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Radost Holler Paul Schäfer

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Norm Prevalence and Interdependence: Evidence from a Large-Scale Historical Survey of German speaking Villages*

Radost Holler†, Paul Ivo Schäfer‡

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Abstract

We use large-scale survey data of German speaking villages from the 1930's to investigate drivers of cooperation, gender, and religious norms. Through geographic cluster analysis, we show that inter-regional variation explains only little heterogeneity in norms. Villages in the same physical and institutional environment still maintain different norms. We argue that local differences in the structure of social relationships can explain intra-regional heterogeneity in norms. We focus on a community's ability to transmit and enforce norms to derive theoretical links between correlates of community social relationships and the number of norms it maintains (norm prevalence). Empirically we find that: (1) norm prevalence is positively related to three correlates of community social relationships: religiously homogeneous villages, villages that border on other villages with a different majority religion, and villages with more within-village social gatherings; (2) villages with stronger community-level social relationships are also less likely to segment their reference group for the cooperation norm to smaller social units; (3) cooperation norms make other norms more likely.

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†Radost Holler, Bonn Graduate School of Economics. Email: holler[at]uni-bonn[dot]de.

‡Paul Schäfer, Bonn Graduate School of Economics. Email: paul.schaefer[at]uni-bonn[dot]de.

1 Introduction

Economic and social science research has shown that social norms [1] are an important factor in explaining cross-cultural differences in economic and political outcomes.[2]Heterogeneity in the existence and evolution of norms is frequently attributed to large and medium-scale environmental and institutional variations. Variation in norms within cultural groups has rarely been explored because researchers are usually constraint by the available data. The available data sets have limited within cultural coverage. To overcome this issue, we present a newly digitized data set. This data set contains information on particular norms concerning religion, gender, and cooperation for up to 23,000 Central European, German speaking villages.

We first demonstrate that norms are local. That is, norms vary largely within regions even when regions are explicitly chosen to be variance minimizing. In a second step, we explore a potential mechanism underlying this local variation: within-community social relationships. We build on theories in which within-community social relationships foster norms through transmission and social sanctioning: a community that frequently interacts can transmit information, monitor norm adherence, and enact sharper social sanctions. Thus, the existence of a specific norm does not only depend on institutional and environmental variation changing the value or the need of a norm but also on community-level characteristics that determine the ability of a community to maintain a norm.

We further explore two important implications of this mechanism. First, when communities lack sufficiently dense social-relationships to implement a norm on the community-level, norms may still be fostered within better-connected subgroups, thus changing the reference group of a norm to smaller, more segmented units of the community. Second, norms that foster within-community social interactions or make community membership more beneficial, such as norms of mutually beneficial cooperation, make other norms more common on the community-level by improving norm transmission and social sanctioning. This should induce a positive interdependence between some norms, but not all.

[1] There are multiple ways to define social norms (see Legros and Cislaghi, 2020, for a cross-disciplinary review). We view social norms as informal standards of behavior within a community to which individuals in a community conform even in the presence of deviating incentives on the individual level. This definition is similar to Burke and Young (2011) and Bicchieri et al. (2018). As opposed to suggestions of Bicchieri et al. (2006) and Bicchieri et al. (2018), we will not distinguish between expected and actual conformity because we cannot disentangle them empirically. However, we will implicitly assume that a norm's existence also implies that it is adhered to at least to some degree.

[2] See, for instance, Gelfand et al. (2011), Gelfand et al. (2017), J. C. Jackson et al. (2020), Alesina et al. (2013), Buggle (2020), Buggle and Durante (2021), and McCloskey (1991).

Our analysis relies on newly digitized data from the German Ethnographic Atlas (GEA) on norms, customs, and religious denomination on the village level. The GEA was collected in the early 1930s and sampled up to 23,000 German speaking villages in Central Europe.[3] Thus, the data were collected when contacts and mobility between rural villages were low. In this setting, the naturally largest reference group for a norm and the level of observation in the data is the village community. This congruence, in addition to the dense distribution of data points, makes the data well suited for studying local variation in norms and the role of community-level social relationships. In contemporary Western societies, communities are less isolated than in the society described by our data set. Because our data contains many non-overlapping village communities, we can exploit local variation to a degree that would be impossible with contemporary data.

The data set contains three types of norms: cooperation norms as measured by neighborhood-help obligations, gender norms as measured by restrictions on women after giving birth, and religious norms as measured by the presence of individuals that are religiously unaffiliated. The data also contain information on the reference group for neighborhood help obligations. Obligations may, for instance, apply to the whole village, or more segmented groups, such as next-door neighbors. In addition, the data set contains community-level characteristics from which we construct three correlates of community-wide social interactions: religious heterogeneity within villages, religious heterogeneity across villages, and communal labor activities.

We conduct our analysis in several stages. We start by investigating the geographic distribution of norms by conducting a geographic cluster analysis for each domain (gender, cooperation, and religion) of norms. We choose the resulting geographic regions to minimize the within region variance in the respective variables. The cluster analysis reveals that the observed norms are widespread over the sampling area, and intra-regional variation explains a large fraction of overall variability in the existence of these norms on a community-level.

In the second step, we explore the local determinants of *norm prevalence* (the number of different norms in a village). We focus on the above mentioned mechanism, namely the role of community-level social relationships in maintaining norms. We use three indicators of community-wide social relationships: religious heterogeneity within a village, religious

[3]Sample size varies by questionnaire and variable.

heterogeneity across villages, and communal labor activities. We argue that within-village religious heterogeneity is associated with lower community-wide interactions. On the contrary, heterogeneity across villages shifts social interactions towards the religiously more similar local community. Communal labor activities are voluntary production activities and primarily provide occasions for socializing and regular community gatherings. Thus, they foster interaction among community members.

Our results suggest that indeed the structure of social relationships is a driver of local norm prevalence. First, our correlates of community-wide social interactions are associated with norms in the predicted direction. Opportunities for regular community interactions increase norm prevalence, social heterogeneity within communities is associated with lower norm prevalence, and heterogeneity between groups is associated with higher norm prevalence across domains. Second, communities adapt to obstacles for community-wide social interaction by changing the reference group of norms. Third, cooperation norms that increase the intensity of social interactions within a community are associated with a higher prevalence of norms unrelated to cooperation, while these other norms are insignificant or negatively related to each other.

While our results are only correlational, they form a coherent picture in line with theories on norm transmission and social sanctioning. There are two major challenges to our interpretation: (1) unobserved variables might affect the prevalence of norms and at the same time determine community characteristics and social relationships; (2) reverse causality. Our results continue to hold when accounting for narrow geographical fixed effects (20 km $\times$ 20 km) and political boundaries. Consequently, remaining confounders vary within these grid cells and affect norm measures as well as determinants of social relationships. We try to control for ruralness as one likely candidate. We further discuss the issue of unobserved heterogeneity, internal validity and reverse causality in greater detail when interpreting our results.

Our work is related to the literature on the role of social sanctioning in establishing cooperative behavior and norms. The theoretical strand of this literature defines norms as equilibria in (repeated) social dilemma games. In these theories, cooperative equilibria are maintained by (off equilibrium path) sanctioning of deviant behavior and social monitoring (see, e.g. Schelling, 1958; Ullmann-Margalit, 1977; Kreps et al., 1982; Axelrod, 1986; Kandori, 1992; Coleman, 1994; Aoki, 2001; Genicot and Ray, 2003). This literature's empirical

strands focus on lab and lab-in-the-field experiments to analyze conditions amenable to cooperation, despite the threat of free-riding. It shows that altruistic punishment of uncooperative behavior is frequent when available to the individual and that the availability helps to sustain cooperation (see Fehr and Fischbacher, 2004, and references therein). It further highlights that repeated interaction, monitoring, and stable social network ties are key in maintaining cooperation at high levels (see, e.g. Fehr and Gächter, 2000; Duffy and Ochs, 2009; Rand et al., 2011; Chandrasekhar et al., 2018). We extend this literature by showing that these mechanisms are not only key for maintaining cooperation, but also for maintaining other norms prevailing in communities. Further, we argue that these mechanisms imply a direct interdependence between cooperation norms and other norms. Both of these implications are important for policy design. Strengthening cooperation norms can strengthen other norms within the same communities. Thus, when evaluating the welfare improvements of these type of interventions, this potential side-effect should be considered.

In addition, our research contributes to the literature on cultural tightness, which studies the prevalence of norms across domains (Gelfand et al., 2011; Gelfand et al., 2017; J. C. Jackson et al., 2020). Tight cultures have a higher prevalence of norms and higher levels of conformity. According to this literature, variations in cultural tightness are related to differences in social or ecological threat. J. C. Jackson et al. (2020) finds that cultural tightness is not domain-specific. That is, the prevalence of norms across domains is correlated. J. C. Jackson et al. (2020) attribute this to spillovers across domains. We contribute to this literature by examining social relationships and social sanctioning as another possible mechanism. Our results differ from J. C. Jackson et al. (2020), because we do not find a general positive complementarity in norms across domains. In our context the positive complementarity seems to be limited to cooperation norms only.

Besides this broader contribution, we contribute to the literature about social heterogeneity and cooperation (Varughese and Ostrom, 2001; Miguel and Gugerty, 2005; Alexander and Christia, 2011; Hoang et al., 2021). In particular, we analyze the dimension of religious heterogeneity, which has been under-represented in this literature. Further, we expand on Posner (2004) and investigate the effects of heterogeneity at different levels. We find that heterogeneity between communities increases norm prevalence while heterogeneity within communities decreases norm prevalence. These results are consistent with the theory that differences between groups foster in-group cohesion.

Finally, our data addresses a lack of data lamented in the literature on collective action and ethnographic data in historical economics (Poteete and Ostrom, 2004; Poteete and Ostrom, 2008; Lowes, 2020). Lowes (2020) notes that while ethnographic datasets can be very useful for economic historians, currently available datasets have several shortcomings. Existing datasets are compiled from many ethnographies that might use differing definitions. These data sets' patchwork nature makes the resulting data less systematic and hides variation within pre-defined cultural boundaries. Such data sets also include very few European data-points. The data, we digitized, contributes towards filling those gaps. In particular, the village-level data allows for geographically narrow fixed effects to partially account for institutional and geographical variation.

We introduce our data in section 2. Section 3 uses cluster analysis to describe large-scale spatial patterns in norm prevalence. Starting with the theory section 4 we shift perspective and focus on social relationships as a local determinant of norm prevalence. In this section we describe our conceptual framework and empirical predictions. In section 5 we test these prediction. Section 6 concludes.

2 Data

We use a newly digitized data set containing the results of the German Ethnographic Atlas (GEA) collected by anthropologists between 1930 and 1935. The data consists of five questionnaires, each containing different questions. In total, the GEA contains 243 questions. With a sample of more than 20,000 German Speaking communities, the project pioneered the concept of an Ethnographical atlas (Schmoll, 2009). The aim of this data collection was to capture rural culture before its transformation caused by industrialization (Schmoll, 2009, p. 236-238).

The target population of the GEA consists of German speaking villages that have at least one school.[4] We compare the coverage of the GEA with the official number of municipalities in a region in Appendix A. For each sample village, researchers recruited volunteers to fill out the questionnaires for one or multiple villages (Kehren, 1994). We display characteristics of respondents in the Rhine Province digitized by Kehren (1994) in Appendix B. The questions asked about customs in a village, and not about the individual behavior of the

[4]Note that even though the aim was to capture rural life, the final sample also contains cities such as Hamburg, and part of cities such as Berlin-Charlottenburg or Berlin-Spandau.

respondent. The topics of the survey range from agricultural production, food, festivities, folklore, religious and profane rituals, to marriage customs, and norms concerning varying areas of life. We focus on the questions about norms, communal labor, and religion. Cooperation norms as well as particular norms affecting women were asked in questionnaire 4 collected in 1933[5]; communal labor was surveyed in questionnaire 2 collected in 1931, and religious composition of the villages was asked in every questionnaire (1930-1933).

The researchers behind the GEA collected their data mainly in the German Reich in its inter-war borders (1919-1939) including the Saar Region, Gdansk, the Czech part of Czechoslovakia, Luxembourg, Liechtenstein and the First Austrian Republic.[6] Some questionnaires were only asked in some regions, and some data is only fragmentally included in the published materials.[7] As we attempt to analyze spatial variation, we exclude data points that are geographically comparably isolated because of the fragmented sampling within the region. In consequence, we only include answers from the German Reich, the first Austrian Republic, the Czech part of Czechoslovakia, Luxembourg, Liechtenstein, and Gdansk in this study.

[5]We discuss the relationship between the GEA researchers and the national socialist government in Appendix A.

[6]More fragmented attempts at data collection were conducted in Slovakia, Transylvania, Bessarabia, Banat, Lorraine, Klaipėda Region, Switzerland, Poland, German speaking parts of Belgium, regions ate the German-Dutch border, and Denmark. Sampled villages and regions are taken from the official list of villages provided in the GEA. This contains only the list of villages included in questionnaires one through four. Not all regions participated in all questionnaires.

[7]Switzerland and Lorraine were only included in the questionnaire 1, Luxembourg only in the questionnaire 1 and 2. Border region with Denmark is only available in questionnaire four. Data collection in the Polish corridor was conducted covertly (Schmoll, 2009, p. 88) and is only partially documented in the official list of villages.

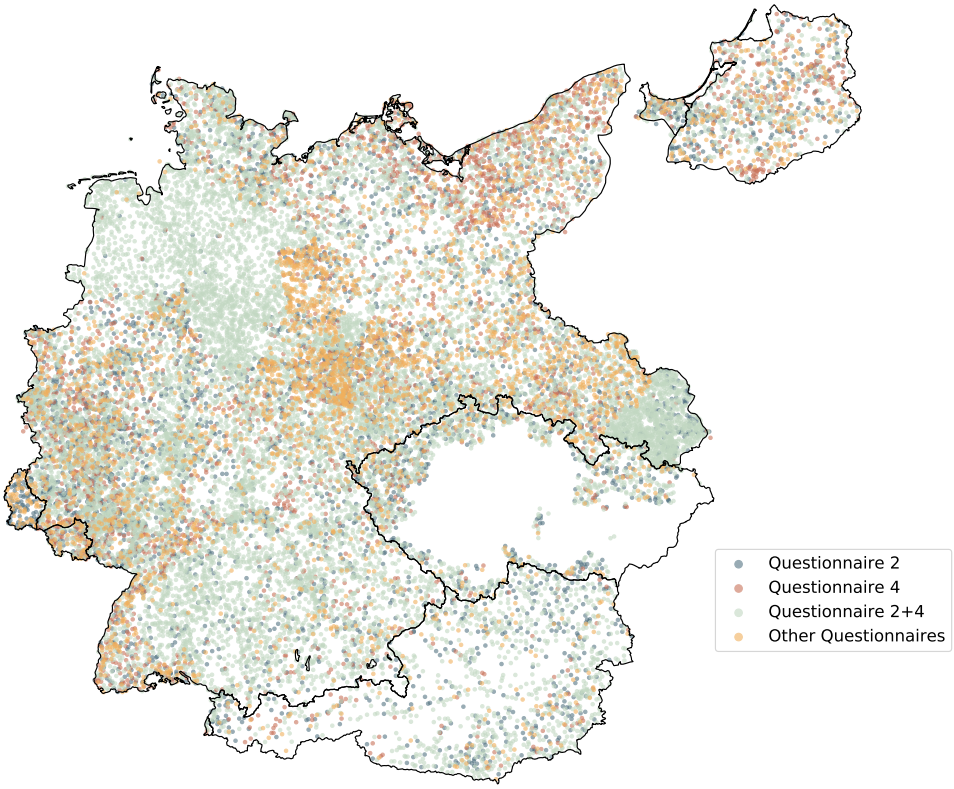


Figure 1: Data points by questionnaire.
Notes: Sample restricted to villages included in questionnaires two or four in the German Reich, Austria, Czech part of Czechoslovakia, Liechtenstein, Gdansk, and Luxembourg.

Figure 1 displays the geographic distribution of data points of the questionnaires. We indicate each surveyed village with a point on the map. We display Villages surveyed in both, questionnaire 2 and 4, in green, villages only surveyed in questionnaire 2 in blue; villages only surveyed in questionnaire 4 in red and those from other questionnaires, namely 1 and 3, and that are not included in questionnaire 2 and 4 in orange. [8] Most observations lie in the German Reich (15,096 of questionnaire 2, 14,540 of questionnaire 4, 15,799 of the other questionnaires). The data set covers the whole area of the German Reich. The majority of observations outside the German Reich are in Austria and Czechoslovakia. Both contain more than 1,100 observations from questionnaire 2 and the other questionnaires and

[8] These additional observations come from the religion questions that were asked in all questionnaires. We use them for descriptive analyses concerning religion.

between 868 and 901 from questionnaire 4. While Austria is fully covered, the observations in Czechoslovakia are clustered around the border to the German Reich, reflecting German settlement patterns. For an overview of sample sizes by region see Table A.1 in Appendix A.

The samples of the questionnaires mostly overlap. As Figure 1 shows, questionnaire 2 has more observations in Austria, and Czechia while questionnaire 4 contains more observations in the Northeast of the German Reich. The majority of observations (13,818) are contained in both questionnaires. Luxembourg was not covered in questionnaire 4 with the exception of one village. The number of observations decreases from questionnaire two to questionnaire four by roughly 1,200 observations. This decrease is concentrated outside of the German Reich.

As the questions were open and not ratings or multiple-choice, the answers ten to be texts with varying details of background explanations.[9] The answers were transcribed onto answer cards by the researchers. After WWII, a group of anthropologists additionally categorized the answers to a subset of questions, among which are the questions about local cooperation and norms (Schmoll, 2009). We rely on their very broad categorizations of the raw data. We provide additional information on our digitization procedure in Appendix H.

2.1 Measuring Norms

Cooperation Norms. Our measure for the prevalence of cooperation norms is the number of activities with which community members are obligated to help their neighbors. Neighborhood help as a common cooperative activity of historic village communities is also documented in Kramer (1954), Weber (1922), and Wurzbacher (1961). We use answers to the following (translated) survey question in order to quantify the extent of neighborhood help and the structure of obligations.[10]

a) In your village, are neighbors traditionally obligated to mutual assistance?

[9] Some were even essay-like answers (Zender and Wiegelmann, 1959).

[10] In the German original the survey question is given by:
a) Sind in ihrem Ort die Nachbarn noch von alters her zu gegenseitiger Hilfeleistung verpflichtet? b) Bei welchen Anlässen des Familienlebens , wie Geburt (z.B. Pflege der Wöchnerin), Hochzeit (z.B. Hilfe in der Küche), Krankheit (z.B. Nachtwache), Tod (Tragen des Sargs, Graben des Grabs)? c) bei welchen wirtschaftlichen Arbeiten, wie Ernte, Hausbau (Anfahren des Bauholz) usw.? d) Für wen gelten diese Nachbarschaftspflichten? e) wer sonst ist dazu verpflichtet ohne Nachbar zu sein? (Zender and Wiegelmann, 1959, p. 30)

b) At which occasions of family life, like childbirth (e.g. care for women in childbed), weddings (e.g. help in the kitchen), illness (e.g. night watch), death (carrying the coffin, digging the grave)

c) for which economic tasks, like harvests, building a house (transporting wood) etc.?

d) to whom do these obligations apply?

e) to whom, who isn't a neighbor do these obligations apply?

To quantify the degree of neighborhood obligations, we rely on answers to part (a)-(c). Barruzi-Leicher and Frauenknecht (1966) pre-categorized the answers to the question. Their categories are displayed in Figure C.4 in Appendix C.1. We summarize the specific obligations under three coarser categories: help at death, help with weddings, help with (re-)building a house, and help at birth or sickness. While we use an aggregated measure for neighborhood help in our final analysis, we use this broader categorization to describe the spatial patterns of neighborhood help and the heterogeneity hidden behind this aggregated measure.

While most communities only prescribe neighborhood obligations in one specific activity, more than a third require neighborhood help in more than one area and multiple activities. The relative frequencies of each aggregated sub-type of neighborhood help are shown in Table 1. For a bar-chart of the disagregated data, see Figure C.4 in Appendix C.1. More than 50% of villages prescribe some neighborhood obligation. With 45% of communities prescribing it, neighborhood help at death is the most common neighborhood help obligation. In 39% of communities, neighbors are obligated to help with (re-)building a house; in 24% neighbors help each other at weddings. Help at birth or sickness is with 3% of villages less frequent. On average, villages have 1.4 neighborhood obligations.

We use the answers to parts (d)-(e) of the neighborhood help survey question to measure neighborhood segmentation. These sub-questions explicitly ask about the reference group for neighborhood-help. These answers were grouped into 42 categories by Barruzi-Leicher and Frauenknecht (1966). All 42 categories with their corresponding sample frequency are displayed in Figure C.5 of the Appendix. We focus our analysis on answers that indicate that the *whole* village is obligated to mutual help. These answers indicate to which degree a village is segmented into particular subgroups. Measuring segmentation into sub-groups allows us to analyze endogenous adaptations of the community to external factors such

Table 1: Summary statistics: norms

	N	Share	Mean	Std	Min	p25	p50	p75	Max
N. Nbh. Help	16,467		1.37	1.44	0	0	1	2	8
Type of Help									
Death		0.45							
Building house		0.39							
Wedding		0.24							
Birth/Sickness		0.03							
Unsegmented Neighborhood	10,088	0.17							
N. Childbed Norms	14,927		0.74	0.95	0	0	0	1	9
Type of Norm									
Both		0.10							
Protective		0.23							
Impurity		0.15							
None		0.51							
Dissidents	22,967	0.08							

Note: For categorical and dichotomous variables, table displays shares. For continuous variables mean, standard deviation, minimum, 25th, 50th, 75th percentile and maximum are reported. Gender norms have a lower number of observation because part of the data was destroyed in the war, for more details see Appendix H. N. Nbh. Help = Number of neighborhood help obligations; N. Childbed Norms = Number of childbed norms.

as religious heterogeneity. In our analysis we use an indicator whether neighborhood help is conducted at the village level (*Unsegmented Neighborhood*). Out of the villages that conduct neighborhood help, 17% do so as an unsegmented village (see Table 1).

Gender Norms. The GEA asks about norms that apply to women in the weeks after birth, also called '*Wöchnerin*' which can be translated as woman in childbed. The birth of a child used to be surrounded with behavioral rules for the new mother in Europe (see e.g. Labouvie, 1992; Nowottnick, 1935).[11] The GEA contains the first quantitative assessment of the prevalence of these norms. The question reads as follows:

> a) Where is the woman in childbed not allowed to go before her first church-going? (e.g. basement, attic, barn, well, neighbor)
>
> b) Which boundary is she not allowed to pass? (e.g. gutter, street, crossroad, village border)
>
> c) Which other traditional precautions does the women in childbed follow?[12]

There are two different hypothesized origins of these behavioral rules. On the one hand, general behavioral rules for the women in childbed can be found in the old testament and are related to beliefs about womens' impurity after birth.[13] On the other hand, the rules usually prescribed are not related to the rules prescribed in the old testament. Additionally, both the Protestant church as well as the Catholic church have not stipulated rules related to the women in childbed at least since the 17th century (Grober-Glück, 1977). A different approach explains the existence of some of these rules by their protective function for women in the vulnerable weeks after birth. They are hypothesized to function as an early maternity leave and protect women from hard work, they would have to do otherwise (Arx, 1978; Grober-Glück, 1977). Grober-Glück (1966b) analyzed the original answers of the question regarding norms that apply to the women in childbed. Her categorization

[11] The time period that new mother was considered to be a 'Wöchnerin' was usually between 2-4 weeks (max. 40 days) after birth and was oftentimes connected to the time a new mother was not allowed to go to church (Nowottnick, 1935).

[12] Original German: a) Wohin darf die Wöchnerin vor dem ersten Kirchgang (Aussegnung) nicht gehen? (z.B. Keller, Boden, Stall, Brunnen, Nachbar) b) Welche Grenze darf sie nicht überschreiten? (z.B. Dachtraufe, Gosse, Straße, Kreuzweg, Dorfgrenze) c) Welche besonderen altherkömmlichen Vorsichtsmaßnahmen beachtet die Wöchnerin sonst vor dem ersten Kirchgang?

