Family Systems and Fertility Intentions: Exploring the Pathways of Influence

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Abstract Family systems, as normative frameworks in which family processes unfold, are believed to exert a major influence on fertility. While a number of studies have addressed family system effects on family size and the timing of births, the question of how family systems influence fertility intentions has remained largely unexplored. Because fertility intentions are often not realized, studying the pathways through which these intentions are framed warrants further attention. Addressing this research gap, this paper explores the pathways of influence between family systems and people's intentions to start or to extend their family in the framework of the theory of planned Behaviour. We use a path analysis to analyse data from the Generations and Gender Survey (GGS) on fertility intentions of 28,988 individuals from nine European countries that considerably vary in family systems. Regional indicators of family systems were constructed on the basis the Survey of Health, Aging and Retirement in Europe (SHARE) and incorporated in the analytical sample. The results demonstrate an important link between family systems and fertility intentions. Family systems frame people's intentions by influencing their attitudes towards children and their ideas about existing norms regarding fertility. This influence works partly through affecting household size and partly through influencing people's ideas about the requirements for having children. Family system effects vary between intentions to start and to extend a family. While nearness to kin decreased positive attitudes towards having children of

This paper uses data from the Generations and Gender Program (GGP). For more information on the Generations and Gender Survey (GGS), see <http://www.ggp-i.org/>.

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childless respondents, having kin nearby had the opposite effect for those that were already parents.

Keywords Family systems · Fertility · Fertility intentions · Europe · Pathways · Theory of planned behaviour

1 Introduction

There is a growing interest in the effects of family organization patterns, so-called family systems, on people's fertility behaviour (Micheli 2004; Dalla-Zuanna and Micheli 2004; Kok 2009; Rotering and Bras 2015). Family systems consist of the norms, values and practices associated with the organization of family ties that are geographically anchored and shared within societies. Family systems refer to the customary, normative manner in which family processes unfold—to the usually preferred pattern of household dynamics incorporating marriage form(s), succession, transmission of property, the normal sequence of co-residential arrangements and the customary bias by gender and relative age that informs these dimensions (Skinner 1997, p. 238). Several authors have argued that family systems as a normative framework that influences people's attitudes and behaviour exert an important influence on fertility behaviour (Davis 1955; Nag 1975, p. 305; Todd 1990; Skinner 1997; Das Gupta 1999; Therborn 2004).

However, despite a growing theoretical interest, the impact of family systems on fertility has received little attention in empirical studies of contemporary fertility in western societies. While a number of studies have addressed family system effects on family size and the timing of births in mainly developing and transitional societies (for an overview, see Burch and Gendell 1970; Nag 1975, p. 305; Dyson and Moore 1983; Das Gupta 1997; Skinner 1997; Veleti 2001; Chen 2006), the question of how family systems influence fertility intentions has remained largely unexplored (for an exception, see Harknett et al. 2014). Although fertility intentions are often a precursor of later fertility behaviour (Schoen et al. 1999; Kuhnt and Trappe 2015), they do present a different dimension, particularly in contemporary developed societies where fertility intentions are often not realized (Liefbroer 2009; Régnier-Loilier and Vignoli 2011; Spéder and Kapitány 2009, 2015). Because family systems comprise the norms, values and practices around family and kin, including people's attitudes towards having children (Burgess 1931, p. 188; Reher 1998, p. 215; Lois and Becker 2014), studying the effects of family systems on fertility intentions warrants further research.

This paper explores the effects of family systems on fertility intentions in nine European countries that vary considerably in family systems (Austria, Belgium, Czech Republic, France, Germany, Hungary, Italy, Poland and Sweden). Inspired by the work of Ajzen and Klobas (2013) and Harknett et al. (2014), we use the theory of planned behaviour (TPB) to theorize about the pathways through which family systems may influence fertility intentions. The significance of these pathways is then analysed on the basis of the Generations and Gender Survey (GGs) ($N = 28,988$) using path analysis, for the fertility intentions of starting or extending a family.

Novel in the paper is that we construct indicators of regional family systems, i.e. contact frequency and spatial proximity, on the basis of another dataset, the Survey of Health, Aging and Retirement in Europe (SHARE). Indicators are constructed for 42 European regions (NUTS 1) and then incorporated in our analytical sample.

This paper is structured as follows: First, the concept of family systems is introduced and regional patterns of family systems in contemporary Europe are described. We then present the theory of planned behaviour (Ajzen 1991) to conceptualize the pathways of influence of regional family systems on fertility intentions. Next, we describe our data, the measurements of regional family systems and of people's fertility intentions and our methods. Subsequently, the results of the path analysis, testing the influence of the two family system indicators on fertility intentions, are presented. Finally, in the discussion and conclusion section the main findings are discussed in the light of previous research. In addition, we address the limitations of our study and come up with suggestions for future research.

2 Theoretical Background

2.1 Family Systems and Fertility in Europe

Family systems are sets of norms, values and practices associated with the organization of family ties that differ geographically across regions (Höllinger and Haller 1990; Skinner 1997; Reher 1998, p. 215; Das Gupta 1999; Oppenheim Mason 2001, pp. 160–161; Therborn 2004). In his famous article, Reher (1998) identified two extremes of family systems, i.e. strong family regions which are regions where relationships among kin are close and traditionally the family group has had priority over the individual, and weak family regions where relationships among kin are loose and the individual and individual values have had priority (p. 203). Several studies have shown that different types of behaviour, ranging from openness to economic innovation, female labour force participation, political attitudes and demographic behaviour differ across family systems and have been relatively persistent over time (Todd 1990; Reher 1998; Hank 2007; Duranton et al. 2009).

