Does the Hajnal Line Persist in 21st Century Europe?
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BACKGROUND

Conceived in 1965, the "Hajnal line" has been one of the most theoretically important and commonly cited concepts in European family demography. Running diagonally through Europe from St. Petersburg to Trieste, the imaginary line illustrates the centuries-old geographic division in European marriage patterns. Hajnal observed that until the 1940s, late and non-universal marriage had prevailed in Northwestern Europe for centuries while marriage in Southern and Eastern European countries had remained early and near-universal (Hajnal 1965).

Hajnal's dichotomization of marriage patterns in Europe has since manifested itself in more complex frameworks on family formation. Drawing on the Hajnal's ideas, Reher (1998) notes that "weak" family ties are characteristic of Northern and Western European countries while "strong" family ties are prevalent in Southern and Eastern Europe. He asserts that these family ties explain divergent patterns and norms regarding nuptiality, divorce, cohabitation, "nest leaving" (i.e., the age at which children leave their parental home), familial solidarity and intergenerational care. Others have taken Reher's conceptualization of "weak" and "strong" familism a step further, arguing that the former family regimes tend to have higher levels of gender equity, fertility, and individual autonomy than the latter (e.g., Billari and Wilson 2001; Anderson and Kohler 2013; Suzuki 2008; Dalla Zuanna and Micheli 2005).

That geographic differences in family ties in Europe will eventually dissipate has been of topical debate in the literature. On one side of the debate, Roussel (1992) posits a gradual process of convergence on the continent, rendering a universally "European" family style. On the other side, Reher (1998) staunchly disagrees with this prediction, stating the differences in family ties "have characterized European societies for centuries, and it would not be prudent to write their death certificate too hastily" (Reher 1998:220).

OBJECTIVE

While a historical division in family values in Europe has been well-documented, no study has empirically tested whether this geographical division persists in the 21st century. Furthermore, no study has taken a cross-national, over-time approach in looking at changes in family values.

The purpose of this paper is two-fold: 1) to test whether a geographic division in family values persists in contemporary Europe and 2) to gauge whether family values have changed over the last two decades. With an abundance of data spanning 20 years on values and attitudes toward marriage and the family, the European Values Survey (EVS) provides a unique opportunity to answer these two research questions.

METHODS

We use latent class analysis to dichotomize individuals based on responses to a set of categorical questions pertaining to views on family formation. Introduced by Lazarsfeld in 1950, latent class analysis searches for unobserved classes based on measured categorical variables. Responses to each manifest categorical variable are assumed to be conditional upon

the latent classes. The number of classes used can be chosen based on a combination of theoretical justifications and parsimony measures given in each individual model. This procedure gives us two important sets of results: the item response probabilities conditional on class membership and the estimated class membership proportions.

To produce these two sets of results, let π_{jrk} represent the probability that class r produces the kth outcome on the jth variable, and let p_r represent the mixing proportions that provide the weights of the weighted sum of the cross-classification tables. After choosing the number of classes, we estimate p_r and π_{jrk} by maximizing a log likelihood function using the expectation maximization (EM) algorithm (Dempster, Laird, and Rubin, 1977). We then estimate the posterior probability that each individual belongs to each class using Bayes formula. The following analysis uses the poLCA package in R (Linzer and Lewis 2011).

In this case, views on norms of family formation were used to group individuals into two classes. The hope is that members in one of these classes will represent more traditional views of family formation, while the members of the other group will represent more deinstitutionalized (or progressive) views of family formation. The model was also run using three, four, five, and six classes, but the Bayesian information criterion and Akaike information criterion changed little between models, so the more theoretically intuitive option of two classes was chosen.

Latent class analysis is far more powerful than simply looking at the trends in responses to these questions for several reasons. First, and most vividly, latent class analysis reduces dimensionality and makes interpretation more straight-forward and applicable to the question at hand. Second, latent class analysis interprets the relationships between individuals and sets of responses at a level of dimensionality that is impossible using simpler techniques.

In this case, there are nearly 2000 cells or possible combinations of responses. Third, this paper works under the assumption that it is useful to see individuals as belonging to one of two groups. While this is overly simplistic and there is surely overlap, in the context of an institutional shift, this assumption is useful.

