DEMOGRAPHIC RESEARCH
A peer-reviewed, open-access journal of population sciences

DEMOGRAPHIC RESEARCH

VOLUME 42, ARTICLE 16, PAGES 461–496
PUBLISHED 11 MARCH 2020
http://www.demographic-research.org/Volumes/Vol42/16/
DOI: 10.4054/DemRes.2020.42.16

Research Article

Patterns of spatial proximity and the timing and spacing of bearing children

Bastian Mönkediek

This publication is part of the Special Collection on "The Power of the Family," organized by Guest Editors Hilde A.J. Bras and Rebecca Sear.

Contents

Demographic Research: Volume 42, Article 16
Research Article

Patterns of spatial proximity and the timing and spacing of bearing children

Bastian Mönkediek[1]

Abstract

BACKGROUND
People's demographic decision-making is embedded in regional cultural contexts that include regional patterns of family organization called family systems. Although previous research has shown that family systems explain regional variation in fertility, it has focused mainly on historical or developing societies. Processes of modernization have led to substantial changes in family structures and values and to an overhaul of the traditional family formation system in most developed countries. Therefore, questions arise regarding whether family systems also influence fertility in contemporary developed societies.

OBJECTIVE
The paper addresses the research question by examining the association between regional patterns of spatial proximity between kin and (1) the age at first birth, (2) the length of the interbirth interval between the first and second child, and (3) the length of the interbirth interval between the second and third child. In this context, the paper controls for changes in the associations occurring with age.

DATA AND METHODS
The paper derives regional indicators of spatial proximity between kin for 54 regions in nine European countries using the first two waves of the Survey of Health, Ageing and Retirement in Europe (SHARE) (N = 38,484). The paper studies the association between these regional indicators and fertility using individual-level data from the Generations and Gender Survey (GGS) (N = 58,689). The analysis relies on a set of discrete-time hazard models.

RESULTS AND CONCLUSIONS
The results support the idea that regional patterns of family organization help to explain fertility in contemporary developed societies. However, the results are more complex than expected because the association between spatial proximity and fertility is time-varying. For example, on average, closer proximity to kin increases the likelihood of

[1] Research Fellow, TwinLife Projekt, Faculty of Sociology, Bielefeld University, Germany.
Email: bastian.moenkediek@uni-bielefeld.de.

having a second child during the first three years after the first child is born. Future research needs to replicate the results and investigate the underlying mechanisms more closely to better understand how and when patterns of family organization impact fertility.

1. Introduction

People's demographic decision-making does not "occur in a vacuum" (Liefbroer, Merz, and Testa 2015: 141). It is embedded in regional cultural contexts where fertility-related norms define whether individuals should or should not follow certain behaviours (Liefbroer, Merz, and Testa 2015: 142–143; Liefbroer and Billari 2010) and provide "cultural timetables" on when specific behaviours should take place (Settersten and Hagestad 1996: 186; Nauck, Groepler, and Yi 2017). The degree to which people learn about or are enabled to follow these norms is affected by the ways in which families are organized. Depending on who is coresiding and living in proximity, families differ in their ability to provide opportunities for social learning, social support, and social control (Bott 1971; Kolk 2014; for an overview on these processes, see Bernardi and Klärner 2014: 649–652).

Fertility-related norms and the ways in which families are organized are not independent of another. They are part of a wider system of organizational principles that relate to regional patterns of household and family formation, what we call family systems (Hajnal 1982; Reher 1998; Skinner 1997; Faragó 1998; Szołtysek 2008). Family systems have been identified as a useful concept to explain regional variation in fertility (Burch and Gendell 1970; Hajnal 1982; Dyson and Moore 1983; Das Gupta 1997; Veleti 2001; Mason 2001; Neven 2002; Delger 2003; Dalla-Zuanna and Micheli 2004; Rotering and Bras 2015) and the persistence of regional demographic traits (Kok 2009, 2014). However, the majority of the empirical research studying how family systems shape people's demographic decision-making has focused on historical and developing societies and has often been limited to only a small number of regions and countries (e.g., Hajnal 1982; Das Gupta 1997: 181; Veleti 2001; Rotering and Bras 2015[2]; for an exception see Kok 2009, who focuses on extra-marital fertility). Processes of modernization have led to serious changes in family structure and values and to an overhaul of the traditional family formation system in most developed countries (Lesthaeghe and Surkyn 2008: 81; Van de Kaa 1987: 32–35; for an overview see Van

[2] Rotering and Bras (2015: 111) include the type of regional family system as a control variable in their analysis.

de Kaa 2010; Zaidi and Morgan 2017). Therefore, questions arise regarding whether family systems also influence fertility in contemporary developed societies.

Addressing this research question, this paper looks at regional patterns of spatial proximity between kin as an indicator describing regional patterns of family organization, and their role in explaining regional differences in fertility in nine European countries. The indicator describing regional patterns of spatial proximity between kin is derived for 54 European regions (NUTS 1)[3] using the Survey of Health, Ageing and Retirement in Europe (SHARE). The association between the derived indicator and fertility is then tested using individual-level data from the Generations and Gender Survey (GGS). Since most researchers agree that historical shifts in the timing of childbearing are the major reason behind periods of low and lowest-low fertility (Billari 2008; Goldstein, Sobotka, and Jasilioniene 2009; Bongaarts and Sobotka 2012), the paper examines the impact of regional patterns of spatial proximity between kin on the timing and spacing of children. More precisely, the paper includes a separate analysis for explaining differences in (1) the respondent’s age at first birth, (2) the length of the interbirth interval between the first and second child, and (3) the length of the interbirth interval between the second and third child. The existence of fertility-specific age norms suggests specific time points at which fertility might be favored. Therefore, the analysis is based on Discrete-Time Event History Models to control for time-varying effects. To the author’s knowledge, this is the first study that examines the time-varying effects of an indicator describing regional patterns of family organization on fertility behaviours in contemporary developed societies.

2. Theoretical background

2.1 European family systems and fertility behaviours

Family systems can be defined as regionally embedded sets of norms, values, and practices associated with the organization of kinship (Mason 2001: 160–161). Through relating to the customary, normative manner in which family processes unfold, family systems can shape people’s behaviours (Skinner 1997: 54; Das Gupta 1999; Therborn 2004). Key examples are customs related to age at leaving the parental home, marriage (Reher 1998: 215), inheritance practices (Mason 2001: 160), and patterns of family care (Hareven 1991: 108–111; Mason 2001: 160). For all these customs, family systems provide ‘blue prints’ that (1) govern when and under which conditions particular family members gain in importance, (2) regulate patterns of social support (e.g., in the case of

[3] NUTS regions divide the European Union into areas of relative comparable size for the purpose of “the collection, development and harmonisation of European regional statistics” (Eurostat 2017).

childbirth or elderly care; Reher 1998; Segalen et al. 2010: 178/179, 195–197, 202; Bucx, Wel, and Knijn 2012: 109) and (3) provide certain life course stages with meaning, such as the transition to adulthood (see Hilevych 2016; Mason 2001: 160–161).

By providing certain life course stages with meaning, family system norms relate to ideas about the ideal ‘start’ and ‘end’ of the reproductive career (Neugarten, Moore, and Lowe 1965; Settersten and Hägestad 1996; Mynarska 2010; Billari et al. 2011). These ideals can lead to age-related norms regarding fertility and behaviours connected with fertility, such as marriage and the age of leaving the parental home (compare Reher 1998; Aassve, Arpino, and Billari 2013: 389; Arpino and Tavares 2013; Nauck, Groepler, and Yi 2017 for the existence of these norms).

By providing kin members with different rights and obligations, family systems provide different incentives for kin to cooperate with each other and shape intra-family relations and household structures (Höllinger and Haller 1990; Das Gupta 1999: 176). For example, in regions with norms of shared inheritance, such as joint family regions,[4] siblings have more incentives to cooperate for their mutual benefit (and for practical reasons). In regions where each sibling has “to make their own way in life and has little claim on or obligation to another” (Das Gupta 1999: 177), such as stem family regions,[5] siblings have a greater incentive to leave the parental household early, to marry, and to establish a household of their own. Finally, by creating interdependencies between kin members’ lives, family systems facilitate their social position within the kinship group (Hilevych 2016:16; Mason 2001) and structure the normative control of kin members over each other’s behaviour (Therborn 2004: 242).

Turning to regional variation in family systems, Reher (1998) describes two extremes of European family systems that run from weak family regions in northern Europe to strong family regions in southern Europe. While the weak family regions are characterized by loose family ties and individual values having priority over everything else, strong family regions are characterized by close family ties and the family group traditionally having priority (Reher 1998: 203).

Furthermore, as Reher (1998: 203) argues, “[t]he way in which the relationship between the family group and its members manifests itself has implications for the way society itself functions.” For example, the patterns of family care embedded in family

[4] Joint family regions are characterized by partible or equal inheritance among children and a family structure consisting of two or more conjugal units, with at least two of them in the same generation (Skinner 1997: 55–56).

[5] Stem family regions are characterized by unequal inheritance favoring one heir and a family structure consisting of two or more conjugal units, with no more than one conjugal unit per generation (Skinner 1997: 55–56).

systems structure the organization of the welfare state by shaping social policies.[6] In fact, different types of behaviour, ranging from openness, to economic innovation, female labour force participation, political attitudes, and demographic behaviour, vary across family systems (Todd 1990; Reher 1998; Hank 2007; Duranton, Rodriguez-Pose, and Sandall 2009; Alesina and Giuliano 2010). Such variation in behaviours makes fundamental changes in the family system costly and reduces their likelihood,[7] resulting in the relative persistence of regional differences between family systems (e.g., Reher 1998). This notion is supported by the empirical evidence of various recent studies that have continued to observe the previously described patterns of variation in family ties and household organization across European regions (Hank 2007; Kohli, Albertini, and Künemund 2010; Heady, Gruber, and Ou 2010; Heady, Gruber, and Bircan 2010; Dykstra and Fokkema 2011; Micheli 2012).