[13] "A woman who [..] gives birth to a son will be ceremonially unclean for seven days, just as she is unclean during her monthly period. [...] 4 Then the woman must wait thirty-three days to be purified from her bleeding. She must not touch anything sacred or go to the sanctuary until the days of her purification are over. If she gives birth to a daughter, for two weeks the woman will be unclean, as during her period. Then she must wait sixty-six days to be purified from her bleeding." (Leviticus 12)

yields 93 different subcategories. The translation of each subcategory including the answer frequency can be found in Tables C.3-C.4. She additionally divides the rules according to their likely function or origin. She argues that rules that are connected to the belief that women in childbed bring harm, such as "Do not attend a public event [...] because it will cause a dispute or fight" are likely connected to the impurity notion, while rules such as "The woman in childbed should not mend, knit, spin [...]" likely function as protection of the young mother's health. We categorize her subcategories into *Impurity* and *Protective* norms accordingly.

In appendix C.2, we regress *Impurity* and *Protective* norms child mortality, ratio of female to male labor force participation, and the ratio of female to male mortality on the county level. We, indeed, find different associations for each category. Protective norms are more prevalent in regions where there is relatively higher female mortality and relatively lower child mortality, while impurity norms are not significantly associated with relative female mortality, but positively associated with child mortality (see Table C.5). This seems to support the categorization of Grober-Glück (1966b). Since both the regression results as well as the pre-existing categorization of norms indicate that impurity and protective norms are two distinct groups we also distinguish between these groups in our analysis.

Table 1 displays the relative frequency of each norm type. Note that the number of observations of childbed norms is lower than those of neighborhood help obligations because some part of the data was destroyed in World War II or deemed unreadable. 49% of villages have at least one norm or custom regarding the woman in childbed.[14] 10% of villages have both a protective norm and an impurity norm. 23% of villages only display protective norms, 15% of villages have only an impurity norm. On average, a village displays 0.74 restrictions for women in childbed. The distribution is highly right skewed with the 75th percentile being one norm and the maximum being nine.

Religious Norms. All questionnaires asked about the religious composition of the village. Accordingly, respondents also indicated whether there were dissidents, i.e., they did not belong to any major religious denomination.[15] We interpret this as a measure of deviations

[14]The frequency of a particular subcategory mostly ranges from below 0.5% to 3%. A notable exception builds the rule: 'do not visit the neighbor' which is prevalent in 15% of all settlements.

[15]Starting with the reformation, the term dissident changed its meaning from protestant, to being a member of a catholic or protestant sect, to being an atheist (Dehli, 2001). In 1910 the Prussian statistical office defined a dissident as a person that does not belong to any official denomination (Dehli, 2001) (In contemporary parlance Konfessionslose / religious "nones"). The GEA's definition includes Atheists as well as members of smaller religious sects. All definitions point to the dissident as a person who rejected mainline religious dogma and religious norms as the protestant or catholic church represented them.

from religious norms since Protestants and Catholics require adherence to their dogma, and dissidents by definition reject that norm. Nine percent of villages are home to dissidents. However their number as a fraction of the total population mostly remains below 5 percent (see Figure C.6 in the Appendix) (Grober-Glück, 1966a). Because the information on the population share of dissidents is imprecise, we use an indicator variable which is one if dissidents are absent.

3 Spatial Dependence of Norms

To analyze the geographic distribution of the norm measures (neighborhood obligations, norms regarding women in childbed, dissidents), we conduct a regionalization analysis (geographic clustering) separately by each norm domain (gender, religion and cooperation).[16] If the prevalence of norms is mostly driven by medium to large scale environmental, political or economic factors that shift the need or value of norms, we would expect that clear cut regions emerge that explain a large part of the overall variability in norms. If, however, norms are also strongly influenced by locally varying factors, such as community-level characteristics, we would expect that clusters can only explain little variation in norms. That the intra-regional variance should remain high.

Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Given the number of clusters, the algorithm chooses clusters such that the sum of squared differences in the input variables within all clusters is minimized given the connectivity constraint. The connectivity constraint is given by the geographic distribution of observations. We define each point to be connected to its four nearest neighbors in our data set (see Figure D.14). The connectivity constraint ensures that a point can only be added to a cluster if it is directly connected to another point in that cluster. As a result, points within clusters are all geographically connected.

The German Reich was geographically separated by Poland in the East, and some points lie isolated around Prague. The four nearest neighbors connectivity matrix yields three

[16] An alternative way to look at spatial dependence is to investigate the spatial autocorrelation in our norm measures. Spatial autocorrelation is also a necessary condition for regionalization to work well. If variables are not at all spatially autocorrelated, will not be able to explain any variation in the variables because values are randomly distributed across space. Table D.8 shows that all of our norm measures display significant spatial autocorrelation.

disconnected components in all cases.[17] We perform the cluster analysis only on the largest component which comprises the main land of the German Reich, Austria, Luxembourg, Liechtenstein and the border region of Czechoslovakia. We treat East Prussia as an exogenously given geographic cluster.

We do not have an ex-ante prior about the number of clusters. Instead, we determine the number of clusters by eyeballing the Calinski-Harabasz metric for three to 50 clusters. The Calinski-Harabasz metric is the ratio of within to between cluster dispersion. In neither of our cluster analyses, a clear elbow emerges. However, the gain from including an additional cluster above ten clusters tends to be very low. Increasing the number of clusters chosen by one or two only yields very small subregions of existing regions – the tendency of results thus tends to stay rather stable. A robustness check in which we double the number of chosen clusters is contained in Appendix D.3.

Norms in different norm domains (gender, cooperation, religion) are likely affected by different environmental factors. We analyze each norm domain separately to account for these differences. Joint clustering, which forces the same regions on all norm domains may smooth clusters across those environmental factors and thus pushing down the overall explanatory of the clusters. As a result, clusters for different domains are incongruent. In an additional robustness check in Appendix D.4, we further segregate our norm measures and conduct a separate cluster analysis for each variable. The overall picture and the explanatory power of the resulting clusters remain similar.

We start by analyzing the geographic distribution of our cooperation norm measures. We use the four underlying indicator variables: help at wedding, death, house building and birth/sickness, as our input variables to the clustering algorithm. The results are displayed in Figure 2. We choose eleven clusters in addition to the exogenous cluster of East Prussia according to the Elbow Graph depicted in Figure 2a. We calculate the average number of the sum of neighborhood help obligations per village for each cluster. The points which belong to a cluster with a high average number of neighborhood help activities are colored in a darker shade of blue.

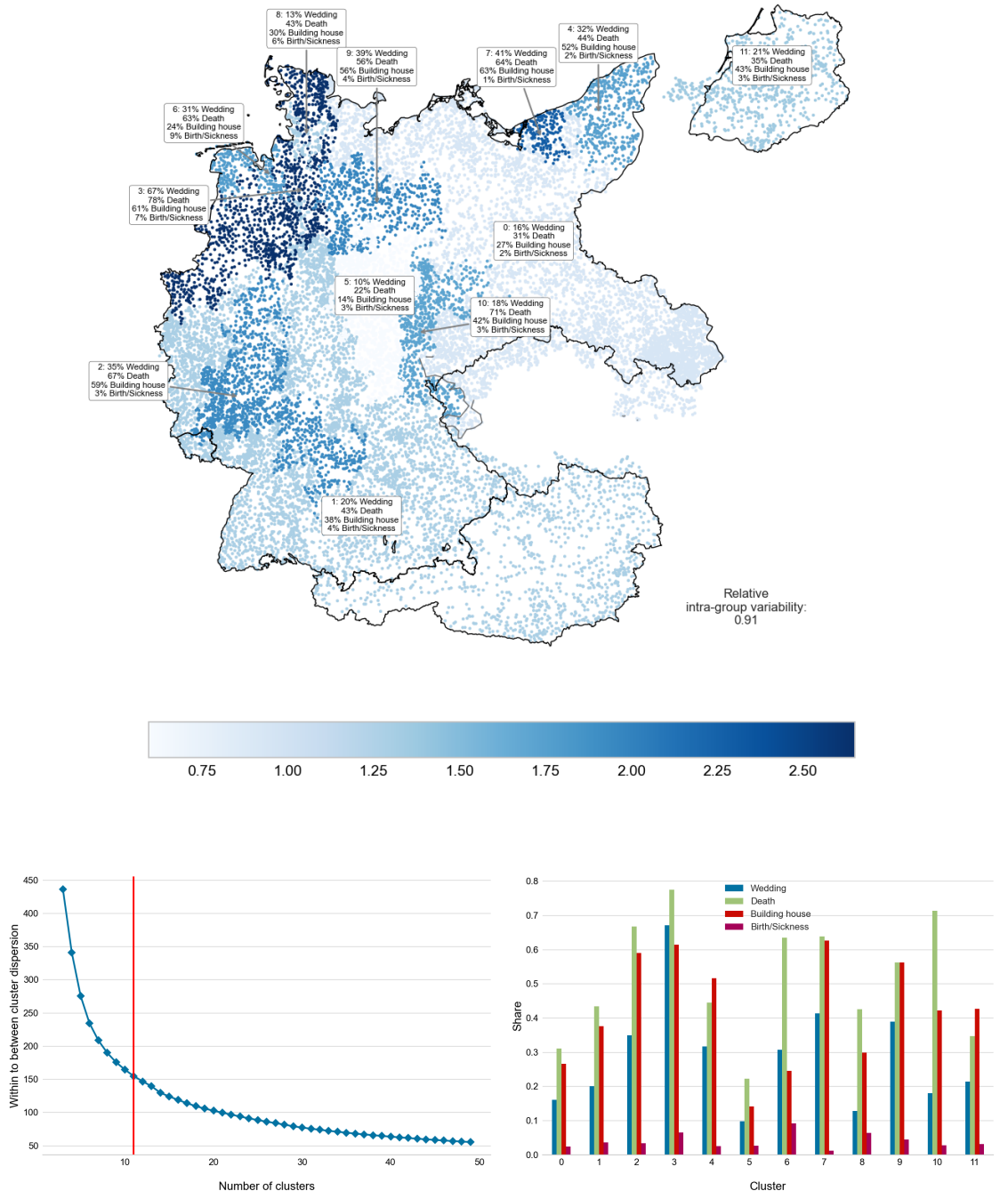
Each cluster contains a large share of villages that have at least one neighborhood obligation (see Figure 2b). Neighborhood help obligations are strongest in the Northwest and

[17] We exclude isolated points lying in and around the center of the Czech part of Czechoslovakia, the island Helgoland. When using only variables available in questionnaire 4, we additionally exclude the area around Berlin because it is not connected to the remaining points according to the connectivity matrix.

weakest in the eastern and center of the main land of the German Reich. Clusters in the Northwest tend to display a higher prevalence of neighborhood obligations across all activities. Only the small cluster 7 in the Northeast matches the level of neighborhood activities of this region. Neighborhood help obligations are also relatively less pronounced in the South. In Cluster 1, which covers Baden-Wurttemberg, Bavaria, Austria as well as the Saar Region, south-western part of the Rhine province and part of the center, all types of neighborhood obligations are prevalent but on average each village performs slightly more than one activity. Thus, there is some regional variation in the prevalence of neighborhood help. However, it is neither universal nor non-existent in either region. Instead, all type of neighborhood obligations are widespread across the sampling region. Accordingly, the explanatory power of the cluster regions is low. The intra-cluster variability is still approximately 91% of the overall variability in the underlying variables. Further, cluster regions do not display clear-cut boundaries and do not strongly coincide with political borders. Most cluster regions have fuzzy edges in which villages of neighboring clusters are intermingled with each other.

Next, we turn to the cluster analysis of our gender norms. As input, we use the two different indicator variables of gender norms: impurity norm, and protective norm, explained in previous section. The results are displayed in Figure 3. The resulting regions are colored by the average number of childbed norms each cluster has. Note that in the southern center there is a connected region for which the original answer cards of the data regarding these norms were destroyed or partly unreadable. We hence have to exclude these villages. As can bee seen in Figure 3a no clear ellbow emerges, however, above ten clusters an additional cluster does not capture a lot of additional variation. Thus, we choose ten clusters in addition to the disconnected component of East Prussia.

Every resulting region contains a large share of villages that have some gender norm regarding the woman in childbed. However, some geographical patterns emerge. Impurity norms are relatively most prevalent in the North, and center, while protective norms are most prevalent in the center and the South. As both impurity as well as protective norms are wide-spread in the center, the center region (clusters 2, 3, 5 and 8) displays the highest average number of childbed norms per village. Despite this rather consistent picture, the clusters explain little variation (90% of overall variability) and are incongruent with political and religious boundaries as well as the clusters from our analysis of cooperative norms.

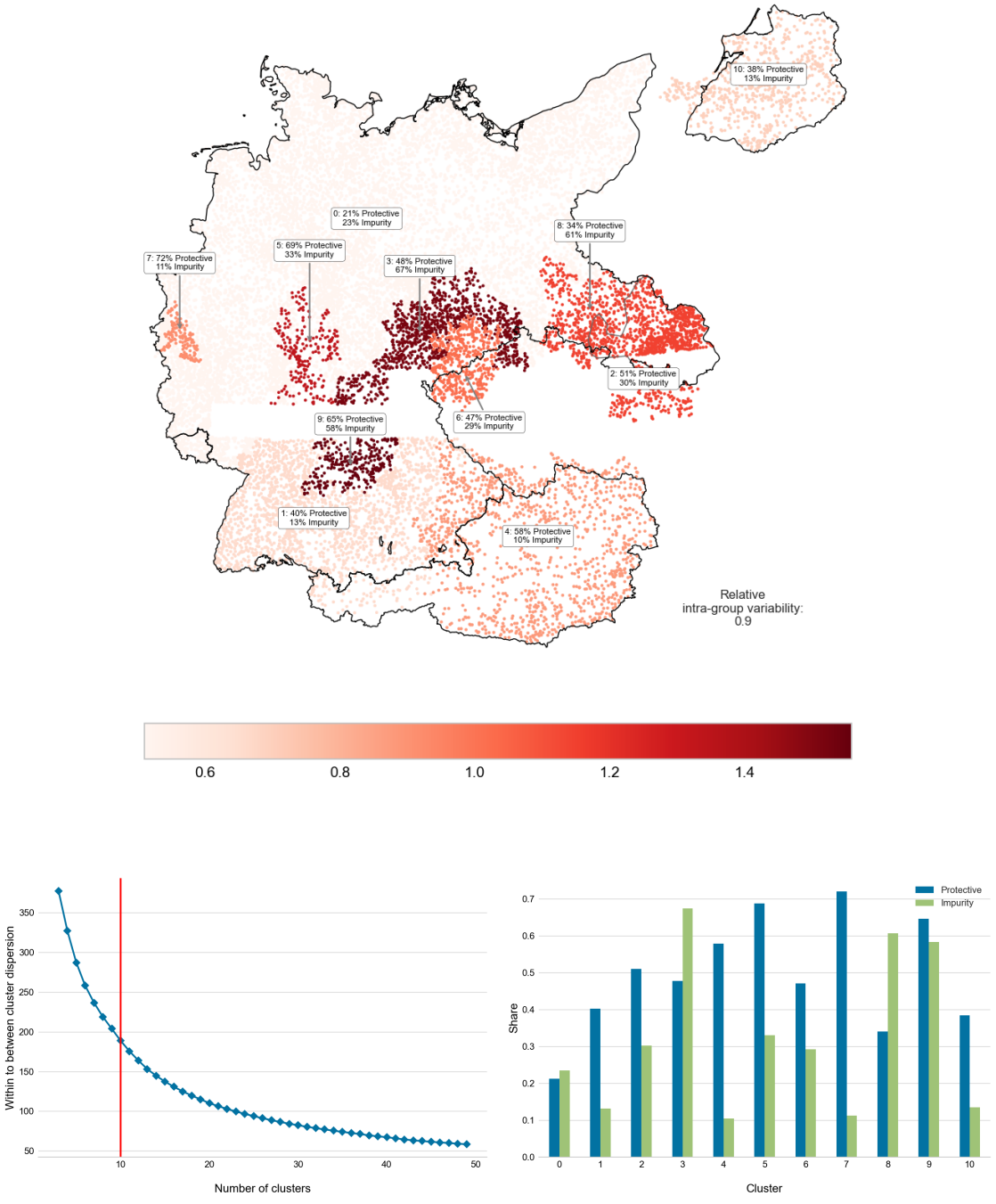


(a) Elbow graph

(b) Shares by cluster

Figure 2: Clustered cooperation norms

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Variables that are clustered: Help at wedding, death, building a house, birth/sickness. Help at birth and sickness is not available separately. Number of clusters=11 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables. Elbow graph is based on the Calinski-Harabasz metric, which gives the ratio of within to between cluster dispersion. Red line indicates the number of clusters used.



(a) Elbow graph

(b) Shares by cluster

Figure 3: Clustered gender norms

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Variables that are clustered: *Impurity norm*, *Protective norms*. Number of clusters=10 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables. Elbow graph is based on the Calinski-Harabasz metric, which gives the ratio of within to between cluster dispersion. Red line indicates the number of clusters used. White space in the center are regions in which the data on women in childbed are partly destroyed.

Last but not least, we investigate the spatial dependence in our religious norm measure, namely the existence of dissidents in a village. With only 8% of villages, villages with dissidents are rare. We depict the distribution of villages with dissidents on a map in Figure 4a. This map shows that these villages occur in all regions. However, they are relatively more concentrated in the center-east of the German Reich (Thuringia, Saxony, Anhalt) and Bohemia. Because villages that have dissidents are rare, and are rather evenly distributed even within regions in which they are less rare, the explanatory power of clusters obtained by means of cluster analysis remains low. When choosing eight clusters – which is the closest we can get to an elbow (see Figure 4b) –, the intra-cluster variability is 91% of the overall variability.[18] As the resulting clusters hide the underlying spatial distribution in the variable, we display the resulting clusters only in the Appendix (see Figure D.15).

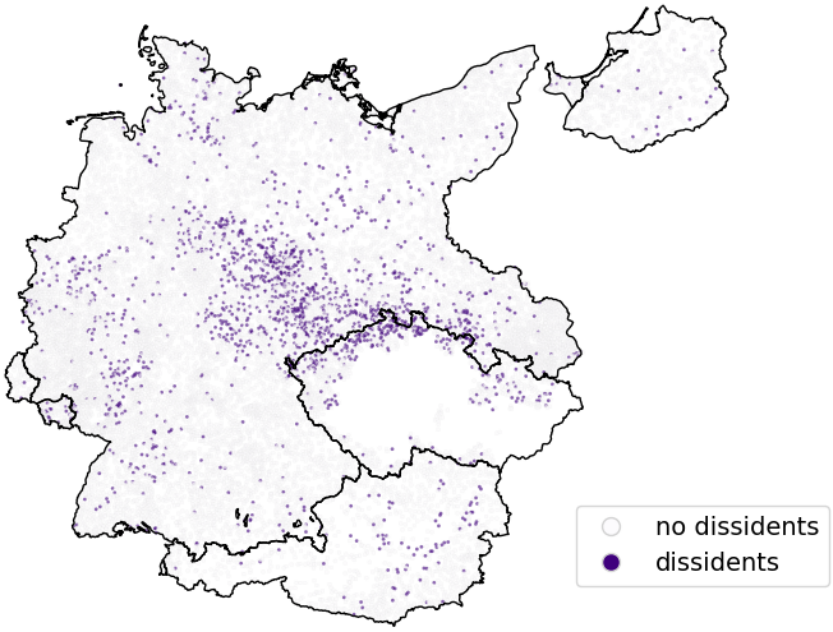
We conclude that across domains and norms, intra-regional variation does not explain a large chunk of the variation in norms even if regions are explicitly chosen to be variance minimizing. In addition, emerging regions rarely coincide with institutional boundaries. Thus, the existence of particular norms seems to depend to a large degree on local factors. In the next section, we will present one of such local factors that can help explain the local variation in norms across communities, namely the structure of community-level social relationships.

4 Conceptual Framework

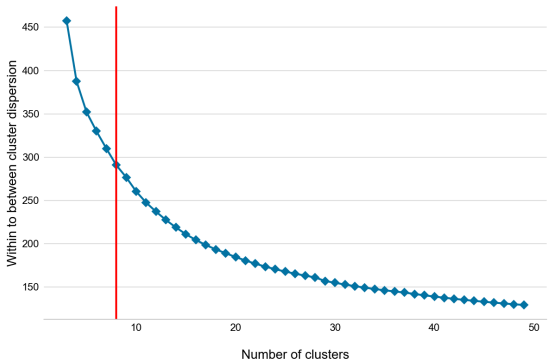
As we observe in the previous section, macro-level institutions are unlikely to account for a large share of heterogeneity in norm prevalence. Thus we shift our focus towards micro-institutions enacted through social relationships. Social relationships provide a community with two ways of maintaining norms: social sanctioning and norm-transmission. In the first part of this section, we will explain these two ways in more detail. In the second part, we map the theoretical arguments and concepts to empirical predictions for our data. In this discussion, we argue that:

1. norm following is costly on the individual level,

[18] For reference, when using the 44 states and Prussian provinces as exogenous clusters, the intra-region variability is 93% of the overall variability.



(a) Geographic Distribution of Dissidents



(b) Elbow graph

Figure 4: Geography of religious norms

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors).

2. community members punish deviations from gender and religious norms by excluding them from neighborhood help, and

3. social norms are transmitted through regular social interactions.

Social sanctioning of deviations enables a community to enforce its social norms. Wurzbacher (1961) reports multiple forms of social sanctions, such as talking badly about someone, not greeting them, confronting them, shunning them, excluding them from neighborhood help, boycotting them economically, or ostracizing them . These sanctions deny a community member access to at least some of the benefits flowing from within-community social relationships.

According to social collateral theory increasing an individual community member's benefits from their relationships to other community members increases norm prevalence by increasing social sanctions' efficacy. A community member decides to follow a norm if the present and future norm adherence costs are lower than the costs of being sanctioned. This trade-off shifts towards norm-adherence if the value of social relationships rises. Social collateral theory is a common element of repeated game and social network models of norm enforcement, informal insurance, or public goods provision (e.g. Akerlof, 1976; Basu, 1986; Kandori, 1992; Besley and Coate, 1995; Aoki, 2001; Bowles and Gintis, 2002; Genicot and Ray, 2003; Bloch et al., 2008; Ambrus et al., 2014; Ali and Miller, 2016; Chandrasekhar et al., 2018).

Social sanctioning may be more effective within subgroups than on the community-level if social relationships within subgroups are more developed than those across subgroups. A person that deviates from a norm suffers more from punishment by people with whom they interact regularly. If a community contains a religious minority that interacts less with the broader community, the community is worse at enforcing norm adherence from members of that sub-group.

If norms have to apply uniformly to the whole community, the existence of that subgroup lowers community-wide norm prevalence. For norms such as neighborhood help, the community can counteract this tendency and adjust the reference group to which the norm applies. For example, a heterogeneous neighborhood might split into homogeneous subgroups for neighborhood-help (segmentation). This segmentation of the reference group mitigates the problems stemming from the limited possibility for community-level social sanctioning.

Norm Transmission links social ties to norm prevalence. This mechanism can be distinguished into three parts: transmitting information about deviations, coordinating on the norm, and transmitting the norm through socialization. Transmitting information about deviations from the norm directly enables social sanctioning. For deviations to be sanctioned, they have to be known (Genicot and Ray, 2003; Carpenter et al., 2012; Ambrus et al., 2014). Additionally, information transmission facilitates belief coordination among community members. Thus, even if norm adherence were not costly to the members, it influences norm prevalence by helping to coordinate on the equilibrium where the norm is adhered to.[19]

If within-community social relationships are robust, norm transmission through socialization favors having many community norms. A community that has more inward-facing social relationships compared to outward facing social relationships can maintain cultural practices for a longer time because it is less receptive to outside influences. This orientation towards the local community facilitates community norm transmission through role models from a different generation and peers from the same generation. First, community relationships increase local families' interaction with other local families, leading to a higher scope of oblique transmission of local norms and customs to the next generation.[20] More within-community relationships increase the chance of being exposed to a role model from the local community instead of an outsider (see e.g. Brueckner and Smirnov, 2007; Panebianco, 2014; Patacchini and Zenou, 2016; Panebianco and Verdier, 2017, for the role of social networks in the transmission process). Secondly, within-community relationships also facilitate norm transmission among peers (see M. O. Jackson, 2011; Burke and Young, 2011, and references therein).

