on herding	0.880***	0.651***	0.700**	0.516**	0.612**	0.512***
	(0.339)	(0.236)	(0.282)	(0.207)	(0.252)	(0.182)
	[0.434]	[0.354]	[0.358]	[0.284]	[0.316]	[0.283]
Settlement complexity		0.007		0.006		0.000
		(0.013)		(0.012)		(0.010)
		[0.017]		[0.015]		[0.013]
Jurisdictional hierarchy		-0.005		0.002		0.010
		(0.020)		(0.018)		(0.015)
		[0.029]		[0.021]		[0.019]
Distance from equator		0.430		0.392		0.564
		(4.748)		(4.275)		(3.317)
		[0.006]		[0.005]		[0.005]
Longitude		0.852		0.597		0.508
		(0.966)		(0.785)		(0.699)
		[0.001]		[0.001]		[0.001]
Population (ln)		0.118***		0.099***		0.068***
		(0.012)		(0.011)		(0.008)
		[0.022]		[0.021]		[0.014]
Land size (ln)		0.124***		0.102***		0.086***
		(0.014)		(0.013)		(0.010)
		[0.027]		[0.022]		[0.022]
Ruggedness		-0.035		-0.064		-0.129
		(0.157)		(0.143)		(0.112)
		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.091	0.067	0.081	0.059	0.090	0.074
Mean of dependent var	0.52	0.53	0.42	0.42	0.29	0.29
SD of dependent var	1.25	1.25	1.12	1.12	0.88	0.89
Adj. R-squared	0.28	0.44	0.28	0.42	0.22	0.35
Number of Obs.	7,036	6,240	7,036	6,240	7,036	6,240
Number of Countries	211	211	211	211	211	211
Number of Clusters	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. The coefficients for distance from equator, longitude, and ruggedness have been scaled up by 1000. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A5: Traditional herding and contemporary conflict: Nomadic controls

	Dependent variable (in log form)		
	All conflicts	Civil conflicts	Non-civil conflicts
	(1)	(2)	(3)
Dependence on herding	0.581***	0.476***	0.477***
	(0.185)	(0.168)	(0.146)
	[0.251]	[0.207]	[0.195]
Settlement complexity	0.046	0.046	0.027
	(0.031)	(0.028)	(0.023)
	[0.045]	[0.039]	[0.032]
Jurisdictional hierarchy	-0.009	-0.002	0.007
	(0.020)	(0.017)	(0.015)
	[0.030]	[0.021]	[0.019]
Distance from equator	0.004	-0.134	0.161
	(4.734)	(4.252)	(3.353)
	[0.006]	[0.005]	[0.004]
Longitude	0.854	0.597	0.508
	(0.975)	(0.792)	(0.707)
	[0.001]	[0.001]	[0.001]
Population (ln)	0.119***	0.100***	0.068***
	(0.012)	(0.011)	(0.008)
	[0.022]	[0.021]	[0.015]
Land size (ln)	0.123***	0.100***	0.085***
	(0.014)	(0.012)	(0.010)
	[0.026]	[0.021]	[0.021]
Ruggedness	-0.022	-0.054	-0.120
	(0.155)	(0.140)	(0.111)
	[0.000]	[0.000]	[0.000]
Nomadic indicator	0.241	0.248	0.166
	(0.177)	(0.161)	(0.130)
	[0.237]	[0.204]	[0.171]
Sedentary indicator	0.088	0.102	0.048
	(0.132)	(0.118)	(0.097)
	[0.166]	[0.138]	[0.122]
Country FE	Yes	Yes	Yes
Beta coef. for Herding	0.072	0.065	0.083
Mean of dependent var	0.53	0.42	0.29
SD of dependent var	1.25	1.12	0.89
Adj. R-squared	0.44	0.42	0.35
Number of Obs.	6,240	6,240	6,240
Number of Countries	211	211	211
Number of Clusters	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. The coefficients for distance from equator, longitude, and ruggedness have been scaled up by 1000. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A6: Traditional herding and contemporary conflict: Controlling for historical marginalization