Differences among family systems in Europe are usually conceptualized according to two major dividing lines that split Europe in four parts: the north-western, central, southern, and eastern regions (Laslett 1983; Heady et al. 2010). Family systems in north-western Europe, including countries like the Netherlands, Sweden and Denmark, are often characterized by weak kin ties, high levels of cohabitation and relatively small household size. In contrast, family systems in southern Europe, such as Spain, Italy and Greece, are marked by strong kin ties, low levels of cohabitation and on average more complex household structures (Reher 1998; Heuveline and Timberlake 2004, p. 1222; Kalmijn 2007, p. 254). Central European countries like Germany and France often range in between (Reher 1998; Heady et al. 2010; Mönkediek and Bras 2014), while Eastern Europe resembles the family systems in Southern Europe with the exception that marriage occurs early in people's lives and divorce rates are high (Kalmijn 2007, p. 249, 251).

There is only limited empirical evidence on the effects of regional family systems on fertility. First, many empirical studies examine the family system–fertility nexus at the national level and look at the association between national indicators of family systems and country-level total fertility rates (TFRs) or household size (Davis 1955; Burch and Gendell 1970; Hajnal 1982; Das Gupta 1997, p. 181; Veleti 2001; Micheli 2004; Duranton et al. 2009). In addition, many empirical studies address only single pathways through which family systems influence fertility, for instance through household composition (for an overview, see Nag 1975, p. 305; i.e. Veleti 2001; Chen 2006). However, the possible pathways are manifold and include processes of socialization, means of fertility control, marriage behaviour and patterns of kin support (Davis 1955; Naldini 2003, pp. 150–157, 169–172, 203; Mönkediek and Bras 2016). Apart from direct effects, family systems may influence fertility also indirectly through their impact on economic development and the development of welfare regimes (Balbo et al. 2013; Duranton et al. 2009). Thus, in order to systematically theorize the pathways through which family systems impact fertility intentions, a theory is needed that allows controlling for possible direct and indirect effects. The theory of planned behaviour (TPB) incorporates such diverse pathways and has already been applied successfully to the study of fertility intentions (Mönkediek 2011; Ajzen and Klobas 2013; Liefbroer et al. 2015; Spéder and Kapitány 2015; Kuhnt and Trappe 2015).

2.2 The Theory of Planned Behaviour (TPB)

The theory of planned behaviour (TPB) developed by Ajzen (1991) differentiates between people's behavioural intentions and their behavioural outcomes. According to the TPB, behavioural intentions are regarded as the causal explanation of an observable behaviour, such as leaving the parental home. Disparities between behavioural intentions and behavioural outcomes result from inconsistencies between people's 'perceived' and 'actual behavioural control' (Ajzen 1991, p. 183). 'Perceived behavioural control' relates to people's beliefs about their capabilities to perform certain behaviour. 'Actual behavioural control' comprises people's real abilities, resources and given opportunities, and thus broadly the socio-economic setting in which a behaviour occurs. Since people's perceptions might differ from their actual socio-economic conditions, differences between people's intentions and behavioural outcomes occur (Ajzen 1991). However, humans are able to reflect on the conditions in which their behaviour takes place. Accordingly, people's actual behavioural control is not only expected to moderate the effect of intentions on behavioural outcomes, but also expected to influence people's perceived behavioural control via a feedback loop (Ajzen and Klobas 2013, p. 206).

Next to their 'perceived behavioural control', people's behavioural intentions emerge out of two additional background factors: people's 'attitudes' towards certain behaviour and their 'subjective norms'. 'Attitudes' are based on people's assumptions about positive or negative consequences of performing certain behaviour, such as their ideas about the costs and utilities of having children (Ajzen and Klobas 2013, p. 205). 'Subjective norms' describe perceived social

pressure and normative beliefs to engage or not to engage in certain behaviour (Ajzen 1991; Ajzen and Klobas 2013, p. 206).

2.3 Family Systems and the Pathways of Influence on Fertility

Many behaviours can be studied within the TPB framework, including people's intentions to have children, given that the stated questions are precisely formulated so that the behavioural goal is clearly defined (for a further discussion, see Ajzen and Klobas 2013, p. 208). Figure 1 provides an overview of a conceptual model describing the possible pathways through which family systems may influence fertility intentions. The concept of family systems is integrated as a background factor that influences people's attitudes towards having children, their subjective norms and their behavioural control, because family systems are part of the social environment in which people grow up and in which their, i.e. fertility behaviour takes place. Through the provision of norms and values that regulate kin relationships, family systems govern obligations and social interactions among kin, influencing household structures and relationships to kin living within and beyond the co-residential unit (De Vos and Palloni 1989, p. 177; Rossi and Rossi 1990, p. 156). The kind of interactions with family and the types of household in which children grow up influence their experiences within the family group and impact their socialization (Reher 1998, p. 215). Growing up in close-knit family networks (strong family system) is thought to influence children's attitudes towards family and family-related values positively (Lorimer 1954, pp. 199–203, 247). Therefore, children from strong family system regions likely attach higher value to family in general and to having children in particular. Hence, individuals in strong family system regions have more positive attitudes towards fertility compared to individuals from weak family system regions (**H1**).

