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THE GAP BETWEEN LIFETIME FERTILITY INTENTIONS AND COMPLETED FERTILITY IN EUROPE AND THE UNITED STATES: A COHORT APPROACH

EVA BEAUJOUAN AND CAROLINE BERGHAMMER

Vienna
Institute of
Demography

Abstract

We study the aggregate gap between intended and actual fertility in 20 countries in Europe and the United States, adopting a cohort approach that differs from the period approach widely used in prior research. We compare the mean intended number of children and percentage intending to be childless among young women aged 25-29, measured during the 1990s, with the data on completed or almost completed fertility in the same cohorts later in life when they were aged 40 and older. In addition, we analyze the aggregate intentions-fertility gap among women with different educational attainment. Our exploration is informed by the cognitive-social model developed by Bachrach and Morgan (2013). The results reveal distinct regional patterns with regard to the completed fertility-intentions gap, most apparent for the childlessness gap. In addition, the gap is the largest among highly educated women in most studied countries and its educational gradient also varies by region.

Keywords

Fertility, childlessness, lifetime intentions, gap, education, Europe, United States.

Authors

Éva Beaujouan (corresponding author), Wittgenstein Centre for Demography and Global Human Capital (IIASA, VID/ÖAW, WU), Vienna Institute of Demography/Austrian Academy of Sciences. Email: eva.beaujouan@oeaw.ac.at

Caroline Berghammer, Wittgenstein Centre for Demography and Global Human Capital, Vienna Institute of Demography/Austrian Academy of Sciences and Department of Sociology, University of Vienna. Email: caroline.berghammer@oeaw.ac.at

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The Gap between Lifetime Fertility Intentions and Completed Fertility in Europe and the United States: A Cohort Approach

Eva Beaujouan and Caroline Berghammer

1.   Introduction

In contrast to the generally low fertility rates, fertility intentions remain close to replacement level in Europe: across the 27 countries of the European Union analyzed in 2011, women in young adulthood (aged 15 to 24) intended to have 2.1 children on average (Testa 2012). Lower numbers are reported for some countries in the East and South as well as for the German-speaking countries. However, across Europe couples tend to have fewer children than they plan with a persisting gap identified between intentions and behavior (see e.g. Harknett and Hartnett 2014). This notion of a "fertility gap" has been picked up by policy makers who have formulated the aim to enable couples to have the number of children they want (Philipov 2009). It entered policy debates in the 1990s and 2000s as well as official policy documents of the European Commission and became one of the main justifications for family policies. The "fertility gap" has been prominently addressed in the scholarly literature; it is typically measured by comparing stated family size ideals or future fertility intentions with period indicators of fertility in a recent past (Adsera 2006; Bongaarts 2008; Lutz 2007; Sobotka and Lutz 2010; Testa 2012). These comparisons are clearly misaligned with respect to the periods or cohorts analyzed and, as a result, the messages arising from them can be misleading (Sobotka and Lutz 2010).

More articulated cohort designs connecting lifetime intentions, completed fertility and the estimated gap between them have been developed recently. The framework of this study relies on ideas from two prominent contributions. First, on research by Bachrach and Morgan (2013) on the predictive value of intentions reported early in life for fertility at the (cohort) aggregate level (Morgan 2003), as well as their suggestion of factors that contribute to the change in intentions with age. Second, on an investigation by Bongaarts (2001) of the factors possibly enhancing and reducing the gap (however expressed in a period perspective). The cognitive-social model of fertility intentions posits that schemas of the family are established during childhood and adolescence (Bachrach and Morgan 2013). The lifetime fertility intentions reported during young adulthood tend to be more influenced by such schemas or cultural models than by specific experiences and actual circumstances, which involve little commitment to act. Fertility outcomes are then influenced by fertility intentions as well as by experiences, constraints, transitions and intentions in other life course domains ("competition" factors or competing goals), most importantly education, work, relationships and leisure (Bachrach and Morgan 2013;

Bongaarts 2001). Having completed education and living in a steady partnership are important preconditions for having children in contemporary societies as is stable employment (Billari, Liefbroer and Philipov 2006). In conclusion, rethinking the cohort intention-fertility gap by considering that young adults' fertility intentions are rather influenced by family experiences and cultural expectations while actual fertility is particularly driven by life circumstances refines our understanding of this gap.