	Dependent variable (in log form)					
	All conflicts		Civil conflicts		Non-civil conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependence on herding	0.879***	0.564***	0.722***	0.465**	0.651***	0.474***
	(0.285)	(0.202)	(0.247)	(0.187)	(0.212)	(0.159)
	[0.379]	[0.271]	[0.318]	[0.237]	[0.276]	[0.202]
Excluded	0.122**	0.130***	0.134**	0.134***	0.049	0.057*
	(0.060)	(0.046)	(0.053)	(0.043)	(0.039)	(0.032)
	[0.064]	[0.047]	[0.051]	[0.048]	[0.046]	[0.034]
Settlement complexity		0.015		0.012		0.007
		(0.013)		(0.013)		(0.010)
		[0.018]		[0.016]		[0.013]
Jurisdictional hierarchy		-0.010		-0.004		0.008
		(0.020)		(0.018)		(0.016)
		[0.031]		[0.023]		[0.021]
Distance from equator		1.981		1.852		1.249
		(4.775)		(4.328)		(3.379)
		[0.006]		[0.006]		[0.005]
Longitude		2.006		1.445		1.388
		(1.569)		(1.298)		(1.168)
		[0.002]		[0.002]		[0.001]
Population (ln)		0.126***		0.107***		0.072***
		(0.012)		(0.011)		(0.009)
		[0.023]		[0.021]		[0.015]
Land size (ln)		0.140***		0.115***		0.098***
		(0.016)		(0.014)		(0.012)
		[0.030]		[0.025]		[0.024]
Ruggedness		0.050		0.013		-0.091
		(0.161)		(0.146)		(0.115)
		[0.000]		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.11	0.067	0.096	0.061	0.11	0.080
Mean of dependent var	0.59	0.60	0.48	0.48	0.33	0.33
SD of dependent var	1.32	1.33	1.19	1.20	0.93	0.94
Adj. R-squared	0.29	0.46	0.29	0.44	0.24	0.37
Number of Obs.	6,009	5,318	6,009	5,318	6,009	5,318
Number of Countries	163	163	163	163	163	163
Number of Clusters	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. The coefficients for distance from equator, longitude, and ruggedness have been scaled up by 1000. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A7: Traditional herding and contemporary conflict: Interstate conflicts

	Dependent variable (in log form)			
	Sample: UCDP		Sample: ACLED	
	(1)	(2)	(3)	(4)
Dependence on herding	0.002	-0.038	0.158*	0.129
	(0.032)	(0.031)	(0.089)	(0.079)
	[0.045]	[0.040]	[0.083]	[0.092]
Settlement complexity		0.003		0.002
		(0.002)		(0.007)
		[0.003]		[0.007]
Jurisdictional hierarchy		0.006*		0.009
		(0.004)		(0.008)
		[0.005]		[0.005]
Distance from equator		1.380**		-0.170
		(0.686)		(2.345)
		[0.001]		[0.003]
Longitude		0.088		0.569
		(0.083)		(0.986)
		[0.000]		[0.001]
Population (ln)		0.004***		0.021***
		(0.001)		(0.007)
		[0.002]		[0.009]
Land size (ln)		0.007***		0.017***
		(0.002)		(0.007)
		[0.003]		[0.007]
Ruggedness		-0.013		0.182
		(0.035)		(0.122)
		[0.000]		[0.000]
Country FE	Yes	Yes	Yes	Yes
Beta coef. for Herding	0.0012	-0.028	0.073	0.057
Mean of dependent var	0.015	0.017	0.059	0.061
SD of dependent var	0.20	0.21	0.33	0.33
Adj. R-squared	0.13	0.15	0.20	0.26
Number of Obs.	7,036	6,240	2,286	2,134
Number of Countries	211	211	57	57
Number of Clusters	1,104	985	498	450

Note. The unit of observation is a within-country language group from the *Ethnologue*. The dependent variables in the first two columns are based on information from the *Uppsala Conflict Data Program* (UCDP) about conflict events around the globe for the period 1989-2016. The dependent variables in the last two columns are based on information from the *Armed Conflict Location and Event Data Project* (ACLED) about conflict events in sub-Sahara Africa for the period 1997-2016. 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. The coefficients for distance from equator, longitude, and ruggedness have been scaled up by 1000. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A8: Herding and revenge-taking in the descriptions of ACLED events

	Dependent variable: Mentioning of revenge-related terms							
	All conflicts		Civil conflicts		Non-civil conflicts		Localized conflicts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Herding-related terms	0.031***	0.025***	0.007	0.005	0.038***	0.028***	0.046***	0.030***
	(0.007)	(0.006)	(0.005)	(0.005)	(0.009)	(0.008)	(0.011)	(0.009)
Length of description (ln)		0.012***		0.008***		0.019***		0.027***
		(0.002)		(0.001)		(0.005)		(0.007)
Country FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Source FE	No	Yes	No	Yes	No	Yes	No	Yes
Mean of dependent var	0.014	0.014	0.0092	0.0092	0.019	0.019	0.025	0.025
SD of dependent var	0.12	0.12	0.096	0.096	0.14	0.14	0.16	0.16
Adj. R-squared	0.0015	0.017	0.000049	0.011	0.0024	0.035	0.0030	0.061
Number of Obs.	129270	129270	68,035	68,035	61,235	61,235	35,859	35,859

Note. The unit of observation is an event from the *Armed Conflict Location and Event Data Project* (ACLED) about conflict events in sub-Sahara Africa for the period 1997-2016. The dependent variables are based on the text description of the event. Coefficients are reported with standard errors clustered at the ethnicity level. *, **, and *** indicate significance at the 10, 5, and 1% levels.