2.2 Family systems and fertility decline: Tempo and quantum effects

There is a long tradition in studying spatial differences in demographic developments across European countries, such as variation in extra-marital fertility and fertility decline[8] (Coale and Treadway 1986; Watkins 1986; Lesthaeghe and Neels 2002; Kok 2009; Klüsener 2015). Most researchers agree that historical shifts in the timing of childbearing, so-called tempo effects, were the major reason behind periods of low and lowest-low fertility in several European countries in the 20th century (Billari 2008; Goldstein, Sobotka, and Jasilioniene 2009; Bongaarts and Sobotka 2012). Interestingly, researchers have observed a cultural divide between the countries that experienced very low fertility, those that experienced moderate-low fertility, and the countries that have experienced a recent rise in fertility (Suzuki 2008; Bongaarts and Sobotka 2012: 112;

[6] Family systems influenced the historical evolution of the welfare state and limited the future pathways of welfare organization (Galasso and Profeta 2018; for an example see Naldini 2003: 150–157, 169–172, 203). At the same time, patterns of welfare organization facilitate existing patterns of family ties (Baizán, Michielin, and Billari 2002: 200–201; Naldini 2003: 202–203; Kalmijn and Saraceno 2008: 501–502; Grandits 2010: 31–33, 40–42; Herlofson and Hagestad 2012: 41–42).
[7] This observation does not reject the notion that such changes do occur. For example, in approximately 1900, Poland was characterized by economically separated nuclear families (Sklar 1974: 234–236; Možný and Katrňák 2005: 235–236). However, an economic crisis and political disturbances strengthened kinship ties (Synak 1990: 334–335) and made multigenerational households more common during the 21st century (Iacovou and Skew 2011: 471).
[8] For example, Sobotka (2004) studied the effect of changes in the overall timing of childbearing on the TFR of different European countries. He compared the TFR with an adjusted fertility rate (based on the Bongaarts-Feeney adjustment), which provided an estimate of fertility levels if there had been no changes in the timing of childbearing (Sobotka 2004: 198). Interestingly, he found strong tempo effects in southern European and several central (called 'western') and eastern (called 'central') European countries, but not in Scandinavian Europe (p. 202).

Anderson and Kohler 2013; Arpino and Tavares 2013). To a certain extent, this divide follows the dividing lines separating regions with different family systems (Dalla-Zuanna and Micheli 2004; McDonald 2006: 498–499; Suzuki 2008; Kok 2009; Hartnett and Parrado 2012). Fertility rates are lower in strong family countries than in weak family countries (McDonald 2006: 498–499; Frejka and Sobotka 2008: 39).

Researchers explain these patterns by the, on average, stronger and more standardized kin relationships, which promote stronger lines of social control (Dalla-Zuanna 2004; Dalla-Zuanna and Micheli 2004; Romero and Ruiz 2007; Suzuki 2008), as well as the stricter criteria to start a family in strong family countries than in weak family countries (Synak 1990; Billari et al. 2002: 18–19; Goldstein et al. 2013; Newson 2009: 470). In many strong family countries, these criteria include marrying, establishing a household of one's own, and living in financial security before having children (Livi-Bacci 2001; Sobotka, Zeman, and Kantorová 2003: 266; Možný and Katrňák 2005: 235–236). In addition, extra-marital births are less accepted (Guerrero and Naldini 1996: 51–53). Because there are obstacles to fulfilling these criteria, e.g., due to economic uncertainty,[9] and because traditional family system norms clash with social modernization,[10] the stronger lines of control in strong family countries increase the pressure that future parents feel to "forego their ideal family size for fewer children so that they can maximize their children's success" later in life (Anderson and Kohler 2013: 210).[11]

By contrast, many weak family countries, such as Sweden and Denmark, provide less-strict criteria for starting a family, while they are also better adapted to processes of late childbearing (Kohler, Billari, and Ortega 2002); e.g., cohabitation is much more widespread (Kiernan 2001: 3, 5), fertility is separated from marriage, and extra-marital fertility is common[12] (Trost and Levin 2005: 348–349, 353–354). In addition, by

[9] Economic uncertainty made it difficult to fulfill these criteria, while the welfare state even increased family dependencies and led individuals to postpone leaving the parental household (Livi-Bacci 2001: 145–152; Dalla-Zuanna 2004: 111–115, 147–148; Aassve, Mazzuco, and Mencarini 2005: 284–285), by regarding the family unit as the main provider of support (Esping-Andersen 1999; Baizán, Michielin, and Billari 2002: 197–199; Daatland and Lowenstein 2005: 179).

[10] Traditional family norms clash with social modernization, such as single-parenthood, and result in new obstacles, such as balancing home and work life (Anderson and Kohler 2013: 199–200).

[11] As argued by the economic theory of fertility and evolutionary theories, fertility postponement can be a strategy to improve children's chances of better socioeconomic placement (Becker and Lewis 1974; Becker and Barro 1988) and their future chances to reproduce (Turke 1989; Voland 1998).

[12] Fertility is higher in weak family regions, which are frequently characterized by a greater extent of extra-marital fertility (Klüsener, Perelli-Harris, and Sánchez Gassen 2013: 141, 149–153; Billari and Kohler 2004: 168–169). As demonstrated by Heuveline and Timberlake (2004), the percentage of children born to cohabiting parents (p. 1224, Figure 2 at birth) is lower in strong family countries such as Poland, Italy, and Spain, than in the weak family countries Sweden and Finland. However, percentages are also low in Belgium and Switzerland and comparatively high in Austria, Germany, and Slovenia. Interestingly, Belgium is characterized by both comparatively close kin relationships (Dumon 2005: 227–228) and a high degree of marital fertility (Rosina 2004: 27).

promoting non-family caregiver activities and improving the compatibility between a wife’s work and childcare, there is a better fit between family and welfare organization patterns (Suzuki 2003, 2008: 36). As a result, the fit between the ideal and actual family size is better in weak family countries than in strong family countries,[13] and declines in family-size ideals are less likely in most weak family countries (Goldstein, Lutz, and Testa 2004: 484–487). Taken together, one can expect to find that **(H1a)** *first childbirth occurs later in strong family regions than in weak family regions*.

However, research by Kohler, Billari, and Ortega (2002) and Hilevych (2016) suggest that low fertility is not necessarily linked to late childbearing in all strong family countries. According to Kohler, Billari, and Ortega (2002), low fertility in Italy is mainly due to “a low progression probability after the first child and a ‘falling behind’ in cohort fertility at relatively late ages” (p. 646). Comparing two cities in Eastern and Western Ukraine (Kharkiv and Lviv), Hilevych (2016) finds comparatively young ages at first birth and fertility postponement for a second child in eastern Ukraine joint families. Accordingly, it can also be expected that the **(H1b)** *first childbirth occurs earlier in strong family regions than in weak family regions* due to social norms and the higher value attached to the family, while there is a low progression probability to a subsequent birth. This lower progression probability can also be reflected in increased lengths of interbirth intervals. Accordingly, it can be assumed that **(H2)** *the interbirth interval between the first and second child and between the second and third child is longer in strong family regions than in weak family regions*, lowering fertility in strong family countries in the long run.

3. Data, measures, and method

3.1 Data

To answer the main research question and test the derived hypotheses, this paper uses the first wave of the Generations and Gender Survey (GGS) (Vikat et al. 2007: 391; Gauthier, Cabaço, and Emery 2018). The first wave of the GGS was conducted between 2002 and 2013 in several European and non-European countries to study social and demographic developments (Vikat et al. 2007: 391). This paper only includes those European countries that are also included in the Survey of Health, Ageing and Retirement in Europe (SHARE) and for which a regional indicator of the family system is constructed (Austria, Belgium, Czech Republic, Estonia, France, Germany, Italy,

[13] Although in strong family countries such as Italy the ideal family size remains high, differences between ideal and realized family size are greater than in many weak family countries where family size ideals are slightly lower (Goldstein, Lutz, and Testa 2004: 484–487).

Poland, and the Netherlands). These countries represent different parts of Europe, characterized by a wide range of different family systems (Laslett 1983; Reher 1998). In addition, the study is limited to individuals aged between 16 and 46 years who were born between 1941 and 1980 and provided information on their fertility and their geographical location (NUTS), for a total of N = 58,689 cases nested in 54 regions.

3.2 Measures

3.2.1 Dependent variable

This paper studies the association between regional patterns of family organization and the timing of fertility based on three dependent variables: (1) respondent's age at first birth, (2) the length of the interbirth interval between the first and second child, and (3) the length of the interbirth interval between the second and third child. The population at risk of experiencing a second or third birth is restricted to those respondents who have experienced a previous birth event. Respondents who did not experience a birth event before the age of 46 are censored. Marriage is not a requirement for fertility in all countries: Therefore, the paper studies all birth events, irrespective of whether they occurred within or outside marriage.

Table 1 gives an overview of the cohort fertility, the mean ages at the first, second, and third births in each cohort, and the average age of respondents. As expected, fertility is lower in the younger birth cohort (1961–1980). However, on average these respondents are 36 years old, and thus not all of them have finished their reproductive careers. Nevertheless, there is a slight increase in the mean ages at first and second birth across cohorts, in particular for women, which suggests that fertility levels are likely to be lower in the younger group than in the older group (1941–1960).

Table 1: Mean ages at first, second, and third births

Cohort (N cases)	Mean fertility (N children)	Mean age	Mean age at first birth	Mean age at second birth	Mean age at third birth
Total					
1941–1960 (28,104)	1.48 (1.28)	55.1 (6.2)	25.4 (4.8)	28.4 (4.9)	31.1 (5.2)
1961–1980 (30,585)	1.30 (1.19)	36.0 (6.0)	25.8 (4.6)	28.6 (4.5)	30.8 (4.6)
For men					
1941–1960 (12,459)	1.45 (1.29)	55.0 (6.2)	27.0 (4.8)	30.0 (4.8)	32.9 (5.1)
1961–1980 (13,306)	1.10 (1.17)	35.9 (6.1)	27.2 (4.5)	30.0 (4.4)	32.6 (4.5)

Table 1: (Continued)

Cohort (N cases)	Mean fertility (N children)	Mean age	Mean age at first birth	Mean age at second birth	Mean age at third birth
For women					
1941–1960 (15,645)	1.50 (1.28)	55.2 (6.2)	24.3 (4.5)	27.2 (4.5)	29.9 (4.8)
1961–1980 (17,279)	1.46 (1.18)	36.0 (6.0)	25.0 (4.5)	27.8 (4.4)	30.0 (4.5)
N = 58,689	1.39 (1.24)	45.1 (11.3)	25.6 (4.7)	28.5 (4.7)	31.0 (5.0)

Note: standard deviation in brackets

3.2.2 Explanatory variables: Regional family system

To describe regional differences in family systems, the paper relies on differences in patterns of family ties. Family ties, in particular those relating to differences in household composition and the spatial proximity between kin, are well established as indicators of family systems (see Reher 1998; Viazzo 2010a: 282/283; Viazzo 2010b: 148). Patterns of family ties often relate to differences in family norms, customs, and practices that structure the rights and obligations between kin (Heady 2012: 95), such as the care of elderly (Reher 1998). In particular, the spatial proximity between kin reflects opportunities to provide and receive social support, as well as conditions of experiencing social pressure and means of social control (Dykstra and Fokkema 2011; Heady 2012: 95).