As Reher (1998), p. 203 has argued, in strong family regions the family has priority over the individual. Moreover, in such regions the family also often functions as a provider of welfare and social support, reinforcing parents' social influence (Reher 1998, pp. 208–209; Esping-Andersen 1999, p. 35, 47; Hilgeman and Butts 2009, p. 107; Balbo 2012, p. 100). As a result, parents' control over their children's behaviour is more effective (Granovetter 2005, p. 34; Lorimer 1954, p. 247), while this control has been shown to be more authoritarian as well (Romero

Fig. 1 Conceptual model explaining fertility intentions by regional family systems, based on TPB (Ajzen 1991)

and Ruiz 2007). Thus, perceived social pressure and people's normative beliefs to engage or not to engage in certain behaviours are more relevant in strong family than in weak family regions, where individualism is more prevalent. Moreover, the requirements for starting a family or having another child are higher and more difficult to fulfil in strong than in weak family regions (Newson 2009, p. 470). In many strong family countries, such as Italy, Spain or the Czech Republic, being married and having established an own household are seen as necessary preconditions for having children (Ongaro 2001, pp. 186–188; Livi-Bacci 2001; Billari et al. 2002, p. 30, 32, 33; Možný and Katrňák 2005, p. 239). At the same time, young couples are able to acquire independent housing often only after they have reached economic independence¹ (Ongaro 2001, p. 187; Baizan 2001, pp. 288–289). Growing economic uncertainties and high youth unemployment, as well as housing shortages, are increasingly higher hurdles for starting a family (Guerrero and Naldini 1996, pp. 48–53; Billari et al. 2002, pp. 18–19; Kohler et al. 2002, p. 645, 655; Možný and Katrňák 2005, p. 241; Ghodsee and Bernardi 2012). Moreover, high opportunity costs and parents' aim that their children at least maintain the family's social status² suggest limiting fertility as a result of perceived social pressure and (family system) normative beliefs (Turke 1989, pp. 64–66; Voland 1998; Livi-Bacci 2001, p. 152). Thus, given the fact that perceived social pressure and normative beliefs about accepted behaviours are more relevant in strong family than in weak family regions, it can be expected that strong family systems affect people's subjective norms negatively and thereby reduce their intentions to have a(nother) child within the next three years (**H2**).

In addition, by regulating degrees of kin support and because of different requirements for starting a family, strong family systems can be expected to influence fertility intentions negatively through raising the perceived requirements for having children that influence people's perceived behavioural control (**H3**). In contrast, in weak family systems, such as Sweden, the often more generous welfare state mediates these effects through lowering the costs of fertility.

2.4 Starting a Family or Having Another Child

People's intentions of starting a family (having a first child) and expanding their current family (having a higher-order child) differ because both cases provide different behavioural contexts (Harknett et al. 2014). In the case of starting a family, couples have no own experiences yet with having children. However, in the second case the intention to have another child is likely to be influenced by the earlier experience of raising children and/or having received support, or not. These earlier experiences can be expected to impact people's attitudes towards children, their subjective norms, as well as their perceived behavioural control. In addition, differences arise because of changes in the opportunity costs and the utility of

¹ In weak family countries, such as France or Finland, it is more and more common to leave home before or at the time of having a first job (Corijn 2001, p. 137). In Finland, this is supported by a system of housing allowance (Forsberg 2005, pp. 264–265).

² Compare also Steelman et al. (2002, p. 248ff), Dalla-Zuanna (2007), Becker and Lewis (1974), and Simon (1955) for a more detailed discussion.

having children. Opportunity costs, such as leaving the job, are especially high for the first child (Gauthier and Hatzius 1997, p. 296, 300). ‘Benefits’ of having another child³ on the other hand decrease with every child birth. Recent research by Harknett et al. (2014, p. 23) demonstrates that higher-order births are likely to be more responsive to policy and environmental changes compared with first births. In addition, Gauthier and Hatzius (1997), pp. 300–303 observe important country differences in the effects of cash benefits on fertility across welfare states. Cash benefits have stronger effects on fertility in countries where benefits increase with parity. Thus, there is a clear need to distinguish between first- and higher-order births in the analysis of childbearing intentions.

3 Data, Measures and Methods

3.1 Data

To study the effects of regional family systems on people’s fertility intentions, we use the first wave of the Generations and Gender Survey (GGS) (United Nations Economic Commission for Europe 2005; Vikat et al. 2007, p. 391). The GGS was conducted to study demographic and social developments in several European and some non-European countries and contained extensive data on fertility behaviour and intentions (Vikat et al. 2007, p. 391). The first wave of the GGS was held between 2002 and 2013, depending on the year when countries joined the survey. We selected those European countries that are also included in the SHARE survey that we used to construct our family systems indicators (described later), i.e. Austria, Belgium, Czech Republic, France, Germany, Hungary, Italy, Poland and Sweden.⁴ These countries comprise all four parts of Europe (northwest, south, east and central) and thus represent a wide enough range of different family systems (Laslett 1983; Reher 1998).

Next, childless respondents and respondents with one or two children were selected in order to study intentions to start a family and to have a second or third child. In addition, the sample was restricted to respondents aged 20–40 years covering the largest part of the female reproductive life span. These selection criteria amount to an analytical sample of 28,988 cases. Due to item non-response, the final sample (in the multivariate analyses) includes 12,226 childless and 10,623 respondents with children for analysis. Because of some variables not having been charted in all survey countries, sub-parts of the path models are estimated on even fewer cases, i.e. the path coefficients explaining fertility intentions are based on 5468 childless and 7234 respondents with children (nested in six countries). We discuss this limitation in the discussion and conclusion part of the paper.

³ Apart from positive experiences, these can be reduced uncertainty over the future life course and increased marital solidarity (Friedman et al. 1994, p. 394).

⁴ Estonia and the Netherlands were excluded, because the country samples did not include all the variables needed for the analysis.

