NATIONAL RESEARCH UNIVERSITY
HIGHER SCHOOL OF ECONOMICS

Maria Kravtsova, Aleksey Oshchepkov,
Christian Welzel

THE SHADOW OF THE FAMILY: HISTORICAL ROOTS OF SOCIAL CAPITAL IN EUROPE

BASIC RESEARCH PROGRAM

WORKING PAPERS

SERIES: SOCIOLOGY
WP BRP 82/SOC/2018

This Working Paper is an output of a research project implemented at the National Research University Higher School of Economics (HSE). Any opinions or claims contained in this Working Paper do not necessarily reflect the views of HSE

Maria Kravtsova [1], *Aleksey Oshchepkov*[2], *Christian Welzel*[3]

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This study provides new evidence on the impact of historic household formation patterns on present day levels of social capital (SC). We distinguish effects on bonding and bridging social capital, of which only the latter is beneficial for a society as a whole. Our results challenge the view that large household size in the past per se was responsible for institutional drawbacks of contemporary societies restricting social capital.

We unveil the true processes lying behind the idea that prevalence of nuclear households fostered institutional development, testing three mechanisms through which household size may influence social capital: (a) family size in terms of the number of household members; (b) the strength of loyalty bonds within the family, and (c) generational and gendered power hierarchies within the family.

Our hypotheses are explored on the basis of 26 European countries covered by the Life in Transition Survey (LiTs) in 2010. The contrast between Western and Eastern European countries in the LiTs provides a controlled environment that is free from the potentially confounding influence of European colonialism. We generate a new historical database using historical census data for 429 sub-national regions in 5 West European and 21 East European countries. Individual responses from the LiTs are attributed to the sub-national region in which the respondent lives. We find that power relations within the family have more essential consequences for contemporary values and attitudes than nuclearity/extendedness dimension. Within-family hierarchies revealed to be the strongest predictor of social capital today, indicating lower levels of bridging SC and higher level of corruption in form of monetary transfers or exchange of favors.

We suggest that within-family hierarchies in the past might have affected the contemporary level of SC provoking a longstanding commitment to authority within the society. This evidence is illustrated by the significant positive correlation between the historical index of within-family hierarchy and autocracy preference as measured on LiTs data. Societal commitment to authority rooted in historical family pattern might have prevented generalized trust formation and fostered vertical patron-client relations, favoritism and corruption.

Our results may drive further research from concentrating on family extendedness (nuclearity) as a predictor of the current state of modernization towards using more meaningful indicators of within-family hierarchies.

JEL: N33, J12.

Key words: historical family structure, social capital, bridging social capital, bonding social capital, corruption, modernization.

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[1] Laboratory for Comparative Social Research (LCSR), National Research University Higher School of Economics (HSE), Moscow, maria_krav@mail.ru

[2] Center for Labour Market Studies (CLMS) and Laboratory for Comparative Social Research (LCSR), National Research University Higher School of Economics (HSE), Moscow, aoshchepkov@hse.ru

[3] Leuphana University (Lueneburg), Laboratory for Comparative Social Research (LCSR), cwelzel@gmail.com

[4] The article was prepared within the framework of the Basic Research Program at the National Research University Higher School of Economics (HSE) and supported within the framework of a subsidy by the Russian Academic Excellence Project '5-100'. We are thankful to Ulf Brunnbauer, Gilles Duranton, Siegfried Gruber, Karl Kaser, Sebastian Kluesner, Vladimir Kozlow, Aleksandr Libman, Peter Öri, Levente Pakot and Franz Rothenbacher for their help with historical demographic data and useful comments on earlier versions of our paper.

"Family is the crystal of a society"

Victor Hugo (1802-1885)

Introduction

Ever since the onset of the Industrial Revolution, scholars struggle with the puzzle of why modernization progresses more rapidly in some countries than in others. As is well known, Western Europe, North America and Australia/New Zealand, as well as Japan, South Korea and Taiwan in East Asia, along with Uruguay and Chile in South America lead the world in all kinds of life quality and social well-being indicators, including life expectancy, GDP per capita, educational attainment, technological knowhow, governance quality, political stability, social trust, tolerance, happiness etc. As all "good things" come together entangled in a bundle, it is almost impossible to distinguish causes and consequences among these contemporary indicators.

A growing number of scholars address this problem by searching for deep historical roots of contemporary indicators of development (e.g., Acemoglu, Johnson & Robinson, 2001; Acemoglu & Robinson, 2012; Alesina, Giuliano & Nunn, 2013; Putnam, 1993; Welzel, 2013). Today this branch of research is rapidly expanding due to an increasing availability of historical data.

In this article, we investigate historical predictors of one of the essential ingredients of the entire modernization complex--social capital. The "capital" component in this term refers to an asset in the possession of an agent that s/he can use to reap some form of benefit; the "social" component denotes that the asset consists in the connections embedded in social networks and that the benefits are shared among the members of the network (Putnam, 1993; Portes, 1998; Bartolini et al., 2009; Griesshaber, Geys, 2012). An asset of particular importance in this context is interpersonal trust because trust facilitates cooperation among network members, thus elevating the network's collective action capacity and the number and quality of common goods proliferated within the network. To the extent to which interpersonal trust extends to people in general, the collective action/common good effects of trust transgress across specific networks, all the way into a society as a whole (Delhey, Newton, 2005; La Porta et al., 1997).

Our analyses follows the well-known distinction between "bridging" and "bonding" social capital (Paxton, 2002; Putnam, 2000). Bridging social capital means the often rather loose connections between individuals from different social groups who are dissimilar in their origin and background, while bonding social capital means the opposite: strong ties among members of the same group who share a similar origin and imprint. The literature is more or less consensual in that most scholars consider the presence of bonding social capital in families, local neighborhoods, at the workplace and in other social circles of a limited radius as a universal feature of any human society.

By contrast, societies differ greatly in the presence of bridging social capital, which is the decisive lubricant for the myriad of inter-human transactions that drive modernization, prosperity, democracy and impartial government (Delhey, Newton, Welzel, 2011; Welzel, Delhey, 2015). We operationalize bridging social capital as trust towards out-groups and participation in inclusive voluntary organizations which are characterized by a broader societal reach. As measures of bonding social capital we use in-group solidarity and its manifestation in an informal exchange of favors among in-group members.

Bridging social capital reflects the bright side of this concept as it is positively linked to economic development (see Knack and Kiefer, 1997 and a recent literature review by Algan and Cahuc, 2013), the persistence of democracy and governmental quality (Putnam, 1993; Paxton, 2002; Coffe and Geys, 2005).

Bonding social capital, by contrast, has at best ambiguous connotations. On the one hand, bonding social capital provides insurance to survive in harsh environments and more generally under pressing existential conditions (Harrison, 1985; Stack, 1974). Bonding social capital is also a substitute for universal institutions, most notably universal justice, policing and welfare systems (Portes, 1998). On the other hand, bonding social capital can be so dominant that it impedes the emergence of bridging social capital, in which case solidarity and cooperation remain limited to closely-knit in-groups of a narrow social radius. As a consequence, public goods remain under-developed and corruption fills the void as an alternative system to exchange goods and services (Banfield, 1958; Lipset, Lenz, 2000). Hence, while bridging social capital shifts societies into an upward-spiraling virtuous dynamic, bonding social capital entraps societies in vicious stagnation.

Given the centrality of social capital for development and well-being, we search for the deep historical roots of bridging and bonding social capital. We would like to add to the literature that links the countries' economic, political, and cultural traits of today to household organization principles that prevailed already in pre-industrial times (e.g., Duranton, Rodríguez-Pose & Sandall, 2009; Galasso & Profeta, 2012; Greif, 2006; Reher, 1998; Todd, 1990). Inspired by the pioneering work of Hajnal (1983), many scholars consider pre-industrial patterns of household/family extension (nuclearity) as a significant influence on present day societal functioning, from prosperity to democracy to good government (e.g., Duranton, Rodríguez-Pose & Sandall, 2009; Todd, 1990, Greif, 2006 a, b; Hartman, 2004). This literature infuses historic institutionalism with a fresh perspective. Until recently, historic institutionalism followed a one-sided top-down perspective in explaining contemporary development by pre-industrial institutional legacies, focusing narrowly on historic features of state formation (Bockstette et al. 2002). By bringing back in the household and the family as an institution, a bottom-up perspective amends the top-down perspective. This bottom-up part is

inherently plausible because the household and the family are the grassroots institution of any society. Higher-level institutional aggregations--from business corporations to voluntary associations to state bureaucracies—always began to evolve from here: the family as the society's cellular unit. Hence, Welzel at al. (2018) assume that the principles of family organization are transplanted into higher-ordered institutional contexts as these contexts begin to aggregate bottom-up. If, for instance, the principle of forging social alliances is mutual consent already in the family (i.e., consensual marriage), it is more likely that consent becomes the general principle for arrangements in higher-ordered institutions as well. If, however, people (especially teenage girls) are forced into marriage by parental arrangements, it is more likely that coercion becomes a society's general institutional principle. Thus, one can think of societies as being organized along axial principles that connect family structures at the bottom of societies with government structures at the top in a consistent manner: consensual family structures associate with democratic government structures; and patriarchal family structures ally with autocratic government structures.

Recent empirical findings corroborate this historical bottom-up perspective with increasingly compelling evidence. Specifically, scholars have shown that the patriarchal-vs-consensual organization of family patterns from pre-industrial times significantly influences prosperity, democracy and government quality today (Dilly 2015; Carmichael et al. 2016; Szoltysek, Poniat, 2018). We build on this work and extend it by looking at historic family effects on social capital as the common source of prosperity, democracy and government quality.

Our analyses of the role of historical family patterns focus on Europe for two reasons. One is the availability of comparable historic family data. The other is that Europe offers a controlled environment in which there is no potentially confounding influence of European colonialism, as there is in most other parts of the world. We analyze 26 countries included in the Life in Transition Survey (LiTs) conducted by the European Bank of reconstruction and development (EBRD) in 2010: 21 East European countries and 5 Western European countries (France, Germany, Italy, Sweden, and United Kingdom). We use multivariate regressions to explain various individual-level measures of social capital available in LiTs data by different indicators of historical household arrangements that existed in the region where these individuals live now. All historical family indicators that we use are derived either directly from national censuses of the end of the 19th century or from the census based projects (NAPP project, Mosaic project[5]). To match historical data and contemporary data we place contemporary localities (the lowest level of aggregation in LiTs) on the historical maps of European countries using their geographical coordinates.

[5] http://www.censusmosaic.org/, https://www.nappdata.org/napp/

Several features distinguish our study from previous research. First, to construct historical indicators we rely on national censuses which are the most accurate and comprehensive source of information. Second, our historical indicators are aggregated at the level of sub-national regions which makes more sense than nation-level aggregations due to historically shifting country boarders. Furthermore, regions offer a finer aggregate-level resolution between countries and individuals, thus providing a three-level design with individuals nested in regions and regions nested in countries. Third, unlike many previous studies that focused mostly on Western Europe and relied on the family classification by Todd (1990), we include a large group of Eastern European countries, among them the republics of the former Soviet Union. The inclusion of these countries adds more heterogeneity to the West European sample in historical family patterns and social capital that makes our results more robust, apart from giving them a broader empirical scope. Besides, East European societies provide an ideal laboratory to study informal manifestations of social capital as they exhibit relatively high levels of corruption and possess strong informal social networks (Kravtsova & Oshchepkov, 2015; Ledeneva, 1998; Sandholtz & Taagepera, 2005), which are deeply rooted in the culture and penetrate all levels of state bureaucracy.