Unfortunately, the GGS cannot be used to derive indicators of regional family systems because this would induce an endogeneity problem in the analysis. Using the GGS, it would remain unclear whether the observed pattern of family ties is the result or the cause of the observed fertility behaviours.[14] To work around this problem, the paper utilizes the information on household structures (complexity) and parent-child relationships[15] provided in SHARE (Börsch-Supan et al. 2013). The first two waves of SHARE were conducted in 2004/2005 and 2006/2007 in fourteen European countries[16] and Israel. The target population of the survey was 50 years and older, while this study

[14] The reason for the lack of clarity is that family systems structure people's social networks and thereby influence fertility (Veleti 2001; Micheli 2004). Moreover, fertility also affects social networks (Belsky and Rovine 1984).
[15] Parent–child relationships include respondents' relationships with their parents (if alive) and with their own children (if present).
[16] The first wave includes Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Spain, Sweden, and Switzerland. The second wave added the Czech Republic, Ireland, and Poland.

only includes respondents aged 50 to 80 years old with valid information on their kin relationships and their geographical location (N = 38,484).

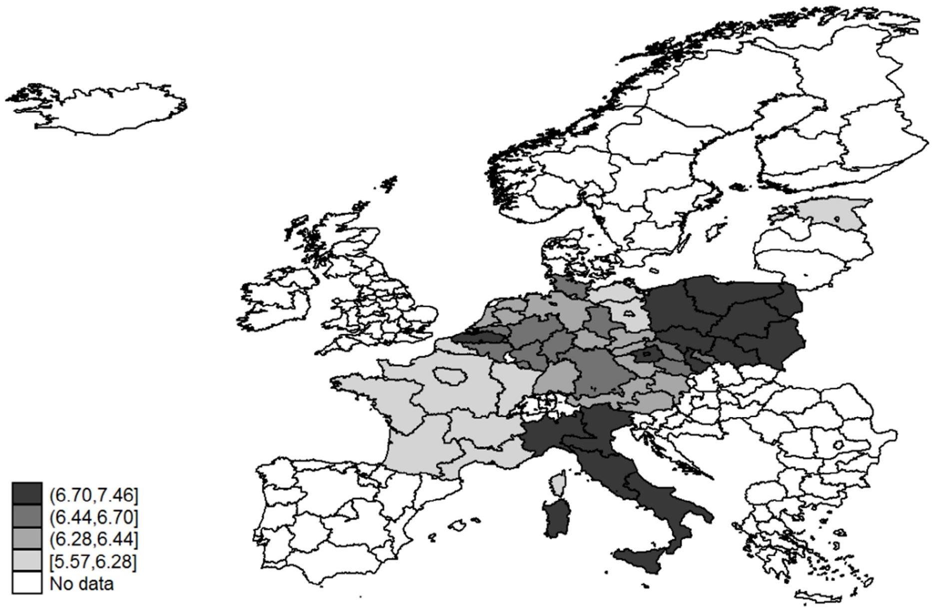
To derive a score that reflects the average spatial proximity between kin in a region from 2004 to 2007, the paper uses information on respondents' household size and information on all parent–child relationships (ties) that extend beyond the respondents' household (following Mönkediek and Bras 2014). To derive this score, the first step counts the number of family members related by blood or marriage, such as parents, children, siblings, aunts, and uncles, living in the respondents' household (N_h). In the second step the paper counts the number of ties outside the household between the respondents and their parents (N_p) and between the respondents and their children (N_c). The third step sums up the values reported in the variables describing the spatial proximity[17] between the respondents and their alter egos for the counted ties. After dividing the resulting score (S) by the number of all included relationships ($N_h + N_p + N_c$) the new variable 'proximity' is rescaled and aggregated to the regional levels (NUTS 1).[18] The new variable 'proximity' ranges between 1 ('very distant') and 9 ('very close proximity'), where a higher value reflects an on average greater family density in a region.

Figure 1 provides an overview of the resulting variable and its regional variation (see also Table 2). As Figure 1 shows, on average the spatial proximity between kin is higher in traditional strong family countries such as Italy and Poland, and much lower in the relatively weak family countries such as France and the Netherlands. Meanwhile, the German-speaking countries and Belgium have moderate spatial proximity between kin, supporting the results of previous research (e.g., Höllinger and Haller 1990; Hank 2007).

Because NUTS regions vary according to their population density, the study tests whether the variable 'proximity' is associated with regional population density. If this is the case, it could bias the results of the analysis. Testing the correlation between regional population density[19] and calculated regional spatial proximity between kin shows that the association is weak and the null hypothesis cannot be rejected (Pearson = –0.155, p = 0.274).

[17] The variables describing the spatial proximity between respondents and their children range between (1) 'in the same household' and (9) 'more than 500 km away in another country.'
[18] For the Czech Republic, the scores are aggregated at NUTS 2 levels.
[19] The information on population density was derived from Eurostat (2018a).

Figure 1: Average spatial proximity between kin by NUTS region



3.2.3 Control variables

Different time-invariant control variables were included in the analysis. Table 2 provides a descriptive overview of these variables, presented at the country level.

Gender. To control for possible gender differences, the models control for respondents being male or female.

Education. To account for people's socioeconomic position influencing the timing of fertility, the respondent's highest level of education is included in the analysis. In the data set, educational degrees are classified based on the ISCED-97 classification (UNESCO 2006).

Birth cohort. To control for changes in demographic behaviour over cohorts, respondents' birth cohorts are included in the form of cohort groups. The distribution of the respondents' birth cohort groups is as follows: 1941–1960: 47.9% and 1961–1980: 52.1%.

Age at marriage/being married. For most of the regarded cohorts, nuptiality played an important role in shaping fertility behaviour. In many cases, marriage is a normative precondition for starting a family, while at the same time pregnancies often also trigger marriages (Skinner 1997: 63–64; Dribe and Lundh 2014: 229–232). Younger ages at marriage often lead to a longer reproductive phase for women (Van Bavel and Reher 2013: 271–276), while increases in the age at marriage across cohorts, e.g., due to modernization processes, often shorten it. To control for changes in the age at marriage explaining fertility behaviour, the respondent's age at marriage is included in the analysis by including an indicator informing the model whether the respondent was married during the studied periods. As demonstrated in Table 2, the mean age at marriage is particularly high in the Netherlands (26.4 years) and Austria (26.1 years) and comparatively low in Eastern European countries such as the Czech Republic (22.9 years), Estonia (23.1 years), and Poland (23.5 years).

Regional gross domestic product (GDP). To describe the economic activity of a region, the paper includes the regional Purchasing Power Standard per inhabitant (PPS). Regional data on the PPS was derived for the year 2000 from Eurostat (2018b).

Country. To control for unobserved factors at the country level, the analysis includes a dummy variable for each country in the sample.

Table 2: Descriptive statistics

Country	N	Female resp.	Respondent education (ISCED)	Mean age at marriage	Average spatial proximity
Austria	2,894	60.7%	3.503 (0.018)	26.1 (0.12)	6.35 (0.001)
Belgium	4,502	51.9%	3.411 (0.021)	24.1 (0.08)	6.65 (0.002)
Czech Republic	6,683	52.0%	3.332 (0.014)	22.9 (0.06)	6.56 (0.002)
Estonia	4,607	62.0%	3.656 (0.017)	23.1 (0.07)	6.202*
France	6,351	57.2%	3.559 (0.019)	24.3 (0.08)	5.893 (0.002)
Germany	6,156	55.3%	3.584 (0.013)	25.1 (0.08)	6.409 (0.003)
Italy	7,952	52.7%	2.685 (0.016)	25.7 (0.06)	7.319 (0.002)
Netherlands	5,853	58.4%	3.405 (0.018)	26.4 (0.09)	6.426 (0.001)
Poland	13,691	57.4%	3.135 (0.135)	23.5 (0.04)	6.941 (0.001)
Total N	**58,689**	**56.1%**	**3,296 (0.005)**	**24.3 (0.02)**	**6.619 (0.002)**

Note: standard errors in brackets, * Estonia consists of only one NUTS region

3.3 Method

To answer the research question and study the associations between fertility and patterns of spatial proximity between kin, the paper uses event history analysis as a tool (for more information, see Vermunt 2009). More precisely, the paper relies on discrete-time hazard models because the paper uses retrospective data with discretely measured events (in years). In addition, discrete-time models allow testing for changes in the studied associations across time in a more effective way (for more information, see Allison 1982, 2014). To perform this analysis the dataset needs to be reorganized into a person-year format. In this context, the data set is expanded to create separate observations for each year that each respondent was observed and had the potential to experience an event under study, starting at age 16 until the maximum age of 46 years.[20] Having reorganized the data set in a person-year format, where each line is treated as a separate observation (Allison 1982: 75), a second step creates two indicator variables: the spell identifier (t) and an identifier telling whether respondents experienced an event of interest during the spell under observation. Respectively, the corresponding discrete-time hazard (h_j) is defined as the conditional probability that a respondent (j) experiences an event (y) in a time period (t), given that he or she did not experience an event prior to t (Singer and Willett 1993: 163):

$$h_{tj} = \Pr[T_j = t \mid T_j \geq t],\ t = 1, \ldots, p. \tag{1}$$

with the conditional probability:

$$\Pr[T_j = t \mid T_j \geq t] = P_{tj} \sum_{u=1}^{t_{j-1}} (1 - P_u) \tag{2}$$

For the underlying hazard rate, the paper assumes a complementary log-log-function (Allison 1982: 72):

$$\log\{-\log[1 - P_{tj}]\} = \propto_t \beta x_{tj} \tag{3}$$

The exponential coefficients of the presented models can be interpreted in terms of hazard rations.

The risk of experiencing a birth event in a given year shall be explained by the regional differences in patterns of spatial proximity between kin, controlling for respondent’s gender, education, birth cohort, age at marriage/being married, regional GDP, and country. The population at risk of experiencing a second or third birth event is restricted to those respondents who have already experienced a previous birth event, i.e., only respondents with a first child have the potential to experience a second birth event. Respondents without any birth events are censored at the age of 46 and ten years

[20] The fecundity of both men and women strongly decreases after the age of 40 (ESHRE 2005; Kidd, Eskenazi, and Wyrobek 2001).

after the previous childbirth to reduce the number of 'long term survivors.'[21] Any interbirth interval starts with the birth of the last child; i.e., the data is reorganized into a person-year format where the first spell corresponds to the first year after the last childbirth.

To account for the possibility that the association between patterns of spatial proximity between kin and respondent's age at first birth varies with age, the paper additionally presents the results of separate models for the episodes before and after the respondents turned 24 years old. In this context, the models only include spells for respondents at risk of experiencing a first birth in a given year. The time point for splitting the combined model is based on the observation that fertility is often postponed until after education and first job entrance (Jackson and Berkowitz 2005: 57–59, 75), while the mean age at first childbirth is approximately 25.6 years for the studied cohorts (see Table 1).