Table 1 Fertility intentions

Country	Fertility intentions			
	Not intended	After 3 years	Within 3 years	<i>N</i>
Austria	857 (33.1%)	814 (31.4%)	920 (35.5%)	2591
Belgium	716 (45.5%)	335 (21.3%)	523 (33.2%)	1574
Czech Republic	1012 (29.9%)	684 (20.2%)	1689 (49.9%)	3385
France	1010 (39.2%)	498 (19.3%)	1,071 (41.5%)	2579
Germany	837 (52.5%)	333 (20.9%)	423 (26.6%)	1593
Hungary	616 (18.3%)	976 (29.0%)	1771 (52.7%)	3363
Italy	1107 (33.0%)	1120 (33.4%)	1126 (33.6%)	3353
Poland	1986 (44.7%)	746 (16.8%)	1712 (38.5%)	4444
Sweden	556 (26.4%)	736 (35.0%)	811 (38.6%)	2103
Total	8697 (34.8%)	6242 (25.0%)	10,046 (40.2%)	24,985

3.2 Measurements

3.2.1 Dependent Variable

Within the GGS fertility, intentions regarding the timing of births are charted using two questions. The first question asked whether respondents intend to have a(nother) child within the next three years (short-term realization) on a scale from 1 to 4 (definitely not, probably not, probably yes, definitely yes). If respondents did not intend a(nother) childbirth within the next three years, they were asked whether they intended a childbirth at all, that is after 3 years (long-term realization) on a scale from 1 to 4 (definitely not, probably not, probably yes, definitely yes). Combining both questions allows us to obtain life-long fertility intentions, as was also discussed by Beaujouan (2013), pp. 38–39. For simplification, the answer categories of the two questions are collapsed into a dummy variable charting whether respondents did or did not intend childbirth within or after 3 years. The resulting variable charts the share of respondents that at the time of the interview (1) intended childbirth within the next three years, (2) intended to have a childbirth after three years and (3) did not intend to have any children. Table 1 demonstrates that this share is highest in Hungary (52.7%), followed by the Czech Republic (49.9%), France (41.5%), Sweden (38.6%) and Poland (38.5%). We observe the lowest proportions of respondents with explicit childbirth intentions in Germany (26.6%) and Belgium (33.2%).

3.2.2 Independent Variables

According to our conceptual model (Fig. 1), people's fertility intentions are explained by the three background factors attitudes towards children, subjective norms and perceived behavioural control. Within the GGS, the items charting these factors were hypothetically formulated following the TPB framework, allowing us

to study their effects on people's short- and long-term fertility intentions. Descriptive statistics of the included variables by country are presented in Table 2.⁵

Attitudes GGS has eleven items that measure opinions about the perceived effects of having a(nother) child. On a scale from 1 (much better) to 5 (much worse), these items measure whether a(nother) child would improve or worsen life aspects such as 'the possibility to do what you want', 'your employment opportunities', or 'your financial situation'.⁶ Unfortunately, only two items were charted in all survey countries. Accordingly, we combined the left nine items, taking their mean and constructed the new variable 'attitudes' (Cronbach's alpha 0.751). After rescaling, high values on this new variable reflect positive attitudes towards children (mean 2.857, SE 0.003).

Subjective Norms Respondents' subjective norms were charted by three items that referred to people's opinions about whether most friends, parents and most relatives think that they should have a(nother) child.⁷ On a scale from 1 (strongly agree) to 5 (strongly disagree), respondents could state that they expect that their kin and peers would agree or disagree to have a(nother) child. We rescaled the items so that high values reflect expected positive reactions and took the items' mean. The resulting variable 'subjective norms' is highly reliable⁸ (alpha 0.911). Interestingly, the distribution of the new variable shows that respondents more often expect negative reactions of their social networks in case of having another child (mean 2.629, SE 0.009).

Perceived Behavioural Control Perceived behavioural control (PBC) was measured using five items that charted respondents' perceptions about their capabilities to control specific aspects of their lives within the next three years.⁹ These aspects included their financial situation, their work, their housing conditions, their health, and their family life and were measured on a scale ranging from 1 (not at all) to 4 (a great deal). Calculating means for these items, the resulting variable 'behavioural control' is reliable (alpha 0.785, mean 2.870, SE 0.004).

Requirements for Starting or Expanding a Family In the GGS, requirements were charted by asking respondents about their opinions to what extent their decisions about having a(another) child depend on different factors, including their financial

⁵ As is evident from Table 2 for France and Hungary, the items charting perceived behavioural control were not included in the questionnaire.

⁶ For the full list of items, see the GGS questionnaire: http://www.ggp-i.org/sites/default/files/questionnaires/GGP_QuestW1Full.pdf (access date: 18.08.16).

⁷ The exact wording of the question was: "Although you may feel that the decision to have a/another child is yours (and your partner's/spouse's) alone, it is likely that others have opinions about what you should do. I'm going to read out some statements about what other people might think about you having a/another child during the next three years. Please tell me to what extent you agree or disagree with these statements, choosing your answer from the card." (Source: http://www.ggp-i.org/sites/default/files/questionnaires/GGP_QuestW1Full.pdf, access date: 18.08.16).

⁸ In Italy, respondents were asked about their opinions about the expectations of their parents concerning respondent's fertility using separate items, while their opinions about expectations of other relatives were not charted (Alpha for Italy: 0.876).

⁹ The exact phrasing introducing the items was: "How much control do you feel you will have over the following areas of your life in the next three years?" (Source: http://www.ggp-i.org/sites/default/files/questionnaires/GGP_QuestW1Full.pdf, access date: 18.08.16).

Table 2 Descriptive statistics (control variables)