Our results suggest that it is first and foremost the hierarchical character of extended family traditions that accounts for their negative effect on bridging social capital. Generational and gender hierarchies within the family (1) decrease the level of bridging social capital and (2) increase the negative effects of bonding social capital. Other characteristics of extended families, like their self-sufficiency or their strong loyalty norms, show no negative effect on bridging SC.

Our article is organized as follows. First of all, we present our theoretical ideas about why historical family patterns might influence contemporary processes. In the second section we review the historical demography literature on household formation systems in different parts of Europe. We also discuss results of previous empirical studies that link historical family indicators to the countries' economic outcomes and institutions at present. Finally, we review existing mechanisms why historical family structures might have an impact on social capital and formulate our hypotheses. In the third section, we describe our data and methodology. In the fourth section, we present our empirical findings. In conclusion, we discuss the possible implications and limitations of our study.

Why do historical family organization principles still matter today?

As noted by Alesina and Giuliano (2014: 183), "…Many authors have stressed the relevance of the historical origins of modernization but a still unanswered question is how differences in historical experiences are perpetuated till today". This general assertion is also true for the case of historical

family organization and its effects on modern development. Based on previous research, we outline three main groups of possible explanations for the statistically significant correlation between historical family indicators and contemporary variables.

The most straightforward explanation relies on the inherent persistence of geographical family patterns. While household formation principles may have changed in time within countries, differences between countries remained similar to the differences that existed in the past (e.g., Reher, 1998; Wall, 1983). And if we assume that household organization rules and customs affected societal institutions and values in the past, then we should expect that a similar influence exists at present. In other words, the statistically significant correlation of contemporary institutions or values with historical family systems may reflect a strong correlation between historical and modern family structures.

The second explanation relies on the inherent stickiness and slow evolution of values and cultural beliefs. Values, and especially traditional family values, "are likely to be transmitted vertically from one generation to the next, to a large degree within the family, rather than horizontally across unrelated individuals" (Alesina & Giuliano, 2014: 185). There are numerous theoretical (e.g., Guiso, Sapienza & Zingales, 2008; Tabellini, 2010) or empirical (e.g., Albanese, De Blasio & Sestito, 2016) studies on the intergenerational transmission of values. In the same vein, many authors show that the values of the children of immigrants are strongly correlated with cultural traits of the countries of origin of their parents (e.g., Alesina, Giuliano & Nunn, 2013; Alesina & Giuliano, 2014; Alesina et al., 2015).

The third explanation which extends the second one is based on the plausible assumption that cultural beliefs and societal values provoked by different family systems are often complemented by laws and societal institutions, which, in turn, support and reinforce those beliefs and values. The literature provides many examples to confirm this presumption, and we mention only three of them. First, the early leaving of the parental household and late marriage custom generated labor supply for manufacturing and service sectors (e.g., as was in France, see Todd, 1991), and the growth of these sectors, in turn, allowed young adults to earn money and live independently from their parents. Second, the earlier introduction of institutionalized elderly and child care systems in societies with weak family ties (Galasso & Profeta, 2011) prevented a possible strengthening of these ties. Third, nuclear family structures were conducive to the development of multiple corporations which, in turn, provided the safety nets and public goods that supported nuclear families and made them more competitive with kinship groups (Greif, 2006). It is clear that these explanations are not mutually exclusive. Moreover, none of them seem to be dominant and more convincing than the others.

Literature review

The existing knowledge on the effect of historical family pattern on contemporary institutions

Empirical studies that link family with economic development and institutions can be divided into two groups. One group examines how modern family ties and values are related to the countries' modern economic development and institutions. Although these studies do no focus on historical family organization principles, they explicitly assume that modern family ties/values have long historical roots and have not been established by modern institutions. The main findings are that strong family ties are negatively linked to political participation and generalized trust (Alesina, Giuliano, 2011), female and youth labor force participation (Alesina, Giuliano, 2010) and are positively associated with stronger demand for labor market regulation (Alesina, Algan, Cahuc & Giuliano,2015). Alesina & Giuliano (2014) provide an encompassing review of similar studies.

The other group of studies is focusing on historical family patterns per se. These studies analyze the legacy left by historical family patterns for modern economic development and institutions. They demonstrate correlations between historical family indicators and modern variables. These results are used, inter alia, in the first group of studies to argue that family ties/values are very persistent over time. As our project belongs to the second group of studies, we discuss a selection of works from the this group in some detail.

The natural starting point for the literature review is the work by Todd (1990) whose results were used in many subsequent studies. Todd's contribution is threefold. First, he proposed a concise classification of family structures and placed them on the political map. His classification was based on such features as extendedness of the family and inheritance type. The second contribution of Todd was to argue that family structures in many countries remained similar to those existing in Middle Ages. Therefore, he provided arguments in favor of the strong time persistence of geographical family patterns, which was widely used in subsequent research in economics and political economy (but massively criticized among historical demographers). Third, Todd linked family structures with the timing and speed of the Industrial Revolution and the current economic development of Western European regions and countries.

Duranton, Rodríguez-Pose and Sandall (2009) refined Todd's third contribution. They digitized Todd's map of different family structures and overlaid it with the map of NUTS III European regions. This allowed to match historic family structures with many regional socioeconomic indicators and to apply more rigorous statistical analyses to examine possible links between them. The authors found statistically significant correlations between Todd's types of family

organization and regional disparities in household size, educational attainment, social capital, labour force participation, industrial structure of the economy, wealth, and inequality.

Galasso and Profeta (2011) and Costa-Font (2010) argue that family organization affects the design of modern social security systems. Using Todd's (1990) classification of family structures, Galasso and Profeta (2011) show that countries with weaker families and family ties (primarily those with absolute nuclear family type) tend to introduce less comprehensive and generous pension systems (e.g., with lower replacement rates) than countries with stronger family ties. In general, the authors suggest that new-born economic institutions tend to adapt their organizational principles from within-family relationships. The results of Costa-Font (2010), however, support the opposite intuition: welfare institutions intended to substitute family relationships develop worse in cultures where family ties are stronger. The author shows that stronger family ties impede the development of insurance for long-term care for elderly as they assume stronger children's obligations for care of their parents. The exceptionally generous welfare regimes of the Scandinavian countries, in contrast to the weak welfare states in the Mediterranean countries, make this point of view appear more plausible: family ties are much stronger in the South than in the North.

Besides cross-country comparisons, there are also studies that explore variations in family structures within one country and link this variation to the regional differences in economic and political outcomes and institutions. In this regard, the most studied country is, probably, Italy. For instance, Percoco (2015) finds that a family structure characterized by weaker family ties tends to reduce the negative impact of land concentration on entrepreneurship. Bertocchi and Bozzano (2016) illustrate the links between historic family structures and a set of socio-economic outcomes, in the short, medium, and long run.

There are also studies that do not consider family organization as a whole but rather focus on its specific aspects. The 'EMP literature' considers the so-called European Marriage Pattern (late marriage and high rate of celibacy, see Hajnal, 1965) and its positive role in the economic and institutional development of North-Western Europe. For instance, Foreman-Peck (2011) argues that the later marriages of women in North-Western Europe allowed them to accumulate more human capital as well as to give better education to their children, which increased the overall stock of human capital and contributed to the economic development of the region. In the same vein, scholars have shown that late marriages strengthened women's position and provoked economic growth (Carmichael et al., 2016; Pleit et al., 2016). These literatures stress the idea that development stalls when gender inequality condemns half of humankind not to work for pay, to innovate and to take important decisions. Improving gender equality, by contrast, means an increased number of economic agents who foster economic development.

A better position of women may also result in "smarter" political regulation and reduced corruption (Dollar et al., 2001). Gender equality and lack of dominance of older generations over younger ones are also conducive to democracy (Dilly, 2016). This finding is based on the idea that, when there is no power hierarchy within the family, people are less prone to accept authoritarian political regimes as a natural way of government.

Despite of this large literature, it is not yet clear if the European family system and marriage pattern were indeed an engine of development. Several studies would answer this question positively (Todd, 1990; Duranton, 2009; Foreman-Peck; 2011; Carmichael et al.,2016; Pleit et al., 2016; Greif, 2006), while other studies cast some doubts on this evidence (Dennison, Ogilvie, 2014; Bertocchi & Bozzano, 2016). Dennison and Ogilvie (2014), for instance, have shown that the most extreme manifestations of the EMP were associated with economic stagnation rather than growth. Bertocchi and Bozzano (2016) didn't find any effect of female age at marriage on income per capita within Italy. Moreover, they find a negative effect of nuclear family patterns on territorial wealth and labor force participation. Their results go in line with Silverman's (1968) qualitative analysis, which illustrates that the more economically and socially advanced central Italy had extended families while in backward Southern Italy nuclear families were prevailing[6].

These contradictory results might be due to different historical data used in the analysis[7] or different coverage areas. We are going to add to this discussion using the most reliable census data and coverage of West European as well as East European countries.

Family extension and social capital: hypotheses

Historically, families differed considerably in their size and structure, with the distinction between nuclear and extended families being one of the key features. In the nuclear family setting, the household consists of just the two spouses and their children, whose number was often smaller than in extended families. In the extended family setting, three and more generations (including grand-parents) as well as lateral relatives (aunts, uncles, cousins) live in the same household.

Family extendedness/nuclearity was associated with the need of additional hands that is typically common for agricultural societies (see Alesina and Guliano, 2014 for the review of anthropological literature; Murdock, 1949; Nimkoff, Middleton, 1960), lack of security in remote mountainous regions where the central state failed to fulfill its monopoly on violence (Kaser 2002, p.386, Brunnbauer, 2003), regulation by the landlords (Mitterauer, 1996 ; Kaser, 2012; Kaser, 2001;

[6] In the most advanced Northern Italy stem families and egalitarian nuclear families (the same family type as in the Southern Italy) were prevailing (see the map in Duranton, 2009).

[7] Scholars who find a positive relation between European marriage pattern and family system use Todd's (1990) data, while their opponents use different data sources.

Kaser, 2002; Kaser, 1996; Silverman, 1968) or village communities (Kaser, 2001), influence of Catholic Church (Greif, 2006).

Extended and nuclear families differ structurally and culturally. Structurally, extended families include more individuals than nuclear families. The more numerous the kin group is, the stronger should be the integration pressures that assure group discipline and cohesion. These structural differences generate corresponding cultural differences between extended and nuclear families.

Polanyi (1957) suggested three types of group integrators: reciprocity, redistribution and exchange. As exchange means exchange of goods at the free market it can't be applied to the family life and thus it can't be used for our purposes. In contrast reciprocity and redistribution are two important integrators of the family.

Reciprocity implies exchange of gifts or favors between family members in such a manner that every favor must be reciprocated also when time and form of this reciprocation are not specified. Redistribution is an attribute of hierarchical relations within the family when all resources are accumulated by the household head and will be redistributed at his discretion.

Considering that extended families face stronger integrational problems than nuclear families we can assume that the former might have stronger reciprocity norms and a stronger commitment to hierarchy. The difference between nuclear and extended families at the structural and at the cultural level might be crucial for the formation of bridging and bonding SC.

Mechanism 1:

Household size reflects a subsistence system's labor demands. Extended households often represented almost all-sufficient "production units" and, at the same time, "social cells" that tended to fulfill all needs of their members, including child and elderly care using their own internal capacities (Hartman, 2004). In contrast, small and more vulnerable nuclear households often had to connect with outsiders to satisfy their economic and physical needs and to ensure child and elderly care. A greater need for voluntary cooperation with non-kin might stimulate the creation of bridging SC in the past which could survive until present, through well-established mechanisms of inter-generational transmission, which are a quintessential element of family functioning.