Earlier research suggests that parents try to space their children to fit their household's economic situation (Van Bavel 2004; Amialchuck and Dimitrova 2012). Since the household situation can change with age, the paper presents the results of additional models studying the association between patterns of spatial proximity between kin and the occurrence of a birth event in a specific year before and after three years since the last childbirth.

4. Results

4.1 Spatial variation in the timing of the first birth and the transition to subsequent birth events

First, the spatial variation in the timing of birth events is examined to determine the extent to which patterns vary across regions with different patterns of spatial proximity between kin. As demonstrated by Figures 1, 2, and 3, the mean age at first, second, and third birth varies substantially across European countries. The mean age at first birth ranges from approximately 23.6 years in eastern Germany, parts of the Czech Republic, and southern Italy (for example, in Basilicata or Calabria) to approximately 29.0 years in Belgium, the Netherlands, and western Germany. Supporting the results by Kohler, Billari, and Ortega (2002: 667), low fertility in Italy is not linked to the postponement of the birth of the first child. However, the results also suggest that subsequent birth events occur comparatively early in strong family countries.

[21] The probability of women giving birth to another child more than ten years after her previous childbirth is small.

Figure 1: Mean age at first birth by NUTS region

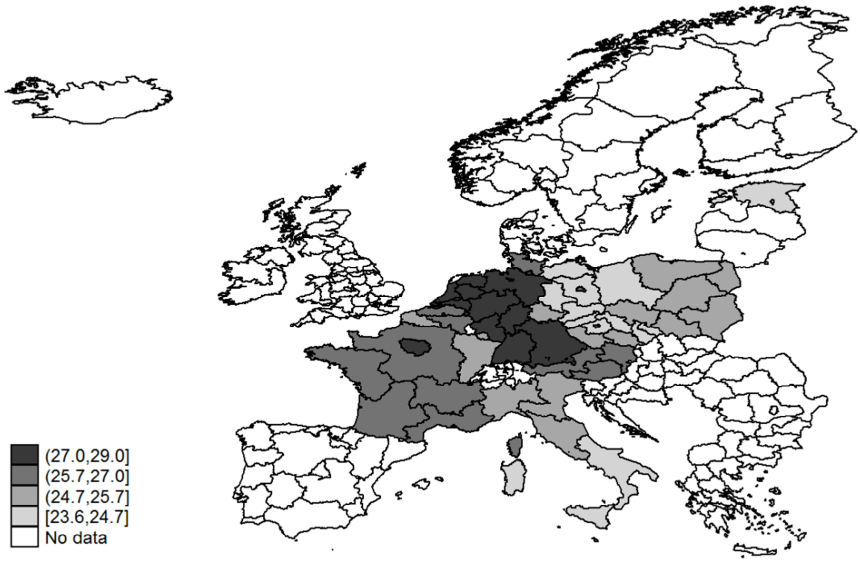


Figure 2: Mean age at second birth by NUTS region

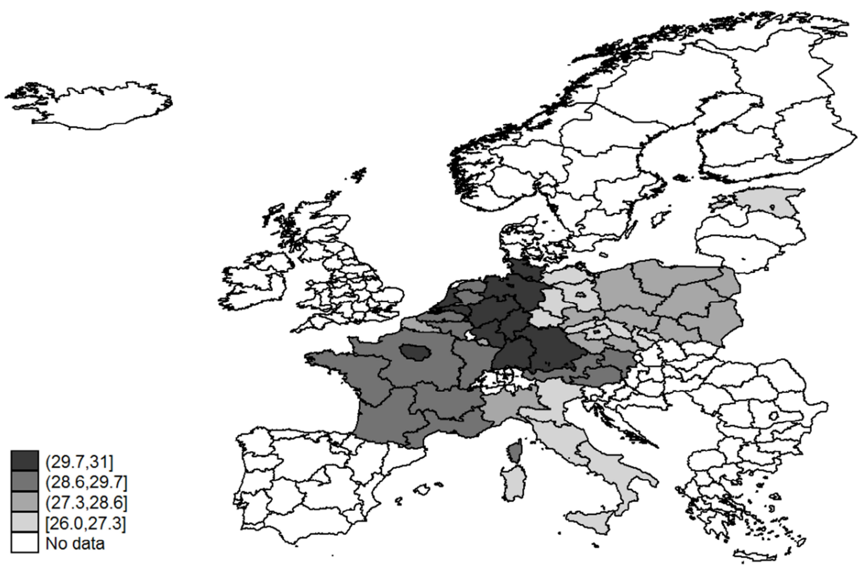
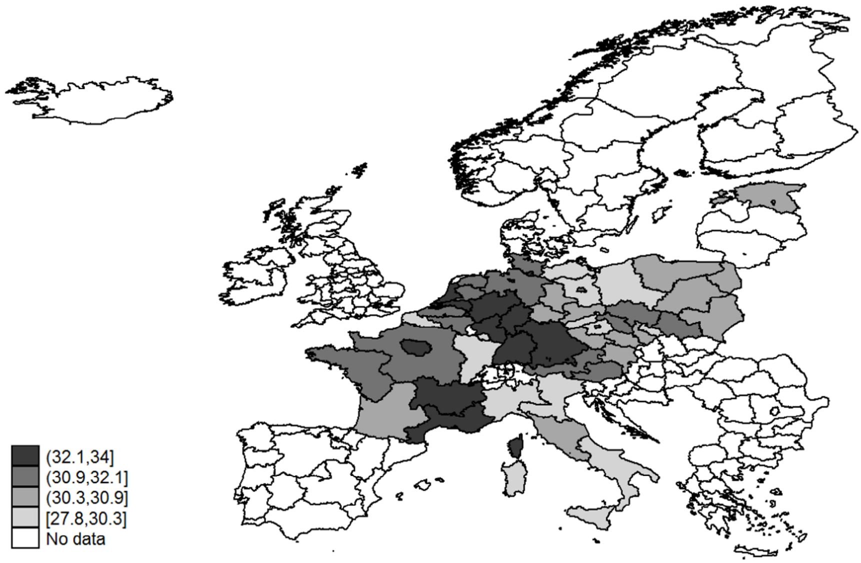


Figure 3: Mean age at third birth by NUTS region



Interestingly, the results indicate some variation in the respondent's age at first birth at the regional level within countries – particularly for Germany. Here, previously observed differences between the eastern and western German regions become obvious. They appear to be even stronger than those found in previous research (Witte and Wagner 1995; Goldstein and Kreyenfeld 2011). While similar regional patterns can be observed for age at the birth of the second child, there is more regional diversity for the age at third birth (e.g., in France). This diversity might indicate different regional demographic systems that gain importance for structuring fertility when people deviate from the still-dominant two-child ideal (Sobotka and Beaujouan 2014; Hilevych and Rusterholz 2018).

4.2 Results of the discrete-time hazard models

As shown in Table 3 (model 3.1), the likelihood of having a first child increases over time (by approximately 28% per year) and slightly diminishes with respondent's age. The effect is stronger for younger (< 24 years) than for older respondents (≥ 24 years) (model 3.2 and model 3.3). As expected, there are differences between countries in the risk of having a first child. These differences do not follow patterns of regional family systems. In addition, there are differences in the risk of having a first child between men and women, between cohorts, across educational groups, and between married and unmarried respondents. Women and respondents born between 1961 and 1980 are at higher risk (approximately 17%–18%) of having a first child than men or respondents from older cohorts. As expected, being better-educated reduces the risk of having a first child, while being married leads to strong increases. Finally, with the exception of marriage, gender, and education, the effects are time invariant: the effects of being married decrease over time, women are more likely to have a first child when they are young (below 24 years old), and more highly educated respondents tend to become more likely to have a first child birth as they get older (above 24 years old).

Regarding the hypotheses of whether a first childbirth event occurs later (H1a) or earlier (H1b) in strong family regions than in weak family regions, the results support the first hypothesis (H1a). The risk of having a first child is 54.4% lower in regions with kin living in close proximity than in other regions, independent of the respondent's age.

Concerning the length of the interbirth intervals between the first and second child (Table 4) or between the second and third child (Table 5), the risk of experiencing a second or third childbirth increases with the length of the interbirth interval (model 4.1 and model 5.1). Interestingly, in both cases there are strong changes in the risk ratios across time. In both cases the risk of having another child is extremely low during the first three years after the first child is born and strongly increases over time (model 4.2 and model 5.2). Four years after the last childbirth the risk is much higher, and then slowly begins to diminish (model 4.3 and model 5.3). In other words, the results suggest significant 'spacing' between the first and second children and between the second and third children. In this context, a higher respondent age reduces the risk of having another child, as indicated by the ages at first and second birth (model 4.1 and model 5.1). Being female and belonging to the youngest cohort group has a similar effect. Being married increases the risk of having another child, but not during the first three years after the last child is born (model 4.2 and model 5.2).

Table 3: Results of discrete-time event history analysis for age at first birth

First birth event	Model 3.1 Combined				Model 3.2 < 24 years				Model 3.3 ≥ 24 years			
	Exp(b)	P <	95% Conf. Interval		Exp(b)	P <	95% Conf. Interval		Exp(b)	P <	95% Conf. Interval	
Individual level												
Female	1.18	0.000	1.12	1.24	1.64	0.000	1.52	1.77	0.97	0.342	0.92	1.03
Cohort												
1941–1960		Ref.				Ref.				Ref.		
1961–1980	1.17	0.004	1.05	1.30	1.16	0.004	1.05	1.28	1.18	0.011	1.04	1.34
Married	12.9	0.000	10.6	15.6	19.0	0.000	15.6	23.1	7.96	0.000	6.84	9.27
Education	0.90	0.000	0.85	0.94	0.63	0.000	0.60	0.66	1.06	0.047	1.00	1.13
Regional level												
Average spatial proximity (Nuts)	0.46	0.000	0.44	0.48	0.42	0.000	0.40	0.45	0.52	0.000	0.48	0.56
PPS	0.96	0.261	0.88	1.03	0.83	0.000	0.75	0.92	1.01	0.849	0.93	1.09
Country												
Austria	1.09	0.268	0.93	1.27	1.12	0.062	0.99	1.27	1.09	0.388	0.89	1.34
Belgium	0.72	0.020	0.54	0.95	0.45	0.000	0.33	0.60	0.82	0.140	0.64	1.07
Czech Republic	0.85	0.059	0.72	1.01	0.91	0.306	0.76	1.09	0.76	0.001	0.64	0.90
Estonia	1.40	0.000	1.22	1.60	1.15	0.122	0.96	1.38	1.46	0.000	1.27	1.67
France	0.49	0.000	0.44	0.55	0.36	0.000	0.31	0.41	0.58	0.000	0.52	0.66
Germany		Ref.				Ref.				Ref.		
Italy	0.33	0.000	0.27	0.42	0.62	0.001	0.46	0.83	0.25	0.000	0.20	0.32
The Netherlands	1.15	0.003	1.05	1.26	0.64	0.000	0.57	0.72	1.34	0.000	1.21	1.48
Poland	1.94	0.000	1.62	2.34	1.56	0.000	1.25	1.96	1.96	0.000	1.64	2.33
Time (x)	1.28	0.000	1.25	1.32	1.94	0.000	1.78	2.10	1.13	0.000	1.07	1.20
Time squared (x^2)	0.99	0.000	0.98	0.99	0.96	0.000	0.95	0.96	0.99	0.000	0.99	0.99
Clusters	**54**				**54**				**54**			
N cases	**58,383**				**58,383**				**58,383**			
N person-years (spells)	**892,339**				**440,634**				**451,705**			
N zero spells	**855,065**				**426,931**				**428,134**			
N non-zero spells	**37,274**				**13,703**				**23,571**			