Country	N	Female (%)	Mean age	Mean education (ISCED-97)	Mean attitudes	Mean subj. norms	Mean PBC	Mean requirements	Mean household size*
Austria	2758	58.9	29.9 (0.115)	3.511 (0.017)	2.816 (0.006)	2.495 (0.021)	2.919 (0.012)	2.102 (0.014)	2.347 (0.023)
Belgium	1978	51.2	29.8 (0.136)	3.739 (0.028)	2.847 (0.011)	2.066 (0.030)	3.115 (0.013)	1.749 (0.017)	2.439 (0.026)
Czech Republic	3434	48.7	29.6 (0.100)	3.321 (0.019)	2.840 (0.009)	2.751 (0.024)	2.767 (0.012)	2.371 (0.015)	2.283 (0.018)
France	2961	58.0	30.2 (0.112)	3.982 (0.027)	2.962 (0.010)	2.365 (0.030)	–	1.751 (0.015)	1.873 (0.017)
Germany	2202	53.0	30.8 (0.133)	3.451 (0.022)	2.765 (0.009)	2.143 (0.031)	2.805 (0.015)	2.036 (0.017)	1.815 (0.018)
Hungary	3630	48.7	28.5 (0.084)	3.721 (0.015)	3.028 (0.007)	2.647 (0.026)	–	2.147 (0.013)	2.748 (0.021)
Italy	3478	51.4	31.2 (0.100)	2.923 (0.016)	2.999 (0.009)	3.716 (0.022)	2.961 (0.008)	2.158 (0.019)	2.654 (0.018)
Poland	6038	54.4	30.0 (0.074)	3.629 (0.014)	2.740 (0.006)	2.689 (0.017)	2.747 (0.009)	2.379 (0.013)	2.518 (0.016)
Sweden	2509	49.7	29.3 (0.124)	3.819 (0.021)	2.681 (0.013)	2.962 (0.030)	3.068 (0.014)	2.034 (0.023)	1.876 (0.014)
Total	28,988	52.7	30.0 (0.035)	3.556 (0.007)	2.805 (0.003)	2.664 (0.010)	2.890 (0.005)	2.181 (0.007)	2.339 (0.007)

SD in brackets; – data not available for this country

situation, their work, their housing conditions or the availability of childcare institutions.¹⁰ Respondents could indicate the importance of these factors for their fertility intentions on a scale ranging from 1 (not at all) to 4 (a great deal). We combined these items in a new variable ‘requirements’ (alpha 0.859). The new variable ‘requirements’ is skewed towards lower values. Accordingly, a large share of respondents (about 50.4%) perceives only few (2) or no (1) requirements that need to be fulfilled before having a(nother) child.

Household Complexity (Household Size Net of Children) We use household size as an indicator of household complexity. It is calculated net of children of respondents so that, for example, an increase more likely relates to changes in the household composition and type. As demonstrated in Table 2, household size is on average larger in strong family countries, such as Italy (2.654), Hungary (2.748) and Poland (2.518), as expected households are on average smaller in weak family countries, such as France (1.873) and Sweden (1.876). The Central European countries range in between (Austria 2.347, Belgium 2.439), following the dividing lines between strong and weak family regions observed by previous research (i.e. Reher 1998; Heady et al. 2010). Germany is an outlier (1.815) with a lower than expected household size.

3.2.3 Regional Family Systems

Unfortunately, GGS cannot be used to derive indicators of regional family systems. Using the information on people’s social relationships provided in GGS is problematic. Family systems not only structure people’s social networks and thereby influence fertility (Veleti 2001; Micheli 2004), but people’s social networks are often also affected by fertility (Belsky and Rovine 1984). To solve this problem, the paper uses the first two and the fourth wave¹¹ of the Survey of Health, Aging and Retirement in Europe (SHARE) (Börsch-Supan et al. 2013) to derive regional indicators of family systems. As described before, indicators are constructed for the nine countries included in GGS. The indicators are based on valid information for 38,484 individuals¹² in SHARE. These respondents in SHARE are 50 years and older. The composition of social relationships of these older respondents have been identified as a useful indicator of differences between strong and weak family regions (compare Reher 1998; Castiglioni et al. 2016, pp. 70–72).

Two indicators of regional family systems are constructed based on respondents’ social relationships¹³ (following Mönkediek and Bras 2014). These indicators describe the average frequency of contact between kin and the average spatial

¹⁰ The exact phrasing of the question introducing the response items was: “How much would the decision on whether to have or not to have a/another child during the next three years depend on the following?” (Source: http://www.ggp-i.org/sites/default/files/questionnaires/GGP_QuestW1Full.pdf, access date: 18.08.16).

¹¹ The first wave of SHARE was conducted in 2004/2005 in eleven European countries (Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Spain, Sweden and Switzerland) and Israel. The second, conducted in 2006/2007, and the fourth wave, conducted in 2010/2012, added the Czech Republic, Estonia, Hungary, Ireland, Poland, Portugal and Slovenia to the survey. The third wave was not included due to a different set-up.

¹² We only included the anchor persons in SHARE, not their spouses.

¹³ In this context, the paper utilized the information on respondents’ co-residential relationships, relationships with their parents (if alive), relationships with their children (if existent) and relationships

Fig. 2 Average spatial proximity and average frequency of contact per country (*left*) and NUTS 1 region (*right*)

proximity between kin in a region. The first indicator, average contact, was calculated by dividing the summed up contact frequency of all family relationships of respondents by the number of all social ties in the network. After rescaling, the resulting score ranges from 1 ('no contact' to family members) to 7 ('very frequent' contact). For the second indicator, average spatial proximity, the proximity of all family relationships of respondents was counted and their sum divided by the number of all family ties (Mönkediek and Bras 2014, 2016). The resulting score ranges from 1 ('very distant') to 9 ('in the same household'). Aggregating the individual scores at NUTS 1 levels¹⁴ results in two macro-indicators that describe the average social and geographical density of respondents' family networks in a region. These two indicators are matched with GGS through identifying the NUTS regions in which respondents of GGS lived and assigning all respondents in the same NUTS region the same values. This is being done for 47 NUTS 1 regions.

Although contact frequency and spatial proximity are correlated, we assume that 'when measured at the same point in time, distance affects contact but not the reverse' (Greenwell and Bengtson 1997, p. S19). Figure 2 provides an overview of

Footnote 13 continued

with up to three persons to whom respondents provided or from whom respondents received any kind of support within the last twelve months.

¹⁴ NUTS levels divide the European Union into areas of relative comparable population size. Source <http://ec.europa.eu/eurostat/web/nuts/principles-and-characteristics> (access date: 18.01.17).

the regional variation of the two family system indicators. As demonstrated in Fig. 2, contact frequency and spatial proximity between kin are on average higher in European strong family regions, supporting previous research (i.e. Höllinger and Haller 1990; Hank 2007).