Table A9: 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.

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

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,

[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.

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. Bag-of-words for folklore analysis

Violence and conflict concepts are: 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.

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

D. 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 provides information on the names of the two actors involved in each conflict event. We code an event as a civil conflict if one of the actors involve the government of a given state. We code an event as a non-civil conflict if neither of the two actors is the government of a given state. We exclude events in which both actors are state governments. [18]

We provide examples of entries in the dataset for each type of conflict. PLEASE CONFIRM WHETHER WE NEED ALL OF THE EXAMPLES BELOW.

[18]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.

- Civil conflict:
  - Side A: the Government of Somalia; Side B: Somali National Movement (SNM); Starting date: January 6, 1991; Ending date: January 6, 1991; Location: Woqooyi Galbeed region; Country: Somalia; Deaths (side A): 100; Deaths (side B): 0.
  - Side A: the Government of Azerbaijan; Side B: Republic of Nagorno-Karabakh; Starting date: January 25, 1994; Ending date: January 25, 1994; Location: Kelbajar rayon; Country: Azerbaijan; Deaths (side A): 70; Deaths (side B): 4.
  - Side A: the Government of Sudan; Side B: Darfur Joint Resistance Forces; Starting date: June 27, 2014; Ending date: June 28, 2014; Location: Kutum district; Country: Sudan; Deaths (side A): 10; Deaths (side B): 13.
  - Side A: the Government of Georgia; Side B: Republic of Abkhazia; Starting date: September 1, 1992; Ending date: September 1, 1992; Location: Sukhumi town; Country: Georgia; Deaths (side A): 15; Deaths (side B): 60.
- Non-civil conflict:
  - Side A: Fulani; Side B: Tiv; Starting date: December 19, 2016; Ending date: December 19, 2016; Location: Gassol lga; Country: Nigeria; Deaths (civilians): 11.
  - Side A: Afar; Side B: Issa; Starting date: November 15, 2022; Ending date: December 10, 2002; Location: Gewane; Country: Ethiopia; Deaths (civilians): 30.
  - Side A: Al-Maraziq; Side B: Al-Saida; Starting date: November 23, 2004; Ending date: December 3, 2004; Location: al-Jawf governorate; Country: Yeman; Deaths (side A): 6; Deaths (side B): 22.
  - Side A: the National Democratic Front of Boroland (NDFB); Side B: Civilians; Starting date: July 24, 1994; Ending date: July 24, 1994; Location: Kokrajhar district; Country: India; Deaths (civilians): 69.
- Interstate conflict (which we exclude from the main analysis):
  - Side A: the Government of Iraq; Side B: the Government of Kuwait; Starting date: February 25, 1991; Ending date: February 25, 1991; Location: Al Khubar town; Country: Saudi Arabia; Deaths (side A): 27.
  - Side A: the Government of South Sudan; Side B: the Government of Sudan; Starting date: April 17, 2012; Ending date: April 17, 2012; Location: Southern Darfur state; Deaths (side A): 15; Deaths (side B): 7.
  - Side A: the Government of Afghanistan; Side B: the Government of United Kingdom and the Government of United States of America; Starting date: October 10, 2001; Ending date: October 10, 2001; Location: Karam village; Country: Afghanistan; Deaths (civilians): 160.

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, civil conflicts. The total number of civil conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Civil conflict refers to violence that involves the government of a given state as a participant. Log number of events is computed as ln(1+number of events).

Number of deaths, civil conflicts. The total number of deaths from all civil conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Civil conflict refers to violence that involves the government of a given state as a participant. Log number of deaths is computed as ln(1+number of deaths).

Number of months, civil conflicts. The total number of months during the sample period that experienced a civil conflict incidence, aggregated at the dialect group level over the 1989–2016 period. Civil conflict refers to violence that involves the government of a given state as a participant. Log number of months is computed as ln(1+number of months).

Number of conflict events, non-civil conflicts. The total number of non-civil conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Non-civil conflict refers to violence that does not involve the government of a given state as a participant. Log number of events is computed as ln(1+number of events).

Number of deaths, non-civil conflicts. The total number of deaths from all non-civil conflict events in the UCDP database, aggregated at the dialect group level over the 1989–2016 period. Non-civil conflict refers to violence that does not involve the government of a given state as a participant. Log number of deaths is computed as ln(1+number of deaths).