The effect of the average spatial proximity between kin in a region is time varying. Interestingly, respondents in regions with traditionally greater spatial proximity are 22.9% more likely than respondents in other regions to have a second child during the first three years after the last childbirth took place. Four years later, the same respondents are less likely to have a second (57.8%) or third child (44.4%). Accordingly, the results lead us to reject the second hypothesis that suggests that the interbirth intervals between the first and second child and between the second and third child are longer in strong family regions than in weak family regions.

Table 4: Results of discrete-time event history analysis for the interbirth interval between first and second child

Interval before second birth												
	Model 4.1 Combined				Model 4.2 < 4				Model 4.3 ≥ 4			
	Exp(b)	P <	95% Conf. Interval		Exp(b)	P <	95% Conf. Interval		Exp(b)	P <	95% Conf. Interval	
Individual level												
Female	0.94	0.000	0.91	0.97	1.01	0.715	0.97	1.05	0.56	0.000	0.82	0.90
Cohort												
1941–1960		Ref.				Ref.				Ref.		
1961–1980	0.82	0.000	0.77	0.88	0.90	0.000	0.85	0.95	0.78	0.000	0.70	0.86
Married	1.85	0.000	1.72	1.99	1.01	0.798	0.94	1.08	1.89	0.000	1.75	2.06
Education	1.02	0.666	0.93	1.11	0.95	0.031	0.90	1.00	1.01	0.698	0.96	1.07
Age at first birth	0.94	0.000	0.94	0.95	1.00	0.557	0.99	1.00	0.90	0.000	0.89	0.90
Regional level												
Average spatial proximity (Nuts)	0.83	0.000	0.78	0.88	1.23	0.010	1.05	1.44	0.42	0.000	0.40	0.45
PPS	0.95	0.212	0.87	1.03	1.00	0.983	0.94	1.07	0.96	0.502	0.86	1.07
Country												
Austria	1.44	0.000	1.21	1.71	1.15	0.002	1.05	1.25	1.50	0.000	0.92	1.34
Belgium	1.48	0.000	1.21	1.80	1.03	0.550	0.93	1.15	1.58	0.000	1.32	1.90
Czech Republic	0.96	0.645	0.79	1.16	0.99	0.887	0.87	1.12	1.20	0.166	0.93	1.54
Estonia	0.82	0.026	0.70	0.98	1.36	0.000	1.18	1.56	0.80	0.046	0.64	1.00
France	1.26	0.001	1.10	1.44	0.99	0.885	0.85	1.15	1.11	0.260	0.92	1.34
Germany		Ref.				Ref.				Ref.		
Italy	0.61	0.000	0.48	0.77	0.80	0.031	0.66	0.98	0.99	0.951	0.92	1.34
The Netherlands	2.21	0.000	1.93	2.53	1.10	0.070	0.99	1.23	2.06	0.000	1.69	2.49
Poland	1.12	0.264	0.92	1.36	1.14	0.096	0.98	1.34	1.92	0.000	1.47	2.52
Time (x)	1.49	0.000	1.37	1.63	0.01	0.000	0.00	0.05	7.12	0.000	6.55	7.73
Time squared (x^2)	0.94	0.000	0.93	0.95	6.86	0.000	4.05	11.6	0.85	0.000	0.84	0.86
Clusters		**54**				**54**				**54**		
N cases		**36,572**				**16,056**				**20,522**		
N person-years (spells)		**196,537**				**33,865**				**162,672**		
N zero spells		**171,325**				**17,820**				**153,505**		
N non-zero spells		**25,212**				**16,045**				**9,167**		

Table 5: Results of discrete-time event history analysis for the interbirth interval between second and third child

Interval before third birth												
	Model 5.1 Combined				Model 5.2 < 4				Model 5.3 ≥ 4			
	Exp(b)	P <	95% Conf. Interval		Exp(b)	P <	95% Conf. Interval		Exp(b)	P <	95% Conf. Interval	
Individual level												
Female	0.84	0.000	0.80	0.88	0.97	0.490	0.90	1.05	0.76	0.000	0.72	0.80
Cohort												
1941–1960		Ref.				Ref.				Ref.		
1961–1980	0.85	0.000	0.80	0.91	0.92	0.035	0.84	0.99	0.80	0.001	0.70	0.91
Married	1.20	0.000	1.10	1.30	0.91	0.043	0.84	1.00	1.23	0.000	1.11	1.36
Education	0.91	0.143	0.81	1.03	0.94	0.007	0.89	0.98	0.92	0.100	0.82	1.02
Age at second birth	0.89	0.000	0.88	0.90	1.00	0.420	1.00	1.00	0.86	0.000	0.85	0.87
Regional level												
Average spatial proximity (Nuts)	1.04	0.310	0.96	1.13	1.14	0.223	0.92	1.42	0.56	0.000	0.51	0.60
PPS	0.98	0.753	0.87	1.10	0.99	0.775	0.89	1.09	0.99	0.913	0.88	1.13
Country												
Austria	1.19	0.040	1.01	1.40	1.14	0.221	0.93	1.40	1.24	0.084	0.97	1.59
Belgium	1.38	0.002	1.13	1.70	1.00	0.981	0.87	1.14	1.56	0.004	1.15	2.11
Czech Republic	0.59	0.000	0.47	0.74	1.31	0.038	1.02	1.68	0.66	0.004	0.50	0.88
Estonia	1.00	0.989	0.80	1.24	1.14	0.138	0.96	1.37	0.90	0.418	0.68	1.17
France	1.45	0.000	1.22	1.71	1.00	0.988	0.82	1.22	1.07	0.569	0.84	1.37
Germany		Ref.				Ref.				Ref.		
Italy	0.64	0.000	0.51	0.82	1.07	0.686	0.77	1.48	1.22	0.177	0.91	1.63
The Netherlands	1.59	0.000	1.34	1.88	0.90	0.060	0.80	1.00	1.30	0.056	0.99	1.69
Poland	1.16	0.246	0.90	1.50	1.15	0.237	0.91	1.44	1.64	0.002	1.20	2.26
Time (x)	1.16	0.000	1.08	1.24	0.03	0.001	0.00	0.22	5.03	0.000	4.60	5.50
Time squared (x^2)	0.97	0.000	0.96	0.98	4.86	0.000	2.38	10.0	0.88	0.000	0.87	0.89
Clusters		**54**				**54**				**54**		
N cases		**25,799**				**4,381**				**21,418**		
N person-years (spells)		**204,568**				**9,211**				**195,357**		
N zero spells		**196,467**				**4,834**				**191,633**		
N non-zero spells		**8,101**				**4,377**				**3,724**		

5. Discussion and conclusion

This paper studies whether regional patterns of spatial proximity between kin explain individual differences in the timing and spacing of children. The paper contributes to existing research in three respects. First, the paper investigates the influence of regional patterns of family organization on fertility in contemporary developed countries. Previous research has mainly focused on historical or developing societies (e.g., Hajnal 1982; Dyson and Moore 1983; Das Gupta 1997; Veleti 2001; Neven 2002; Delger 2003; Dalla-Zuanna and Micheli 2004; Rotering and Bras 2015). Second, the study includes a broad range of different European regions (54 NUTS regions) to increase the variability in regional patterns of family organization. Third, to the author's knowledge, this is the first study that accounts for time-varying effects of regional patterns of family organization on fertility. The results demonstrate that regional patterns of spatial proximity between kin impact the likelihood of a first, second, or third childbirth. Supporting the results of previous research, closer proximity between kin, i.e., a greater share of kin coresiding, reduces the likelihood of having a first child (e.g., Dalla-Zuanna 2004; Dalla-Zuanna and Micheli 2004). Although this effect might relate to a greater economic burden being correlated with coresiding kin and leading to fertility postponement, this effect might also reflect stronger lines of social control exhibited by kin living in proximity (Dalla-Zuanna 2004; Romero and Ruiz 2007; Suzuki 2008). Interestingly, there is a similar effect for the length of the interbirth interval between the first and second child. In regions with closer spatial proximity between kin the likelihood of having a second child is lower.

However, the likelihood of a first, second, or third childbirth varies with the respondent's age (at first childbirth) and with the time that has passed since the last childbirth (the second and third childbirth). Moreover, the effect of spatial proximity on fertility is time-variant. Closer proximity to kin increases the risk of experiencing a second childbirth only during the first three years after the first child is born, and not afterwards. Comparing the effects for the first and second child supports the idea that stronger lines of social control affect age at the time of starting a family in regions with, on average, closer proximity between kin. At the same time, a greater risk of having a second child might reflect better opportunities to receive support from kin living in proximity (Heady 2012: 95). Kin living in proximity might improve the compatibility between work and family and reduce the costs of having an additional child by providing support, e.g., taking care of children (Turke 1989: 64–69; Suzuki 2003, 2008: 36). However, once again the effect is time-variant, which suggests that greater opportunities for social support do not support the expansion of an existing family under all circumstances. Four years after the second child is born the former positive effect of proximity on the risk of having a third child disappears, and even becomes negative.

Taken together, the results support the idea that regional patterns of family organization help to explain individual fertility behaviours in contemporary developed societies. However, the results need to be interpreted with care. The effects are more complex than expected and future research needs to investigate the underlying mechanisms more closely to better understand how and when specific norms, values, and practices associated with patterns of family organization impact fertility. Further, this study is not without its limitations: First, regional average spatial proximity between kin was not measured at the time point when the majority of respondents reproduced (for the first child between 1974 and 1996; mean: 1985, SD: 11 years), but in 2005/2006. The paper is thus based on the assumption that patterns of spatial proximity between kin in Europe have been relatively stable over the last few decades, which is a serious limitation of this study. There is empirical evidence suggesting a relative persistence of regional differences between family systems that shape special proximity between kin (e.g., Reher 1998). Nevertheless, changes in patterns of family organization could introduce a certain bias into the analysis and affect the results. Although path dependency in how family systems could develop over time should limit the effect of this bias, future research needs to address this issue and account for possible changes in patterns of family organization over time.