3.2.4 Control Variables

The paper includes different control variables (Table 2).

Gender Fertility intentions might differ according to gender (Schoen et al. 1999, p. 794). To control for gender differences, the paper includes respondents' sex in the analysis.

Educational Level People normally try to postpone their fertility until after they finish education (Blossfeld and Huinink 1991, p. 161; Klein 2003, p. 521). Accordingly, people's fertility intentions might be explained by their educational degree or their years in schooling. In addition, educational degree can be used as an indicator of people's socio-economic standing. Respectively, the paper controls for respondents' highest educational degree.

Age Previous studies demonstrate that expected family size declines with age (Liefbroer 2009).

Cohort In GGS, the country surveys were conducted in different years. Accordingly, it is necessary to distinguish between age and cohort effects. To limit the effect size, year of birth is divided by the earliest year observed in the data, resulting in a variable that ranges from 1 (born in 1962) to 31 (born in 1993).

GDP Regional socio-economic condition might also explain differences among family structures and requirements for having children. We include regional values (NUTS 1) of gross domestic product (GDP) for the year 2000 obtained from Eurostat.¹⁵ Although the measured regional GDP does not describe regional socio-economic conditions during the reproductive periods of respondents, it is still a valuable approximation of often persistent socio-economic regional disparities.

3.3 Methods

In this paper, we use multi-level path analysis to test the effects of regional family systems on people's fertility intentions via the theorized pathways simultaneously. Path analysis is a special case of structural-equation models (SEM) without latent variables. With path-analysis complex, causal relationships between different endogenous and exogenous variables can be tested, while it makes assumptions, variables and hypothesized relationships explicit (Olobatuyi 2006, p. 41, pp. 53–61). Rather than simply testing a set of data for a linear relationship (p. 11), path analysis is based on the estimation of simultaneous regression equations. Correlation coefficients describing the associations between exogenous and endogenous variables are decomposed into direct and indirect effects, as well as unanalysed correlations and spurious effects (Olobatuyi 2006, p. 12, 29). Using a standard

¹⁵ GDP is measured in Purchasing Power Standard (PPS), per capita. Source: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_r_e2gdp&lang=en (19.03.15).

multi-level approach to model the complex relationships that we assumed would have complicated our models. In that case, it would have been necessary to include third- or fourth-level interaction into our models.

We apply two recursive generalized path models. The dependent variable in the analysis is ordinal scaled (0–2), while models assume that the observed distribution of the dependent variable follows a logit distribution. Accordingly, the coefficients (b) describe the influence of the background factors on the dependent variable in terms of the increase in the log-odds of the respondents' intentions to have a (another) child. Since path analysis is sensitive to model specifications, in particular to the failure of including relevant causal variables (Garson 2008, p. 1), the models control for unobserved relevant factors shared between individuals that may explain similarities in attitudes, subjective norms and ideas about behavioural control. Therefore, the models control for the covariance in the error terms of these factors. Since any significant covariance in these error terms would affect the estimation of the statistical models using OLS (Olobatuyi 2006, pp. 10–11, 87–89), the path models are estimated using maximum likelihood. Moreover, to account for the hierarchical structure of the data (individuals nested in regions, nested in countries), the models include country fixed effects (Cameron and Miller 2011, 2015, pp. 331–332). Since fixed effects cannot completely capture all within-country correlation of the error term (Cameron and Miller 2015, pp. 329–330), the paper additionally accounts for clustered error terms at NUTS 1 levels. To account for different selection probabilities and to correct for non-response, the GGS includes different types of weights. However, for some countries (Sweden, Hungary and Poland) no weights are provided. In addition, comparing the weighted and unweighted results of the derived models reveal only minor differences in the results. Accordingly, in this paper the results of the unweighted models are presented.

Finally, the pathways are estimated in two steps: in a first step, the paper presents two simple models in which the family system factors influence the background factors directly. In a second step, the models are extended based on the earlier theorized pathways (see Fig. 1). Comparing the results of the nested models using AIC and BIC reveals to what extent the added pathways improve the estimated models.

4 Results

To test the effects of family systems on fertility intentions via the earlier described pathways (see Fig. 1), we present the results of the different path models (Figs. 3, 4, 5, 6). The first two models only include the direct effects of the family system indicators on the three background factors described in the TPB (Figs. 3, 4).

In Fig. 3, we look at the pathways for birth intentions of still childless respondents. As demonstrated in Fig. 3, the results suggest differences in fertility intentions among respondents in the included countries. People in Austria, the Czech Republic, Poland and particularly Italy intend an earlier childbirth than respondents in Germany (the reference category). In addition, childless respondents'

Fig. 3 Path analysis explaining fertility intentions of childless respondents (aged 20–40). Note $^{\wedge} p < 0.10$, $* p < 0.05$, $** p < 0.01$ and $*** p < 0.001$

Fig. 4 Path analysis explaining fertility intentions, for respondents with one or two children (aged 20–40). Note $^{\wedge} p < 0.10$, $* p < 0.05$, $** p < 0.01$ and $*** p < 0.001$

fertility intentions are significantly influenced by their attitudes towards children ($b = 1.718$, $p = 0.000$), their subjective norms concerning the reactions of others in their social networks ($b = 0.663$, $p = 0.000$), and their education ($b = 0.229$, $p = 0.000$). Interestingly, perceived behavioural control does not play a significant role in influencing fertility intentions. Moreover, there are unobserved factors that

Fig. 5 Path analysis explaining fertility intentions of childless respondents (aged 20–40)—extended model. Note ^ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$ and *** $p < 0.001$

explain similarities in people's subjective norms and attitudes towards children (cov 0.199, $p = 0.000$), and attitudes and perceived behavioural control (cov 0.016, $p = 0.009$), as indicated by the significant covariance factors included in the model. One of these factors might be SES. Previous research observed important differences in fertility behaviour among SES groups (Skirbekk 2008; Dribe and Scalone 2014). These differences could relate to variations in attitudes and norms regarding fertility. Accordingly, future research should integrate SES factors not captured by education to better describe these differences.