Similar ideas were proposed by Greif (2006). He points out that extended families slowed down the processes of corporation formation. Corporations such as monasteries, fraternities or insurance guilds and other forms of voluntary associations accomplished almost the same functions as extended families, as social safety nets against famine, unemployment and disability. Consequently, in territories with extended families there was less need for corporations and

associations, which hindered institutional development beyond the confines of the extended family. Bridging SC was not necessary under such circumstances, so no agent engaged in its creation.

Self-sufficient extended families also had no need to hire servants, which was a common practice among nuclear families. Since servants are non-kin from other families, getting used to cooperate with them might have contributed to generate bridging social capital in territories with prevailing nuclear families.

Thus we can identify a first mechanism: extended families lead to reduced contacts with outsiders and consequently to a lower level of bridging SC in the past and in present. Formal hypotheses:

H1.1: Family size is negatively linked with bridging SC.

H1.2: The number of servants is positively linked with bridging SC.

Mechanism 2:

Extended families might enculture stronger reciprocity norms because they have a bigger need for integration. Extended families by definition include more people, which requires strong reciprocity norms in order to assure that no member free-rides on the others' contributions to the group. Also, extended families require cross-generational cooperation in child care and elderly care, which is another function that requires strong reciprocity norms.

Reciprocity norms imply feelings of obligation, loyalty and a form of solidarity that is highly selective in its strict limitation towards one's own kin. These norms might favor negative phenomena associated with bonding SC, like corruption or the use of personal connections to get some benefits. So we can formulate a second mechanism: extended families might breed stronger reciprocity norms which nurture bonding SC. Formal hypothesis:

H2: Reciprocity norms in the past are positively correlated with bonding SC today.

Mechanism 3:

Hierarchical relations within the family might dampen bridging SC. By hierarchical relations we mean the dominance of older generations over younger and of men over women. Hierarchy within the family might be transmitted into the hierarchy within the society. A vertically ordered society is detrimental for horizontal ties, as most people are awaiting orders from above before they associate with peers beyond the family circle to cooperate for the common good (Putnam, 1993).

Simultaneously, authoritarian family relations might support bribery and clientelistic practices as these phenomena are indispensable without commitment to power hierarchy. The mechanism at work is the following: extended families tend to be more hierarchically ordered because hierarchy is

needed for their integration. Commitment to hierarchy is detrimental for bridging SC and creates favorable conditions for bonding SC. Hypotheses:

H3.1: Hierarchy within historical family stuctures is negatively related with bridging SC today.

H3.2: Hierarchy within historical family structures is positively related with bonding SC today.

Additionally we test the mechanism of transmission of hierarchy within historical family into commitment to hierarchy within the contemporary societies.

H3.3: Hierarchy within historical family structures is positively associated with autocracy preference today.

Data

Contemporary data

As the primary source of contemporary data, we use the Life in Transition Survey (LiTs), conducted by the European Bank of Reconstruction and Development (EBRD) in all post-communist countries in 2006 and 2010. This survey covers 17 countries of Central, Eastern and South-Eastern Europe and 13 CIS countries. We use data from the 2010 round as it contains different questions that allow to measure various components of social capital. The 2010 round also includes for comparative purposes 5 Western European countries: France, Germany, Italy, Sweden, and the United Kingdom. The samples for each country are representative. The total LiTs sample counts about 38,000 individuals. All micro-data are freely available at the official web-site (http://www.ebrd.com/news/publications/special-reports/life-in-transition-survey-ii.html).

BRIDGING SC

To measure *bridging SC* we use out-group trust index (Welzel, 2010; Delhey et al., 2011). We sum up the scores of the following three items: 1) trust people you meet for the first time; 2) trust people of another religion; 3) trust people of another nationality.

As a robustness check we imply another widely used measure of social trust, namely generalized trust. It is captured by the question: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?" An alternative measure of bridging SC used as a robustness check as well is participation in inclusive voluntary organizations (Putnam, 1993; Griesshaber, Geys, 2012; Knack & Keefer 1997; Zmerli 2003). Inclusive voluntary organizations are organizations with a broader societal focus that reach across the boundaries of the organization: sport and recreational organizations; art, music and educational organizations; environmental organizations and humanitarian or charitable organizations. We construct a composite index of participation in these organizations.

BONDING SC

To measure *bonding SC* we construct an indicator of "in-group solidarity" which includes in-group trust and frequency of contacts with relatives and friends. We sum up the following items to obtain an in-group trust measure (Delhey et al., 2011): 1) trust family 2) trust neighborhood 3) trust friends and acquaintances. Then we draw a principal component from in-group trust and meeting with relatives and friends.

INFORMAL MANIFESTATIONS OF BONDING SC

To measure corruption we use "bribery justification" question. As a measure of readiness to use connections network we use perceived importance to use social connections to influence decisions in one's favor.

AUTOCRACY PREFERENCE

We measure autocracy preference drawing principal component from two items: 1) individual preference for political liberties vs. economic growth 2) individual preference democracy vs autocracy.

CHARACTERISTICS OF INDIVIDUAL'S FAMILY

We construct indicators of the respondent's family that measure the degree of its hierarchical order. We use them in our analysis to test whether the impact of historical family on social capital today is mediated by contemporary family characteristics.

Co-residence with the adult children=1 if in respondent's family there are adults (21+ years old) who have a status of child.

Age difference between husband and wife measures the difference in age between two spouses in respondent's household.

Female household head = 1 if in respondent's household the household head is female and if her husband is not household head.

Historical data

As we are not aware of a unique historical dataset suitable for the goals of our study, we collect our own data deriving information from several different sources. The primary source of information are national historical censuses. For many countries, we collect data by ourselves from country specific sources (e.g., France, Germany, Italy, Serbia, Hungary (partly), Czech Republic, Russia, Ukraine, Belarus). For some countries (e.g., United Kingdom and Sweden), we rely on data from the North Atlantic Population Project (NAPP, www.nappdata.org). For other countries (e.g., Albania, Poland, Ukraine, Belarus, Slovakia, Slovenia, Croatia, Bulgaria, Hungary (partly), Romania), we rely on data from the Mosaic project (http://censusmosaic.org) coordinated by the Max Plank

Institute for Demographic Research. Most data refer to the 19th century, while some even refer as far back as the 17th-18th centuries. Among our total of 26 contemporary countries, data are collected for sub-national regions or administrative districts, as defined in the respective historical censuses. Different variables are available for different number of sub-national regions: the maximum number of regions is 429 and the minimum number is 152. The further restriction of our study is that not all historical regions for which data are available are represented in the LiT. When we merge our historical and contemporary data we are left with a maximum of 293 regions and a minimum of 93 regions that we can match with individual responses from the LiT survey.

For our analysis we use three types of samples: small, medium and large. We choose this design because we have a maximum number of indicators for the small sample and, vice versa, a minimum number of indicators for the large sample. We use three samples in order not to lose valuable information and to check the robustness of our results on larger samples. Table 1 provides a complete sample description, Tables A1 and A2 contain information about the sources and periods of observation for all the variables available.

We construct a list of historical indicators that describe as fully as possible the relevant historical family arrangements. We borrow some indicators from Gruber and Szoltysek's (2016) patriarchy index (these indicators are marked with *(G)*).

1) *Mean hh size*: Mean family household size (one-person households are excluded[8], servants are included). This is the most vague measure of family extension which is available for the most regions.
2) *Kin group size*: Mean adult kin group size (one person households are excluded, servants and other non-relatives are excluded, small children 0-14 are excluded). Mean adult kin group size is a better indicator of a household's self-sufficiency because adult persons are more active as a labor force. As we are also interested in values like obligation for mutual help and reciprocity, which exist between relatives, we exclude from this indicator the representatives of non-kin group.
3) *Lateral relatives*: Percent of households which contain lateral relatives and don't contain married sons. It is a measure which enables to distinguish extended households (lateral relatives) from multiple households (multi-generational households).
4) *Single hh*: Percent of single households.

[8] We follow Franz Rothenbacher's (2013) approach to measure mean family household size and the number of single households separately. Considering the fact that large family households may coexist with a large number of single households it seems to be a more appropriate approach than computing mean household size from both types of households.

5) *MUH* (marital units per household): It is a measure of household extension controlling for the number of children and can be constructed on the base of most censuses. MUH was introduced by Burch (1970), Parish and Schwarz (1972) and now it is relatively often used for the analysis of census data. It is calculated according to the formula: (number of married men + number of widowed or divorced men + number of widowed or divorced women) / number of households. MUH equals 1 when all families are nuclear and every marital unit lives separately.
6) *hh adult children*: Percent of households containing individuals over 20 in status of children. It is a measure of generational hierarchy within the household.
7) *hh married son*: Percent of households containing married sons, who are not household heads. It is a measure of patrilocality which mirrors intergenerational hierarchy.
8) *Neolocality (G)*: Percent of household heads 20-29 living only with spouse and children (Gruber, Szoltysek, 2016). This indicator measures neolocality.
9) *Son hh head*: Percent of households where the older and the younger generation live together and the representative of the younger generation has the status of household head. This is a measure of the dependent status of elderly.
10) *Son hh head (G)* : Percent of elderly men 65+ living in a HH headed by a man of younger generation (Gruber, Szoltysek, 2016). This is an alternative measure of the dependent status of elderly.
11) *Female hh heads(G)* (Gruber, Szoltysek, 2016): Percent of female household heads. Emancipation of women.
12) *Young brides(G)* (Gruber, Szoltysek, 2016): Percent of married women 15-19. Dependent status of women. The idea behind it is that when women gets married early she is more likely to obey her husband (Hartmann, 2004). There is a significant difference between situations in which a woman gets married as a teenager by her parents and situations in which a woman marries as an adult based on her own agreement. In the latter case, women are adult individuals with matured attitudes, self-confidence and often some financial endowment earned during years of working for wages. In the latter case, gender relations within the family tend to be more equal.
13) *Women20_29*: Percent of single women in the age group 20-29. It is an alternative measure of age at first marriage and it is a proxy for women's emancipation.
14) *Wives older(G)* (Gruber, Szoltysek, 2016): Percent of wives who are older than their husbands. It is a measure of women's emancipation because when wife is older than her husband she is less likely to obey.

15) *Female non kin (G)* (Gruber, Szoltysek, 2016): Percent of women 20-34 who live in the household as non-kin. It is an indicator of women's emancipation. In a patriarchal society a young women can live either with her father or with her husband.
16) *Servants1*: Mean number of servants per household.
17) *Servants2* Percent of households having servants.
18) *Literacy*: Percent of literate people 6+, Percentage of brides and grooms making marks.

Methodology

Matching historical and present data

The essential problem with linking regional historical indicators with contemporary variables is that the borders of countries and especially the borders of regions within countries have been changing in time. It is particularly problematic if we want to match some historical indicators with indicators for the end of 20th century for European regions, as two World Wars induced numerous state border revisions. To solve this problem, we place contemporary localities (the lowest level of aggregation available in LiTs) on the historical maps of European countries using their geographical coordinates. One technical moment here is that the administrative division of the county used in historical shape files is not always the same as in national historical censuses. In such cases, we match regions manually based on their names.