Second, the models did not include household characteristics that might represent deviations from regional patterns of family organization. Characteristics that pertain to household organization and composition are correlated with measures of regional family systems. Nevertheless, there could be deviations that reflect differences in opportunity structures and are linked to whether or not the household's socioeconomic situation affects specific kin.[22] In some regions close kin relationships may offer more opportunities for receiving support than in other regions where the same relationships are related to increased social burdens (Grundy and Henretta 2006: 708–710; Herlofson and Hagestad 2012: 41). For example, Schaffnit and Sear (2014: 5, 7) find that having a mother still alive is associated with increased fertility for women. However, mothers residing in their children's households have a negative effect on their children's fertility. These two findings support the idea that mothers function differently as either providers (being alive but living separate) or receivers (being alive and coresiding) of social support. Future research should control for household characteristics and differentiate between the type of kin living in proximity and coresiding. Adding these characteristics to the current study would have made it overly complex.

Third, there might be other regional factors driving differences in patterns of family organization (in this case coresidence) and differences in the timing of birth events, such as patterns of welfare organization. However, the effects of the regional characteristics should be limited because several of these factors have been shown to vary with family system (e.g., Duranton, Rodriguez-Pose, and Sandall 2009), while

[22] For example, in a region in which it is common to have a coresiding grandmother, her absence has greater effects than her presence (Dong 2015: 2).

patterns of family organization influenced the historical evolution of the welfare state (for an example see Naldini 2003: 150–157, 169–172, 203).

6. Acknowledgments

The study was supported by a VIDI Innovational Research Grant from the Netherlands Organization for Scientific Research (NWO) to Dr. H. Bras for the research project titled ‘The Power of the Family: Family Influences on Long-Term Fertility Decline in Europe, 1850–2010’ (contract Grant Number 452-10-013).

This paper uses data from the GGS Waves 1 and 2 (DOIs: 10.17026/dans-z5z-xn8g, 10.17026/dans-xm6-a262), see Gauthier, A.H. et al. (2018) or visit the GGP website (https://www.ggp-i.org/) for methodological details.

This paper uses data from SHARE Wave 5 release 1.0.0, as of 31 March 2015 (doi: 10.6103/SHARE.w5.100) or SHARE Wave 4 release 1.1.1, as of 28 March 2013 (doi: 10.6103/SHARE.w4.111) or SHARE Waves 1 and 2 release 2.6.0, as of 29 November 2013 (doi: 10.6103/SHARE.w1.260 and 10.6103/SHARE.w2.260) or SHARELIFE release 1.0.0, as of 24 November 2010 (doi: 10.6103/SHARE.w3.100). The SHARE data collection was primarily funded by the European Commission through the 5th Framework Programme (Project QLK6-CT-2001-00360 in the thematic programme Quality of Life), through the 6th Framework Programme (Projects SHARE-I3, RII-CT-2006-062193, COMPARE, CIT5- CT-2005-028857, and SHARELIFE, CIT4-CT-2006-028812) and through the 7th Framework Programme (SHARE-PREP, No. 211909, SHARE-LEAP, No. 227822 and SHARE M4, No. 261982). Additional funding from the U.S. National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, R21 AG025169, Y1-AG-4553-01, IAG BSR06-11 and OGHA 04-064), the German Ministry of Education and Research, and various national sources is gratefully acknowledged (see www.share-project.org for a full list of funding institutions).

Many thanks to the guest editors and the anonymous reviewers for their comments and suggestions.

References

Aassve, A., Mazzuco, S., and Mencarini, L. (2005). Childbearing and well-being: A comparative analysis of European welfare regimes. *Journal of European Social Policy* 15(4): 283–299. doi:10.1177/0958928705057262.

Aassve, A., Arpino, B., and Billari, F.C. (2013). Age norms on leaving home: multilevel evidence from the European Social Survey. *Environment and Planning* A 45(2): 383–401. doi:10.1068/a4563.

Alesina, A. and Giuliano, P. (2010). The power of the family. *Journal of Economic Growth* 15(2): 93–125. doi:10.1007/s10887-010-9052-z.

Allison, P.D. (1982). Discrete-time methods for the analysis of event histories. *Sociological Methodology* 13: 61–98. doi:10.2307/270718.

Allison, P.D. (2014). *Event history and survival analysis: Regression for longitudinal event data* (Vol. 46). London: SAGE publications. doi:10.4135/9781452270029.

Amialchuck, A. and Dimitrova, E. (2012). Detecting the evolution of deliberate fertility control before the demographic transition in Germany. *Demographic Research* 27(19): 507–542. doi:10.4054/DemRes.2012.27.19.

Anderson, T. and Kohler, H.-P. (2013). Education fever and the East Asian fertility puzzle: A case study of low fertility in South Korea. *Asian Population Studies* 9(2): 196–215. doi:10.1080/17441730.2013.797293.

Arpino, B. and Tavares, L.P. (2013). Fertility and values in Italy and Spain: A look at regional differences within the European context. *Population Review* 52(1): 62–86.

Baizán, P., Michielin, F., and Billari, F.C. (2002). Political economy and life course patterns: The heterogeneity of occupational, family and household trajectories of young Spaniards. *Demographic Research* 6(8): 191–240. doi:10.4054/DemRes.2002.6.8.

Becker, G.S. and Barro, R.J. (1988). A reformulation of the economic theory of fertility. *The Quarterly Journal of Economics* 103(1): 1–25. doi:10.2307/1882640.

Becker, G.S. and Lewis, H.G. (1974). Interaction between quantity and quality of children. In: Schultz, T.W. (ed.). *Economics of the family: Marriage, children, and human capital*. Chicago: University of Chicago Press: 81–90.

Belsky, J. and Rovine, M. (1984). Social-network contact, family support, and the transition to parenthood. *Journal of Marriage and Family* 46(2): 455–462. doi:10.2307/352477.

Bernardi, L. and Klärner, A. (2014). Social networks and fertility. *Demographic Research* 30(22): 641–670. doi:10.4054/DemRes.2014.30.22.

Billari, F.C. (2008). Lowest-low fertility in Europe: Exploring the causes and finding some surprises. *The Japanese Journal of Population* 6(1): 2–18.

Billari, F.C., Castiglioni, M., Castro Martin, T., Michielin, F., and Ongaro, F. (2002). Household and union formation in Mediterranean fashion: Italy and Spain. In: Klijzing, E. and Corijn, M. (eds.). *Dynamics of fertility and partnership in Europe: Insights and lessons from comparative research*, Vol. 2. New York: United Nations: 17–41.

Billari, F.C., Goisis, A., Liefbroer, A.C., Settersten, R.A., Aassve, A., Hägestad, G., and Spéder, Z. (2011). Social age deadlines for the childbearing of women and men. *Human Reproduction* 26(3): 616–622. doi:10.1093/humrep/deq360.

Billari, F.C. and Kohler, H.-P. (2004). Pattern of low and lowest-low fertility in Europe. *Population Studies* 58(2): 161–176. doi:10.1080/0032472042000213695.

Bongaarts, J. and Sobotka, T. (2012). A demographic explanation for the recent rise in European fertility. *Population and Development Review* 38(1): 83–120. doi:10.1111/j.1728-4457.2012.00473.x.

Börsch-Supan, A., Brandt, M., Hunkler, C., Kneip, T., Korbmacher, J., Malter, F., Schaan, B., Stuck, S., and Zuber, S. (2013). Data resource profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology* 42(4): 992–1001. doi:10.1093/ije/dyt088.

Bott, E. (1971). *Family and social networks*. London: Travistock Publications.

Bucx, F., Wel, F., and Knijn, T. (2012). Life course status and exchanges of support between young adults and parents. *Journal of Marriage and Family* 74(1): 101–115. doi:10.1111/j.1741-3737.2011.00883.x.

Burch, T.K. and Gendell, M. (1970). Extended family structure and fertility: Some conceptual and methodological issues. *Journal of Marriage and Family* 32(2): 227–236. doi:10.2307/350128.

Coale, A.J. and Treadway, R. (1986). A summary of the changing distribution of overall fertility, marital fertility, and the proportion married in the provinces of Europe. In: Coale, A.J. and Watkins, S.C. (eds.). *The decline of fertility in Europe*. Princeton: Princeton University Press: 31–181. doi:10.1515/9781400886692-007.

Daatland, S.O. and Lowenstein, A. (2005). Intergenerational solidarity and the family–welfare state balance. *European Journal of Aging* 2: 174–182. doi:10.1007/s10433-005-0001-1.

Dalla-Zuanna, G. (2004). The banquet of Aeolus: A familistic interpretation of Italy's lowest low fertility. In: Dalla Zuanna, G. and Micheli, G.A. (eds.). *Strong family and low fertility: A paradox?* Alphen: Kluwer: 105–125. doi:10.1007/1-4020-2837-7_5.

Dalla-Zuanna, G. and Micheli, G.A. (2004). Introduction: New perspectives in interpreting contemporary family and reproductive behaviour of Mediterranean Europe. In: Dalla-Zuanna, G. and Micheli, G.A. (eds.). *Strong family and low fertility: A paradox?* Alphen: Kluwer: 7–21. doi:10.1007/1-4020-2837-7_1.

Das Gupta, M. (1997). Kinship systems and demographic processes. In: Kertzer, D.I. and Fricke, T. (eds.). *Anthropological demography: Toward a new synthesis*. Chicago: University of Chicago Press: 36–52.

Das Gupta, M. (1999). Lifeboat versus corporate ethic: Social and demographic implications of stem and joint families. *Social Science and Medicine* 49(2): 173–184. doi:10.1016/S0277-9536(99)00096-9.

Delger, H.E. (2003). *Nuptiality and fertility: An investigation into local variations in demographic behaviour in rural Netherlands about 1800*. [PhD thesis]. N.W. Posthumus Series. Hilversum: Verloren.

Dong, H. (2015). *Family influence on male reproduction: An East Asian comparison, 1700–1950*. Paper presented at the 'Power of the Family' Workshop, Wageningen, The Netherlands, October 9–10 2015.

Dribe, M. and Lundh, C. (2014). Social norms and human agency: Marriage in ninetheenth-century Sweden. In: Lundh, C., Kurosu, S. (eds.). S*imilarity in difference: Marriage in Europe and Asia, 1700–1900*. Cambridge: The MIT Press: 211–260. doi:10.7551/mitpress/9780262027946.003.0007.