Finally, Fig. 3 suggests that the average frequency of contact between kin in a region influences respondents' subjective norms ($b = 1.165$, $p = 0.013$) and their attitudes towards children ($b = 0.253$, $p = 0.019$). Both effects are positive leading to earlier childbirth intentions. Finally, spatial proximity between kin raises people's opinions about the costs of having children ($b = -0.155$, $p = 0.011$). These effects are controlled for regional GDP capturing regional socio-economic conditions.

Regarding the effects of the background variables and regional family systems variables on people's intentions to have another child (Fig. 4), we find similar effects of people's subjective norms ($b = 0.875$, $p = 0.000$) and attitudes towards children ($b = 2.904$, $p = 0.000$) on fertility intentions. Moreover, positive effects of contact frequency on people's subjective norms ($b = 1.580$, $p = 0.000$) and

Fig. 6 Path analysis explaining fertility intentions, for respondents with one or two children (aged 20–40)—extended model. Note $^{\wedge} p < 0.10$, $* p < 0.05$, $** p < 0.01$ and $*** p < 0.001$

attitudes towards children ($b = 0.282$, $p = 0.006$) are found, improving respondents' attitudes towards children and their subjective norms. Average spatial proximity between kin exerts a negative effect, raising the perceived costs of having another child ($b = -0.133$, $p = 0.024$) just as in the case of childless respondents. Interestingly, in regions with better socio-economic conditions (GDP) people's attitudes towards children are more positive ($b = 0.067$, $p = 0.000$).

In the next step, the paper presents the extended models. To improve readability, Figs. 5 and 6 only show the significant effects (path) of the family systems indicators and GDP on the background factors included in the TPB (the other paths do exist, but are not shown here).

Figure 5 demonstrates important changes in the effects of the family system indicators on the background factors attitudes, subjective norms and behavioural control. Interestingly, the results suggest that contact frequency has direct positive effects on subjective norms ($b = 1.090$, $p = 0.018$) and attitudes towards children ($b = 0.219$, $p = 0.025$). People living in regions with on average more frequent contact between kin expressed greater benefits of having children and expected more positive reactions towards fertility in their social networks. Spatial proximity affects attitudes indirectly via influencing respondents' household size ($b = 0.519$, $p = 0.011$). In regions with on average close spatial proximity among kin,

respondents tend to live in larger households, indicating a higher incidence of kin co-residence. Larger households decrease respondents' expected utility of having children ($b = -0.017$, $p = 0.002$) and influence their subjective norms negatively ($b = -0.140$, $p = 0.000$). Accordingly, those living in regions with on average larger households more often expect negative reactions of their social networks in case of childbirth.

Figure 6 presents the results for respondents who already have children. We observe a direct effect of contact frequency on respondents' subjective norms ($b = 1.559$, $p = 0.000$) and attitudes towards children ($b = 0.264$, $p = 0.002$) just as in the case of childless respondents. In addition, proximity among kin has indirect effects on people's attitudes towards children and perceived norms, working through framing perceived requirements for having children ($b = 0.396$, $p = 0.049$) and influencing household size ($b = 0.138$, $p = 0.023$). In regions with on average close spatial proximity among kin, household size is larger and perceived requirements are greater, while perceived requirements influence people's attitudes towards children and their subjective norms negatively. The higher the perceived requirements, the less positive are people's attitudes towards children ($b = -0.159$, $p = 0.000$), and the more likely respondents expect a negative reaction in their social networks in the case of childbirth ($b = -0.071$, $p = 0.075$). Interestingly, this time household size exerts a positive effect on respondent's subjective norms ($b = 0.104$, $p = 0.000$). Accordingly, in larger households respondents more often expect positive reactions of their social networks in case of childbirth.

Finally, comparing the AIC and BIC of the models presented in Figs. 3 and 5, and the models presented in Figs. 4 and 6, demonstrates that the later models in which household size and perceived requirements were added fit the observed data structure better. Accordingly, the results support the idea that the two factors are needed and that part of the influence of family systems on fertility intentions is working through framing people's household size and their perceptions of requirements that need to be fulfilled before having children.

5 Discussion and Conclusion

Although family systems have been said to influence fertility behaviour (Das Gupta 1997, 1999; Skinner 1997; Veleti 2001), there is very little empirical research analysing the actual pathways of this influence. This paper is one of the first to study the extent to which family systems explain fertility intentions via different pathways simultaneously. Inspired by the work of Ajzen and Klobas (2013) and Harknett et al. (2014), this study utilized the theory of planned behaviour (TPB) to test the pathways through which family systems affect fertility intentions. Family systems were expected to influence childbearing intentions via framing people's attitudes towards children, their subjective norms, and their perceived behavioural control. These pathways were then estimated using path analysis as a tool. Path analysis has the advantage that it allows complex modelling of the causal relationships between variables, while it makes assumptions, variables and hypothesized relationships explicit (Olobatuyi 2006, p. 11, 41, pp. 53–61). The paper is innovative in the sense

that it used two different data sources (GGS and SHARE) to overcome endogeneity problems. While the main pathways for fertility intentions were tested using the Generations and Gender Survey (GGS), the SHARE survey was used to derive regional indicators of family systems for different parts of Europe.