The theories laid out in the preceding paragraphs provide a common framework for explaining norms in all areas of life. We can use the GEA to analyze three major predictions of these theories.

Prediction 1. Intensive and valuable social interactions facilitate social sanctioning and norm transmission and thus increase the prevalence of all norms. The GEA contains three types of norms in different domains of life: cooperation norms measured by neighborhood

[19] see Bicchieri et al. (2018) and Bicchieri et al. (2006) for the role of beliefs and norm adherence in coordination games.

[20] Empirical evidence on the role of the social environment on the inter-generational transmission is provided by Dohmen et al. (2012). Henrich and Broesch (2011) measure transmission networks on a Fijian Island. In addition to an individual's prestige, its proximity to the child in question makes her more likely to be selected as a role model in the cultural transmission process.

help obligations, gender norms measured by restrictions for women in childbed, and norms regarding religious dogma as measured by the existence of religious dissidents in a village. When we speak of increasing norm prevalence, we mean that all of these norms are more likely to exist.

Prediction 1: Factors that influence the frequency and value of social interactions within a community influence the prevalence of all norms within that community: factors that make interaction more frequent or increase their value make the prevalence of all norms more likely; Factors that make interaction less frequent or decrease their value make the prevalence of all norms less likely.

We can construct three factors that influence community wide social relationships from the GEA: community gatherings in the form of communal labor, within village social heterogeneity in the form of religious heterogeneity within a village, and across village heterogeneity in the form of religious heterogeneity across villages. Column 3 of Table 2 and the following paragraphs illustrate of how these measures should map into the prevalence of all norms according to *Prediction 1*.

Table 2: Theoretical predictions for the association between correlates of social relationships and norm prevalence as well as segmentation.

Concept	Operationalization	*Prediction 1* Norm Prevalence	*Prediction 2* Village Nbh.
Community Gatherings	Communal Labor	Positive	Positive
Within Village Heterogeneity	Religion	Negative	Negative
Heterogeneity Between Villages	Rel. diff. 4NN.	Positive	Positive

Notes: Norm prevalence stands for the existence of cooperation norms, gender norms, and norms regarding religious dogma. Village Nbh. is an indicator variable that is 1 if neighborhood obligations apply to the village level and 0 if they apply to only a subgroup of the community.

Community gatherings. With communal labor, the community meets at a specific place and works. Common communal labor activities are processing poultry or produce, or spinning in a shared room together. In these activities, villagers mainly worked on their own projects but next to each other. The supplementary material to the GEA characterizes these activities mainly as an opportunity for socializing (Baruzzi-Leicher, 1959). Regular community gatherings affect the information flow inside communities in two ways: they act as a direct conduit for information transmission and lead to long-term social relationships. The social ties that have been formed in these activities can then facilitate norm

enforcement and transmission. [21] For that reason, we should expect a positive correlation between the number of communal labor activities and norm prevalence across domains (see first row of Table 2). [22]

Social Heterogeneity within Villages. The second row of Table 2 contains the relationship of norm prevalence and within-community social heterogeneity. [23] Heterogeneity within a village is likely to reduce norm prevalence on the village level because it is associated with looser within village social relationships. We use religious heterogeneity as a measure of heterogeneity in group membership. Members of each group interact more with each other than with members of the other group: Catholics interact with Catholics and Protestants with Protestants. [24] This lack of interactions across groups is reflected in less relationships across-groups. Since the members of heterogeneous communities belong to different groups, a lack of across-group relationships leads to looser within-community relationships. This lack of connection across-group lines can lead to lower enforce-ability and, thus, prevalence of norms [25].

[21] For evidence that repeated interactions can lead to the formation of social tie see for example Feinberg et al., 2014 and Fafchamps and Quinn, 2018. For evidence that these ties can lead to higher adherence to (pro-social) norms see Chandrasekhar et al., 2018

[22] For a detailed discussion of this measure that draws on the historical literature about communal spinning see appendix F

[23] By social heterogeneity, we mean heterogeneity in the ways in which an individual relates to their community. We do not mean heterogeneity in exogenous preferences.

[24] Contact and therefore social relationships between Catholics and Protestants have been sparse because a large part of social life was happening in church or clubs aligned with the corresponding religious denominations (Bendikowski, 2016, p.208).

Further impediments to inter group contact were religious stigma or church prohibitions and animus between the denominations. Religions can use behavioral restrictions and stigma to tax activities outside of the religion and induce higher contributions to club goods within the religion (Iannaccone, 1992; Berman, 2000). Consistent with these considerations the Protestant as well as the Catholic church did their best to reduce contact between Catholics and Protestants.

The churches' main target were mixed-marriages between the denominations. These marriages were only permissible under strict constraints (Bendikowski, 2016). These attempts to separate Protestants and Catholics were at least partly successful. For example, in the 18th century, Protestants and Catholics tried to avoid each other and not to depend on each other (Dietrich, 2004, p.183).

Besides official prohibitions, the church's discouragement of interdenominational contact was also reflected in people superstitions. People believed that if Catholics and Protestants met after church service a person in the village was going to die the next day (Hoffmann-Krayer and Bächtold-Stäubli, 1974, p.181). The discouragement of mixed marriages was reflected in the belief that the remains of people that were part of a mixed marriage were cursed (Hoffmann-Krayer and Bächtold-Stäubli, 1974, p. 179). Protestants and Catholics disliked each other and used slurs for each other even centuries after the reformation (See Hoffmann-Krayer and Bächtold-Stäubli, 1974, p.177-178 as well as `https://www.welt.de/print-wams/article106154/Die-geteilte-Kleinstadt.html`, accessed 15.03.2021.) While a lot of the descriptions in this paragraph concern earlier periods than the 20th century the conflicts and separation between Catholics and Protestants persisted up to the 20th and 21st century (Bendikowski, 2016, p.267, p.334).

[25] The consequences of this mechanism for the enforcement of cooperation through social sanctions are explored in Fearon and Laitin, 1996; Miguel and Gugerty, 2005; Alexander and Christia, 2011.

The GEA includes a binned measure of village-level religious denomination. We report the distribution of this original categorization in table C.7 in appendix C.4.1. As can be seen from this table there are very few heterogenous villages and the overwhelming majority of them is included in one bin that specifies a minority share between five and thirty per-cent. Consequently, we classify a village as *religiously-heterogeneous* if the share of inhabitants that does not belong to that religious majority is above 5%. According to this definition, 19% of villages are religiously heterogeneous. For more information on the distribution of religious denomination in our sample and a validation against official statistics, consult Appendix C.4.1.

Social Heterogeneity across Villages. While heterogeneity within a community likely decreases norm prevalence, heterogeneity between communities likely increases norm prevalence. We measure heterogeneity between village communities by the fraction of the four closest neighboring villages with a different majority denomination than the village itself. Heterogeneity between villages decreases interactions with inhabitants from neighboring villages and increases interactions between inhabitants of the same village. Further, heterogeneity between communities provides a markedly different out-group, which can increase in-group cohesion (Koyama and Johnson, 2019). These two effects shift an individual's social relationships further towards their village community, making social sanctions (from their community) more painful and fostering transmission of their village's social norms.[26].

We measure *religious heterogeneity between villages* by the difference in majority religion in a village and its 4 nearest neighbors (*Villages Diff. Rel. 4 NN*). We count the number of neighboring villages that have a different majority religion than the village in question and divide this number by four. As a result we get a variable that ranges from zero to 1, where zero means all neighboring villages have a different majority religion and one means no neighboring village has a different majority religion.

We predict that between village heterogeneity likely raises norm prevalence and within village heterogeneity lowers it. As we show in Appendix C.4.1 between and within village heterogeneity are more common in more heterogenous districts. Consequently, we predict

[26]The conflict between Catholics and Protestants can also lead to a positive effect of heterogeneity between villages on norm prevalence. For evidence that inter-group conflict facilitates social sanctioning see Gneezy and Fessler, 2012; Abbink et al., 2010; Bornstein and Ben-Yossef, 1994. While violent open conflicts between Protestants and Catholics mostly ended with the Westfalian peace, the overall conflict lasted until the 1970s, when both churches became less important.

effects of opposite signs for two aspects of the same macro-level concept (district level religious heterogeneity).

Prediction 2 is a consequence of *Prediction 1*. A lack of community-level interactions makes norm transmission and enforcement on the community-level more difficult. This impediment results in fewer community-level norms (*Prediction 1*). Communities, however, can segment into subgroups for which norms are more sustainable and, thus, shift the reference group of a particular norm. The GEA data contains the reference group for neighborhood help obligations. Neighborhood help obligations can apply to smaller groups such as the two next-door neighbors or the whole village. The absence of regular village-level social interactions make it more difficult to implement neighborhood help obligations on the village level because it impedes social sanctioning of the marginal villager making this reference group for neighborhood obligations less likely. Consequently, we expect that among the communities that conduct some neighborhood help, factors that decrease the frequency and value of social interactions are associated with more segmented neighborhood help.

Prediction 2: Communities react to obstacles to community-level social interactions by adapting the reference group of norms.

The last column of Table 2 displays the predicted relationships of our measures and the likelihood of village-level neighborhood obligations. Community-level social gatherings and across villages heterogeneity are predicted to be positively associated with village-level neighborhood obligations because they increase the value and frequency of village-level social interactions. Within village social heterogeneity, on the other hand, impede these, and should thus be negatively associated with village-level neighborhood obligations.

Prediction 3 is again a consequence of prediction 1. If community-level-social interactions and the value of social relationships increase norm prevalence, norms that increase these community features increase the prevalence of other norms. Adherence to cooperation norms (such as neighborhood obligations) benefits community members and makes them interact. Community members interact while performing neighborhood help and benefit from being helped, thus increasing the efficacy of social sanctioning and norm transmission. This pattern does not apply to norms unrelated to cooperation that do not directly increase the value of belonging to a community or increase the value by very little.

Prediction 3: Cooperation norms display a positive complementarity with other norms such as gender or religious norms.

5 Results

To test *prediction 1*, we first investigate the relationship of our covariates of village-level social relationships and an aggregate norm measure *Norm Index*. We construct this measure by standardizing our measures of norm adherence in each domain (religion, gender, and cooperation) and taking the average. We standardize within each norm domain to weight each domain equally.

Column (1) of Table 3 shows the relationship between our aggregate norm measure and our covariates of social relationships: village-level religious heterogeneity; religious heterogeneity across villages; and the number of communal labor activities conducted in a village. In all specifications (including this one) we include latitude, longitude and their interaction as a rough way to model some of the spatial auto-correlation within the data. All of the coefficients are statistically significant at 1% and go in the predicted direction. Religiously heterogeneous villages display less norms, villages that deviate from their surrounding religious denomination as well as villages that conduct more communal labor display more norms.

In column (2) of Table 3, we add variables indicating distance to the nearest city (in km) , an indicator variable whether a village is close to a border, and whether a village's majority religious denomination is Protestant (as opposed to Catholic) to the regression (see appendix C.5 for more information on these controls).

Being closer to a city allows the inhabitants of the village to migrate to said city, access the market of that city, and expose them to new ideas from the city. The opportunity to migrate to a city or access the market in the city undermines community sanctions (Aoki, 2001, p. 51 and Kranton, 1996), provides a substitute for neighborhood help (Wurzbacher, 1961, p. 114), and may make villagers less reliant on the local community.[27] At the same time, cities are more lenient with respect to religious dogma and enforcing boundaries between

[27] High distance to markets is associated with less public good contribution (Gebremedhin et al., 2004). Informal credit, which is also enforced through social sanctions declines with distance to cities (Moahid and Maharjan, 2020) and households with more external network connections participate less in reciprocal exchange (Jaimovich, 2015).

denominations (Bendikowski, 2001), which can increase religious diversity, making it a potential confound of our heterogeneity measure.

Further, as religious denomination in the German speaking area is mainly determined by macro-level political institutions, such as the Westfalian peace and religious conversions of state rulers (Bendikowski, 2016), religious denomination varies more strongly in a country's border region than in its interior (see C.4.1). This affects both, the geographic distribution of within village heterogeneity as well as the likelihood to deviate in the religious denomination from the surrounding villages. For instance, looking at the geographic distribution of across village heterogeneity (see Figure C.8) reveals that this variable traces out the border between Prussia (predominantly Protestant) and Czechoslovakia (predominantly Catholic). Villages that are closer to the border may however be different in several ways from other villages. For instance, they may be more exposed to conflict than other villages which may also affect the ability to maintain norms.

Including these control variables decreases the size of each relationship slightly. However, all coefficients remain statistically significant at 1% and point in the predicted direction. As expected, being closer to a city increases norm prevalence. The relationship between Norms and majority denomination is insignificant. Being close to the border does not have a statistically significant relationship with our norm index.

Our results may be driven by large or medium scale environmental or political factors that both affect the value of a given norm as well as religious denomination and/or suitability for certain agricultural practices that foster communal labor. In order to reduce our identifying variation to variation within fine-grained regions and to account for these influences, we introduce grid fixed effects and province/state [28] fixed effects in column (3) of Table 3. For the grid fixed effects, we divide our data into equally sized grid cells of 400 square kilometers (20 times 20 km). This results in 3,534 grid cells (see Figure E.25). Grid cells contain between 1 and 39 data points. Between 86 and 189 grid cells – depending on the specification – only contain 1 point. When we include grid cell fixed effects, we do not use variation from these points. The geographic distribution of these grid cells is depicted in Figure E.25 in the Appendix.

Column (3) of table 3 shows that after including grid and province/state fixed effects all associations between proxies for village-level social relationships and our norm index stay

[28] To get areas of roughly equal size we use provinces within Prussia and states outside of Prussia. This results in 44 different spatial units.

the same. All coefficients point into the predicted direction and remain significant at 1%. The coefficient for across village religious heterogeneity halves in size. This may be partly driven by low intra-regional variation in this variable (see Figure C.8). [29]

To check if our determinants of social relationships affect norms in all domains similarly, we regress norm prevalence in each domain separately on our correlates of social relationships, controls and fixed effects. We report OLS estimates of these relationships in table 4. To compare results across specifications, we standardize all outcomes by subtracting the mean and diving by the standard deviation. The results reveal that within-village heterogeneity is associated with reduced norm prevalence across all domains, however, at different magnitudes. It is associated with a reduction of more than 0.1 standard deviations in the number of neighborhood help obligations as well as the absences of dissidents. The relationship with childbed norms is up to 0.05 standard deviations weaker and only statistically significant for impurity norms.

Across village heterogeneity is positively associated with norms across domains. The coefficient on childbed norms, however, turns weakly negative in column (6) of table 4. A possible explanation is that it is poorly identified in this specification, because as mentioned above the intra-regional variation in across village heterogeneity is bunched in the southwest corner of the German Reich, where childbed norms vary little. The number of communal labor activities is positively associated with the number of neighborhood obligations and the number of childbed norms within a village across specifications. It is not associated with the absence of dissidents in a village.

Next, we turn to *Prediction 2*, namely, the effect of village-level social relationships on segmentation. According to *prediction 2*, variables that facilitate norm maintenance should lead to less segmentation and variables that impede norm maintenance should lead to more. We measure an unsegmented neighborhood by the standardized dummy indicating village-level neighborhood help (Unsegmented Neighborhood). Our results are displayed in column (4) - (6) of Table 3. Similarly to before, we start by investigating the raw (partial) correlation. As predicted, we find that within village heterogeneity increases the likelihood of village-level segmentation. The number of communal labor activities as well

[29] Within Prussia (with the exception of Schlesia), Austria, and Bavaria this variable almost does not vary because of the strong enforcement of religious denomination of the state's rulers (Bendikowski, 2016). Thus, including grid fixed effects as well as the indicator variable of being close to the border strongly reduces our identifying variation to the regions of to the southwest corner of the German Reich – mostly Palatine and Baden-Wurttemberg – as well as Schlesia which switched from Habsburg Rule to Prussia.

as across village religious heterogeneity reduce the likelihood of village-level segmentation. When including our fixed effects in column (6), the relationship between across village heterogeneity and neighborhood segmentation reduces in magnitude and turns insignificant. The coefficients of within village heterogeneity as well as the number of communal labor activities stay qualitatively as well as quantitatively the same.

We report two *robustness checks* of our regressions concerning prediction 1 and 2 in appendix G. Similar to the childbed norms, we can also divide neighborhood help obligations into its different subcategories (see G.10). The results stay very similar. We also check if our results are robust to using a different measure of between village heterogeneity. Instead of using the share of villages with a different majority religion, we use the continuously measured absolute difference in the share of protestants between a village and its four nearest neighbors. We take the midpoint of the bins to approximate the share of protestants in a village. We document the results of these regressions in table G.11. The results stay qualitatively similar.

According to *prediction 3* cooperation norms should be positively associated with religious and gender norms because of positive complementarities. The left panel of Figure 5 displays the OLS estimate of the standardized number of neighborhood help obligations on the standardized variables of religious norms and childbed norms for different specifications, accordingly. The first line for each outcome variable depicts the coefficient from a regression that controls for latitude, longitude and their interaction. The second line adds community specific covariates of village-level social relationships as well as the control variables majority religious denomination, distance to the nearest city, and closeness to the closest border. The third line adds province and grid cell fixed effects to account for potentially joint environmental causes of these norms.

The results show that all coefficients are positive and significant at 5% across specifications. The coefficient of the number of neighborhood help does not vary a lot across the type of norm and specification and lies around 0.05 standard deviations. The raw relationship between religious norms and cooperation norms tends to be with 0.1 standard deviations larger, however less precisely estimated. This coefficient shrinks towards 0.03 standard deviations when including geographic and political fixed effects, suggesting that part of the relationship is driven by joint environmental factors.

Table 3: Regressions of the norm index and the unsegmented neighborhood dummy on determinants of social relationships.

	Dependent variable:					
	Norm Index			Unsegmented Neighborhood		
	(1)	(2)	(3)	(4)	(5)	(6)
Heterogeneous	-0.120^{***}	-0.101^{***}	-0.107^{***}	-0.043^{***}	-0.042^{***}	-0.029^{**}
	(0.028)	(0.030)	(0.019)	(0.011)	(0.010)	(0.014)
Villages Diff. Rel. 4NN	0.270^{***}	0.269^{***}	0.091^{***}	0.070^{**}	0.080^{***}	0.041
	(0.047)	(0.040)	(0.030)	(0.027)	(0.027)	(0.034)
N. Communal Labor	0.041^{***}	0.050^{***}	0.055^{***}	0.009^{*}	0.009^{*}	0.014^{***}
	(0.008)	(0.007)	(0.006)	(0.005)	(0.005)	(0.005)
Majority Protestant		−0.076	−0.041		0.025	0.008
		(0.053)	(0.032)		(0.018)	(0.015)
Distance to Next City		0.083^{***}	0.065^{***}		0.032^{***}	0.023^{*}
		(0.015)	(0.016)		(0.008)	(0.012)
Close to Border		−0.0005	0.001		−0.0002	0.0001
		(0.0004)	(0.001)		(0.0001)	(0.001)
Sample	Full	Full	Full	Nbh. Help > 0	Nbh. Help > 0	Nbh. Help > 0
Grid FE			✓			✓
Province FE			✓			✓
Observations	11,900	11,900	11,900	8,159	8,159	8,159
Adjusted R^2	0.016	0.032	0.158	0.002	0.006	0.036

Notes: $^{*}p < 0.1;^{**}p < 0.05,^{***}p < 0.01$. Table displays OLS Estimates. We exclude some regions in column (1)-(3), because the childbed norms are incomplete in this region as some of the data has been destroyed in the war (for more details see Appendix H). *Norm Index* is the average over number of neighborhood help obligations, number of childbed norms, and an indicator variable that is one if a village has no dissidents, standardized respectively. *Unsegmented neighborhood* is an indicator variable that is one if a the whole village is obliged to help a neighbor in at least one task. Grid cells have an approx. area of 400km^2; province fixed effects account for the states and provinces (in case of Prussia) of the German Reich, Austria, Gdansk, Liechtenstein, and Czechoslovakia. Close to Border is an indicator variable that is one for the 5% of observation closest to the border of Austria and the German Reich. All specifications adjust for latitude and longitude and their interaction. Column (1) and (4) include an intercept. Standard errors are clustered by the 400 km^2 grid and Prussian provinces/states.

Table 4: Regressions of norm prevalence in different domains on determinants of social relationships.

	Dependent variable:							
	Nbh. Help		No Dissidents		Impurity		Protective	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Heterogeneous	−0.146***	−0.149***	−0.139***	−0.170***	−0.030	−0.058*	−0.051	−0.021
	(0.031)	(0.030)	(0.041)	(0.028)	(0.054)	(0.032)	(0.035)	(0.027)
Villages Diff. Rel. 4NN	0.202***	0.121	0.366***	0.156***	0.107	−0.053	0.087	0.012
	(0.059)	(0.080)	(0.074)	(0.037)	(0.090)	(0.054)	(0.084)	(0.063)
N. Communal Labor	0.106***	0.100***	−0.002	0.006	0.021	0.023**	0.042***	0.056***
	(0.013)	(0.011)	(0.015)	(0.009)	(0.013)	(0.010)	(0.013)	(0.008)
Majority Protestant	−0.049	0.065	−0.170	−0.043*	0.123	−0.012	−0.105*	−0.174**
	(0.072)	(0.056)	(0.126)	(0.023)	(0.086)	(0.050)	(0.060)	(0.065)
Distance to Next City	0.146***	0.089***	0.165***	0.145***	−0.097***	0.013	−0.042*	−0.051***
	(0.016)	(0.022)	(0.047)	(0.024)	(0.030)	(0.023)	(0.023)	(0.019)
Close to Border	−0.001**	0.00004	−0.0004	0.002	−0.0004	−0.0005	0.0001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.0004)	(0.001)
Grid FE		✓		✓		✓		✓
Province FE		✓		✓		✓		✓
Observations	13,117	13,117	16,563	16,563	11,900	11,900	11,900	11,900
Adjusted R^2	0.069	0.195	0.031	0.155	0.022	0.117	0.077	0.125

Notes: $^{*}p < 0.1$;$^{**}p < 0.05$,$^{***}p < 0.01$. Table displays OLS Estimates. Outcome variables have been standardized. We additionally have to exclude some regions in column (5)-(8), because the childbed norms are incomplete in this region as some of the data has been destroyed in the war (for more details see Appendix H). Grid cells have an area of 400km^2; province fixed effects account for the states and provinces (in case of Prussia) of the German Reich, Austria, Gdansk, Liechtenstein, and Czechoslovakia. Close to Border is an indicator variable that is one for the 5% of observation closest to the border. All specifications adjust for latitude and longitude and their interaction. Standard errors are clustered by a 400 km^2 grid and provinces/states.

We cannot exclude that there are omitted variables that drive all of our norms simultaneously. In particular, there is no reason to believe that religious heterogeneity and communal labor activities cover all potential drivers of differences in social relationships between villages and as we put forth, above this positively influences the prevalence of all norms, so one may suspect that estimate is upward biased. We try to address this issue partially by investigating the relationship between religious norms and gender norms for which we do not predict a positive direct interdependence. If there were joint factors the positively influence all norms simultaneously, we should also see a positive empirical relationship between these types of norms, conditional on neighborhood help norms. The results are displayed in the right panel of Figure 5. We use the same specifications as for the neighborhood help norms, with the exception that we additionally control for neighborhood help (in all except for the raw specification). They show that the relationship between religious norms and gender norms are not statistically significant and largely negative. According to this result our previous results on norm prevalence are unlikely to be driven by confounders that affect all norms equally.