Measures

Family hierarchy

Formative indexes

We construct formative indexes, where items are combined based on their substantial meaning, rather than their statistical correlation. A formative index implies that all items adding substantially to a measured concept independently from their correlations could be combined to one composite measure (read more about formative indexes Coltman et al., 2008). Constructing PCA indexes we had to skip several items because of their imperfect correlation with the other items. Formative indexes allow us to keep this valuable information. Moreover in contrast to PCA, formative logic enables to construct one general index combining gender and intergenerational hierarchy. We use the following formulas:

Gender hierarchy*=Female hh heads(G) + Young brides(G) + Wives older(G) + Female non kin (G)* + women20_29

Intergenerational hierarchy*= hh adult children + hh married son + Neolocality (G) + Son hh head + Son hh head (G)* + MUH

Hierarchy= Gender hierarchy + Intergenerational hierarchy

Principal component analysis

Family hierarchy indexes derived from PCA will be used for the robustness check. In order to obtain a condensed pattern of historical family structures, we use a principal components analysis (PCA) as a data reduction method. We run PCA over the following items: *hh adult children, hh married son, Female hh heads(G), Young brides(G), Wives older(G), Female non kin (G), Neolocality (G), women20_29*. We use promax oblique rotation which allows factors to be correlated. Doing so we receive two factors: women obedience and younger obedience (see Table A3 for rotated factor loadings).

Correlation hierarchy indexes

We test the correlation of gender hierarchy (women obedience) and intergenerational hierarchy (younger obedience). The correlation coefficient between the formative indexes is 0.4*** while PCA indexes are correlated at 0.2**. Lack of high correlation between two types of family hierarchy suggests that we need both measures to capture power relations within the family.

Household size and reciprocity

We use mean family household size (*Mean hh size*), mean adult kin group (*Kin group size*) and horizontal or lateral household extension (*Lateral relatives*) as the measures of household extension. As a proxy for reciprocity we use the same indicators of household extension controlled for family hierarchy. Inserting power hierarchy as a control we may capture the degree of reciprocity within the household.

Modeling

As our data have a hierarchical structure we use Multilevel Modeling (MLM) technic. We estimate a 3 level model where Level 1 refers to individuals, Level 2 to historical regions and Level 3 to contemporary countries. The specifications of our model vary according to the sample type. We use the small sample for the main results and large (medium) samples for robustness checks.

The equation for the small sample is (full model):

$$SC_{ijk} = \gamma_{000} + \gamma_{010}*\textbf{mean hh size}_{jk} + \gamma_{020}*\textbf{single hh}_{jk} + \gamma_{030}*\textbf{servants}_{jk} + \gamma_{040}*\textbf{HIERARCHY IND}_{jk} + \gamma_{100}*AGE_{ijk} + \gamma_{200}*SEX_{ijk} + \gamma_{300}*EDUC_{ijk} + \gamma_{400}*MARRIED_{ijk} + \gamma_{500}*INCOME_{ijk} + \gamma_{600}*URBAN_{ijk} + r_{0jk} + u_{00k} + e_{ijk}$$

Equation for the large sample is:

$$SC_{ijk} = \gamma_{000} + \gamma_{010}*\textbf{mean hh size}_{jk} + \gamma_{020}*\textbf{single hh}_{jk} + \gamma_{030}*\textbf{women 20-29}_{jk} + \gamma_{100}*AGE_{ijk} + \gamma_{200}*SEX_{ijk} + \gamma_{300}*EDUC_{ijk} + \gamma_{400}*MARRIED_{ijk} + \gamma_{500}*INCOME_{ijk} + \gamma_{600}*URBAN_{ijk} + r_{0jk} + u_{00k} + e_{ijk}$$

Equation for the medium sample is:

$$SC_{ijk} = \gamma_{000} + \gamma_{010}*\textbf{mean hh size}_{jk} + \gamma_{020}*\textbf{single hh}_{jk} + \gamma_{030}*\textbf{servants}_{jk} + \gamma_{040}*\textbf{women 20-29}_{jk} + \gamma_{100}*AGE_{ijk} + \gamma_{200}*SEX_{ijk} + \gamma_{300}*EDUC_{ijk} + \gamma_{400}*MARRIED_{ijk} + \gamma_{500}*INCOME_{ijk} + \gamma_{600}*URBAN_{ijk} + r_{0jk} + u_{00k} + e_{ij}$$

SC are different measures of bridging SC, bonding SC and its informal manifestations.
HH SIZE: In our main specification we use mean family household size (mean hh size) that is available for the maximum number of observations for all 3 types of samples. As robustness check on the small sample we use mean adult kin group (*Kin group size*) and mean number of lateral relatives per household (*Lateral relatives*) as a measure of horizontal household extension (read more about our historical indicators in the data section).
SERVANTS: this indicator is available only for the small and medium sample. We use for the small sample mean number of servants per household (*servants1*), for the medium sample percent of households having servants (*servants2*). It enables to keep the maximum number of observations.

HIERARCHY IND: formative indexes: intergenerational hierarchy, gender hierarchy indexes; as a robustness check PCA indexes: women obedience and younger obedience. These indexes are available only for the small sample.

WOMEN 20-29: we use this indicator as a proxy for hierarchy on the medium and large samples where hierarchy indexes are not available.

Differences between contemporary countries are captured by the u-term at the level 3.

When testing H3.3 considering the role of autocracy preference in mediating the effect of hierarchy within historical family structures on the level of SC today we use the same model specifications implying "autocracy preference" as a dependent variable.

Controls

We use as a control variable historical literacy rates. We include this control firstly as a proxy for economic development which is available at the regional level. It is important to control for economic development because it is highly correlated with social capital (ex. Knack and Kiefer, 1997). It might be the case that more affluent territories had higher level of out-group trust in the past which survived until present. Therefore we might observe a positive correlation between historical economic development and the present day level of SC.

Secondly historical indicators of education were found to predict the present day level of corruption (Uslaner, Rothstein, 2016). Corruption is one of our dependent variables associated with bonding SC which is an additional argument for including literacy rates in our model as a control variable.

Including literacy rates as a control variable causes additional curtail in our samples. The small sample decreases from 93 to 62 observations at the level 2 and includes Croatia, Hungary, Romania, Slovenia, France, Great Britain. The medium sample shortens from 166 to 135 historical regions and covers 2 West European and 18 East European countries. The large sample drops from 293 to 241 and contains 4 West European and 21 East European countries.

Descriptive data analysis

Correlations between historical family indicators

The correlation between historical family indicators follows the pattern predicted by Hajnal (1983). Regions with higher percentage of never married women in the age 20-29 are, at the same time, regions with a higher percentage of 1-men households, a lower household size and a more use of servants' labor.

Plotting on a map household size and age at first marriage (women20_29) (Figures A1, A2) we clearly see that to the right from the Hajnal line households were larger and age at first marriage was lower. However to the left from the Hajnal line we could not find a clear pattern as our data show a large degree of heterogeneity.

The correlation between HH size and family hierarchy indicators is not perfect ranging from 0.15 to 0.53 (Table A4). This suggests that these two indicators should not be used interchangeably. When our regression results will show that the mechanism which goes through HH size is stronger

than the mechanism based on family hierarchy then it is more appropriate to use HH size as a predictor of contemporary social capital in future research. When we get the opposite result the measure of family hierarchy would be a better predictor.

Empirical results from multilevel regression analysis

We start this section with the most considerable findings concerning the impact of hierarchy within historical family structures. As we see from the Table 2 hierarchy has a negative effect on bridging SC which goes in line with the hypothesis H3.1 (See Figure 1 for the graphical view of this relationship). Our result corresponds with Alesina, Giuliano (2011) who suggested that generalized trust is negatively associated with strong family ties. Their operationalization of strong family ties captures first of all some sort of vertical relations within the family based on parents care in response to children's loyalty. Substantially this measure of strong family ties is very close to our family hierarchy measure. Our result is also in line with Alexander (2018) who finds a positive correlation between gender hierarchy and generalized trust.

Hypothesis H3.2 is only partly verified. Hierarchy does affect positively using connections and corruption but it influences negatively bonding SC itself. The former result mirrors previous findings at the aggregated level that gender hierarchy lowers the level of the rule of law (Alexander, 2018). The latter finding might stem from the evidence that in and out-group trust are linked positively to each other (Welzel, Delhey, 2015)[9].

Hypothesis H3.3 concerning the transmission of commitment to hierarchy within the family into commitment to hierarchy within the contemporary society is verified. Historical family hierarchy indicators are positively associated with autocracy preference today (Table 3). Inclusion of autocracy preference in the main regression equation lowers the effects of historical family hierarchy indicators (Table A6) Substantially it means that commitment to hierarchy within the society proxied with autocracy preference mediates the link between hierarchical structure of historical family and social capital today. But it is only one of the possible channels. To test additional channels we include in our main model characteristics of immediate family of individuals surveyed in LITS (2010). The results presented in (Table A7) are rather inconclusive. The mediating role of the present day family structures should be tested in further research with more fitting for this scope research design.

Our analysis doesn't show support for hypothesis H1.1. We don't find a negative correlation between household extendedness and bridging SC. Probably large number of household members does not always result in self-sufficiency of the household because even extended families may perceive need in additional hands when the land plots are very large or when they cultivate labor

[9] Simple correlations for the main result (Hypothesis H3.1 and H3.2) are presented in a graphical form in Figure A3.

intensive crops. Moreover our findings suggest that when controlled for hierarchical relations within the family household size is positively associated with bridging SC. One of the possible explanations might be that increased number of household members means extension of the circle of people who are defined as "close" relatives that is followed by the extension of trust radius. This explanation echoes the results provided by Silverman (1968) and Banfield (1958) who have shown that people from the Southern Italy who live in nuclear families trust nobody except of their small immediate family. In contrast in Central Italy, dominated by extended families, people are more ready to trust and cooperate not only with their relatives and neighbors but also with strangers.

Hypothesis H1.2 is not verified as well. We can't report to have found the expected positive correlation between the number of servants and bridging SC. The possible explanation might be that servants were often perceived as family members rather than the representatives of the out-group.

The hypothesis H2 generally doesn't contradict our data as we find a positive correlation between household size as a proxy for reciprocity and bonding SC. However this correlation is not robust and depends from sample composition (see Table A8). Moreover household size doesn't correlate significantly with the negative manifestations of bonding SC like corruption and using of personal connections. Our study has several limitations due to restricted sample size thus H2 might be tested in further research.

The abovementioned findings show robustness to the inclusion of literacy rates as a control variable (Table A5). Nevertheless we imply several additional robustness checks that will be discussed in the next section.

Robustness checks

Robustness check 1: re-estimation on the large (medium) sample

As a robustness check we re-estimate our models on larger samples. Unfortunately in order to increase the number of observations we have to sacrifice some valuable substantial information. Model specifications on the main (small) sample are not full analogue of specifications on the larger samples that constitutes the limitation of our study. One of the problems is that for the large (medium) samples we don't have separate measures of household size and generational hierarchy within the household. For the sample of West European countries household size is rather a measure of horizontal kin group extension because multigenerational families were a very rare case in this area. In contrast for the sample of East European countries household size captures more generational hierarchy within the family. The next problem is that for the large sample we have only one item measuring gender hierarchy, namely "percent of single women in the age group 20-29". The other more specific indicators are available only for the small sample.