Dumon, W. (2005). Belgium's families. In: Adams, B. and Trost, J. (eds.). *Handbook of world families*. Thousand Oaks: Sage Publications: 215–234. doi:10.4135/9781412975957.n10.

Duranton, G.A., Rodriguez-Pose, A., and Sandall, R. (2009). Family types and the persistence of regional disparities in Europe. *Journal of Economic Geography* 85(1): 23–47. doi:10.1111/j.1944-8287.2008.01002.x.

Dykstra, P.A. and Fokkema, T. (2011). Relationships between parents and their adult children: A West European typology of late-life families. *Ageing and Society* 31(4): 545–569. doi:10.1017/S0144686X10001108.

Dyson, T. and Moore, M. (1983). On kinship structure, female autonomy, and demographic behavior in India. *Population and Development Review* 9(1): 35–60. doi:10.2307/1972894.

ESHRE Capri Workshop Group (2005). Fertility and ageing. *Human Reproduction Update* 11(3): 261–276. doi:10.1093/humupd/dmi006.

Esping-Andersen, G. (1999). *Social foundations of postindustrial economies*. Oxford: Oxford University Press. doi:10.1093/0198742002.001.0001.

Eurostat (2017). NUTS – Nomenclature of territorial units for statistics [electronic resource]. Luxembourg: European Commission, Eurostat. http://ec.europa.eu/eurostat/web/nuts/overview (access date: 16.02.2017)

Eurostat (2018a). Population density by NUTS 3 region [electronic resource]. Luxembourg: European Commission, Eurostat. http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_r_d3dens&lang=en (access date: 05.11.2018)

Eurostat (2018b). National accounts (including GDP) [electronic resource]. Luxembourg: European Commission, Eurostat. https://ec.europa.eu/eurostat/web/national-accounts/data/main-tables (access date 30.11.2018).

Faragó, T. (1998). Different household formation systems in Hungary at the end of the eighteenth century: Variations on John Hajnal's thesis. *Historical Social Research/Historische Sozialforschung* 23(1–2) 83–111. doi:10.12759/hsr.23.1998.1/2.83-111.

Frejka, T. and Sobotka, T. (2008). Fertility in Europe: Diverse, delayed and below replacement. *Demographic Research* 19(3): 15–46. doi:10.4054/DemRes.2008.19.3.

Galasso, V. and Profeta, P. (2018). When the state mirrors the family: The design of pension systems. *Journal of the European Economic Association* 16(6): 1712–1763. doi:10.1093/jeea/jvx046.

Gauthier, A.H., Cabaço, S.L.F., and Emery, T. (2018). Generations and Gender Survey study profile. *Longitudinal and Life Course Studies* 9(4): 456–465. doi:10.14301/llcs.v9i4.500.

Goldstein, J.R. and Kreyenfeld, M. (2011). Has East Germany overtaken West Germany? Recent trends in order-specific fertility. *Population and Development Review* 37(3): 453–472. doi:10.1111/j.1728-4457.2011.00430.x.

Goldstein, J.R., Kreyenfeld, M., Jasilioniene, A., and Örsal, D.K. (2013). Fertility reactions to the 'Great Recession' in Europe: Recent evidence from order-specific data. *Demographic Research* 29(4): 85–104. doi:10.4054/DemRes.2013.29.4.

Goldstein, J., Lutz, W., and Testa, M.R. (2004). The emergence of sub-replacement family size ideals in Europe. *Population Research and Policy Review* 22: 479–496. doi:10.1023/B:POPU.0000020962.80895.4a.

Goldstein, J.R., Sobotka, T., and Jasilioniene, A. (2009). The end of 'lowest-low' fertility? *Population and Development Review* 35(4): 663–699. doi:10.1111/j.1728-4457.2009.00304.x.

Grandits, H. (2010). Introduction. In: Grandits, H. (ed.). *Family, kinship and state in contemporary Europe*. Vol.1. Frankfurt am Main: Campus Verlag: 23–46.

Grundy, E. and Henretta, J.C. (2006). Between elderly parents and adult children: A new look at the intergenerational care provided by the sandwich generation. *Ageing and Society* 26(5): 707–722. doi:10.1017/S0144686X06004934.

Guerrero, T.J. and Naldini, M. (1996). Is the south so different? Italian and Spanish families in comparative perspective. Mannheim: Mannheimer Zentrum für Europäische Sozialforschung (MZES) (Working Paper 12. ISSN 0948-0072).

Hajnal, J. (1982). Two kinds of preindustrial household formation system. *Population and Development Review* 8(3): 449–494. doi:10.2307/1972376.

Hank, K. (2007). Proximity and contacts between older parents and their children: A European comparison. *Journal of Marriage and Family* 69(1): 157–173. doi:10.1111/j.1741-3737.2006.00351.x.

Hareven, T.K. (1991). The history of the family and the complexity of social change. *The American Historical Review* 96(1): 95–124. doi:10.2307/2164019.

Hartnett, S. and Parrado, E.A. (2012). Hispanic familism reconsidered: Ethnic differences in the perceived value of children and fertility intentions. *Sociological Quarterly* 53(4): 636–653. doi:10.1111/j.1533-8525.2012.01252.x.

Heady, P. (2012). European kinship today: Patterns, prospects and explanations. *Ethnologie française* 42(1): 93–104. doi:10.3917/ethn.121.0093.

Heady, P., Gruber, S., and Bircan, T. (2010). The quantitative background. In: Heady, P. and Schweitzer, P. (eds.). *Family, kinship and state in contemporary Europe*. Vol. 2, The view from below: Nineteen localities. Frankfurt: Campus Verlag: 61–90.

Heady, P., Gruber, S., and Ou, Z. (2010). Family, kindred and marriage. In: Heady, P. and Kohli, M. (eds.). *Family, kinship and state in contemporary Europe*. Vol. 3, Perspectives on theory and policy. Frankfurt: Campus Verlag: 31–70.

Herlofson, K. and Hagestad, G.O. (2012). Transformations in the role of grandparents across welfare states. In: Arber, S. and Timonen, V. (eds.). *Contemporary grandparenting*. Bristol: The Policy Press: 27–50. doi:10.1332/policypress/9781847429681.003.0002.

Heuveline, P. and Timberlake, J.M. (2004). The role of cohabitation in family formation: The United States in comparative perspective. *Journal of Marriage and Family* 66(5): 1214–1230. doi:10.1111/j.0022-2445.2004.00088.x.

Hilevych, Y. (2016). Later, if ever: Family influences on the transition from first to second birth in Soviet Ukraine. *Continuity and Change* 31(2): 275–300. doi:10.1017/S0268416016000229.

Hilevych, Y. and Rusterholz, C. (2018). ‘Two children to make ends meet’: The ideal family size, parental responsibilities and costs of children on two sides of the Iron Curtain during the post-war fertility decline. *The History of the Family* 23(3): 408–425. doi:10.1080/1081602X.2018.1470547.

Höllinger, F. and Haller, M. (1990). Kinship and social networks in modern societies: A cross-cultural comparison among seven nations. *European Sociological Review* 6(2): 103–124. doi:10.1093/oxfordjournals.esr.a036553.

Iacovou, N. and Skew, A.J. (2011). Household composition across the new Europe: Where do the new Member States fit in? *Demographic Research* 25(14): 465–490. doi:10.4054/DemRes.2011.25.14.

Jackson, P.B. and Berkowitz, A. (2005). The structure of the life course: Gender and racioethnic variation in the occurrence and sequencing of role transitions. *Advances in Life Course Research* 9: 55–90. doi:10.1016/S1040-2608(04)09003-3.

Kalmijn, M. and Saraceno, C. (2008). A comparative perspective on intergenerational support. *European Societies* 10(3): 479–508. doi:10.1080/14616690701744364.

Kiernan, K. (2001). The rise of cohabitation and childbearing outside marriage in Western Europe. *International Journal of Law, Policy and the Family* 15(1): 1–21. doi:10.1093/lawfam/15.1.1.

Klüsener, S. (2015). Spatial variation in non-marital fertility across Europe in the twentieth and twenty-first centuries: Recent trends, persistence of the past, and potential future pathways. *The History of the Family* 20(4): 593–628. doi:10.1080/1081602X.2015.1099112.

Klüsener, S., Perelli-Harris, B., and Sánchez Gassen, N. (2013). Spatial aspects of the rise of nonmarital fertility across Europe since 1960: The role of states and regions in shaping patterns of change. *European Journal of Population* 29: 137–165. doi:10.1007/s10680-012-9278-x.

Kidd, S.A., Eskenazi, B., and Wyrobek, A.J. (2001). Effects of male age on semen quality and fertility: A review of the literature. *Fertility and Sterility* 74(2): 237–248. doi:10.1016/S0015-0282(00)01679-4.

Kohler, H.P., Billari, F.C., and Ortega, J.A. (2002). The emergence of lowest-low fertility in Europe during the 1990s. *Population and Development Review* 28(4): 641–680. doi:10.1111/j.1728-4457.2002.00641.x.

Kohli, M., Albertini, M., and Künemund, H. (2010). Linkages among adult family generations: Evidence from comparative survey research. In: Heady, P. and Kohli, M. (eds.). *Family, kinship and state in contemporary Europe*. Vol. 3, Perspectives on theory and policy. Frankfurt: Campus Verlag: 225–248.

Kok, J. (2009). Family systems as frameworks for understanding variation in extra marital births, Europe 1900–2000. *Romanian Journal of Population* Studies Supplement/2009: 13–38

Kok, J. (2014). Historical demography: Understanding temporal change, individual variation and regional persistence. *Tijdschrift voor Sociale en Economische Geschiedenis* 11(2): 237–260. doi:10.18352/tseg.140.

Kolk, M. (2014). *Multigenerational processes in demography* (Doctoral dissertation, Department of Sociology, Stockholm University).

Laslett, P. (1983). Family and household as work group and kin group: Areas of traditional Europe compared. In: Wall, R., Laslett, P., and Robin, J. (eds.). *Family forms in historic Europe*. Cambridge: Cambridge University Press: 513–564. doi:10.1017/CBO9780511897535.018.

Lesthaeghe, R., and Neels, K. (2002). From the first to the second demographic transition: An interpretation of the spatial continuity of demographic innovation in France, Belgium and Switzerland. *European Journal of Population/Revue européenne de démographie* 18(4): 325–360. doi:10.1023/A:1021125800070.

Lesthaeghe, R. and Surkyn, J. (2008). When history moves on: The foundations and diffusion of the second demographic transition. In: Jayakody, R., Thornton, A., and Axinn, W.G. (eds.). *International family change: Ideational perspectives*. London: Routledge: 81–118.