The questions shown in Table 1 were chosen from the EVS based on their consistency across waves and countries, and for their relevance to the above hypotheses. Each question evaluates how much the respondent's views on family formation deviates from the traditional pattern. Table 1 below lists the questions and possible responses. In each case, "other" consists of "missing", "question not asked", "not applicable", "no answer", and "I don't know". "Other" can be best interpreted as "I don't know" since this is the most common response out of the five.

RESULTS

Question 1

To answer our first question—whether the Hajnal line persists in the 21st century—we perform latent class analysis using the 2008 wave of the EVS. The two classes yielded from the model represent two fundamentally different positions on marriage values: class 1 is defined by individuals who are more likely than class 2 members to believe that marriage should involve children, children need both parents, marriage is not outdated, single parents are inappropriate, and divorce is not justifiable. For every question, class 1 members take a more "traditional" view of family formation.

In Table 2 below, the probability of giving each response conditional to class

membership is given. The results of this analysis can best be depicted in the map below

(Figure 1). The map shows every country included in the analysis filled in according to a heat

index. The palest-- Turkey, Azerbaijan, Georgia, and Armenia--have virtually no class 2

membership, while the darkest countries (concentrated in Northern Europe) have

approximately 2/3 class 2 membership.

The map provides strong support for the hypothesis that as late as 2008, as there

exists a geographic divide analogous to the Hajnal line in perceptions about family formation.

The biggest deviation from this divide may be how much Lithuania differs from its formerly

Soviet Baltic neighbors. Besides this exception, there is remarkably clear grouping: the

further southeast one goes, the less class 2 membership.

Question 2

Our second question—whether convergence in family values is occurring within

Europe—is answered by comparing changes in class membership across the last three waves

of the EVS (1990, 1999, 2008). Wave 1 was not included, because it would have severely

limited the questions that could be analyzed. The latent class analysis was run across

individuals from all countries and for all three waves at once. This way, comparisons could

be made between countries and across time.

Like Table 2, Table 3 below illustrates the probability of giving each response

conditional to class membership. The fact that both the cross-sectional and over-time

analyses resulted in such similar classes further justifies the methods employed in this paper,

and supports the notion that views on marriage can be roughly broken up into two consistent

groups.

The results, illustrated in Table 4 below, suggest that family values throughout Europe are becoming less rigid, as class 2 membership increased from wave 2 to wave 4 in every country analyzed. In addition, there were few instances when a country saw a decrease in class 2 membership between waves 2 and 3 or waves 3 and 4. These trends appear to be unidirectional and irreversible across the continent. While the direction of change was the same for all countries analyzed, the pace of increase from class 1 to class 2 membership varied dramatically across countries. For example, Sweden experienced an absolute change of .365 while Italy experienced a mere .0088 increase. To make matters blurry, the pace of increase from 1990 to 2008 varied not only within the continent but also within cultural and geographic regions. In the Baltic States, for example, Lithuania saw a large gain in class 2 membership (+33%), while Latvia and Estonia experienced only modest increases (+10.6% and 7.3%, respectively). Southern Europe presents a similarly mixed picture: an impressive gain in class 2 membership in Spain (+30%), a modest increase in Portugal (+16.5%), a small positive change in Malta (+6.5%) and a negligible increase in Italy (+.8%). While out of the scope of this paper, exploring why some countries have experienced more rapid change than others could provide for a fruitful area of future research.

CONCLUSION

Our findings illustrate that a division in values related to marriage analogous to the Hajnal line persists in Europe in the 21st century. In addition, our analyses provide support to both sides of the debate regarding convergence of European marriage values. On one hand, increases in Class 2 membership have taken place universally and nearly irreversibly throughout

Europe from 1990 to 2008, lending support to the Roussel's prediction of value convergence. On the other hand, significant heterogeneity in family values persists within Europe (see Figure 2), supporting Reher's notion that underpinning historical and cultural contexts matter. Furthermore, that the pace of change varied dramatically from 1990 to 2008 suggests some cultural contexts may be more conducive to change than others.

Because family formation is intrinsically tied to larger scale societal concerns such as low fertility, child well-being, and gender equity, it is important to monitor changes in family values as they take place across space and time.