6 Discussion

We exploit geographically fine-grained data of German speaking villages from the 1930s to investigate drivers of the prevalence of norms. Through geographic cluster analysis, we show that geographic variation in the institutional or physical environment explains little heterogeneity in norms. Consequently, villages in the same physical environments, e.g., mountains, and in the same state, can still exhibit marked differences in the norms they enforce. We argue that locally different community structures inducing tighter or looser social relationships can explain these differences. That is, while environmental factors may shift the value or need for a norm, in order for norms to stick, communities need mechanisms through which they can transmit and enforce these norms.

Accordingly, we find that overall norm prevalence, and the reference group for cooperation norms (segmented versus unsegmented neighborhood) depend on correlates of social relationships in a consistent pattern. Higher religious heterogeneity within villages is associated with fewer norms and a higher likelihood of segmented neighborhood help. Higher heterogeneity across villages and regular community gatherings are associated with more norms and a lower likelihood of segmented neighborhood help. That is, norm prevalence

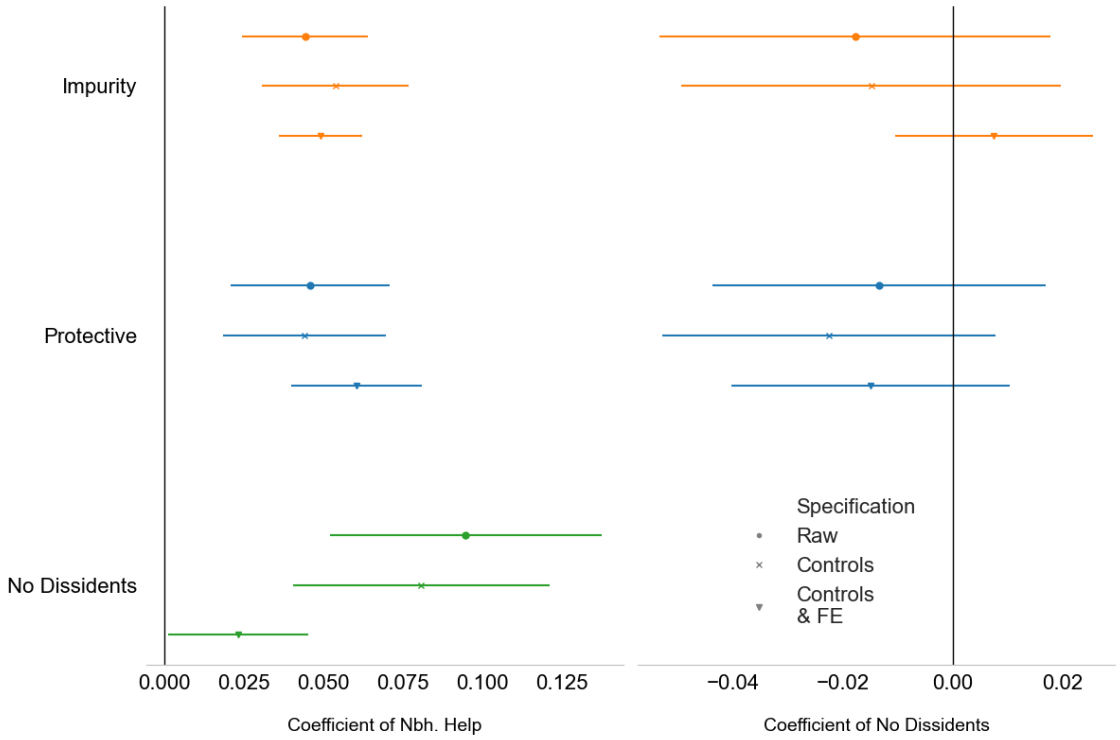


Figure 5: Fixed effect regressions to examine complementarity between norms.

Notes: All regressions include latitude, longitude and their interaction. Lines are 95% confidence intervals. Standard errors are clustered by a 400 km^2 grid and provinces/states. Controls include the community specific covariates of village-level social relationships as well as the control variables majority religious denomination, distance to next city, and closeness to border. The right panel additional includes number of neighborhood help obligations. Fixed effects adjust for 400km^2 grid fixed effects and for states and Prussian Provinces. All outcome variables are standardized by subtracting the mean and dividing by the standard deviation.

as well as segmentation into smaller subgroups are associated with these correlates as predicted by the theories we review in section 4.

According to our conceptual framework, our results may reflect simultaneity. Tight social relationships facilitate cooperation norms, and cooperation norms tighten social relationships. That is, a village might fail to enforce a cooperation norm (e.g., neighborhood help) because it lacks tight within-community social relationships. However, this village might lack social relationships because the village's inhabitants have fewer reasons to engage with each other because of low cooperation among villagers. After all, there is no cooperation norm. Another village might have both of these things, supporting each other's existence. One important implication of this argument is that there should be a direct empirical relationship between cooperation norms and norms unrelated to cooperation. Consequently, we find that cooperation norms correlate with other norms conditional on the external environment: a village that conducts more neighborhood help is also likely to have a higher prevalence of childbed norms and a smaller likelihood of having dissidents. However, childbed norms and religious norms are empirically unrelated. These correlations suggest that cooperation norms facilitate maintaining other norms and that this relationship is one-sided.

Our estimates are strongly suggestive, however, not necessarily causal. As we use variation within small geographic units (20km $\times$ 20km) potential confounding is limited to factors that vary within these units. Our results are robust to including three obviously locally varying factors: ruralness, religious denomination, and political threat proxied by distance to the nearest border. Neither of these factors play a consistent role in explaining norm prevalence across domains. Our empirical identification still relies on the assumption that environmental factors influencing norm prevalence directly do not vary strongly within our 20km $\times$ 20km grid. While we cannot generally exclude the violation of this assumption, it seems rather plausible when looking at we currently know about environmental causes of norms and cooperation. For instance, Alesina et al. (2013) explains differences in the evolution of gender norms by plough agricultural practices; Buggle and Durante (2021) connects the evolution of social cooperation with varying climatic risk across regions; Buggle (2020) explains the existence of collectivist norms by the geographic suitability for irrigation agriculture; Gelfand et al. (2011) argues that norms are caused by social and ecological threat. These types of environmental causes usually vary at a lager scale than our fixed effects.

Other potential confounding may be due to unobserved community-level characteristics. Our correlates of social relationships do not cover the universe of potential factors influencing community-level social relationships. In particular, if we think of the strength of community-level social relationships as latent factor, our correlates may be both causes and consequences of this latent variable: social heterogeneity may yield weaker social ties, but weaker social ties may also allow for more social heterogeneity. Either way, however, social heterogeneity is a proxy of weaker social ties. Thus, this type of simultaneity does not generally invalidate the core interpretation of our results, namely that the prevalence of norms is related to community-level social relationships. Whether this is driven, by ex-ante weaker social ties or directly by heterogeneity cannot be fully answered in our setting. It seems likely that both is true. Religious heterogeneity in the German speaking area is strongly determined by macro political factors such as the Westphalian Peace. However, which villages within a macro political area are heterogeneous is likely determined by the ex-ante community structure. Further research may help to shed more light on this.

Our results show that norms vary locally. Consequently, researchers need to consider locally varying factors, such as community-level social relationships, when explaining the spatial distribution of norms.

Most economic theories of norms and social relationships are concerned with cooperation norms in particular. However, our findings suggest that these theories extend beyond the domain of cooperation. In particular, tight social relationships might provide a common cause behind norm prevalence in all domains and could provide a microfoundation for the concept of tight cultures.

We argue that norms in different domains do not only have a common cause but are also interdependent: more cooperation norms are associated with more norms in other domains. Consequently, strengthening cooperation norms likely also strengthens other norms. Researchers should consider this side-effect when investigating policies to foster cooperation.

Last but not least, we find that heterogeneity at different levels can have very different effects. Religious heterogeneity within villages impedes norm maintenance within villages, while religious heterogeneity between villages fosters it. This also implies that when investigating the effects of heterogeneity, the level of aggregation matters. Investigating the

impact of more aggregated statistics may yield misleading conclusions depending on the underlying distribution and on which effect dominates in the aggregate.

Our study leaves many questions unanswered that could be potentially studied with the GEA. First and foremost, the GEA can aid the study of cultural persistence with respect to norms, but also other phenomena. Research on economic history has shown that cultural phenomena and shocks persist across centuries and influence present-day institutions and behaviors. Often, the original causes are in the past and poorly measured (Voth, 2021). Because of the GEA's timing and the rise of social surveys in the 1980s, the GEA can help us to measure these original causes and understand micro-mechanisms of cultural persistence.

Our results suggest that close community relations stabilize norms. Conversely, norms should be less persistent in villages with looser or loosening social relationships. This mechanism may interact with the depreciation of the value of a particular norm. Putting these two mechanisms together may help understand why and where norms persist over time and what is likely to change them: Norms persist because they form institutional complementarities (Belloc and Bowles, 2013). An important norm loosing its value can undermine tight community social relationships and lead to the disappearance of a whole bundle of norms.

Secondly, the GEA's timing right before the rise of the Nazis in Germany may help to understand this rise better. Satyanath et al. (2017) show that membership in the NSDAP is connected to social capital as measured by membership in other voluntary forms of association. Social capital, however, has multiple facets. One of these is local cooperation which can be measured with our norms related to cooperation and regular community gatherings. Thus, researchers can use the GEA to study whether this association is limited to social capital measured by formal voluntary associations or also holds for other aspects of social capital. Further, it may help us to understand the persistence of Nazi voting and anti-Semitism in Germany (Cantoni et al., 2017; Voigtländer and Voth, 2012) by separating cultural from persisting economic, institutional, and geographic differences.

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Appendix A Sample and Data Gathering of the GEA

Table A.1: Number of observations

	Quest. 2	Quest. 4	Other Quest.	Quest. 2 & 4
German Reich	15,124	14,625	15,799	12,164
Austria	1,141	901	1,143	826
Czechoslovakia	1,119	868	1,134	771
Gdansk	90	65	62	49
Liechtenstein	6	7	8	5
Luxembourg	77	1	68	1
Sum	17,557	16,467	18,214	13,816

Notes: Sample restricted to villages in the German Reich, Austria, the Czech part of Czechoslovakia, Liechtenstein, Gdansk, and Luxembourg. Other Quest. = Villages included in questionnaires 1 or/and 3.

For villages in the German Reich, we can compare the number of villages in the sample to the number of municipalities in 1910 in each state or province.[30] Figure A.1 displays the number of villages contained in, both, questionnaire 2 and 4 as share of the total number of municipalities in a German States and Prussian Provinces in 1910. It shows large variation in the share of municipalities captured in the GEA. The share is with 80% highest in Oldenburg and with 4% lowest in East Prussia. In general, there is a visible East West divide. The share of municipalities captured in the GEA is lower in the Eastern part of Prussia than in the remainder of the German Reich. However, overall coverage seems to be high and for most regions between 10 and 30%. Naturally, the shares tend to be higher when examining questionnaires separately (see Figure A.2).

While the GEA was conducted between 1930 and 1935, the researcher remained largely independent of the national-socialist government until the last wave in 1935, which we do not use in our analysis. The first four questionnaires were conducted by a team of independent researchers financed by the German Science Foundation's predecessor called "Notgemeinschaft der Deutschen Wissenschaften". In contrast, the fifth questionnaire was conducted under a leadership connected to the national-socialist government (Schmoll, 2009). The GEA contains 243 open questions, with most of the questions consisting of

[30] We use the digitized registry of municipalities in the German Reich, provided to us by Ulli Schubert

three or more subquestions. We focus on questionnaires two and four because these contain the questions on norms and cooperation.[31]

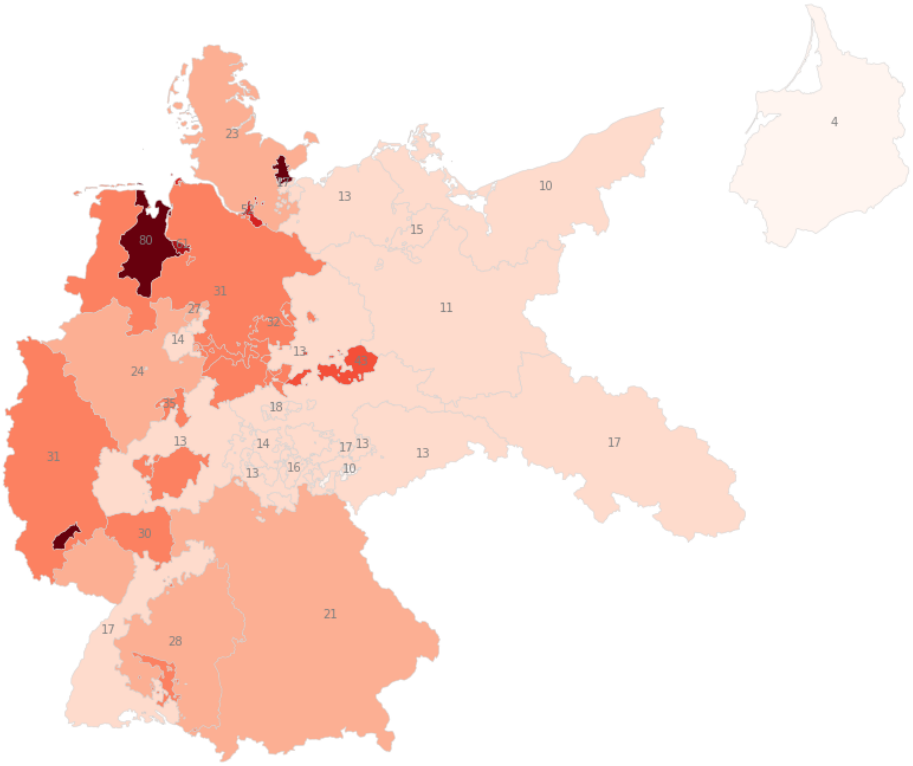


Figure A.1: Number of villages in, both, questionnaire 2 and 4 as share of the total number of municipalities in a State/Province in 1910.

Notes: Sample restricted to villages included in both questionnaire 2 and questionnaire 4. German Reich in its borders from 1914 excluding the Provinces West Prussia, Posen an Alsace-Lorraine.

[31] Information on the content and sample of all questionnaires is available upon request.

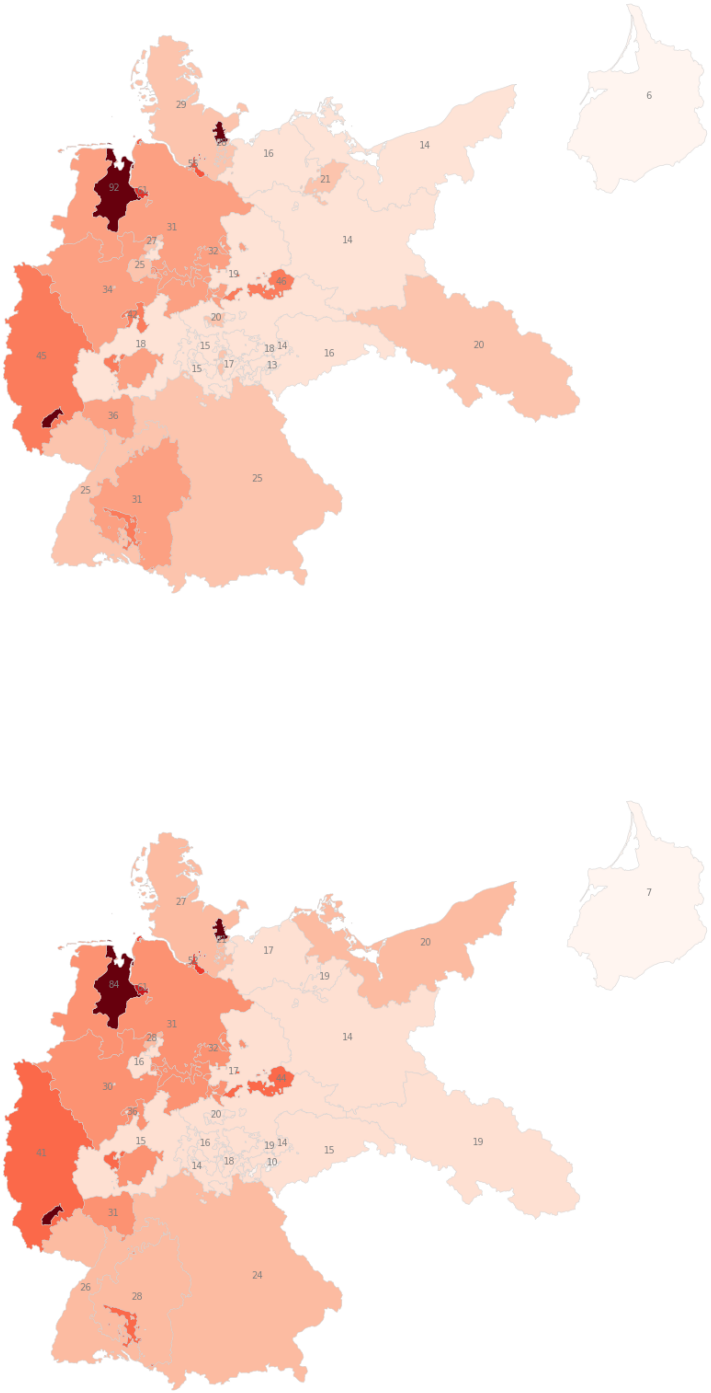


Figure A.2: Number of villages in questionnaire 2 and 4, respectively, as share of the total number of municipalities in a State/Province in 1910.

Notes: Sample restricted to villages included in both questionnaire 2 or questionnaire 4. German Reich in its borders from 1914 excluding the Provinces West Prussia, Posen an Alsace-Lorraine.

Appendix B Volunteer Characteristics

To get a more detailed view of the volunteer's background characteristics, we use data covering the Rhine-Province digitized by Kehren (1994). Around 90% of respondents in this region were teachers. The occupations of the remaining respondents are heterogeneous. The most common additional groups are farmers, students, craftsmen, and individuals occupied in some administrative positions (mostly local government). Each of those groups covers between 1 and 3% of respondents. Below 1% of respondents in the Rhine Province were women, and most of the respondents were between 30 and 50 years old when they answered the survey (see Figure B.3a). The low share of women might lead to higher measurement error in the variables concerning restrictions on women.

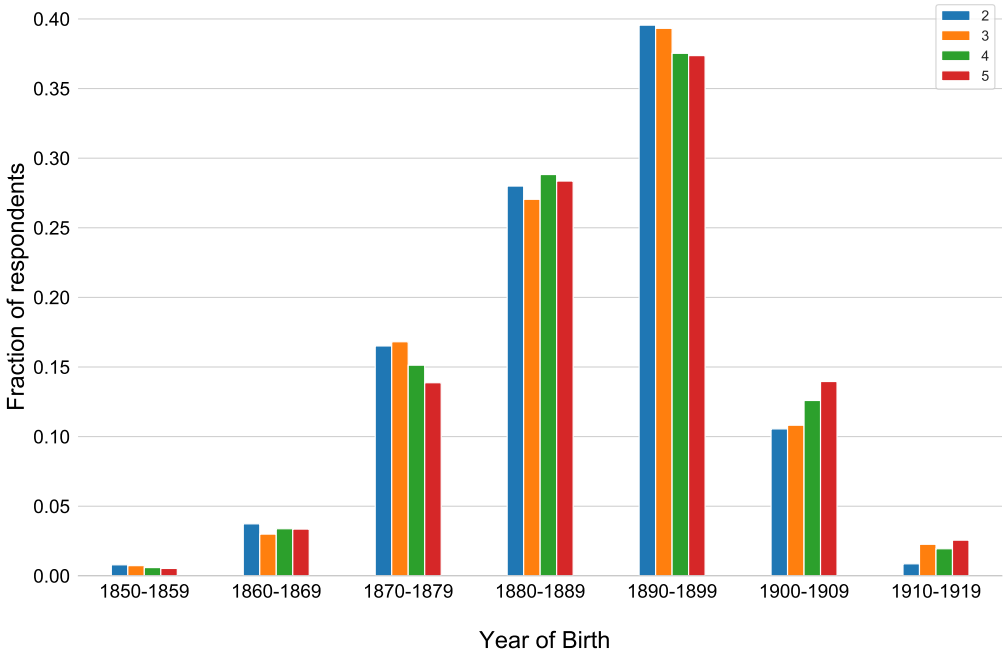
We can also use the data of Kehren (1994) to learn about the volunteer's familiarity with the village they were covering. The share of respondents born in the village they answer for varies between 11.8% and 17.4% and increases over time. In the samples of questionnaires two and four, it is 11.8% and 14.4%, respectively. The majority of the volunteers who were not born in the village moved there before or in 1920, so they spent at least 10 years in the village they answered for.[32] However, a large part also moved there only in the 1920s or even in the 1930s. While volunteers who did not come from the village had a disadvantage in accurately answering the questions, they did so by relying on a village's inhabitants' help.

Table B.2: Occupation of volunteers by questionnaire

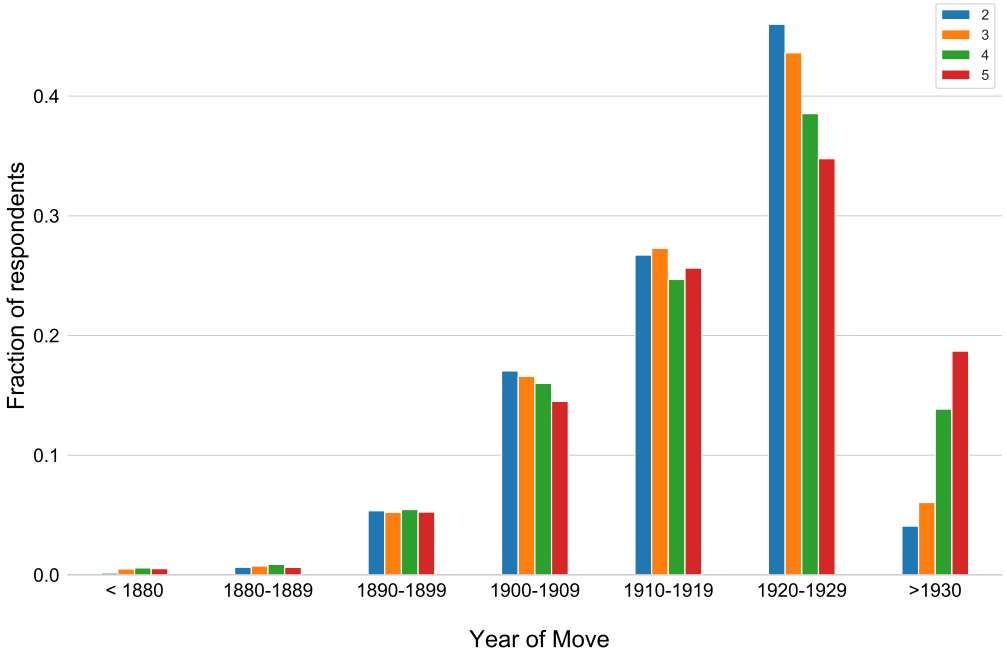
Quest. Occupation	2	3	4	5
Teacher/Principal	92.2	90.8	89.0	87.1
Other	2.1	2.5	3.5	4.3
Farmer/Winemaker	1.7	1.5	2.3	3.4
Student	1.5	2.3	1.2	1.5
Administration	0.9	1.5	1.7	1.7
Craftsman	0.9	0.8	1.3	1.0
Pastor/Chaplain	0.4	0.5	0.3	0.4
No occupation	0.2	0.1	0.5	0.3
Innkeeper	0.1	0.1	0.3	0.3

Notes: Sample restricted to the Rhine Province. Data obtained from Kehren (1994). Own calculations.

[32] We know neither the locality of origin nor the year since when the respondent moved to the village for 1% of the sample in questionnaires two and three, 6.7% in questionnaire four, and 1.7% in questionnaire five. The numbers refer to the remaining sample.



(a) Volunteers year of birth.



(b) Year when volunteer moved to village.