The indicator of gender hierarchy (women20_29) on the large sample generally mirrors the same pattern as hierarchy indexes on the small sample (Table A8) . The only inconsistency is that on the large sample the effect of women20_29 on bridging SC loses its significance though it remains positive. Furthermore we find that the mediating link between women20_29 and autocracy preference is less significant for the large sample and not significant for the medium sample. We might conclude that in the sample of mostly East European countries age at first marriage (as measured by women20_29) is a worse predictor of commitment to hierarchically organized society that is detrimental for bridging SC formation. It might be due to the fact that in East European societies age at first marriage of bride was not the best predictor of her power status within the family because strong societal norms forced all women independently from their personal characteristics to obey their husbands. Being unable to capture nuances in power relations within the family women's age at first marriage has less predictive power for commitment to hierarchy at the societal level and to the bridging SC. In this case to measure gender hierarchy would be more useful to imply indicators associated not with innate characteristics of women but with her direct role in the household, for example the percent of female household heads or percent of women living in a household as non kin. Unfortunately we lack these indicators for the large sample.

Mean household size on the large sample dominated by East European countries shows similar pattern as the measure of generational hierarchy on the small sample. It is positively linked with using connections and negatively related to bridging SC. This is predictable because as it was mentioned above large household size is mostly an attribute of a multigenerational hierarchical household in East European countries that prevail in the large sample.

Finally our results on the medium sample correspond with the results obtained on the small sample and doesn't show any significant effect of the number of servants on bridging social capital (Table A9).

Inclusion of literacy rates as a control variable on the large and medium sample doesn't change considerable our results like it was the case with the small sample (Table A10)

Robustness check 2: using alternative DV and IV

In our study we deal with complex concepts which could be measured by several observable indicators. As a robustness check we use alternative measures of the same concepts. First of all we re-estimate our models with different indicators for dependent variables. To capture bridging SC we insert as dependent variables generalized trust and participation in inclusive voluntary organizations (Table A11). The result revealed to be very similar.

As a next step we substitute independent variables. As alternative hierarchy measures we insert in our model PCA indexes. The results show robustness to these procedure (Table A12). Then

we replace “mean household size” with more precise indicators of family size. The first alternative is “mean adult kin group size” (*kin group size*) which is a more accurate measure of family extension. It excludes servants as non kin members of the household and children because nuclear families with a large number of children may be mixed up with extended families. The second alternative measure is the share of households that have lateral horizontal extensions and don’t have multigenerational components. We use this indicator to disentangle the effects of hierarchical and horizontal family extensions in a better way. The obtained results with alternative measures show similar pattern as the results with the very rough measure as mean household size (Table A13).

Conclusion and discussion

In our study we tested three different mechanisms through which historical family pattern might affect the present day level of bridging and bonding SC. We don’t find arguments in favor of the hypothesis that large families restrained out-group contacts due to their self-sufficiency that led to lower level of out-group trust in the past and nowadays. Moreover we have shown that when controlling for intergenerational hierarchy extended families might positively affect out-group trust because large family means extension of trust radius over a larger number of persons perceived as close relatives.

The mechanism linking large family size with stronger reciprocity values and consequently with higher level of bonding SC and its informal manifestations didn’t show enough robustness. This mechanism might be tested in further research.

The most powerful mechanism revealed to be the following. Large families face stronger integration problems than nuclear families. As hierarchy is an important group integrator, large families tend to be more hierarchical. Commitment to hierarchy within the family echoed in hierarchy within the society fosters bonding SC while restraining bridging SC.

Our study challenges the well-established tradition pioneered by Hajnal (1983) to link institutional and economic underdevelopment with household’s extendedness. Large number of family members might not mean automatically less need in additional hands and consequently less contacts beyond the kin group resulting in lower levels of bridging SC. To capture this issue would be needed more precise indicators like land to labor ratio and crop specific labor intensity. Our finding poses in question the tentative to attribute economic success of Western Europe to nuclear structure of the family.

Holding the position that family as a grass root institution might matter we suggest to focus on various indicators of hierarchical structures within the family which could be the “true” obstacles

of bridging SC formation fostering modernization processes. Commitment to hierarchy learned in family might be detrimental for establishment of horizontal social ties that require individual agency instead of passive expectation of assistance from the rulers.

We leave open the question if authoritarian relations germinated in family or in other societal institutions beyond the family. In the former case family would play an essential role in accumulation of bridging SC and in consequential developmental success while in the later case family pattern might be only a reflection of other more important institutional structures.

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Appendix 1:
Figure 1: Negative correlation between formative hierarchy index and out-group trust

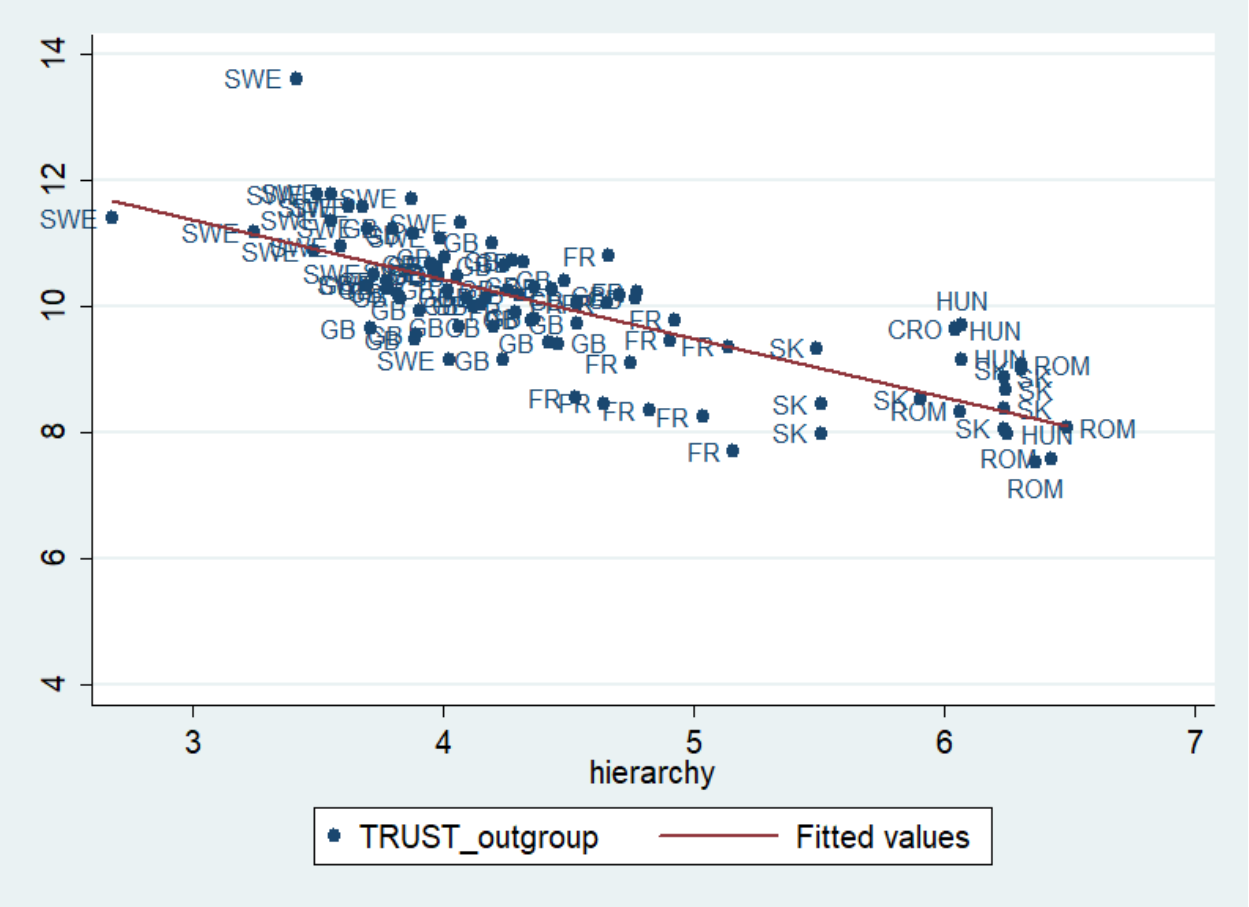


Table 1: Sample description

			Large		Medium		Small	
	country		Level 2 (historical regions)	Level 1(individuals)	Level 2 (historical regions)	Level 1(individuals)	Level 2 (historical regions)	Level 1(individuals)
	France		56	1009	15	305	14	295
	Germany		34	1042				
	Great Britain		42	1504	42	1504	42	1504
	Italy		16	1009				
	Sweden		18	900	18	900	18	900
Total Western Europe		5	166	5464	75	2709	74	2699
	Armenia		1	819	1	819		
	Azerbaidgan		2	1143	2	1143		
	Belarus		4	1060	4	1060		
	Croatia		3	487	1	161	1	161
	Czech Republic		3	1046				
	Estonia		1	642	1	642		
	Georgia		3	940	3	940		
	Hungary		5	431	5	431	5	431
	Kazakhstan		5	500	5	500		
	Kyrgyzstan		2	1458	2	1458		
	Latvia		2	1237	2	1237		
	Lithuania		3	1046	3	1046		
	Moldova		1	1044	1	1044		
	Poland		19	1339	8	622		
	Romania		5	475	5	475	5	475
	Russia		29	1562	29	1562		
	Serbia		16	986				
	Slovakia		8	650	8	650	8	650
	Slovenia		2	869				
	Ukraine		11	1581	9	1201		
	Uzbekistan		2	1681	2	1681		
Total Eastern Europe		21	127	20996	91	16672	19	1717
TOTAL		26	293	26460	166	19381	93	4416

Table 2: Multilevel regression results for the small sample

DV	Informal manifestations of bonding SC				Bonding SC		Bridging SC	
	Connections		bribery disapproval		in-group solidarity		out-trust	
	(1.0)	(1.1)	(2.0)	(2.1)	(3.0)	(3.1)	(4.0)	(4.1)
Servants	-1.369	-1.009	0.039	0.180	-0.412	-0.405	0.108	0.339
	(2.321)	(2.636)	(0.225)	(0.263)	0.417	0.513	(0.799)	(0.885)
Mean hh size	0.558	0.607	0.028	0.045	0.187**	0.188**	0.398*	0.149
	(0.656)	(0.678)	(0.054)	(0.050)	0.079	0.074	(0.219)	(0.225)
Single hh	4.428	4.507	-0.061	-0.113	-0.521	-0.523	1.019	0.007
	(5.395)	(5.434)	(0.277)	(0.290)	0.534	0.562	(1.724)	(1.715)
Hierarchy (formative)	1.191**		-0.104***		-0.234***		-0.623***	
	(0.526)		(0.034)		(0.054)		(0.179)	
Generational hierarchy (formative)		0.928		-0.191**		-0.240*		-0.335**
		(0.952)		(0.094)		(0.141)		(0.335)
Gender hierarchy (formative)		1.289**		-0.075		-0.233**		-0.146
		(0.643)		(0.051)		0.074		(0.216)
Individual level controls	YES	YES	YES	YES	YES	YES	YES	YES
Level 3 variance component	YES	YES	NO	NO	NO	NO	YES	YES

Variance components (Random effects)

Model:	(1.0)			(1.1)		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	1.85	468.971***	82	1.836	468.325***	81
e (Level 1)	16.288			16.288		
Intercept 2: u00 (Level 3)	1.539	43.365***	6	1.682	46.413***	6
Model:	(2.0)			(2.1)		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.027	350.908***	88	0.027	344.782***	87
e (Level 1)	0.398			0.398		
Model:	(3.0)			(3.1)		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.077	378.193	88	0.079	378.582***	87
e (Level 1)	0.764			0.764		

Model:	(4.0)			(4.1)		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.129	202.992***	82	0.12	192.972***	81
e (Level 1)	4.244			4.243		
Intercept 2: u00 (Level 3)	0.175	49.952***	6	0.208	59.403***	6
N Level 1=4416, N Level 2= 93, N Level 3=7						

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model.