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Table 1 Questions used in LCA

Question Code	Question	Responses	Norm Challenged
d038	Here is a list of things which some people think make for a successful marriage. Please tell me, for each one, whether you think it is very important, rather important or not very important for a successful marriage? Children	1-Very important 2-Rather important 3-Not very important 4-Other	A successful marriage needs children.
d018	If someone says a child needs a home with both a father and a mother to grow up happily, would you tend to agree or disagree?	1-Tend to agree 2-Tend to disagree 3-Other	Children being raised by amother and father.
d022	Do you tend to agree or disagree with this/the following statement? Marriage is an outdated institution	1-Agree 2-Disagree 3-Other	Marriage.
d023	If a woman wants to have a child as a single parent, but she doesn't want to have a stable relationship with a man, do you approve or disapprove?	1-Approve 2-Depends 3-Disapprove 4-Other	Getting married before having children.
f121	Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between, using this card.	1-Never Justifiable . . 10-Always Justifiable 11-Other	Staying Married.

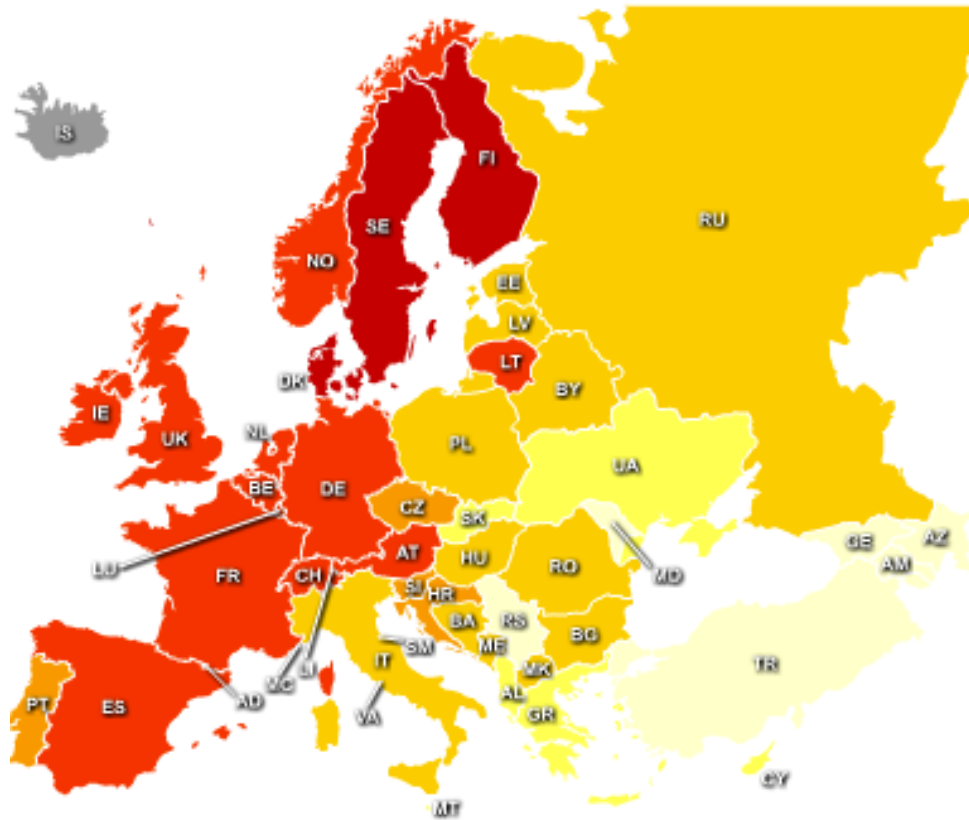*Source:* European Value Survey (EVS), 1990, 1999, 2008

Figure 1 Map of Europe. Redder countries have higher class 2 (Deinstitutionalized views of family formation) membership. Grey countries were not included in the analysis. Class membership probabilities were calculated by conducting a latent class analysis on EVS 2008 data.

Table 2 Item response probabilities conditional on class membership for EVS wave 4.

Question 1: Children are important for a successful marriage.

Class	Pr(1: Very Important)	Pr(2: Rather Important)	Pr(3: Not Very Important)	Pr(4: Other)
1	0.750	0.222	0.031	0.007
2	0.467	0.334	0.164	0.033

Question 2: Children need both parents.