Liefbroer, A.C. and Billari, F.C. (2010). Bringing norms back in: A theoretical and empirical discussion of their importance for understanding demographic behaviour. *Population, Space and Place* 16(4): 287–305. doi:10.1002/psp.552.

Liefbroer, A.C., Merz, E.M., and Testa, M.R. (2015). Fertility-related norms across Europe: A multi-level analysis. In: Philipov, D., Liefbroer, A.C., and Klobas, J.E. (eds.). *Reproductive decision- making in a macro-micro perspective*. Dordrecht: Springer: 141–164. doi:10.1007/978-94-017-9401-5_6.

Livi-Bacci, M. (2001). Too few children and too much family. *Daedalus* 130(3): Italy, Resilient and Vulnerable, Volume II: Politics and Society: 139–155.

Mason, K.O. (2001). Gender and family systems in the fertility transition. *Population and Development Review* 27: 160–176.

McDonald, P. (2006). Low fertility and the state: The efficacy of policy. *Population and Development Review* 32(3): 485–510. doi:10.1111/j.1728-4457.2006.00134.x.

Micheli, G.A. (2004). Kinship, family and social network: The anthropological embedment of fertility change in Southern Europe. In: Dalla-Zuanna, G. and Micheli, G.A. (eds.). *Strong family and low fertility: A paradox?* Dordrecht: Kluwer Academic Publishers: 77–104. doi:10.1007/1-4020-2837-7_4.

Micheli, G.A. (2012). Two strong families in southern Europe? Re-examining the geography of kinship regimes stemming from the reciprocity mechanisms between generations. *European Journal of Population* 28: 17–38. doi:10.1007/s10680-011-9245-y.

Mönkediek, B. and Bras, H. (2014). Strong and weak family ties revisited: Reconsidering European family structures from a network perspective. *The History of the Family* 19(2): 235–259. doi:10.1080/1081602X.2014.897246.

Možný, I. and Katrňák, T. (2005). The Czech family. In: Adams, B. and Trost, J. (eds.). *Handbook of world families*. Thousand Oaks: Sage Publications: 235–261. doi:10.4135/9781412975957.n11.

Mynarska, M. (2010). Deadline for parenthood: Fertility postponement and age norms in Poland. *European Journal of Population* 26: 351–373. doi:10.1007/s10680-009-9194-x.

Naldini, M. (2003). *The family in the Mediterranean welfare states*. London: Frank Cass. doi:10.4324/9780203009468.

Nauck, B., Groepler, N., and Yi, C.C. (2017). How kinship systems and welfare regimes shape leaving home: A comparative study of the United States, Germany, Taiwan, and China. *Demographic Research* 36(38): 1109–1148. doi:10.4054/DemRes.2017.36.38.

Neugarten, B.L., Moore, J.W., and Lowe, J.C. (1965). Age norms, age constraints, and adult socialization. *American Journal of Sociology* 70(6): 710–717. doi:10.1086/223965.

Neven, M. (2002). The influence of the wider kin group on individual life-course transitions: Results from the Pays de Herve (Belgium), 1846–1900. *Continuity and Change* 17(3): 405–435. doi:10.1017/S026841600200440X.

Newson, L. (2009). Cultural versus reproductive success: Why does economic development bring new tradeoffs? *American Journal of Human Biology* 21(4): 464–471. doi:10.1002/ajhb.20925.

Reher, D.S. (1998). Family ties in Western Europe: Persistent contrasts. *Population and Development Review* 24(2): 203–234. doi:10.2307/2807972.

Romero, AJ. and Ruiz, M. (2007). Does familism lead to increased parental monitoring? Protective factors for coping with risky behaviors. *Journal of Child and Family Studies* 16(2): 143–154. doi:10.1007/s10826-006-9074-5.

Rosina, A. (2004). Family formation and fertility in Italy. In: Dalla Zuanna, G. and Micheli, G.A. (eds.). *Strong family and low fertility: A paradox?* Dordrecht: Kluwer Academic Publishers: 23–43. doi:10.1007/1-4020-2837-7_2.

Rotering, P. and Bras, H. (2015). With the help of kin? Household composition and reproduction in The Netherlands, 1842–1920. *Human Nature* 26(1): 102–121. doi:10.1007/s12110-015-9222-y.

Schaffnit, S.B. and Sear, R. (2014). Wealth modifies relationships between kin and women's fertility in high-income countries. *Behavioral Ecology* 25(4): 834–842. doi:10.1093/beheco/aru059.

Segalen, M., Chevalier, S., Augustins, G., Manceron, V., Amiotte-Suchet, L., and Sourdril, A. (2010). Three French localities. In: Heady, P. and Schweitzer, P. (eds.). *Family, kinship and state in contemporary Europe*. *Volume 2, The view from below: Nineteen localities*. Frankfurt: Campus Verlag: 169–224.

Settersten, R.A. and Hägestad, G.O. (1996). What's the latest? Cultural age deadlines for family transitions. *Gerontologist* 36 (2): 178–188. doi:10.1093/geront/36.2.178.

Singer, J.D. and Willett, J.B. (1993). It's about time: Using discrete-time survival analysis to study duration and the timing of events. *Journal of Educational Statistics* 18(2): 155–195. doi:10.3102/10769986018002155.

Skinner, G.W. (1997). Family systems and demographic processes. In: Kertzer, D.I. and Fricke, T.E. (eds.). *Anthropological demography. Toward a new synthesis*. Chicago: University of Chicago Press: 53–95.

Sklar, J.L. (1974). The role of marriage behaviour in the demographic transition: The case of Eastern Europe around 1900. *Population Studies* 28(2): 231–247. doi:10.1080/00324728.1974.10405177.

Sobotka, T. (2004). Is lowest-low fertility in Europe explained by the postponement of childbearing? *Population and Development Review* 30(2): 195–220. doi:10.1111/j.1728-4457.2004.010_1.x.

Sobotka, T. and Beaujouan, É. (2014). Two is best? The persistence of a two-child family ideal in Europe. *Population and Development Review* 40(3): 391–419. doi:10.1111/j.1728-4457.2014.00691.x.

Sobotka, T., Zeman, K., and Kantorová, V. (2003). Demographic shifts in the Czech Republic after 1989: A second demographic transition view. *European Journal of Population* 19: 249–277. doi:10.1023/A:1024913321935.

Suzuki, T. (2003). Lowest-low fertility in Korea and Japan. *Journal of Population Problems* 59(3): 1–16.

Suzuki, T. (2008). Korea's strong familism and lowest-low fertility. *International Journal of Japanese Sociology* 17(1): 30–41. doi:10.1111/j.1475-6781.2008.00116.x.

Synak, B. (1990). The Polish family: Stability, change and conflict. *Journal of Aging Studies* 4(4): 333–344. doi:10.1016/0890-4065(90)90003-Q.

Szołtysek, M. (2008). Three kinds of preindustrial household formation system in historical Eastern Europe: A challenge to spatial patterns of the European family. *The History of the Family* 13(3): 223–257. doi:10.1016/j.hisfam.2008.05.003.

Therborn, G. (2004). *Between sex and power. Family in the world, 1900–2000*. London: Routledge. doi:10.4324/9780203643297.

Todd, E. (1990). *L'invention de l'Europe [The invention of Europe]*. Paris: Seuil.

Trost, J. and Levin, I. (2005). Scandinavian Families. In: Adams, B.N. and Trost, J. (eds.). *Handbook of world families*. Thousand Oaks: Sage Publications: 347–363. doi:10.4135/9781412975957.n16.

Turke, P.W. (1989). Evolution and the demand for children. *Population and Development Review* 15(1): 61–90. doi:10.2307/1973405.

UNESCO (2006). *International Standard Classification of Education, ISCED 1997*. UNESCO Institute for Statistics. Paris: United Nations.

Van Bavel, J. (2004). Deliberate birth spacing before the fertility transition in Europe: Evidence from nineteenth-century Belgium. *Population Studies: A Journal of Demography* 58(1): 95–107. doi:10.1080/0032472032000167706.

Van Bavel, J. and Reher, D.S. (2013). The baby boom and its causes: What we know and what we need to know. *Population and Development Review* 39(2): 257–288. doi:10.1111/j.1728-4457.2013.00591.x.

Van de Kaa, D. J. (1987). Europe's second demographic transition. *Population Bulletin* 42(1): 1–59.

Van de Kaa, D. J. (2010). Demographic transition. *Encyclopedia of Life Support Systems* 1: 65–103.

Veleti, K. (2001). Family structure and its effective influence on fertility. *Journal of Human Ecology* 12(5): 387–390. doi:10.1080/09709274.2001.11907639.

Vermunt, J.K. (2009). Event history analysis. In: Millsap, R. and Maydeu-Olivares, A. (eds.). *Handbook of quantitative methods in psychology*. London: Sage Publications: 658–674. doi:10.4135/9780857020994.n27.

Viazzo, P.P. (2010a). Macro-regional differences in European kinship culture. In: Heady, P. and Kohli, M. (eds.). *Family, kinship and state in contemporary Europe. Vol. 3, Perspectives on theory and policy*. Frankfurt: Campus Verlag: 271–294.

Viazzo, P.P (2010b). Family, kinship and welfare provision in Europe, past and present: Commonalities and divergences. *Continuity and Change* 25(1): 137–159. doi:10.1017/S0268416010000020.

Vikat, A., Spéder, Z., Beets, G., Billari, F.C., Bühler, C., Désesquelles, A., Fokkema, T., Hoem, J.M., MacDonald, A., Neyer, G., Pailhé, A., Pinnelli, A., and Solaz, A. (2007). Generations and Gender Survey (GGS): Towards a better understanding of relationships and processes in the life course. *Demographic Research* 17(14): 389–440. doi:10.4054/DemRes.2007.17.14.

Voland, E. (1998). Evolutionary ecology of human reproduction. *Annual Review of Anthropology* 27: 347–374. doi:10.1146/annurev.anthro.27.1.347.

Watkins, S.C. (1986). Regional patterns of nuptiality in Western Europe, 1870–1960. In: Coale, A.J. and Watkins, S.C. (eds.). *The decline of fertility in Europe*. Princeton: Princeton University Press: 314–336. doi:10.1515/9781400886692-013.

Witte, J.C. and Wagner, G.G. (1995). Declining fertility in East Germany after unification: A demographic response to socioeconomic change. *Population and Development Review* 21(2): 387–397. doi:10.2307/2137500.

Zaidi, B. and Morgan, S.P. (2017). The second demographic transition theory: A review and appraisal. *Annual Review of Sociology* 43: 473–492. doi:10.1146/annurev-soc-060116-053442.