Figure B.3: Characteristics of volunteers in the Rhine Province.
Notes: Sample restricted to the Rhine Province. Data obtained from Kehren (1994). Own calculations. Part B.3b is restricted to volunteers who are not born in the village they answer for.

Appendix C Measures

C.1 Neighborhood obligations

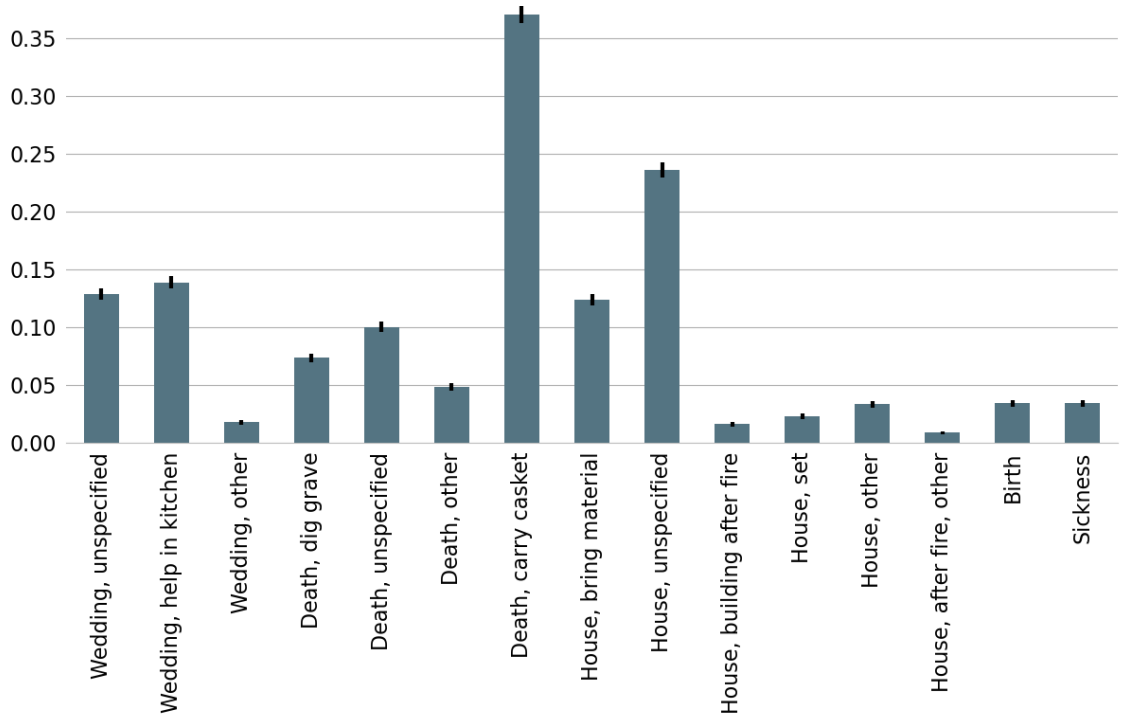


Figure C.4: Fraction of villages in each subcategory of neighborhood obligations

Notes: Categorization of neighborhood help answers as categorized by Barruzi-Leicher and Frauenknecht (1966). Multiple answers possible.

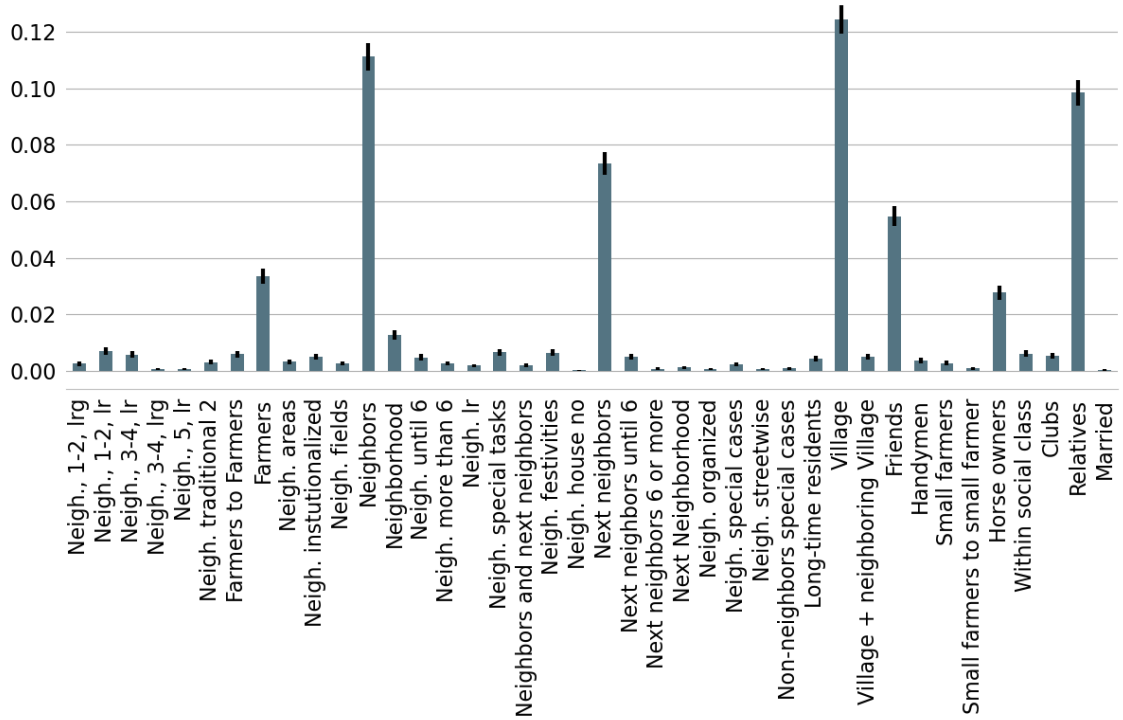


Figure C.5: Fraction of villages in each subcategory of neighborhood scope

Notes: Categorization of neighborhood scope answers as categorized by Barruzi-Leicher and Frauenknecht (1966). Answers to part (d)-(e). Multiple answers possible. Neigh. = Neighbors, l=left, r=right, g=across the street. Multiple answers possible.

C.2 The woman in childbed

Table C.3: Protective norms: subcategories

Category English	Category German	Fraction
The woman in childbed should avoid or not surpass...	Die Wöchnerin soll meiden bzw. nicht überschreiten...	
(House)threshold, front door, yard gate	(Haus)türschwelle, Haustür, Hoftor	0.052
Attic, stable	Boden, Stall	0.001
Ground	Boden	0.005
Eaves, roof	Dachtraufe, Dach	0.090
Foreign eaves, foreign roof	fremde Dachtraufe, fremdes Dach	0.002
Foreign doorstep	fremde Türschwelle	0.002
Foreign stable	fremden Stall	0.001
Cellar, attic, stable	Keller, Boden, Stall	0.017
Basement, attic	Keller, Boden	0.019
Cellar, stable	Keller, Stall	0.006
Basement	Keller	0.036
Crossroad	Kreuzweg	0.023
Gutter	Rinnstein	0.026
Other	Sonstiges	0.002
Stable	Stall	0.014
Lane, driveway, road embankment	Wagenspur, Fahrweg, Fahrdamm	0.005
Water, jetty	Wasser, Steg	0.007
Burial, open grave, sight of a corpse	Begräbnis, offenes Grab, den Anblick einer Leiche	0.003
Other rules ...	Andere Regeln ...	

continued on next page

Table C.3: Protective norms: subcategories

Do not look after a funeral procession	keinem Leichenzug nachblicken	0.002
Don't go to the cemetery (alone)	nicht (allein) auf den Friedhof gehen	0.007
Avoid other encounters with death and grief	sonstige Begegnungen mit Tod und Trauer meiden	0.000
Throw stones across the street before crossing	Steine über die Straße werfen vorm Überschreiten	0.001
The woman in childbed is blessed or crossed herself or sprinkled with holy water, among other things	die Wöchnerin wird gesegnet bzw. bekreuzigt oder mit Weihwasser besprengt, u.A.	0.005
Have a straw (in the shoe)	einen Strohhalm (im Schuh) bei sich haben	0.001
Have pious books (hymn book, bible) with her (in clothes, in bed)	fromme Bücher (Gesangbuch, Bibel) bei sich haben (in der Kleidung, im Bett)	0.002
Have metal objects (scissors, ax, knife, needle, wedding ring, etc.) with her (in clothing, in bed)	Gegenstände aus Metall (Schere, Axt, Messer, Nadel, Trauring u.A.) bei sich haben (in der Kleidung, im Bett)	0.003
Have consecrated objects (e.g. rosary, holy water, etc.) with her (in clothing, in bed)	geweihte Gegenstände (z.B. Rosenkranz, Weihwasser u.A.) bei sich haben (in der Kleidung, im Bett)	0.004
Have herbs and spices with her (in clothes, in bed)	Kräuter und Gewürze bei sich haben (in der Kleidung, im Bett)	0.001
Cross oneself	sich bekreuzigen	0.001
Have other items (e.g. children's stuff, comb, etc.) with her (in clothing, in bed)	sonstige Gegenstände (z.B. Kinderzeug, Kamm u.A.) bei sich haben (in der Kleidung, im Bett)	0.001

continued on next page

Table C.3: Protective norms: subcategories

Praying the Lord's Prayer (and circling the table three times (weekly prayers), saying the blessing formula)	Vaterunser beten (und dabei dreimal den Tisch umkreisen (Wochengebete) beten, Segensformel sprechen)	0.003
Take holy water among others	Weihwasser nehmen u.A.	0.001
The woman in childbed should not wash any clothes	Die Wöchnerin soll keine Wäsche waschen	0.008
The woman in childbed should not mend, knit, spin, etc.	Die Wöchnerin soll nicht flicken, stricken, spinnen usw.	0.002
The woman in childbed takes measures to change clothes and shoes (e.g. turn around, stuffing, swapping)	Die Wöchnerin trifft verändernde Maßnahmen an Kleidung und Shuhwerk (z.B. umkehren, ausstopfen, vertauschen)	0.000
The woman in childbed has to go outdoors under a roof (umbrella or similar)	Die Wöchnerin muss im Freien unter einem Dach gehen (Schirm o.Ä.)	0.003
The woman in childbed should not have anything to do with the clothesline (e.g. do not go under the clothesline, do not hang up laundry, do not pull the clothesline)	Die Wöchnerin soll nichts mit der Wäscheleine zu tun haben (z.B. nicht unter die Wäscheleine gehen, keine Wäsche aufhängen, keine Wäscheleine ziehen)	0.003
The woman in childbed wears a headscarf, also known as a mulch, outdoors (rarely also indoors)	Die Wöhnerin trägt im Freien (selten auch im Haus) ein Kopftuch, auch Maultuch genannt	0.008
The women in childbed wears her husband's things on or with her or has them in bed	Die Wöchnerin trägt Sachen ihres Mannes an oder bei sich oder hat sie im Bett	0.004
Avoid encounters with foreign animals (e.g. dogs, cats)	Begegnung mit fremden Tieren (z.B. Hund, Katze) meiden	0.000
Don't go out alone, and variations	nicht allein ausgehen und Variationen	0.001

continued on next page

Table C.3: Protective norms: subcategories

Do not stay alone or sleep (especially in childbed)	nicht allein bleiben bzw. schlafen (besonders im Wochenbett)	0.004
Don't borrow anything	nichts entleihen	0.003
Don't lend anything	nichts verleihen	0.011
Avoid other contacts such as answering to a knock, shaking hands and others	sonstige Kontakte meiden wie z.B. Antwort auf Anklopfen, die Hand geben u.A.	0.002
Avoid encounters with strangers, and variations	Zusammentreffen mit Fremden meiden, und Spezifikationen	0.001
Avoid meeting other people (e.g. old women, Sinti and Roma, wrong people, etc.)	Zusammentreffen mit sonstigen Personen meiden (z.B. alten Frauen, Sinti und Roma, falschen Leuten u.A.)	0.002
Do not make the bed, do not ventilate and observe the prohibitions on care	Bett nicht machen, nicht lüften u.Ä. Pflegeverbote beachten	0.001
Do not cover the bed with a blanket	Bett nicht mit einer Decke zudecken	0.001
Do not move the bed, etc.	Bett nicht verrücken u.Ä.	0.001
Do not climb stairs or ladders	keine Treppen oder Leitern steigen	0.004
Do not change body wash, etc.	Körperwäsche nicht wechseln u.Ä.	0.001
Don't look out the window, don't go to the window	nicht aus dem Fenster sehen, nicht zum Fenster gehen	0.003
Do not look in the mirror or cover the mirror	nicht in den Spiegel sehen bzw Spiegel verhängen	0.002
Do not sweep or wipe	nicht kehren oder wischen	0.001
Do not go over the threshold, etc.	nicht über die Stubenschwelle gehen u.Ä.	0.001
Do not comb; other prohibitions for activities on the body	sich nicht kämmen; sonstige Verbote für Verrichtungen am Körper beachten	0.001

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Table C.3: Protective norms: subcategories

Do not leave the house after sunset or go to the house before sunset	nach Sonnenuntergang das Haus nicht mehr verlassen bzw vor Sonnenuntergang das Haus aufsuchen	0.008
Do not be in the dark (alone) in the room	nicht im Dunkeln (allein) im Zimmer sein	0.000
Do not leave the house in the dark	nicht im Dunkeln das Haus verlassen	0.002
Other prohibitions against being out of the house at night, e.g. not letting the moon shine on you	sonstige Verbote, nachts außer Haus zu sein, beachten, z.B. sich nicht vom Mond bescheinen lassen	0.001
Stay home during lunchtime or take other precautions	unter Mittag zu Hause bleiben oder andere Vorsichtsmaßnahmen treffen	0.002
Do not leave the house before the prayer rings	vor dem Gebetsläuten früh das Haus nicht verlassen	0.000
Do not leave the house before sunrise	vor Sonnenaufgang nicht aus dem Haus gehen	0.000
Go into the house for the prayer (evening, Ave, after work) rings	zum Gebets- (Abend-, Ave-, Feierabend-) läuten ins Haus gehen	0.007
Do not speak or speak softly	nicht oder nur leise sprechen	0.000
Don't argue, don't scold, and similar	nicht streiten, nicht schelten u.Ä.	0.001
Keep yourself separate, for example also at the table	sich abgesondert halten, z.B. auch bei Tisch	0.005
Do not let the rain drip on you, and similar	sich nicht vom Regen übertropfen lassen, u.Ä.	0.001
Other instructions for behavior indoors and outdoors	sonstige Gebote für das Verhalten im Haus und im Freien beachten	0.002
Be careful with thunderstorms	vorsichtig sein bei Gewitter	0.001
Any of above		0.338

continued on next page

Table C.3: Protective norms: subcategories

Notes: Categorization according to Grober-Glück (1966b).

Table C.4: Impurity norms: subcategories

Category English	Category German	Fraction
Hail and thunderstorms are the result of premature exit or other misconduct	Hagel, Gewitter sind Folgen vorzeitigen Ausgangs oder anderen Fehlverhaltens	0.001
Don't make a fire, Don't go to the fire, Don't look into the heated oven	kein Feuer machen, nicht an Feuer gehen, nicht in den angeheizten Backofen schauen	0.002
Don't touch or salt meat or go to the salting tub	kein Fleisch anfassen oder einsalzen bzw nicht ans Pökelfaß gehen	0.001
Don't go to a wedding, don't look over to a bride and groom	keine Hochzeit besuchen, keinem Brautpaar nachsehen	0.002
Don't attend a public event (e.g. festivity, dance) because there will be dispute or a fight	keine öffentliche Veranstaltung (z.B. Festlichkeit, Tanz) besuchen, weil Streit, Schlägerei entstehen	0.032
Don't visit the neighbor	keinen Besuch beim Nachbarn machen	0.153
Don't step on a green lawn	keinen grünen Rasen betreten	0.002
Don't fill cider or other drinks or vinegar	keinen Most oder andere Getränke bzw Essig abfüllen	0.001
Don't take part in slaughter	nicht am Schlachten teilnehmen	0.001
Don't eat canned fruits or vegetables	nicht an konservierte Früchte oder Gemüse gehen	0.002
Don't go to open containers for laundry and clothing	nicht an offene Behälter für Wäsche und Kleidung gehen	0.002

continued on next page

Table C.4: Impurity norms: subcategories

Don't bake (e.g. bread) or handle baked goods	nicht backen (zB Brot) bzw mit Backsachen umgehen	0.002
Don't boil down or pickle	nicht einkochen oder einlegen	0.001
Don't work in the soil	nicht in der Erde arbeiten	0.001
Don't go to grocery stores	nicht in Lebensmittelläden gehen	0.001
Don't touch the salt	nicht ins Salz fassen	0.001
Don't meet other women who have recently given birth	nicht mit anderen Wöchnerinnen zusammenkommen	0.000
Don't socialize with women or girls who can conceive	nicht mit empfängnisfähigen Frauen oder Mädchen zusammenkommen	0.001
Other prohibitions	sonstige Verbote beachten	0.000
Other prohibitions regarding food	sonstige Verbote für das Umgehen mit Lebensmitteln beachten	0.001
Other prohibitions regarding garden and field	sonstige Verbote für Garten und Feld beachten	0.001
Don't visit the well	Nicht zum Brunnen gehen	0.089
Any of above		0.257

Notes: Categorization according to Grober-Glück (1966b).

Notes: Categorization according to Grober-Glück (1966b).

Table C.5: Determinants of Protective vs. Impurity Norms

	Dependent variable:			
	Protective		Impurity	
	(1)	(2)	(3)	(4)
log(Female-to-male mortality 1914)	0.164***	0.187**	0.031	−0.116
	(0.052)	(0.085)	(0.058)	(0.084)
log(Mortality: Child below 1 1914)	−0.196***	−0.307***	0.126***	0.335***
	(0.046)	(0.069)	(0.047)	(0.065)
log(Ratio of female-to-male lfp 1933)	−0.061	−0.104	0.060	0.131
	(0.065)	(0.106)	(0.076)	(0.106)
Share of aggricultural pop 1933	−0.115	−0.110	−0.074	−0.107
	(0.121)	(0.192)	(0.140)	(0.188)
Distance to city	−0.002*	−0.002	0.001	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Majority protestant	−0.109***	−0.120***	0.025	0.126***
	(0.019)	(0.025)	(0.018)	(0.026)
Close to border	0.002	0.050	−0.024	−0.045
	(0.028)	(0.046)	(0.029)	(0.048)
Constant	3.066***	11.878***	−5.537***	−11.487***
	(0.761)	(1.060)	(0.676)	(1.043)
Sample	Full	Childbed Norms > 0	Full	Childbed Norms > 0
Observations	7,934	3,604	7,934	3,604
Adjusted R^2	0.063	0.121	0.026	0.102

Notes: $^{*}p < 0.1, ^{**}p < 0.05, ^{***}p < 0.01$. Sample is restricted to the German Reich. All specifications additionally control for latitude, longitude and their interaction. Standard errors are clustered on the county level. Ratio of female-to-male labor force participation 1933 as well as the share of agricultural population 1933 are constructed from the social data of the Reichsstatistik 1933 obtained from Hänisch (1989). Female-to-male mortality 1914 as well as the mortality of children below one year of age 1914 is constructed from Galloway (2007). Column (2) and column (4) only include villages that display at least one norm regarding women in childbed.

C.3 Dissidents

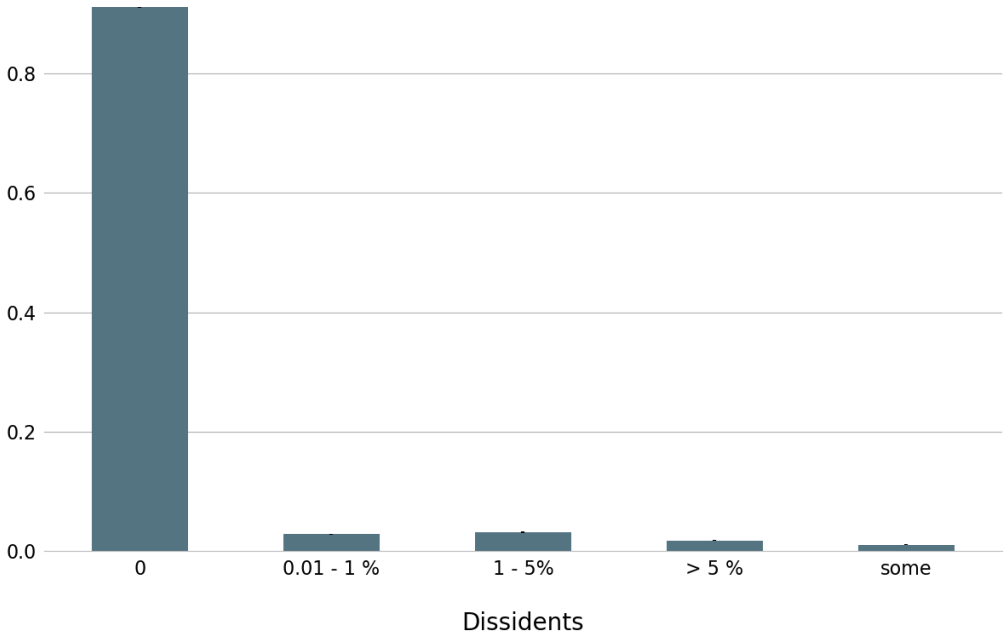


Figure C.6: Frequency of the original coding of the existence of dissidents by Grober-Glück (1966a).

C.4 Determinants of Social Relationships

Table C.6: Summary Statistics: Other characteristics

	N	Share	Mean	Std	Min	p25	p50	p75	Max
Majority protestant	20,067	0.59							
Heterogeneous	20,067	0.19							
Villages Diff. Rel. 4nn	20,063		0.07	0.19	0.00	0.00	0.00	0.00	1.00
N. Communal Labor	16,908		0.93	1.03	0.00	0.00	1.00	1.00	5.00
Type of Communal Labor									
Poultry		0.24							
Vegetables		0.04							
Fruit		0.08							
Flailing		0.03							
Spinning		0.03							
Flax		0.04							
Distance to city	23,617		10.16	7.17	0.01	5.43	8.76	13.18	86.90
Distance to border	23,617		65.20	54.61	0.01	19.93	48.24	101.04	222.24

Note: For categorical and dichotomous variables, table displays shares. For continuous variables, table displays mean (sd). Religious composition was asked in all questionnaires.

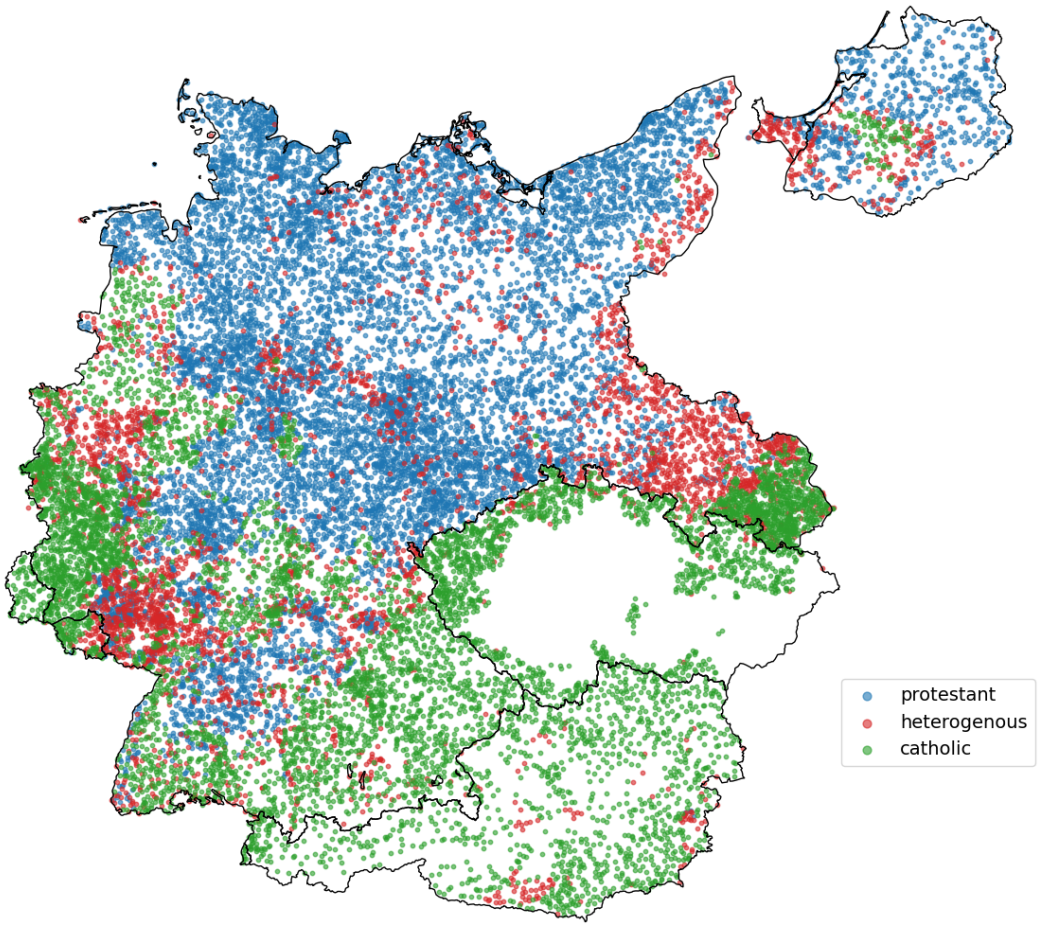


Figure C.7: Geographic distribution within-village religious heterogeneity

Notes: Heterogeneous villages are drawn in red, homogeneous Protestant villages in blue and homogeneous Catholic villages in green.