Class	Pr(1:Tend to Agree)	Pr(2: Tend to Disagree)	Pr(3: Other)
1	0.949	0.045	0.007
2	0.581	0.353	0.066

Question 3: Marriage is outdated.

Class	Pr(1: Agree)	Pr(2: Disagree)	Pr(3: Other)
1	0.116	0.862	0.023
2	0.346	0.549	0.105

Question 4: A woman having a child without a relationship with a man.

Class	Pr(1: Agree)	Pr(2: Depends)	Pr(3 Disagree)	Pr(4: Other)
1	0.331	0.134	0.510	0.025
2	0.689	0.146	0.114	0.051

Question 5: Is divorce justifiable?

Class	Pr(1: Always)	Pr(2)	Pr(3)	Pr(4)	Pr(5)	Pr(6)	Pr(7)	Pr(8)	Pr(9)	Pr(0: Never)	Pr(Other)
1	0.288	0.051	0.070	0.068	0.224	0.082	0.063	0.055	0.027	0.047	0.027
2	0.034	0.013	0.023	0.031	0.167	0.079	0.098	0.139	0.093	0.282	0.042

Source: European Value Survey (EVS) 2008. Item response probabilities were generated using a latent class analysis.

Table 3 Item response probabilities conditional on class membership for EVS waves 2, 3, and 4.

Question 1: Children are important for a successful marriage.

Class	Pr(1: Very Important)	Pr(2: Rather Important)	Pr(3: Not Very Important)	Pr(4: Other)
1	0.709	0.249	0.035	0.008
2	0.440	0.338	0.196	0.026

Question 2: Children need both parents.

Class	Pr(1:Tend to Agree)	Pr(2: Tend to Disagree)	Pr(3: Other)
1	0.956	0.034	0.010
2	0.598	0.335	0.067

Question 3: Marriage is outdated.

Class	Pr(1: Agree)	Pr(2: Disagree)	Pr(3: Other)
1	0.094	0.862	0.044
2	0.351	0.545	0.104

Question 4: A woman having a child without a relationship with a man.

Class	Pr(1: Agree)	Pr(2: Depends)	Pr(3 Disagree)	Pr(4: Other)
1	0.301	0.247	0.421	0.032
2	0.671	0.171	0.114	0.044

Question 5: Is divorce justifiable?

Class	Pr(1: Always)	Pr(2)	Pr(3)	Pr(4)	Pr(5)	Pr(6)	Pr(7)	Pr(8)	Pr(9)	Pr(0: Never)	Pr(Other)
1	0.195	0.055	0.083	0.072	0.253	0.099	0.066	0.066	0.030	0.052	0.031
2	0.024	0.010	0.019	0.026	0.169	0.080	0.094	0.141	0.090	0.308	0.034

Source: European Value Survey (EVS), 1990, 1999, 2008. Item response probabilities were generated using a latent class analysis.

Table 4 Proportion with class 2 membership by year

	1990	1999	2008	Total Change
Austria	0.236	0.317	0.427	0.192
Belgium	0.261	0.389	0.443	0.181
Bulgaria	0.189	0.231	0.252	0.063
Czech Republic	0.119	0.258	0.360	0.241
Germany	0.267	0.317	0.414	0.147
Denmark	0.522	0.587	0.683	0.161
Estonia	0.155	0.230	0.228	0.073
Spain	0.313	0.413	0.613	0.300
France	0.310	0.428	0.460	0.150
Great Britain	0.330	0.484	0.478	0.148
Italy	0.251	0.249	0.260	0.009
Lithuania	0.145	0.363	0.470	0.325
Latvia	0.171	0.226	0.277	0.106
Malta	0.066	0.069	0.132	0.066
Netherlands	0.403	0.555	0.506	0.103
Poland	0.082	0.165	0.243	0.161
Portugal	0.248	0.398	0.413	0.165
Romania	0.200	0.199	0.270	0.070
Sweden	0.319	0.564	0.684	0.365
Slovenia	0.370	0.427	0.411	0.041
Slovakia	0.103	0.193	0.176	0.073

Source: European Value Survey (EVS), 1990, 1999, 2008. Class membership estimated using latent class analysis