Number of months, non-civil conflicts. The total number of months during the sample period that experienced a non-civil conflict incidence, aggregated at the dialect group level over the 1989–2016 period. Non-civil conflict refers to violence that does not involve the government of a given state as a participant. 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 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.

E. Data description for ACLED analysis

a. Data construction

For groups within the African continent, we are able to use data from the *Armed Conflict Location and Event Data Project* (ACLED) as an alternative source of conflict data. The database includes information on the location, date, and other characteristics of all known conflict events in Africa for the period 1997–2016. Compared to the UCDP database, ACLED data is more comprehensive when it comes to small-scale conflicts, yet has a lesser spatial and temporal coverage. We use the "Interaction" variable to group conflicts by the following three sub-types:

- **Civil Conflict** if the Interaction variable takes a value between 10–17, or 20–27. These are all conflict events that involve the government military or rebels (who are seeking to replace the central government) as one of the actors.
- **Non-Civil Conflict** if the Interaction variable takes a value between 30–37, 40–47, 50–57, or 60–67. These are all conflict events that are not civil conflicts.
- **Within-Group** or **Localized Conflict** if the Interaction variable takes a value between 40–47, 50–57, or 60–67. These are all conflict events for which both actors in the conflict are geographically local and/or ethnically local groups.

Another benefit of the ACLED data is that they provide a description of most conflict events, which allows us to perform a textual analysis to test for a relationship between herding and revenge-taking conflict. We follow the same procedure described in our folklore analysis to obtain a bag-of-words that proxies whether a conflict event involves herding or revenge-taking actions. To minimize our degree of discretion with regard to the construction of the bag-of-words, we take two steps. First, we select a set of seed words that describe the key concepts. For herding concepts, we use *herding* and *herder*; for punishment and revenge concepts, we use the same set of seed words that we have used in the folklore analysis: *punish, retaliation, revenge*. Then, we follow the methodology proposed by Michalopoulos and Xue (2021) to retrieve the top-50 list of related terms from *ConceptNet*, which gives us the following terms after dropping duplicates:[19]

1. Herding concepts: herding, sheepherding, herded, herds, herd, herder, herd instinct, cutting horse, livestock, cattle, herdsman, shepherding, sheepherder, hurd, sheep, herders, sheepdog, cows, animal husbandry, goats, sheepdogs, herdsmen, pasturing, pastoralism, shepherds, feeder cattle, ranching, bovines, dairy cattle, drover, cow pasture, domesticated animals, chianina, shearing shed, flock, dairy cows, sheep dog, shorthorn, stockbreeding, shepherd, flocks, corralling, simmental, grazing, corralled, shepherdess, roping, oxen, aberdeen angus, milking, goat herder, goatherd, bergeret, grazier, goatherds, shepherdesses, cowherd, ovis, cattleman, goat, cowman, cow, transhumant, stockman, shepard, schaefer, shepherded, bootes, sam shepard
2. Revenge concepts: retaliation, reprisal, retaliatory, talion, retaliate, reprisals, revenge, vengeance, revenges, retribution, vengeances, retaliated, revanche, retaliating, revenged, vengeful, requital, venge, avenge, payback, revengeful, revenging, revenger, vindictive, vengefulness, vengence, vendetta, avenges, vindictiveness, vengefully, retributive, avenging, qisas, retaliates, reciprocation, poetic justice, vindictively, rematch, comeuppance, avenged, vendettas, revanchist, grievances, recompense, mutual assured destruction, rematches, recrimination, redress, backlash, grievance, punish, punishes, penalize, penalise, punished, punishing, punition, punishment, penalizing, chastise, penalized, penalization, penalised, castigate, punishments, castigating, vulgar language, castigates, chastised, disciplining, punitive, chastisement, imposing sanctions, castigated, punitiveness, chastising, penality, corporal punishment, punitively, punishable, penalty, pillorying, disciplinary, bad behavior, scold, reprimanding, chastisements, discipline, reprimand, spanking, reprimanded, reprimands, chide, spanks, misbehaved, chasten, scolds, spank, vindication, revanchism, avenger, wreak, unavenged, rematched

We constructed two indicators at the conflict event level: one for the mentioning of herding concepts and the other for the mentioning of revenge concepts. From the 139,467 events in the

[19]There are more terms than in our folklore analysis because here we do not restrict the list to concepts that also appear the folklore catalogue.

ACLED database, we identified 3,001 events that involved herders and 1,955 events that involved revenge-taking actions. We aggregate the frequency of revenge-taking conflict at the language group level for *all*, *civil*, *non-civil*, and *localized* conflicts.

F. 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).[20] 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 the individual-level data from the Global Preference Survey (GPS) to measure psychology of punishment. The measure is constructed by Falk et al. (2018) as a weighted average of three questions that elicits 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.

[20]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.

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.