*p < .05; **p < .01; ***p < .001

Table 3: The impact of historical family indicators of autocracy preference today, multilevel regression results.

DV	Authority preference			
	(1.0)	(1.1)	(1.2)	(1.3)
Servants	-0.001	-0.253	0.183	
	(0.681)	(0.368)	(0.365)	
women20_29	-1.921***		-0.419	-0.340*
	(0.211)		(0.336)	(0.201)
Hierarchy (formative)		0.339***		
		(0.048)		
Mean hh size	0.138*	0.076	-0.049	0.018
	(0.077*)	(0.082)	(0.063)	(0.043)
Single	-0.071	-0.538	-0.408	-0.426
	(0.363)	(0.543)	(0.468)	(0.500)
Sample	Small	Small	Medium	Large
	VARIANCE COMPONENTS (RANDOM EFFECTS)			
	Model 1			
	Variance component	χ^2	d.f.	
Intercept 1: r0 (Level 2)	0.031	198.151***	88	
e (Level 1)	0.774			
	Model 1.1			
Intercept 1: r0 (Level 2)	0.043	278.093***	88	
e (Level 1)	0.774			
	Model 1.2			
Intercept 1: r0 (Level 2)	0.038	546.973***	141	
e (Level 1)	0.785			
Intercept 2: u00 (Level 3)	0.14759	651.408***	20	
	Model 1.3			
Intercept 1: r0 (Level 2)	0.059	1024.26***	263	
e (Level 1)	0.838			
Intercept 2: u00 (Level 3)	0.119	618.072***	25	

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model. *p < .05; **p < .01; ***p < .001

Appendix (A)

Table A 1: The list of countries and years of observations for all the variables

List of indicators	Historical countries, years	Number of regions
Indicators constructed by the authors		
MeanHH single muh women20_29	Habsburg Empire (Austrian part) 1900-1910; England and Wales 1881; France 1886; German Empire, 1871; Habsburg Empire (Hungarian part) 1869; Italy 1901; Romania 1838; Russian Empire 1897; Scotland, 1881; Serbia 1900; Sweden 1880.	429
servants1 (mean N per HH)	England and Wales 1881; France 1886; Habsburg Empire (Hungarian part) 1869; Italy, 1901; Romania 1838; Scotland, 1881; Serbia 1900; Sweden 1880	255
servants2 (% HH serv)	England and Wales 1881; France 1886; Russian Empire 1897; Scotland 1881; Sweden 1880; Habsburgian Empire (Hungarian part) 1869; Romania 1838	248
share_hh_adc share_hh_mar_son share_hh_son_head kingr_size	England and Wales 1881; France 1886; Scottland 1881; Sweden 1880; Habsburgian Empire (Hungarian part) 1869; Romania 1838.	159
Indicators constructed by Gruber, Szoltysek (2015)		
female_hhh y_brides o_wives f_nonkin y_hhh neolocal lateral	Albania 1918; Habsburg Empire (Austrian part): Styria 1910, Silesia 1747-1805, Galizia 1785-1819; Bulgaria 1877-1947; England and Wales 1881; France, 1846; German Empire: 1695-1772 (Ostpreussen, Danzig), 1790-1791 (Posen 1, Bromberg 1), 1666 -1809 (Posen 2) , 1766-1792 (Bromberg 2), 1747-1805 (Breslau, Liegnitz, Oppeln), 1846 other regions; Habsburg Empire (Hungarian part) 1869; Rzeczpospolita Polska: 1666 -1809 (Warshau 1) , 1766-1792 (Warshau 2, Plotsk), 1790-1792 (Kalissk), 1789-1792 (Kelitsk, Petrokovsk), 1791-1792 (Ljublinsk, Sedletsk); Romania 1838; Russian Empire: 1768-1804 (Vilna, Minsk 2), 1791-1792 (Volhinya 1), 1791 (Volhinya	225

2, Kiev), 1795 (Minsk 1); Scotland 1881; Serbia 1900; Sweden 1900.

Note: Time periods (ex.1666-1809) mean that different localities within one historical region were studied at different time points

Table A 2: Historical data sources

Countries	Sourses
Austria	1. Household statistic, 1910 Österreichische Statistik, N. F., vol. 4, no. 3, p. 1. Wien 1918. 2. Mosaic project, http://www.censusmosaic.org/
Bulgaria	Mosaic project, http://www.censusmosaic.org/
England and Wales Scotland Sweden	NAPP census micro-data www.nappdata.org
France	1. INSEE, Recencements de 1851 à 1921 (données de la SGF) http://www.insee.fr/fr/service/bibliotheque/tableaux_sgf/tableaux.asp?domaine=rec 2. Mosaic project, http://www.censusmosaic.org/
Germany	1. Vierteljahrshefte zur Statistik des Deutschen Reichs für das Jahr 1873", Verlag des Königlich Preussischen Statistischen Bureaus, 1874, provided by the DFG project 'Digitisation of the Statistics of the German Reich [A.F.] 1873-1883]' 2. Mosaic project, http://www.censusmosaic.org/
Hungary	1. évi népszámlálás. [Census 1910]. Vol. 6. Végeredmények összefoglalása. [Summary of results]. 1920 2. Mosaic project, http://www.censusmosaic.org/
Italy	"Sommario di Statistiche Storiche dell'Italia (1861-1975)", Instituto Centrale di Statistica, Roma, 1976
Poland	Mosaic project, http://www.censusmosaic.org/
Romania	Mosaic project, http://www.censusmosaic.org/

Russian Empire	1. Troinitskiy N. (1899-1904) The first universal census of Russian Empire, 1897. Central Statistical Agency of the Ministry of Internal Affairs (Первая всеобщая перепись населения Российской Империи, 1897 г Центральный статистический комитет МВД). 2. Mosaic project, http://www.censusmosaic.org/
Serbia	Statistique du Royaume de Serbie, Belgrade, Imprimerie de l'etat du Royaume de Serbie, vol. XXIII-XXIV, 1903-1905

Table A3: Principal components analysis, oblique rotated factor loadings

Variable	Factor scores	
Share_hh_adc		0.87
Share_hh_marm		0.75
G_neolocal		0.73
G_femalehhh	0.76	
G_y_brides	0.92	
G_o_wives	0.77	
G_f_nonkin	0.77	
Women20_29	-0.93	

Table A4: Correlation between hierarchy measures and household size

Hierarchy	Mean HH
women20_29	-0.536***
women obedience, PCA	0.155*
younger obedience, PCA	0.468***
Hierarchy (formative=	0.329***
intergenerational hierarchy	0.419***
gender hierarchy	0.230**

Table A5: Multilevel regression results for restricted small sample controlled for literacy

	Informal manifestations of bonding SC				Bonding SC		Bridging SC	
	connections		bribery disapproval		ingroup solid		out-group trust	
	(1.0)	(1.1)	(2.0)	(2.1)	(3.0)	(3.1)	(4.0)	(4.1)
Servants	-0.884	-0.211	0.056	0.373	-0.770	-0.309	-0.311	-0.380
	(3.027)	(3.337)	(0.280)	(0.323)	(0.566)	(0.600)	(0.976)	(1.074)
MeanHH	0.974	1.052	0.048	0.081	-0.315	-0.260	-0.059	-0.056
	(1.015)	(1.027)	(0.136)	(0.132)	(0.210)	(0.230)	(0.370)	(0.370)
Single	24.388**	27.321**	-0.224	1.070	-5.335**	-3.303	-2.143	-2.285
	(9.250)	(11.112)	(1.195)	(1.371)	(2.256)	(2.891)	(4.296)	(4.383)
Hierarchy	1.761***	1.992***	-0.121**	-0.017	-0.099	-0.059	-0.439*	-0.447*
	(0.457)	(0.665)	(0.050)	(0.078)	(0.079)	(0.110)	(0.239)	(0.248)
Literacy		0.015		0.006*		0.010*		-0.002
		(0.032)		(0.003)		(0.005)		(0.012)
Individual level controls	YES	YES	YES	YES	YES	YES	YES	YES
Level 3 variance component	YES	YES	NO	NO	NO	NO	YES	YES

VARIANCE COMPONENTS (RANDOM EFFECTS)						
Model:	1.0			1.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	2.009	279.76***	52	2.002	283.75***	51
e (Level 1)	18.022			18.021		
Intercept 2: u00 (Level 3)	0.001	13.32**	5	0.00006**	12.62**	5
Model:	2.0			2.1		
Intercept 1: r0 (Level 2)	0.027	193.53***	57	0.026	179.22***	56
e (Level 1)	0.463			0.463		
Model:	3.0			3.1		
Intercept 1: r0 (Level 2)	0.092	268.007***	57	0.089	263.637***	56
e (Level 1)	0.787			0.787		
Model:	4.0			4.1		
Intercept 1: r0 (Level 2)	0.109	110.980***	52	0.108	110.529***	51
e (Level 1)	4.092			4.092		
Intercept 2: u00 (Level 3)	0.238	42.48***	5	0.249	46.39***	5
N	N Level 1 = 2785, N Level 2 = 62, N Level 3= 6					

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model.
*p < .05; **p < .01; ***p < .001

Table A6: Testing the mediating role of autocracy preference. Multilevel regression results for the small sample.

DV	Informal manifestations of SC				Bonding SC		Bridging SC	
	Connections		bribery disapproval		in-group solidarity		Out-group trust	
	(1.0)	(1.1)	(2.0)	(2.1)	(3.0)	(3.1)	(4.0)	(4.1)
Servants	-1.369	-1.922	0.040	0.268	-0.406	-0.440	0.108	-0.331
	(2.321)	(2.449)	(0.289)	(0.256)	(0.456)	(0.397)	(0.799)	(0.711)
Hierarchy	1.191**	0.758	-0.104***	-0.030	-0.234***	-0.191***	-0.623***	-0.549***
	(0.526)	(0.555)	(0.037)	(0.033)	(0.059)	(0.052)	(0.179)	(0.162)
MeanHH	0.558	0.425	0.028	0.008	0.187**	0.207***	0.398*	0.092
	(0.656)	(0.694)	(0.054)	(0.048)	(0.086)	(0.076)	(0.219)	(0.195)
Single	4.428	1.423	-0.060	-0.157	-0.525	-0.223	1.019	-0.040
	(5.395)	(5.702)	(0.342)	(0.297)	(0.542)	(0.465)	(1.724)	(1.402)
Authocracy preference		0.431***		-0.045***		-0.009		-0.246***
		(0.081)		(0.011)		(0.017)		(0,0425)
SAMPLE	SMALL							

	RANDOM EFFECTS					
	Model 1.0			Model 1.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	1.850	468.971***	82	2.056	391.628	82
e (Level 1)	16.288			14.699		
Intercept 2: u00 (Level 3)	1.539	43.365***	6	1.643	43.615***	6
	Model 2.0			Model 2.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.025	352.327***	82	0.017	240.149***	82

e (Level 1)	0.398			0.308		
	Model 3.0			Model 3.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.070	383.541***	82	0.043	235.557***	82
e (Level 1)	0.763			0.685		
	Model 4.0			Model 4.1		
Intercept 1: r0 (Level 2)	0.129	202.992***	82	0.051	116.649***	82
e (Level 1)	4.244			3.957		
Intercept 2: u00 (Level 3)	0.175	49.952***	6	0.146	52.058***	6

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model.
*p < .05; **p < .01; ***p < .001

Table A7: Testing the mediating effect of contemporary family structures. Multilevel regression results for the small sample.