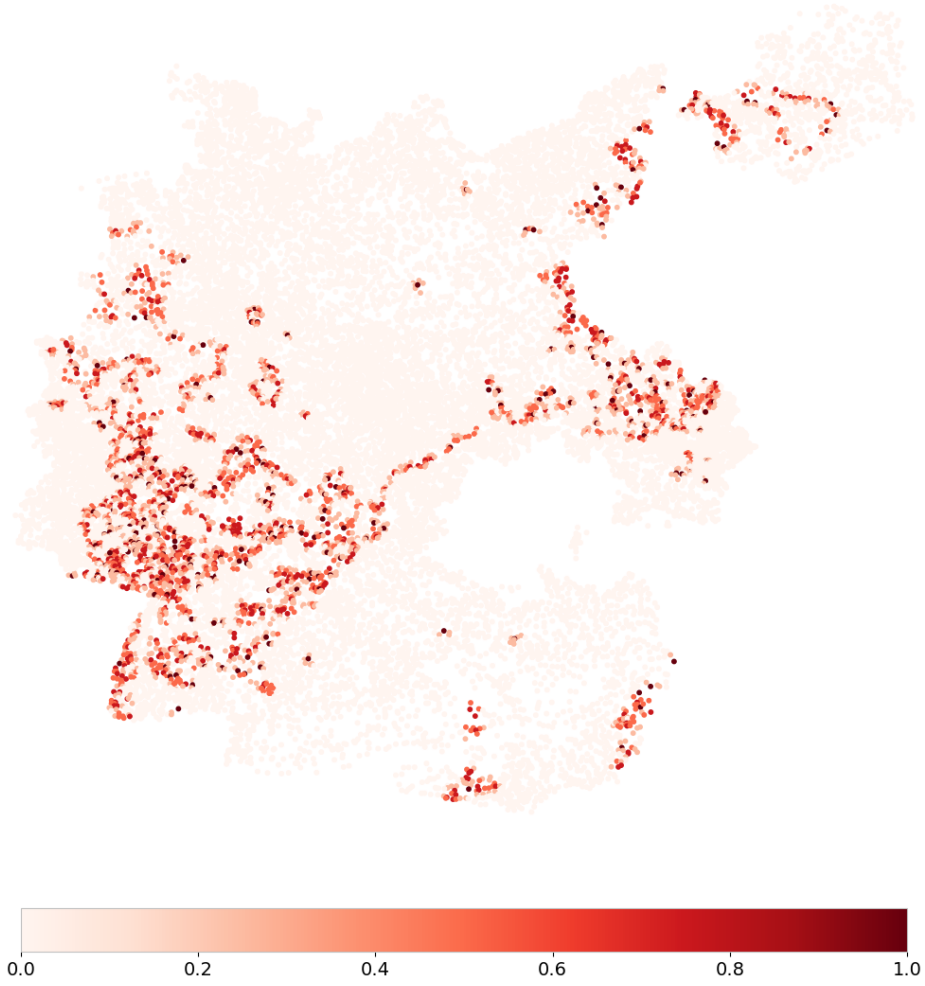


Figure C.8: Geographic distribution across village religious heterogeneity

Notes: Across village heterogeneity is defined as the deviation of a village's majority religious denomination from the religious denomination of surrounding villages. The religious denomination of surrounding villages is calculated by using the four nearest villages in our sample.

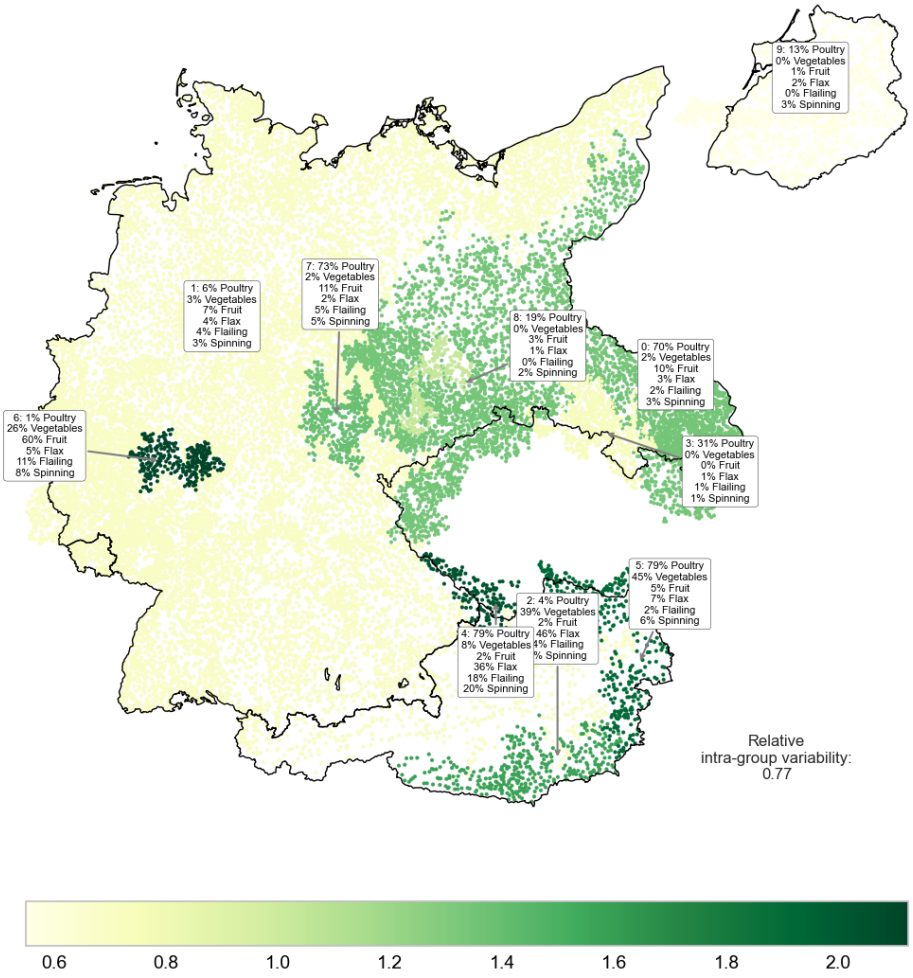


Figure C.9: Geographic Distribution of Communal Labor Activities

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Number of clusters=9 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables.

C.4.1 Religion

We want to gauge the accuracy of our religion data by comparing it to previously digitized administrative data. Since administrative data covers the whole of Germany we would expect discrepancies for three reasons: measurement error, differences between rural and urban populations and sampling variation.

The 1925 Reichstatistik reports district level Protestant shares for the whole German Reich. We use the digitized data provided by Falter and Hänisch (1990). To compare these data, we aggregate the village-level GEA data to the district level by taking the means of the interval middles for the Protestant share in each village. Figure C.10 reports a bin-scatter of these comparison. If both datasets were drawn from the same population and without measurement error we would expect all of the black dots to line up on the 45 degree line. This is the case for low Protestant shares. For high Protestant share the GEA data overestimates the district-level Protestant share. That is in close to completely Protestant districts the GEA misses the small Catholic population. One likely reason for this is that this Catholic population lived in cities because these were more hospitable to religious minorities.

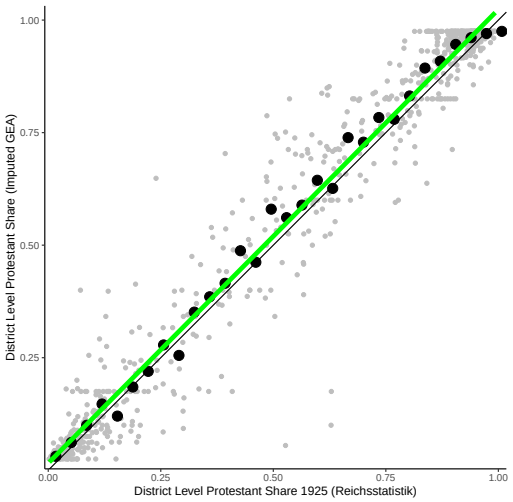


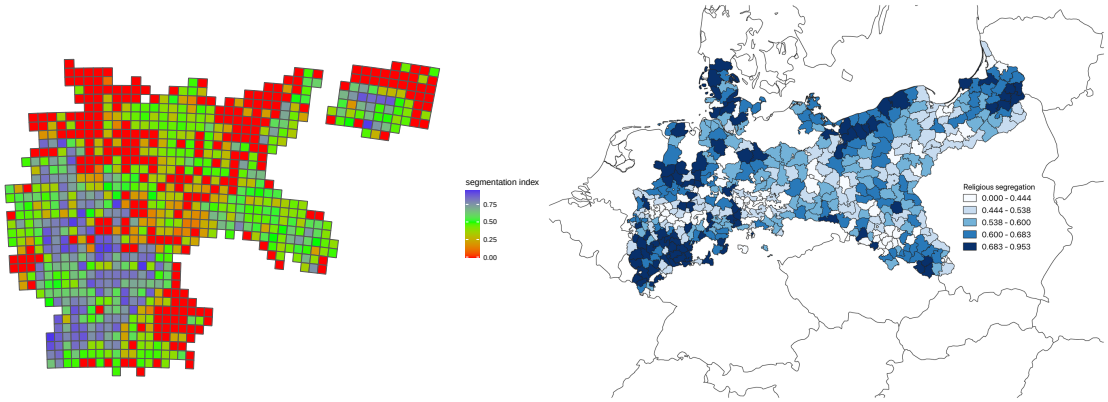
Figure C.10: Bench-marking the (imputed) district level Protestant shares from the GEA against the district-level Protestant shares from the 1925 Reichstatistik (Falter and Haenisch 1990).

The only other source of religious heterogeneity data is Becker and Cinnirella (2020), who digitize (Prussian) locality level data on religious composition. Becker et. al. calculate a district level dissimilarity index from these data. We calculate the same segmentation index for our data, using a 600km^2 grid. In figure C.11, we reproduce Becker et. al.'s map next to a map of dissimilarity indices calculated from the GEA. The comparison reveals that we come to opposite conclusions for exclusively protestant areas. In our data we do not observe any Catholics in these areas which leads to a dissimilarity index of 0 (unsegregated). In contrast to that Becker and Cinnirella (2020) report a dissimilarity index close to 1 (segregated) because they observe a small share of Catholics clustered in a few places. These places are likely the more heterogeneous cities.

Table C.7: Share of Protestants: original categorization

	Share of Protestants
0 - 4.9%	0.34
5 - 29.9%	0.05
30 - 49.9%	0.01
50%	0.00
50 - 69.9%	0.03
70 - 94.9%	0.09
95 - 100%	0.48

Notes: Shares of observations in original bins as constructed by Grober-Glück (1966a)

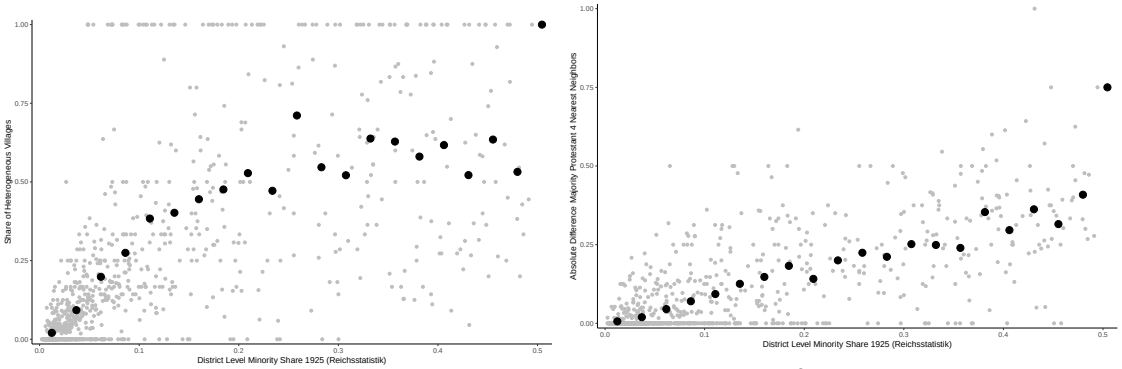


(a) Segmentation index for a 600km^2 grid calculated from GEA data.

(b) Dissimilarity index for Prussian counties in 1871 taken from Becker and Cinnirella (2020), figure 5.

Figure C.11: Religious segregation in the German Reich - comparison GEA data to census data

The major component of district level dissimilarity is segregation across villages. We measure this (at the village level) by the fraction of a village's four closest neighbors with a different religion. We measure segmentation within villages by the village-level religious minority share. As figure C.12 shows these two dimensions of heterogeneity are both positively correlated to the district level minority share. That is more heterogeneous districts on average have higher within as well as between village religious heterogeneity.



(a) Villages with a minority share $< 5\%$ as a fraction of total villages in the 600km^2 grid cells.

(b) Average (600km^2 Grid) difference in Protestant share between each village and its neighbors in a 20km Radius.

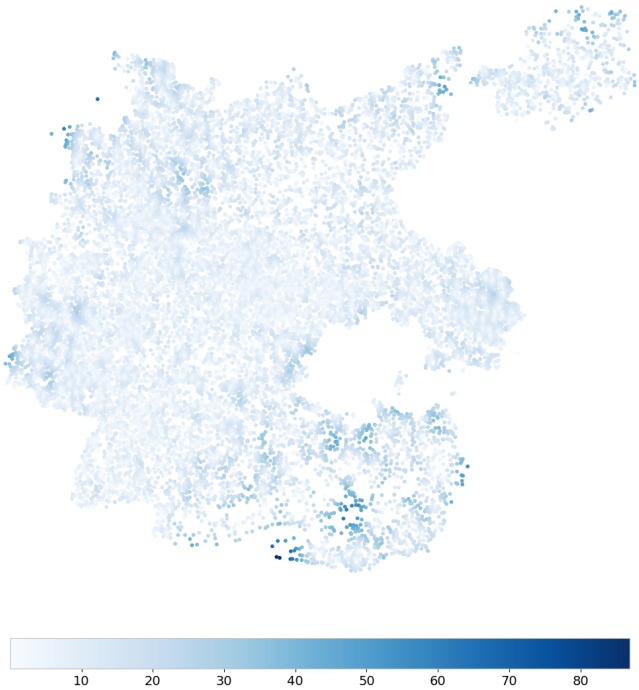
Figure C.12: Different measures of religious segregation/heterogeneity as a function of the population share of the minority in 600km^2 grids

C.5 Additional Controls

We measure urbanization by the distance of each village to the nearest city. We extract a list of cities in the German Reich from the 1910 directory of municipalities in the German Reich. Ulli Schubert from `https://www.gemeindeverzeichnis.de/` kindly provided us with a digitized version of that directory. For Austria, we use towns as classified by Census, 2001 of Austria Statistics, for the Czech Republic we use municipalities with a population of more than 10,000 inhabitants as of January 2021. For Luxembourg and Liechtenstein, we similarly use current (2016, 2019) census results.

We geocode the location of these cities with the contemporary nominatim geocoder `https://nominatim.openstreetmap.org/`. For implausible results and for east Prussia (because of the change in language) we manually checked the results of this automated geocoding by hand using Wikipedia and Google Maps. Using the geocoded list of cities, we calculated the distance of each village to the closest city from that list.

(a) Distance to the closest border (in km).



(b) Distance to the nearest city (in km).

Figure C.13: Geographic distribution of additional control variables .

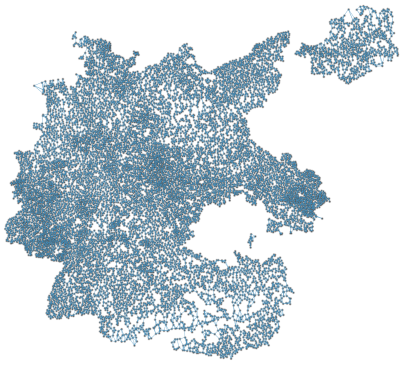
Appendix D Spatial Dependence

D.1 Spatial Autocorrelation

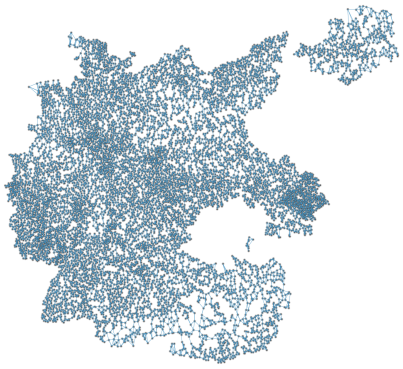
Table D.8: Global Spatial Autocorrelation (4NN)

	Moran's I	Chi2	p-value
N. Nbh. Help	0.18		$p < 0.01$
Type of Help			
Building house		489.34	$p < 0.01$
Wedding		335.68	$p < 0.01$
Death		409.91	$p < 0.01$
Birth/Sickness		22.72	$p < 0.01$
N. Childbed Norms	0.11		$p < 0.01$
Type of Norm			
Protective		303.10	$p < 0.01$
Impurity		651.40	$p < 0.01$
Dissidents		1173.88	$p < 0.01$
Covariates			
Heterogeneous		6252.09	$p < 0.01$
N. Communal Labor	0.29		$p < 0.01$
Villages Diff. Rel. 4nn	0.61		$p < 0.01$

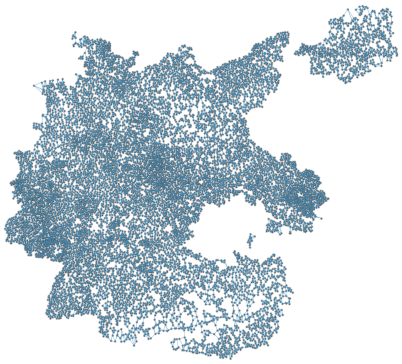
Notes: Reports Moran's I for continuous variables and Chi2 of the contingency table of of joint counts for binary variables based on the four nearest neighbors weighting matrix. p-values are based on random permutations, respectively.



(a) Connectivity graph questionnaire 2



(b) Connectivity graph questionnaire 4



(c) Connectivity graph dissidents.

Figure D.14: Connectivity graphs

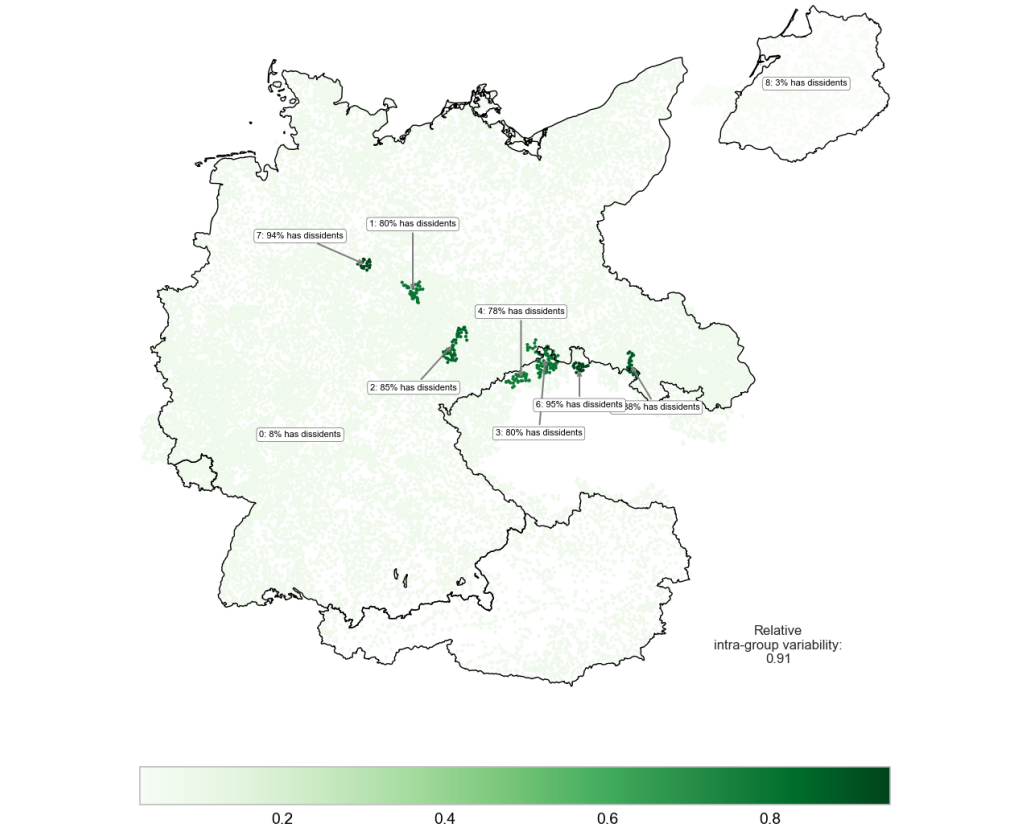
Notes: Connectivity graph based on connection between the four nearest neighbors.

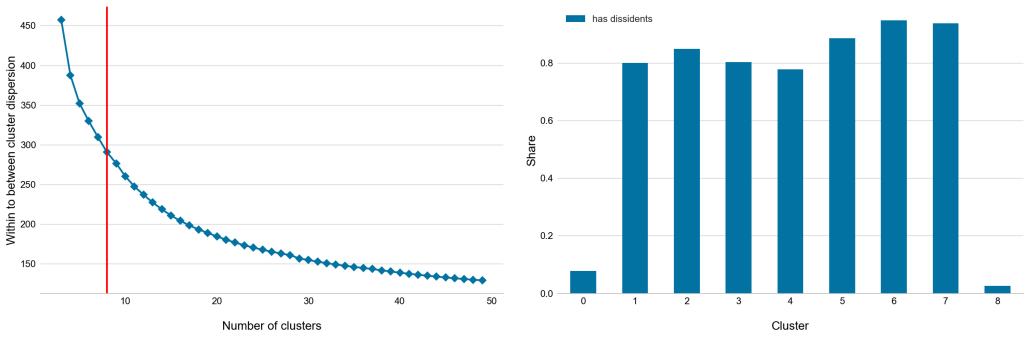
Table D.9: Global Spatial Autocorrelation (Distance 20km)

	Moran's I	Chi2	p-value
N. Nbh. Help	0.15		$p < 0.01$
Type of Help			
Building house		3017.59	$p < 0.01$
Wedding		2992.50	$p < 0.01$
Death		3272.50	$p < 0.01$
Birth/Sickness		96.62	$p < 0.01$
N. Childbed Norms	0.10		$p < 0.01$
Type of Norm			
Protective		2729.36	$p < 0.01$
Impurity		4937.24	$p < 0.01$
Dissidents		13019.94	$p < 0.01$
Covariates			
Heterogeneous		45366.86	$p < 0.01$
N. Communal Labor	0.25		$p < 0.01$
Villages Diff. Rel. 4nn	0.31		$p < 0.01$

Notes: Reports Moran's I for continuous variables and Chi2 of the contingency table of joint counts for binary variables based on the 20km distance-band weighting matrix. p-values are based on random permutations.