Our results demonstrate that regional family systems are an important part of the context in which fertility intentions are developed. Family systems influence people's fertility intentions via moderating their attitudes towards children and their subjective norms. While regional contact frequency influenced people's attitudes towards children and subjective norms positively, a negative direct effect of regional spatial proximity on people's attitudes towards children was observed. Respectively, the results support the finding that in regions with on average more frequent intergenerational exchange and greater likelihood of closer spatial proximity among kin individuals are less likely to plan a first child (Harknett et al. 2014, p. 19). Interestingly, no significant effect of people's perceived behavioural control on fertility intentions was observed in any of the models. From the results, it appears that people's assumptions about their abilities to control their own future are not as relevant as expected for fertility intentions. For many respondents, fertility may be too far ahead in future, while other factors, such as education or housing, may be more important for their current life-course plans. This is evident in the significant effect of respondents' education on fertility intentions. An alternative explanation could be that respondents are aware of the fact that fertility intentions are not necessarily realized and that there are many intervening factors, such as finding a partner or having sexual intercourse, that first need to be realized (Birg 1992, p. 199; Huinink 1995, pp. 157–158). Accordingly, the perception of behavioural control may only gain in importance in determining fertility intentions once fertility becomes a more concrete issue in people's lives. However, the fact that no significant effect was observed for respondents with children as well rejects this assumption and suggests that the variables that captured people's perceived behavioural control might have been too general.

A second contribution of this paper is that it regarded the pathways based on nested path models, trying to test the assumption that family systems influence intentions via framing people's household structures and their ideas about requirements that needed to be fulfilled before having children. These factors were expected to moderate the effects of family systems on the background variables (attitudes towards children, subjective norms and behavioural control). As demonstrated by the results, the average frequency of contact influenced respondents' attitudes and subjective norms directly, supporting the idea that social interactions between kin relate to processes of socialization through which attitudes and ideas about the favoured behaviour are formed. Moreover, the direct effect of the regional average frequency of contact among kin on attitudes could relate to contagion effects of which respondents might not always be aware of (compare Lois and Becker 2014, p. 131). Social contagion relates to an unconscious adoption of new attitudes or behaviours from others without perceiving potential sanctions ('getting used to'). Contagion works most effectively through strong ties and close interactions (Keim 2011, pp. 190–191). The results suggest that these processes

work independent of household size (net of children), since no effect of frequency of contact between kin on household size was observed.

At the same time, average spatial proximity between kin was observed to have mainly indirect effects. Regulating respondents' household size (in the case of starting a family) and framing the perceived requirements for having another child, such as a good financial situation, regional spatial proximity between kin exhibited negative effects on people's attitudes towards children and subjective norms in case of starting a family. In regions with, for example, close spatial proximity between kin perceived requirements occurred to be greater, supporting earlier findings, for example for Italy (Livi-Bacci 2001, p. 149; Dalla-Zuanna 2004, pp. 111–115; Vignoli et al. 2013). These greater requirements led to higher estimated costs of having children and higher expected negative reactions of others in respondents' social networks and finally relate to intentions to postpone fertility. Again, these effects seem plausible, because in regions in which co-residence between kin is more common, also the degree of social support provided between kin is often greater (Reher 1998, pp. 208–209; Esping-Andersen 1999, p. 35, 47; Hilgeman and Butts 2009, p. 107; Höllinger and Haller 1990, p. 115). Greater support obligations often result in increased resource competition between kin (Dykstra and Fokkema 2011) and raise the burdens of the middle generation to care for both parents and children. As a result, increasing family burdens can be expected to raise the costs and requirements for having children, which lower people's fertility intentions (Grundy and Henretta 2006, pp. 708–710; Harknett et al. 2014, p. 6). In addition, facing increased family burdens, also close kin might be more willing to control each other's fertility, in case of starting a family, since conditions favouring early fertility are not given (Lorimer 1954, pp. 201–202).

Interestingly, the effects of spatial proximity between kin turn out differently in case of extending the current family. For respondents with children, a positive indirect effect through household size on attitudes towards children and subjective norms was observed. Accordingly, in regions with on average closer spatial proximity between kin, negative effects on intentions, working through raising requirements for having children, are opposed by positive attitudes towards children and positive normative expectations in respondents' social networks. Again, these effects seem plausible, because opportunity costs, such as leaving the job, are higher for the first child (Gauthier and Hatzius 1997, p. 296, 300), while higher-order birth events are more responsive to the availability of social support, based on either social policies (Harknett et al. 2014, p. 23), or in this case kin support.

One limitation of this study is the relatively small and partly varying sample size. Unfortunately, some variables, such as perceived behavioural control, were not charted in all GGS survey countries. As a result, sub-parts of our path models are based on fewer cases, i.e. the path coefficients explaining fertility intentions are based on 5468 childless and 7234 respondents with children (nested in six countries). Accordingly, our results should be taken with care and need to be confirmed by further research.

Another limitation of this study is the construction of household size as an indicator of household complexity. Although household size (net of children) seemed to be a simple and useful indicator, it neither captures the type of kin co-

residing with respondents, nor includes relationships to kin who live outside the household in proximity. Moreover, household structure changes over the family life cycle (Burch 1979, p. 176). Family system indicators might be important, especially in determining kin relationships that go beyond the household because influential kin is not necessarily limited to co-residential units (Hareven 1994). In addition, historical shifts in residential patterns in strong family countries, such as Italy (Viazzo and Zanutelli 2010, pp. 73–75), from parents living into parents living in close proximity, suggest that the link between family systems and household composition has weakened. Accordingly, future research should pay further attention to different types of households and analyse the effects of family systems on the presence of different kin co-residing with respondents. This would, however, have extended the current paper too much.

Finally, future research may also pay further attention to differences in the observed effects among European regions. So far, the paper presented only averaged effects of the included variables across the studied countries. Although the presented results provided further insights, it would be useful to take a closer look at possible variations in the pathways across European regions in order to better understand regional differences in fertility intentions and the role of regional socio-economic conditions in framing these aims.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

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