DV	Informal manifestations of bonding SC				Bonding SC		Bridging SC	
	Connections		bribery disapproval		in-group solidarity		out-trust	
	(1.0)	(1.1)	(2.0)	(2.1)	(3.0)	(3.1)	(4.0)	(4.1)
Servants	-1.369	-1.326	0.040	0.039	-0.379	-0.387	0.108	0.106
	2.321	2.309	0.289	0.289	0.484	0.483	(0.799)	0.799
MeanHH	0.558	0.552	0.028	0.029	0.204**	0.208**	0.398*	0.399*
	0.656	0.652	0.054	0.054	0.092	0.092	(0.219)	0.219
SingleHH	4.428	4.399	-0.060	-0.059	0.407	-0.407	1.019	1.022
	5.395	5.366	0.342	0.342	0.578	0.577	(1.724)	1.723
Hierarchy	1.191**	1.175**	-0.104***	-0.103***	-0.255***	-0.249***	-0.623***	-0.623***
	0.526	0.524	0.037	0.037	0.062	0.062	(0.179)	0.179
Adult children coresidence		0.545**		-0.020		-0.134***		-0.027
		0.211		0.032		0.047		0.112

Individual level controls	YES					
	RANDOM EFFECTS					
Model:	1.0			1.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	1.850	468.971***	82	1.822	463.768***	82
e (Level 1)	16.288			16.266		
Intercept 2: u00 (Level 3)	1.539	43.365***	6	1.533	43.476***	6
Model:	2.0			2.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.025	352.327***	82	0.025	351.656***	82
e (Level 1)	0.398			0.398		
Model:	3.0			3.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.080	400.359***	82	0.079	397.560***	82
e (Level 1)	0.838			0.837		
Model:	4.0			4.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0,129	202.992***	82	0.129	203.026***	82
e (Level 1)	4,244			4.244		
Intercept 2: u00 (Level 3)	0,175	49.952***	6	0.174	49.625***	6

SAMPLE	SMALL

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model.
*p < .05; **p < .01; ***p < .001

Table A8: Testing robustness of the results on the large sample

DV	Informal manifestations of bonding SC				Bonding SC		Bridging SC	
	Connections		bribery disapproval		in-group solidarity		out-trust	
	(1.0)	(1.1)	(2.0)	(2.1)	(3.0)	(3.1)	(4.0)	(4.1)
women20_29	-5.387**	-1.816**	0.524***	0.184**	0.949***	0.055	2.252***	0.566
	(2.139)	(0.752)	(0.167)	(0.093)	(0.237)	(0.155)	(0.730)	(0.632)
MeanHH	0.785	0.454**	0.008	-0.040	0.126*	-0.046	0.309	-0.056
	(0.675)	(0.199)	(0.053)	(0.028)	(0.070)	(0.051)	(0.222)	(0.123)
Single	2.760	1.449	-0.139	0.019	-0.733	-1.289	2.127	0.273
	(5.349)	(5.363)	(0.275)	(0.316)	(0.517)	(0.917)	(1.652)	(2.121)
Individual level controls	YES	YES	YES	YES	YES	YES	YES	YES
Sample	Small	Large	Small	Large	Small	Large	Small	Large

VARIANCE COMPONENTS (RANDOM EFFECTS)							
Model:	1.0				1.1		
		Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)		1.889	485.106***	83	2.785	1998.240***	264
e (Level 1)		16.286			17.585		
Intercept 2: u00 (Level 3)		1.859	57.216***	6	1.143	124.668***	25
Model:	2.0				2.1		
Intercept 1: r0 (Level 2)		0.027	350.346***	89	0.03	1096.919***	264
e (Level 1)		0.398			0.498		
Intercept 2: u00 (Level 3)					0.014	125.847***	25
Model:	3.0				3.1		

Intercept 1: r0 (Level 2)	0.077	374.015***	89	0.068	1348.940***	264
e (Level 1)	0.765			0.858		
Intercept 2: u00 (Level 3)				0.033	129.241***	25
Model: 4.0				4.1		
Intercept 1: r0 (Level 2)	0.123	193.482***	83	0.401	122.614***	264
e (Level 1)	4.249			5.785		
Intercept 2: u00 (Level 3)	0.233	86.009***	6	0.542	278.438	25

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model.
*p < .05; **p < .01; ***p < .001

Table A9: The effect of the number of servants on social capital tested on the medium sample

Dependent variable	Bridging SC (out-group trust)		
	(1.0)	(1.1)	(1.2)
Servants	0.071	0.716	1.089
	(1.797)	(1.823)	(1.955)
women20_29	1.130	0.812	0.599
	(0.825)	(0.847)	(0.846)
MeanHH	-0.251	-0.509***	-0.504***
	(0.162)	(0.153)	(0.150)
Single	1.365	-4.112	-3.786
	(1.896)	(2.530)	(2.598)
Literacy			0.015**
			(0.006)
N	N Level 1: 19381, Level 2: 166, Level3: 21	N Level 1: 17817, Level 2: 135, Level3: 20	N Level 1: 17817, Level 2: 135, Level3: 20
VARIANCE COMPONENTS (RANDOM EFFECTS)			
		Model 1	

		Variance component	$\chi 2$	d.f.
	Intercept 1: r0 (Level 2)	0.436	838.282***	141
	e (Level 1)	6.262		
Intercept 2: u00 (Level 3)		0.436	140.247***	20
			Model 1.1	
	Intercept 1: r0 (Level 2)	0.519	813.841***	111
	e (Level 1)	6.426		
Intercept 2: u00 (Level 3)		0.195	55.616***	19
			Model 1.2	
	Intercept 1: r0 (Level 2)	0.531	817.655***	110
	e (Level 1)	6.426		
Intercept 2: u00 (Level 3)		0.149	42.966***	19

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. *p < .05; **p < .01; ***p < .001

Table A10: The effect of historical family pattern on SC on a large sample controlling for literacy.

DV	Informal manifestations of bonding SC				Bonding SC		Bridging SC	
	Connections		bribery disapproval		in-group solidarity		out-group trust	
	(1.0)	(1.1)	(2.0)	(2.1)	(3.0)	(3.1)	(4.0)	(4.1)
women20_29	-2.063**	-2.018**	0.217**	0.251**	0.115	-0.096	0.356	0.494
	(1.004)	(1.004)	(0.105)	(0.098)	(0.135)	(0.136)	(0.484)	(0.534)
MeanHH	0.499**	0.500**	-0.035	-0.038	0.093*	-0.094*	-0.190	-0.244**
	(0.226)	(0.224)	(0.030)	(0.027)	(0.050)	(0.049)	(0.122)	(0.118)
Single	10.473**	10.602**	-0.288	-0.176	2.502***	-2.479***	-1.711	-1.918
	(4.543)	(4.541)	(0.337)	(0.332)	(0.803)	(0.825)	(2.245)	(1.396)
Literacy		0.020		0.004***		0.002		0.019***
		(0.017)		(0.0009)		(0.004)		(0.002)
Individual level controls			YES					

VARIANCE COMPONENTS (RANDOM EFFECTS)						
Model: 1.0				1.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	2.708	1653.176***	213	2.628	1649.092***	212
e (Level 1)	17.962			17.962		
Intercept 2: u00 (Level 3)	0.904	83.777***	24	0.949	91.843***	24
Model: 2.0				2.1		
Intercept 1: r0 (Level 2)	0.029	887.248***	213	0.03	913.787***	212
e (Level 1)	0.513			0.513		
Intercept 2: u00 (Level 3)	0.015	124.803***	24	0.009	80.887***	24
Model: 3.0				3.1		
Intercept 1: r0 (Level 2)	0.069	1110.984***	213	0.07	1121.396***	212
e (Level 1)	0.87			0.87		
Intercept 2: u00 (Level 3)	0.033	105.755	24	0.03	96.052***	24
Model: 4.0				4.1		
Intercept 1: r0 (Level 2)	0.417	1080.020***	213	0.434	1096.713***	212
e (Level 1)	5.938			5.938		
Intercept 2: u00 (Level 3)	0.328	146.652***	24	0.194	83.517***	24
N	N Level 1 = 24298, N Level 2 = 241, N Level 3= 25					

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model. *p < .05; **p < .01; ***p < .001

Table A11: The effect of historical family structures on alternative measures of bridging SC, multilevel regression results for the small sample

DV	Bridging SC			
	Out-group trust		Participation in inclusive voluntary organizations	
	(1.0)	(1.1)	(2.0)	(2.1)
Servants	0.149	0.339	1.198	-0.198
	(0.407)	(0.456)	(0.870)	(1.041)
MeanHH	0.105	0.149	-0.113	-0.405**
	(0.111)	(0.111)	(0.263)	(0.190)
SingleHH	-0.129	0.007	-1.792	1.452
	(0.898)	(0.871)	(2.021)	(1.172)
Hierarchy (formative)	-0.187**		-0.537**	
	(0.089)		(0.230)	
Generational hierarchy (formative)		-0.335**		-0.180
		(0.163)		(0.308)
Gender hierarchy (formative)		-0.146		-1.137***
		(0.100)		(0.162)
Individual level controls	YES	YES	YES	YES
RANDOM EFFECTS				
Model:	1.0			
	Variance component		χ^2	d.f.
Intercept 1: r0 (Level 2)	0.043		287.975***	82
e (Level 1)	0.848			
	0.038		52.190***	6
Model:	2			
	Variance component		χ^2	d.f.
Intercept 1: r0 (Level 2)	0.043		293.306***	82
e (Level 1)	0.848			
Intercept 2: u00 (Level 3)	0.028		39.622***	6
Model:	3			
	Variance component		χ^2	d.f.
Intercept 1: r0 (Level 2)	0.156		177.112***	82
e (Level 1)				
Intercept 2: u00 (Level 3)	0.557		128.793***	6
Model:	4			
	Variance component		χ^2	d.f.
Intercept 1: r0 (Level 2)	0.237		294.426***	81
e (Level 1)				

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model. *p < .05; **p < .01; ***p < .001

Table A12: The effect of historical family structures on SC, multilevel regression results for the small sample re-estimated with PCA factors as hierarchy measures.

DV	Informal manifestations of SC		Bonding SC	Bridging SC
	Connections	Bribery disaproval	In-group solidarity	Out-group trust
	(1)	(2)	(3)	(4)
Servants	-1.013	0.099	-0.456	0.302
	(2.441)	(0.301)	(0.478)	(0.838)
MeanHH	0.098	0.081	0.223**	0.550**
	(0.729)	(0.062)	(0.099)	(0.244)
SingleHH	4.927	0.024	-0.308	1.422
	(5.163)	(0.331)	(0.531)	(1.657)
Women obedience, PCA	1.011**	-0.063**	-0.167***	-0.409***
	(0.396)	(0.028)	(0.045)	(0.135)
Younger obedience, PCA	0.526*	-0.052**	-0.055	-0.202**
	(0.285)	(0.023)	(0.037)	(0.097)
Individual level controls	YES	YES	YES	YES
SAMPLE	SMALL			

RANDOM EFFECTS			
Model:	1.0		
	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	1.771	443.585	81
e (Level 1)	16.291		
Intercept 2: u00 (Level 3)	1.337	36.082	6
Model:	2		
	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.024	338.717	81
e (Level 1)	0.398		
Model:	3		
	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.069	374.398	81
e (Level 1)	0.764		
Model:	4		
	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	0.122	195.214***	81
e (Level 1)	4.248		

Intercept 2: u00 (Level 3)	0.164	47.123***	6

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model. *p < .05; **p < .01; ***p < .001

Table A13: The effect of historical family structures on SC, multilevel regression results for the small sample re-estimated with "adult kin group size" as a measure of family extendedness.