D.2 General Information on Clusters



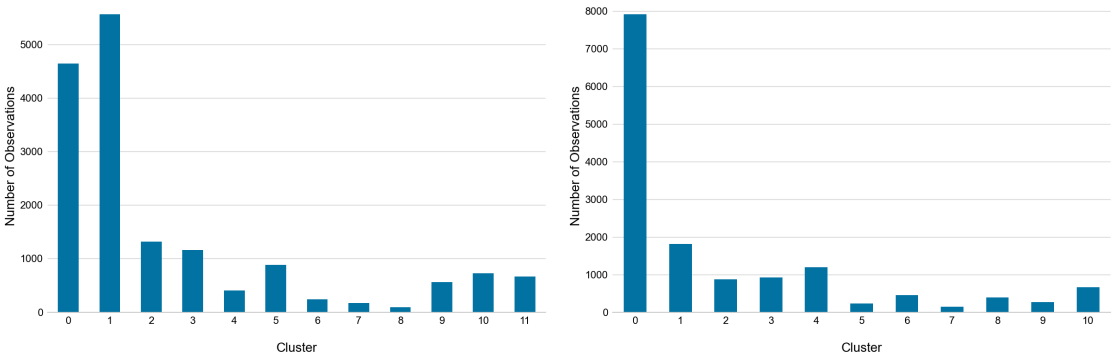


(a) Elbow graph

(b) Shares by cluster

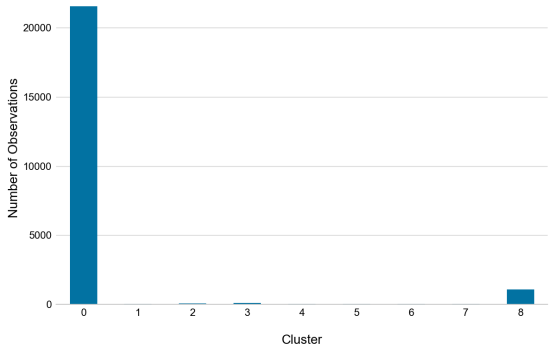
Figure D.15: Clustered Religious Norm

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Number of clusters=8 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables. Elbow graph is based on the Calinski-Harabasz metric, which gives the ratio of within to between cluster dispersion. Red line indicates the number of clusters used.



(a) Clustered by Cooperative Norms

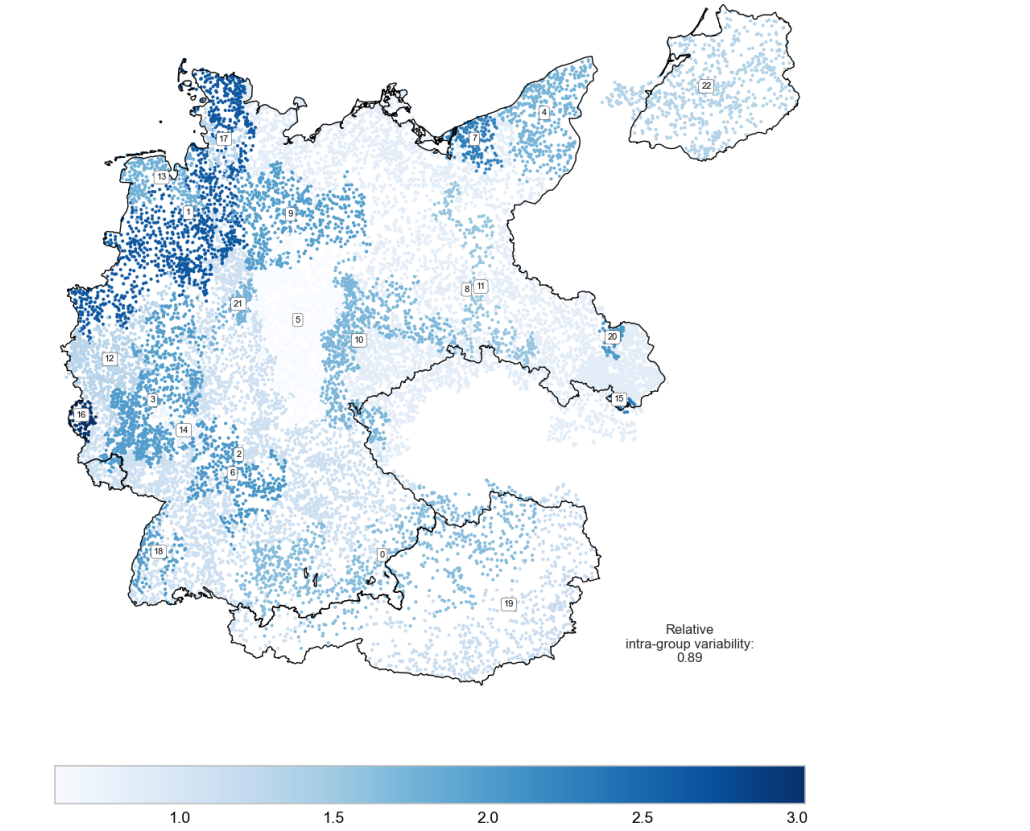
(b) Clustered by Gender Norms

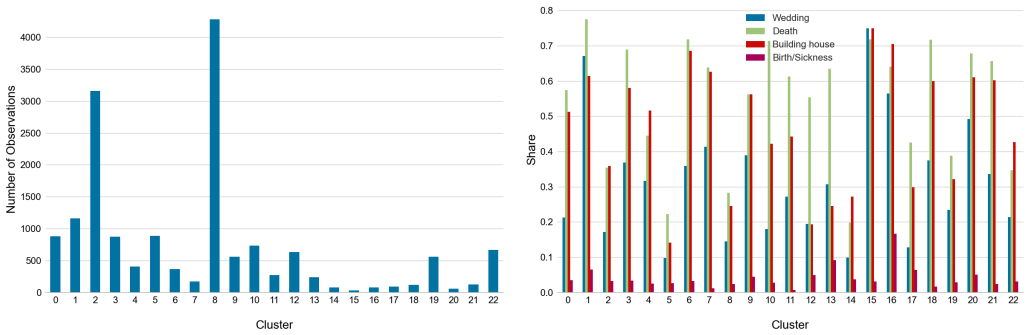


(c) Clustered by Religious Norms

Figure D.16: Number of Observations by Cluster

D.3 Doubling the Number of Clusters



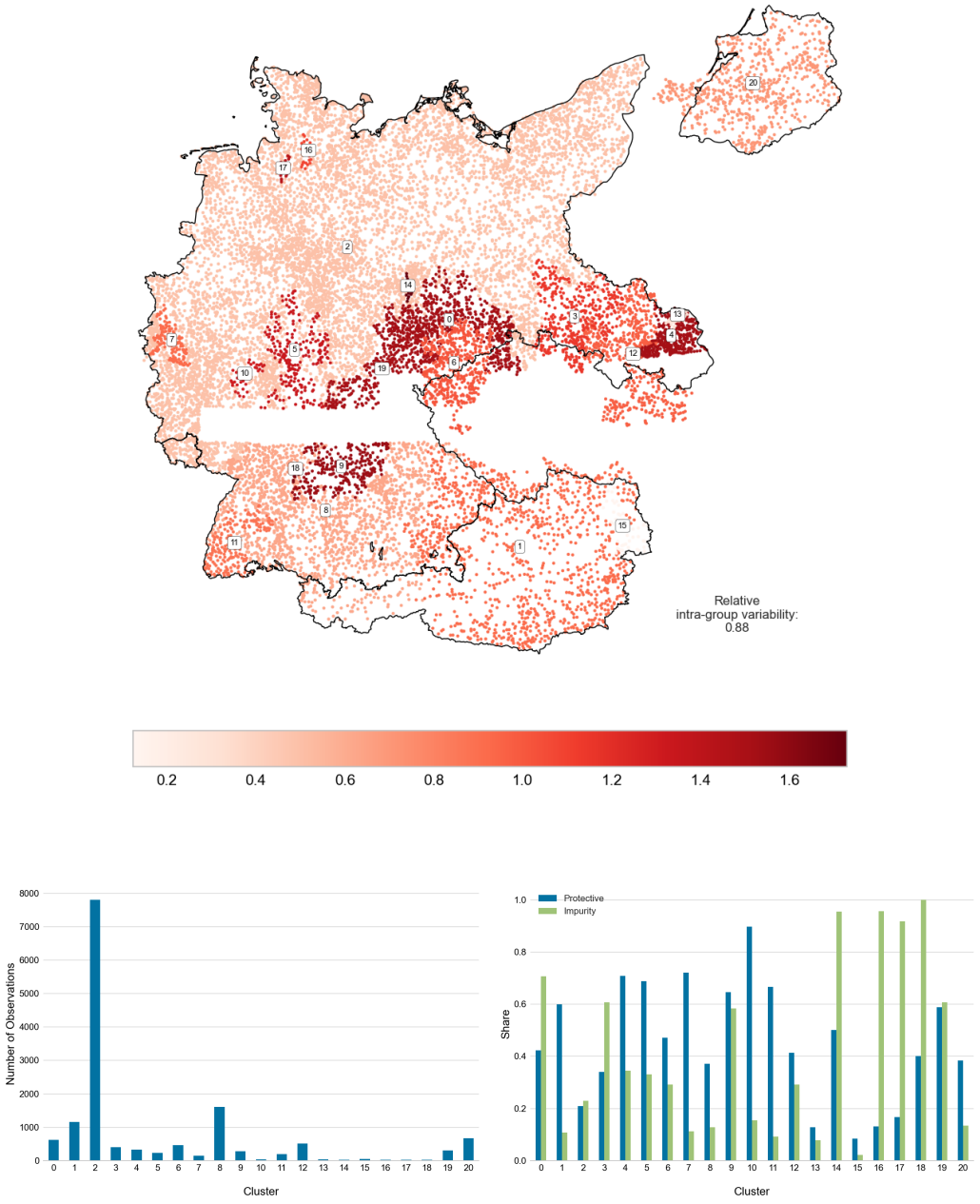


(a) Number of Observations by Cluster

(b) Shares by cluster

Figure D.17: Clustered cooperation norms

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Variables that are clustered: Help at wedding, death, building a house, birth/sickness. Help at birth and sickness is not available separately. Number of clusters=22 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables.

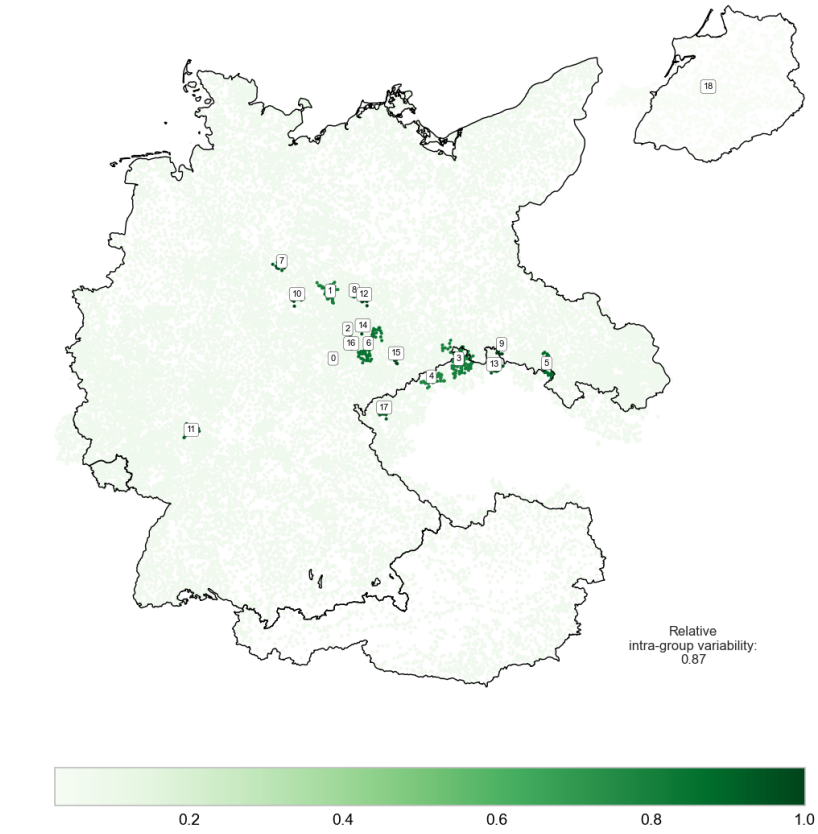


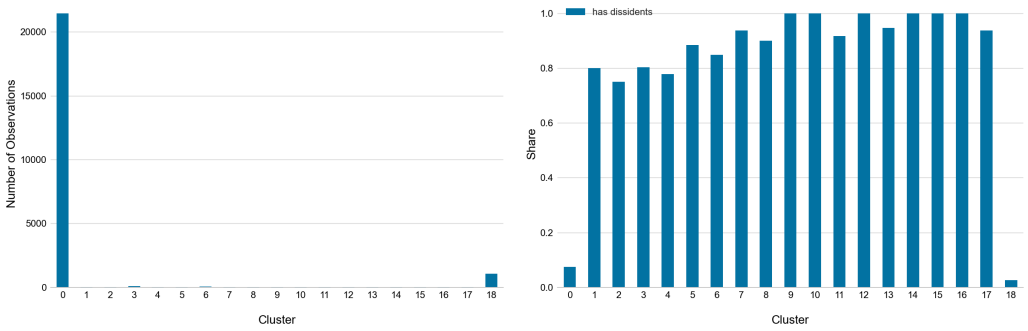
(a) Number of observations by cluster

(b) Shares by cluster

Figure D.18: Clustered gender norms

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Variables that are clustered: *Impurity norm*, *Protective norms*. Number of clusters=20 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables.





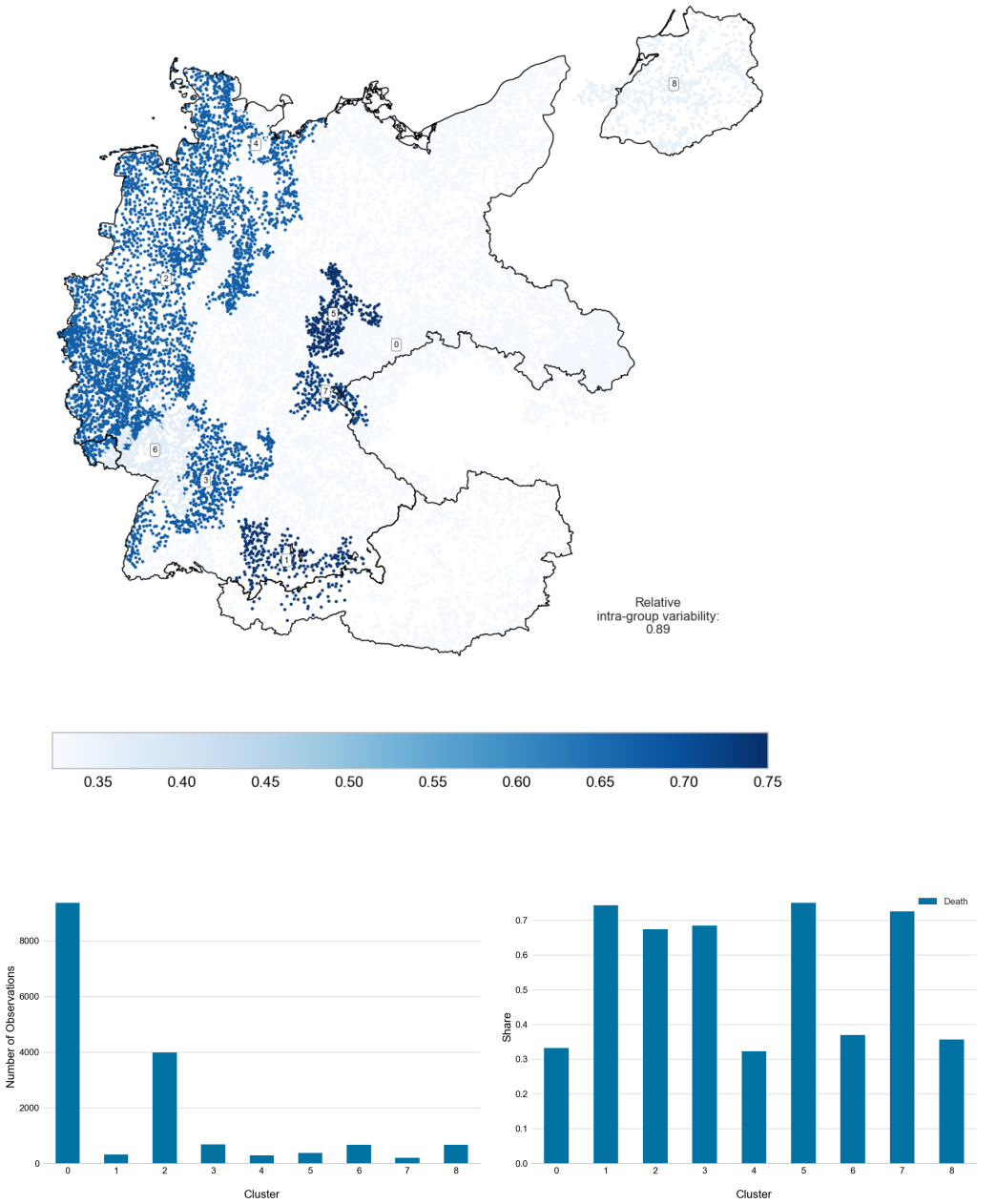
(a) Number of observations by cluster

(b) Shares by cluster

Figure D.19: Clustered gender norms

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Number of clusters=16 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables.

D.4 Each Variable Clustered Separately

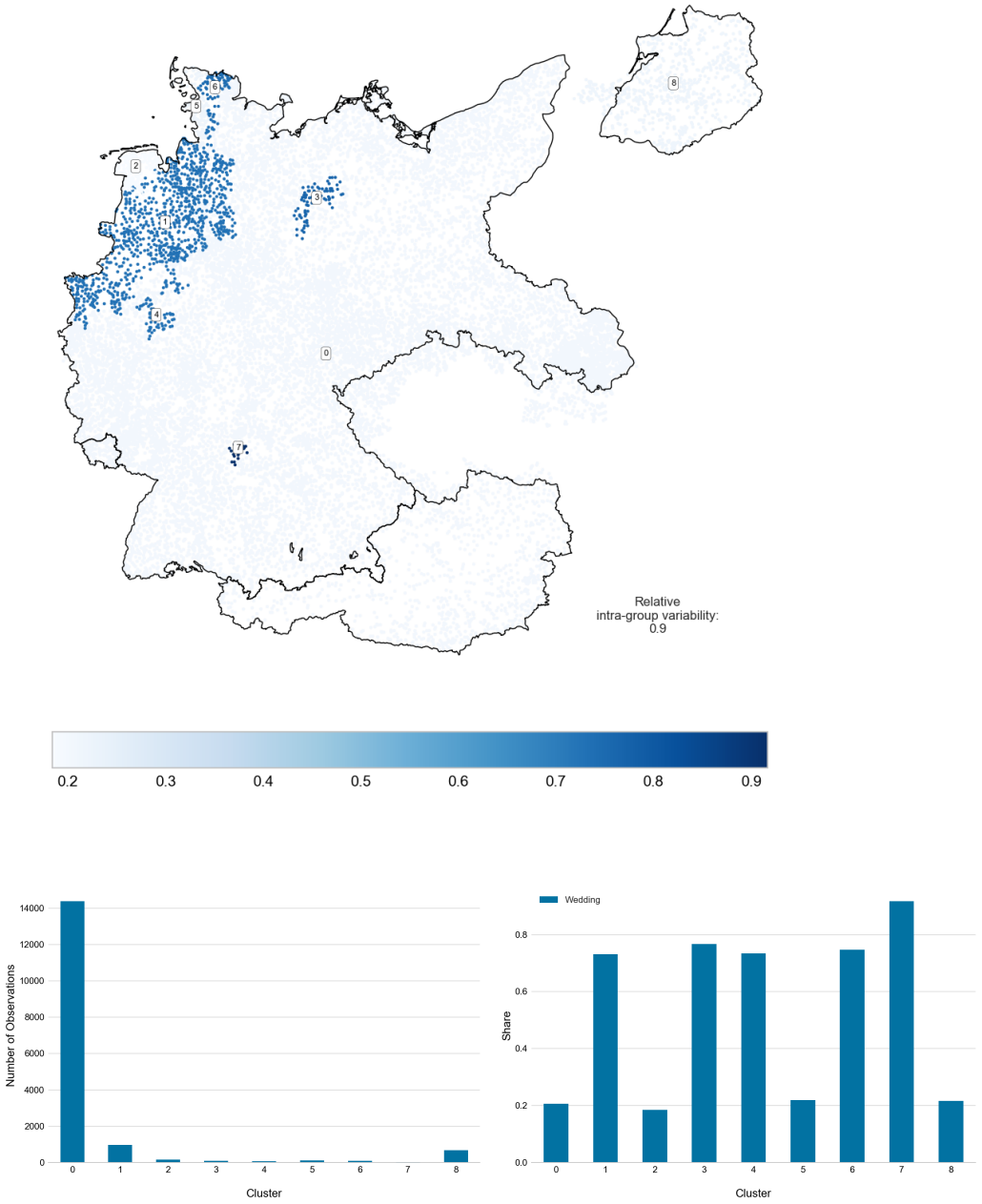


(a) Number of observations by cluster

(b) Shares by cluster

Figure D.20: Clustered help at death

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Number of clusters=8 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables.

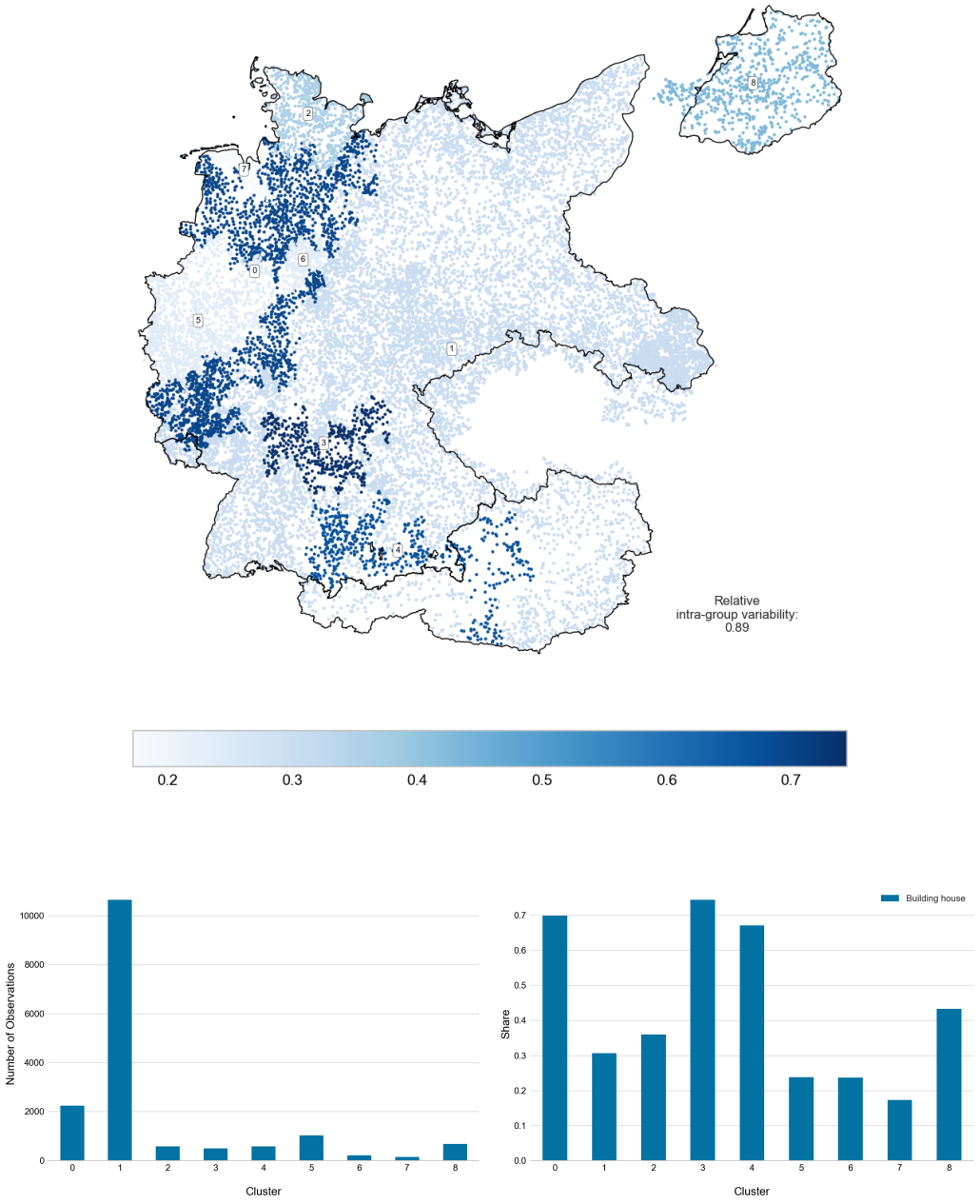


(a) Number of observations by cluster

(b) Shares by cluster

Figure D.21: Clustered help at weddings

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Number of clusters=8 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables.

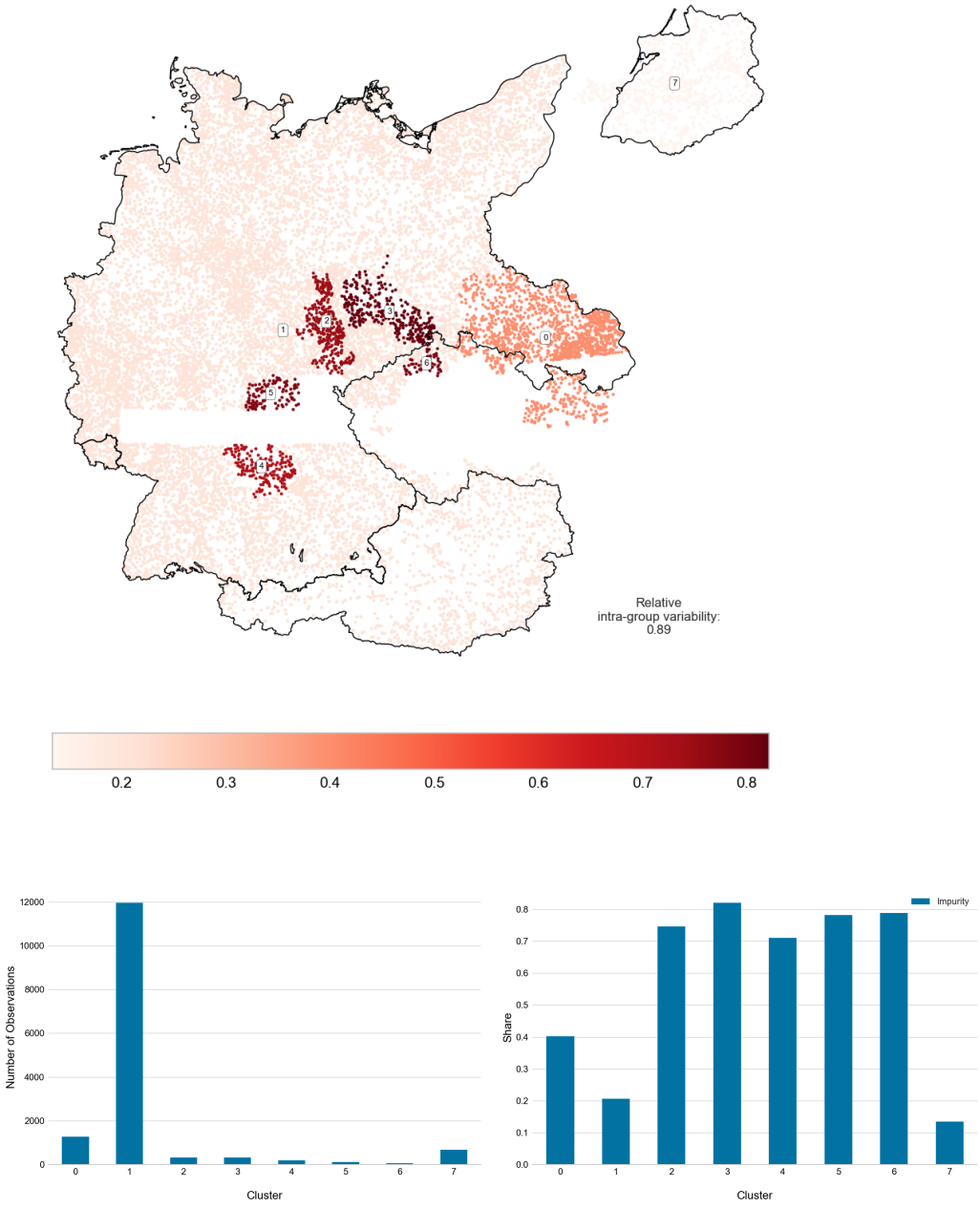


(a) Number of observations by cluster

(b) Shares by cluster

Figure D.22: Clustered help with house building

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Number of clusters=8 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables.

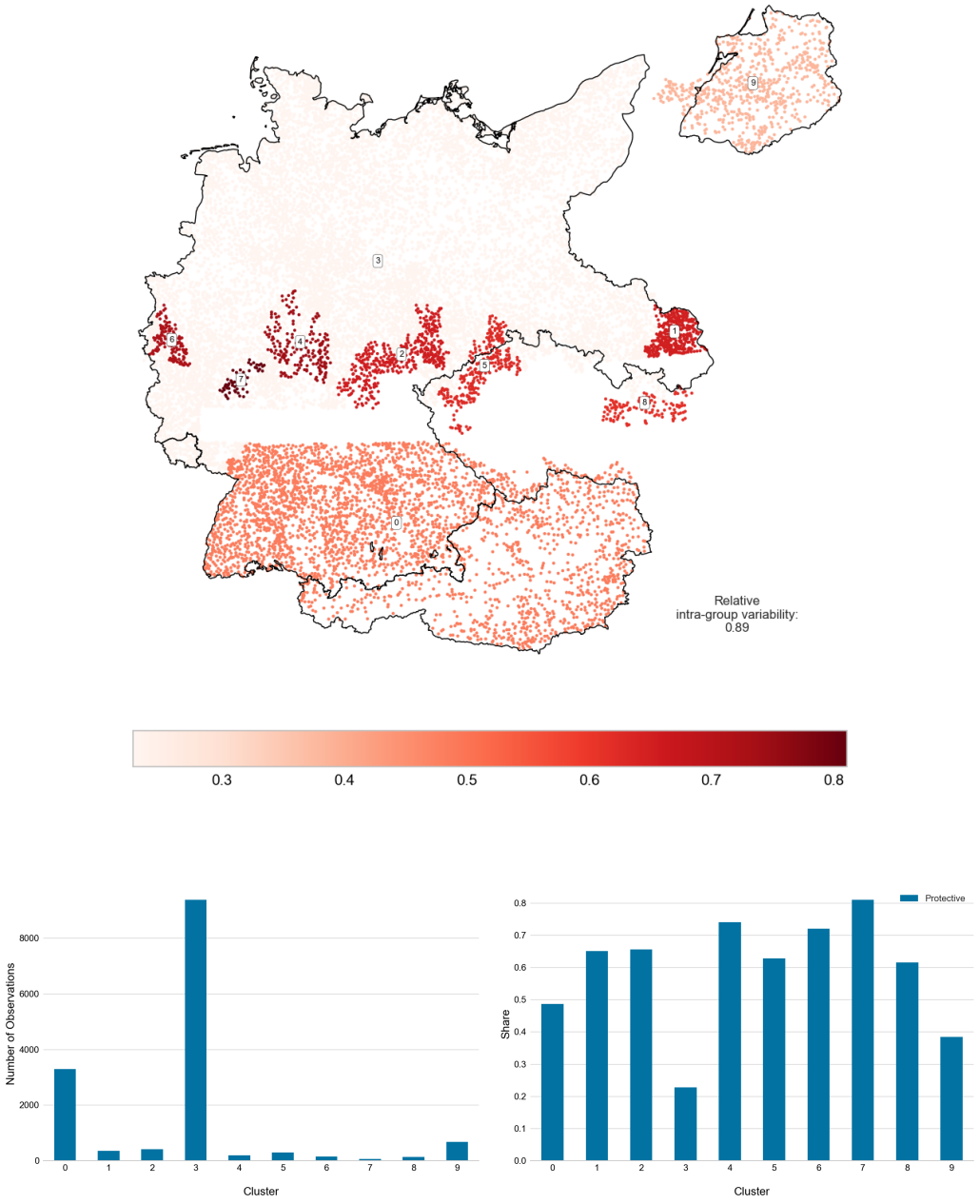


(a) Number of observations by cluster

(b) Shares by cluster

Figure D.23: Clustered impurity norms

Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Number of clusters=7 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables.



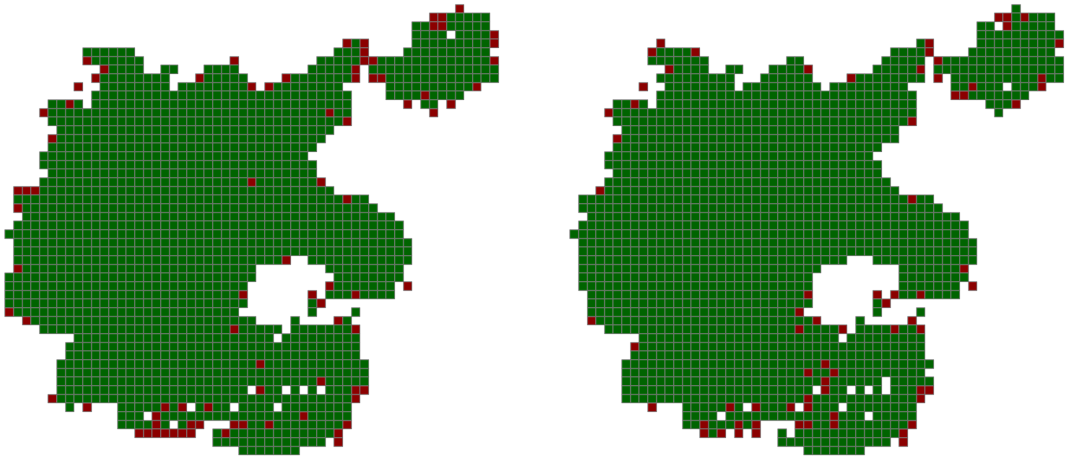
(a) Number of observations by cluster

(b) Shares by cluster

Figure D.24: Clustered protective norms

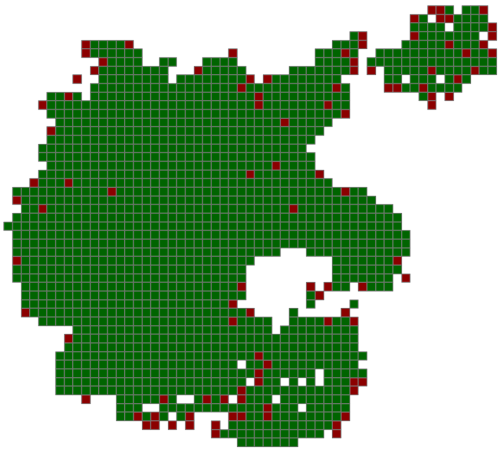
Notes: Clusters are obtained by agglomerative hierarchical clustering under connectivity constraints (four nearest neighbors). Number of clusters=9 + one disconnected component. Relative intra-group variability is defined as the summed intra-group variances scaled by the number of observations in each cluster and meaned across variables divided by the overall variances meaned across variables.

Appendix E Grid Cell Fixed Effects



(a) Questionnaire 2

(b) Questionnaire 4



(c) Questionnaire 2+4

Figure E.25: Points per grid cell by questionnaire 2

Notes: Red grid cells contain only one data point; green grid cells contain more than one data point. Sample restricted to villages included in questionnaires two or four in the German Reich, Austria, Saarland, Czechoslovakia, Liechtenstein, Gdansk, and Luxemburg. Luxemburg was no longer part of the sample in questionnaire 4. For display purposes we only display the border of the Czech part of Czechoslovakia.

Appendix F Communal Labor

Our communal labor variable aggregates different communal labor activities such as poultry, fruit and vegetable processing, flailing, and communal spinning. (Baruzzi-Leicher, 1959) points out that communal labor activities emphasize community building over the specific activity. We follow this claim and use communal labor activities as a proxy of within-community social ties instead of a more general measure of cooperativeness or another measure of cooperation norms. While we cannot check the validity of this approach for every communal labor activity, there is a large historical literature, in particular with respect to communal spinning, that supports it.

Communal spinning describes a regular gathering mostly in a common room provided by the community at which mostly women spun (Baruzzi-Leicher, 1959; Medick, 1980; Göstrich, 1986). It combined work with sociality. Communal spinning enabled the village youth to socialize without control by the married adults of the village. While socializing, such as communal spinning, that is not directly related to collective action has mainly been studied in the context of inter-group conflict, there is evidence from field experiments that working together does lead to the formation of social ties (e.g.: Feinberg et al., 2014, Fafchamps and Quinn, 2018). Compared to most field experiments and to other collective activities in our data set communal spinning allows us to isolate the relationship forming and information transmitting aspects of social interactions as opposed to the linking of several similar collective activities.

Further historical research reveals that especially the women taking part in communal spinning used it as an opportunity to form life-long friendships. During the winter primarily young women and girls of the village met after lunch at the home of a neighbor for communal spinning. The purpose of communal spinning was either to collect an endowment of laundry to be brought into a marriage or the industrial production of textiles in the workshop system (Shnyder, 1996; Medick, 1980). While spinning the women ate, drank coffee or less commonly brandy and sang, told folktales or talked about village affairs and formed relationships with the other participants (Göstrich, 1986; Frey, n.d.; Medick, 1980). One visible sign of these relationships was the custom that at a woman's marriage, the women she spun with contributed to her endowment. The villagers saw these contributions as a sign of the social exchange relationships she formed with the other women (Medick, 1980). Because community building was central to communal spinning the German words for

communal spinning, began to stand for communal village-level gatherings more generally, when the custom of communal spinning began to fizzle out (Medick, 1980). Communal spinning is also often described as one of the precursors of modern rural associations (e.g. Medick, 1980 pp.21 and Baruzzi-Leicher (1959)).

Appendix G Robustness Checks

Table G.10: Regressions of norm prevalence in different domain neighborhood help categories on determinants of social relationships.

	Dependent variable:							
	Death		Wedding		House Building		Birth/Sickness	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Heterogeneous	−0.066**	−0.091**	−0.046*	−0.062*	−0.165***	−0.186***	−0.039*	−0.034
	(0.033)	(0.037)	(0.026)	(0.031)	(0.034)	(0.026)	(0.020)	(0.022)
Villages Diff. Rel. 4NN	0.162***	0.087	0.165***	0.041	0.216***	0.074	0.024	0.072
	(0.046)	(0.059)	(0.054)	(0.065)	(0.073)	(0.078)	(0.051)	(0.066)
N. Communal Labor	0.068***	0.063***	0.078***	0.074***	0.084***	0.079***	0.023**	0.030***
	(0.014)	(0.013)	(0.011)	(0.010)	(0.013)	(0.008)	(0.010)	(0.010)
Majority Protestant	−0.003	−0.024	−0.085	0.062	0.020	0.099**	−0.028	0.057*
	(0.067)	(0.060)	(0.080)	(0.056)	(0.058)	(0.045)	(0.025)	(0.028)
Distance to Next City	0.086***	0.066**	0.089***	0.044**	0.108***	0.066**	0.032***	0.008
	(0.014)	(0.027)	(0.017)	(0.021)	(0.018)	(0.025)	(0.012)	(0.016)
Close to Border	−0.001***	−0.001	−0.001***	−0.002	0.0001	0.001	−0.001**	0.002
	(0.0004)	(0.002)	(0.0004)	(0.001)	(0.001)	(0.002)	(0.0002)	(0.001)
Grid FE		✓		✓		✓		✓
Province FE		✓		✓		✓		✓
Observations	13,213	13,213	13,177	13,177	13,237	13,237	13,123	13,123
Adjusted R^2	0.049	0.123	0.041	0.121	0.027	0.118	0.006	0.029

Notes: $^*p < 0.1$;$^{**}p < 0.05$,$^{***}p < 0.01$. Table displays OLS Estimates. Outcome variables have been standardized. We additionally have to exclude some regions in column (5)-(8), because the childbed norms are incomplete in this region as some of the data has been destroyed in the war (for more details see Appendix H). Grid cells have an area of 400km^2; province fixed effects account for the states and provinces (in case of Prussia) of the German Reich, Austria, Gdansk, Liechtenstein, and Czechoslovakia. Close to Border is an indicator variable that is one for the 5% of observation closest to the border. All specifications adjust for latitude and longitude and their interaction. Standard errors are clustered by a 400 km^2 grid and provinces/states.

Table G.11: Regressions of norm prevalence in on determinants of social relationships using alternative measure of between village religious heterogeneity.

	Dependent variable:					
	Norm Index			Unsegmented Neighborhood		
	(1)	(2)	(3)	(4)	(5)	(6)
Heterogeneous	-0.107^{***}	-0.091^{***}	-0.106^{***}	-0.035^{***}	-0.035^{***}	-0.026^{*}
	(0.029)	(0.031)	(0.019)	(0.012)	(0.011)	(0.015)
Deviation from Share of Protestants 4NN	0.269^{***}	0.292^{***}	0.107^{***}	0.038	0.054	-0.001
	(0.059)	(0.053)	(0.035)	(0.035)	(0.035)	(0.033)
N. Communal Labor	0.042^{***}	0.051^{***}	0.055^{***}	0.009^{*}	0.009^{*}	0.014^{***}
	(0.008)	(0.007)	(0.006)	(0.005)	(0.005)	(0.005)
Sample	Full	Full	Full	Nbh. Help > 0	Nbh. Help > 0	Nbh. Help > 0
Grid FE			✓			✓
Province FE			✓			✓
Observations	11,900	11,900	11,900	8,159	8,159	8,159
Adjusted R^2	0.013	0.030	0.158	0.002	0.005	0.035

Notes: $^{*}p < 0.1;^{**}p < 0.05,^{***}p < 0.01$. Table displays OLS Estimates. Outcome variables have been standardized. We additionally have to exclude some regions in column (5)-(8), because the childbed norms are incomplete in this region as some of the data has been destroyed in the war (for more details see Appendix H). Grid cells have an area of 400km^2; province fixed effects account for the states and provinces (in case of Prussia) of the German Reich, Austria, Gdansk, Liechtenstein, and Czechoslovakia. Close to Border is an indicator variable that is one for the 5% of observation closest to the border. All specifications adjust for latitude and longitude and their interaction. Standard errors are clustered by a 400 km^2 grid and provinces/states.

Appendix H Digitization

The anthropologists' drew their coding of the original material was drawn on maps (see Zehnder, 1958). The data used in this paper is created through digitizing these maps as well as the list of villages included in questionnaire 1 to 4 and matching these two. There is no official list of villages that are included in questionnaire 5.

Our digitization procedure went as follows. We first georeference the scanned maps and then vectorize the points on the maps. We then geocode the list of villages according to the customized geographic coordinate system used to draw the original maps. Third, we match the vectorized points to the geocoded list of villages.

The researchers of the GEA created their own coordinate system in which the map of Cental Europe was divided into a rectangular grid and each village was assigned a four to five part coordinate. The first coordinate divides the map into 287 large rectangles. The rectangles are displayed in Figure H.26 The second coordinate divides the large rectangles into 36 smaller rectangles, the third coordinate divides these smaller rectangles again into 25 small rectangles, and the fourth coordinate divides each of these 25 rectangles into another four rectangles indicated by letters a-d. The fifth coordinate is only assigned when two villages are directly next to each other, i.e. to ensure uniqueness. It is indicated by the letters l,r,o,u, where l is left, r is right, o is up, u is down. So an example coordinate is, thus, given by 105 2 25 al. The customized grid does not follow any standard coordinate system and we recreated this digitally using the description contained in official list of villages.

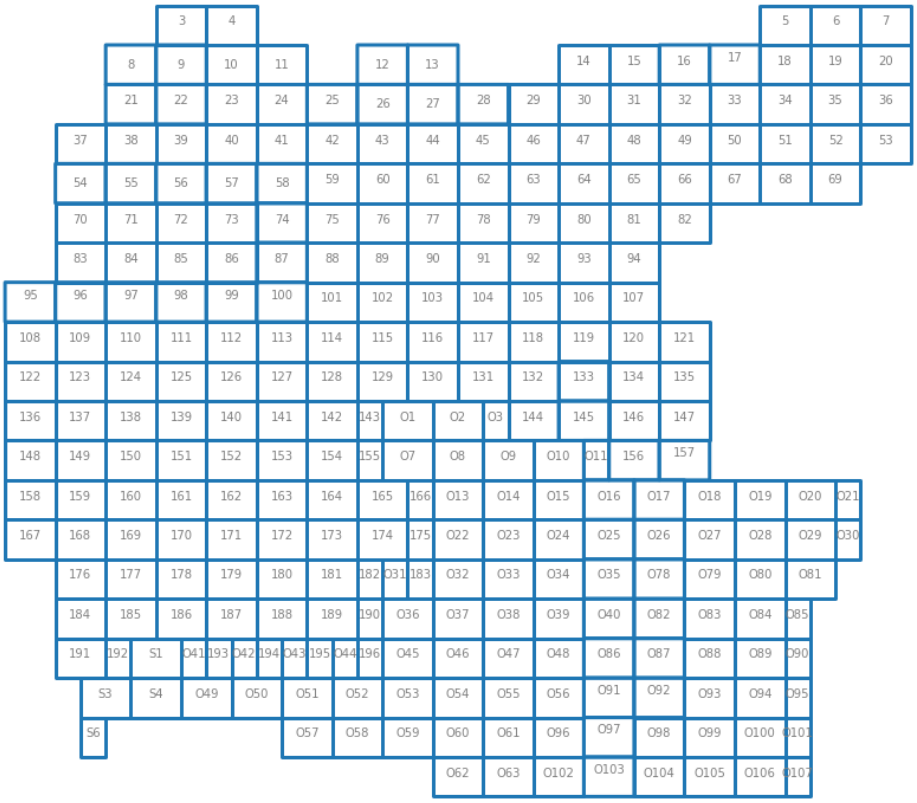


Figure H.26: Large rectangles

We match the vectorized data to the geocoded list of villages by assigning a vectorized point to the geocoded village closest to it. It is important to note that some points on the maps drawn by Zehnder (1958) cannot be assigned to any village contained in the list of villages. This may be due to two reasons. First, it may be that this is a drawing mistake, second it may be that the list of villages is incomplete. Here it is important to note that the list of villages is an old document that contains a lot of handwritten notes on top of the normal typed list. On top of the list of villages, however, there exist maps that contain all villages: basemaps by questionnaire drawn in the interwar period by Röhr and Harmjanz (1936), the map of religious denomination, as well as the map of the number of communal labor activities (for questionnaire 2). We call them *basemaps*. In case where we cannot assign a point to a village within a radius of at most 3km, we investigate whether the point

is contained on any of the basemaps. If yes, we add the point to the list of villages, if not we remove the point. The vast majority vectorized points (more than 90%) can be matched to a village less than 1 or 2 km away.

Women in Childbed

The answers to the question about rules for women in childbed are partly unreadable and destroyed by war. This affects answers within the rectangles 142, 144-147, 150-157 (Grober-Glück, 1966b). We, thus, drop these from our analysis when using this variable.