DV	Informal manifestations of bonding SC				Bonding SC		Bridging SC	
	Connections		bribery disapproval		in-group solidarity		out-trust	
	(1.0)	(1.1)	(2.0)	(2.1)	(3.0)	(3.1)	(4.0)	(4.1)
Servants	-1.170	-0.922	0.059	0.221	-0.222	-0.268	0.301	0.902
	2.315	2.651	0.279	0.312	0.444	0.501	0.792	0.887
SingleHH	3.932	3.950	0.004	-0.049	-0.505	-0.490	0.985	0.913
	5.422	5.442	0.355	0.355	0.568	0.573	1.727	1.718
Kingr_size	0.388	0.409	0.053	0.068	0.180*	0.176*	0.353*	0.392*
	0.602	0.608	0.064	0.065	0.102	0.104	0.203	0.204
Hierarchy (formative)	1.209**		-0.099***		-0.201***		-0.597***	
	0.530		0.035		0.056		0.178	
Generational hierarchy (formative)		1.030		-0.183**		-0.177		-0.956***
		0.939		0.083		0.134		0.328
Gender hierarchy (formative)		1.274*		-0.067		-0.211***		-0.418*
		0.647		0.045		0.074		0.216
Individual level controls	YES	YES	YES	YES	YES	YES	YES	YES
Level 3 variance component	YES	YES	NO	NO	NO	NO	YES	YES
SAMPLE	SMALL							

	Variance components (Random effects)					
Model:	1			1.1		
	Variance component	$\chi 2$	d.f.	Variance component	$\chi 2$	d.f.
Intercept 1: r0 (Level 2)	1.858	474.733***	82	1.849	474.536***	82

e (Level 1)	16.287			16.287		
Intercept 2: u00 (Level 3)	1.620	44.519***	6	1.729	46.719***	6
Model:	2			2.1		
	Variance component	χ 2	d.f.	Variance component	χ 2	d.f.
Intercept 1: r0 (Level 2)	0.025	348.228***	82	0.024	344.331	81
e (Level 1)	0.398			0.398		
Model:	3			3.1		
	Variance component	χ 2	d.f.	Variance component	χ 2	d.f.
Intercept 1: r0 (Level 2)	0.071	382.906***	82	0.071	382.654***	81
e (Level 1)	0.764			0.764		
Model:	4			4.1		
	Variance component	χ 2	d.f.	Variance component	χ 2	d.f.
Intercept 1: r0 (Level 2)	0.126	198.485***	82	0.118	189.566***	81
e (Level 1)	4.245			4.24524		
Intercept 2: u00 (Level 3)	0.176	46.995***	6	0.21216	53.725***	6

Note: Entries are unstandardized regression coefficients with standard errors in parentheses. All independent variables are group mean centered. When the variance component at the level 3 was insignificant we used 2 level model. *p < .05; **p < .01; ***p < .001

Figures:

Figure A1: Map of mean household size divided by the Hajnal line.

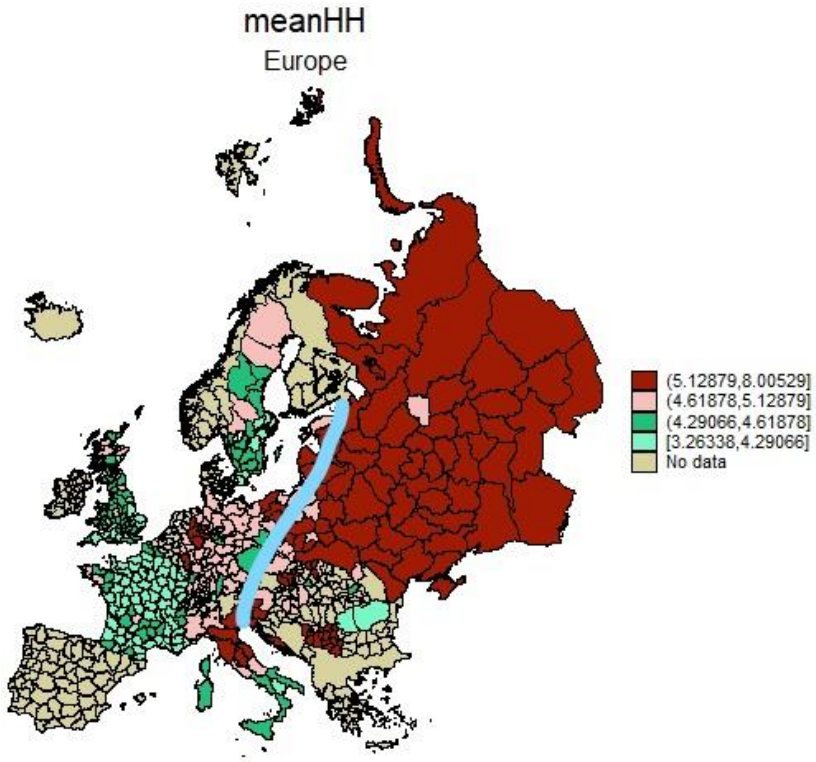


Figure A2: Map of "percent of single women 20-29" divided by the Hajnal line.

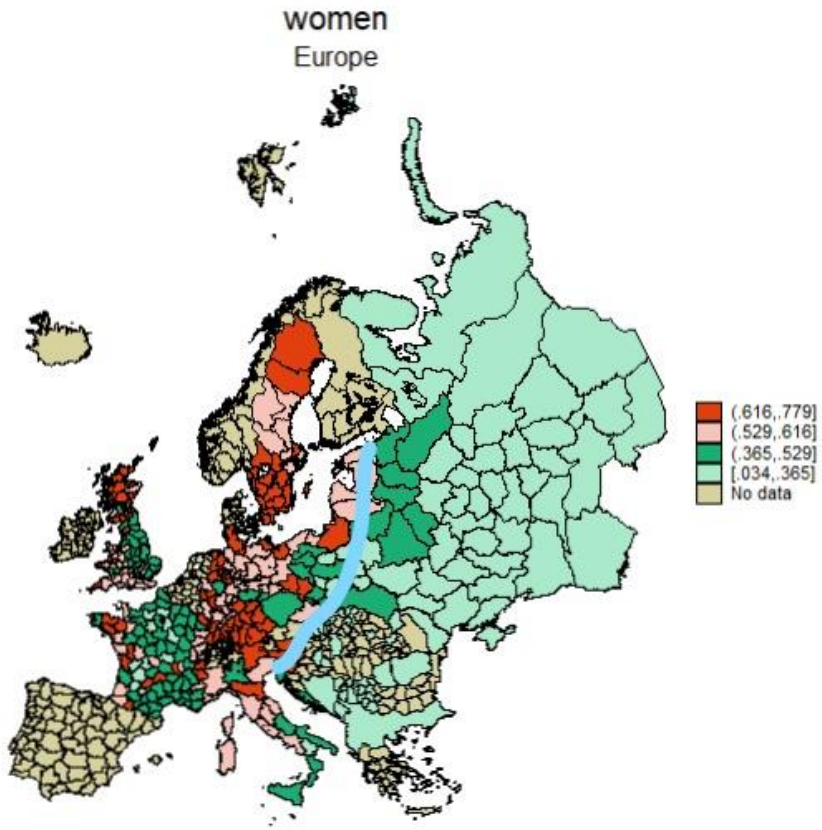
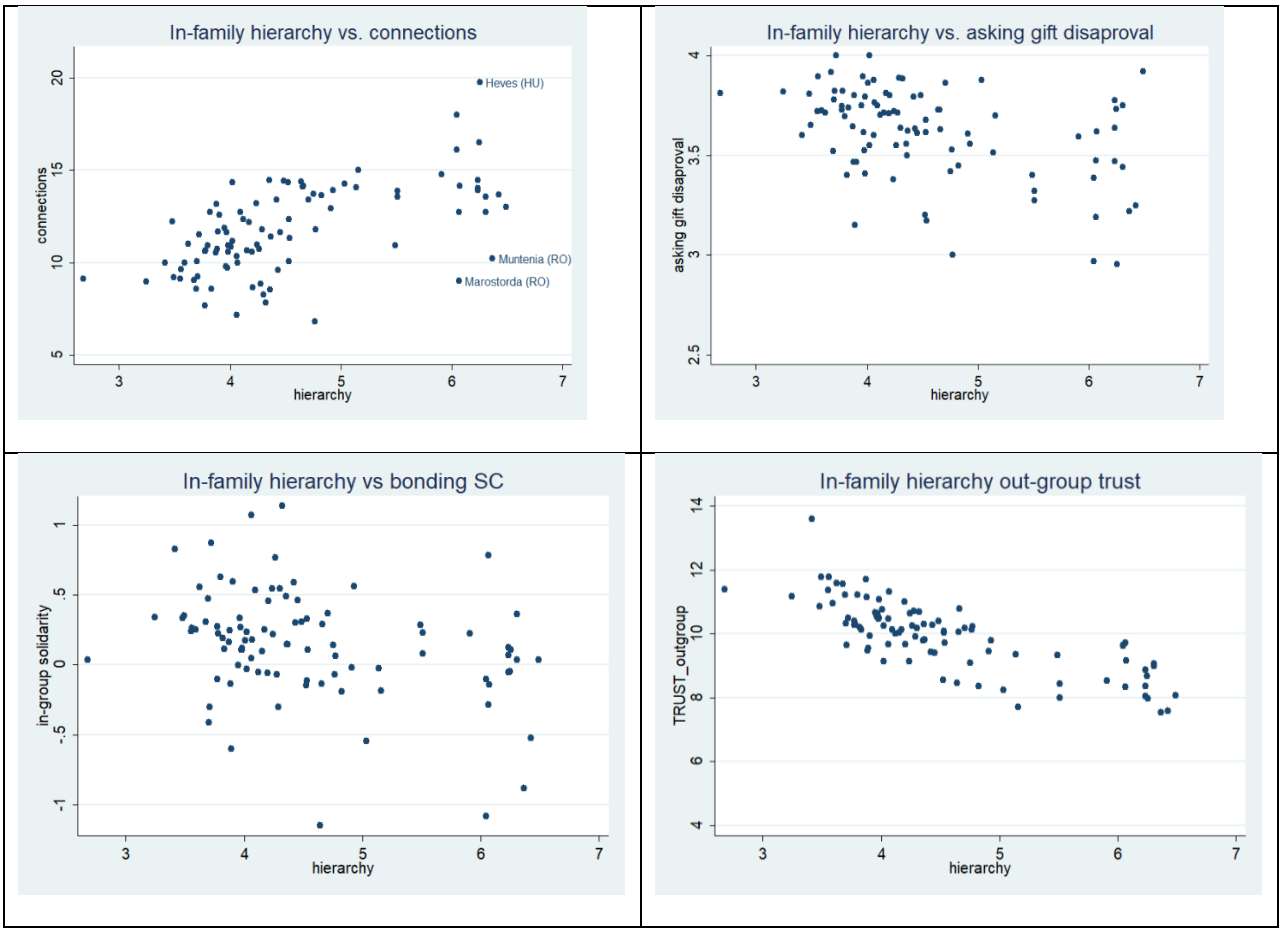


Figure A3: Correlations between hierarchy and social capital



Contact details:

Maria V. Kravtsova
National Research University Higher School of Economics (Moscow, Russia). "Laboratory for Comparative Social Research";
E-mail: maria_krav@mail.ru

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