This study adds to the research on the fertility gap by studying the cohort gap between aggregate fertility intentions expressed in early adulthood and ultimate completed fertility. It is the first to systematically measure the gap across many countries along cohort lines. Many recent studies have covered the formation of and changes in individual-level fertility intentions, both short-term and across the lifetime (e.g. Billari, Philipov and Testa 2009; Dommermuth, Klobas and Lappegård 2011; Iacovou and Tavares 2011; Testa 2014), and the short-term realization of fertility intentions (e.g. Spéder and Kapitány 2009; Testa, Cavalli and Rosina 2014). Differently from short-term intentions which take into account the specific life circumstances, lifetime intentions are often formed and surveyed many years before actual childbearing takes place which implies a higher degree of uncertainty (Ní Bhrolcháin and Beaujouan 2011) and less predictive validity at an individual level. Aggregate lifetime intentions are, on the other hand, on average better predictors of fertility than individual level intentions, because over- and under-achievement may balance each other out, as studies on the United States have shown (Edmonston, Lee and Wu 2010; Morgan and Rackin 2010). In this study, we specifically estimate the gap between the mean intended family size in young adulthood and the cohort total fertility rate as well as the gap between intended and cohort childlessness of women born in the mid- to late-1960s for 20 European countries and the United States. We mainly focus on intentions at age 25 to 29 (though we also test age 20-24, provided in appendix) because most women have completed education by this age (including university graduates) and intentions are less uncertain than earlier in life. Indeed, we also analyze these gaps by education (see Berrington and Pattaro 2014) for a subset of ten countries in order to explore which groups in society fall short of their fertility intentions. This cross-national approach allows us to discuss the importance of structural conditions in shaping fertility intentions, actual fertility, and the gap between them.

Our study contributes to the literature in the following ways. First, we bring back the measure of aggregate lifetime intentions, which were eclipsed by studies on short-term intentions in the recent literature. Second, by comparing intentions earlier in life and actual fertility behavior of the same cohort of women, we adopt internally consistent and methodologically more rigorous approach than most previous studies that used the difference between future lifetime intentions and past period total fertility rate to compute the fertility gap. The cohort approach used here was also recommended by Sobotka and Lutz (2010). Third, single country studies have provided in-depth analyses, but their results cannot be directly compared because they considered different cohorts, measured fertility intentions at different ages and relied on different measures (Berrington and Pattaro 2014; Morgan and Rackin 2010; Smallwood and Jefferies 2003). Our paper takes

another step forward with respect to these earlier works by applying a uniform research design for studying a large number of countries.

2.   The Gap between Lifetime Intentions and Final Parity

2.1. The Gap: A Balance Between Intentions and Completed Fertility

When examining the cohort fertility gap, lifetime intentions and actual fertility need to be studied and understood independently because they are influenced by different processes and determinants. On the intentions side, according to Bachrach and Morgan's cognitive-social model of fertility intentions (2013), during childhood in the family of origin, persons develop schemas – such as the concept of a family – which get connected with sensations and feelings. In adolescence, these schemas are then related to the perception of oneself and oneself-to-be. When children are connected with positive feelings, then the formation of positive fertility intentions later in life becomes more likely, especially if institutional conditions facilitate having children. Intentions are commonly conceived as behavioral goals corresponding to specific circumstances and involve a clear commitment to act. As Miller explains, "intentions involve a specific decision to pursue an actionable goal, with an associated commitment and, commonly, a plan for implementing the decision" (Miller 2011: 78). This suggests that lifetime intentions reported in the mid-to late-20s are often uncertain and tentative. This uncertainty is reinforced because the common preconditions for having a child – having a steady partner, completing education, acquiring a stable job position, and accumulating resources such as income or housing – are often not fulfilled (Ní Bhrolcháin and Beaujouan 2011). Empirical evidence has confirmed that fertility intentions are particularly volatile in young adulthood and only become more realistic and certain with increasing age and certainty in other life situations (Iacovou and Tavares 2011; Ní Bhrolcháin and Beaujouan 2011).

Young adults' intentions thus appear little tied to their current situation, but are rather influenced by cultural expectations on family size prevalent in a certain society (Ní Bhrolcháin and Beaujouan 2015). Bachrach and Morgan argue: "In some cases, the answers may reflect intentions; in other cases, they may reflect scripts or cultural models imbued with positive affect and integrated into self-schemas […]; in yet others, answers may simply reflect basic prototypes of a family—a mother, father, and two children, for example—perhaps associated with positive affect but not deeply integrated into a schema of a future self." (Bachrach and Morgan 2013: 470). The authors actually call them 'reported intentions' in contrast to 'actual intentions'. This distinction is important for interpreting lifetime intentions and the resulting gap to realized numbers of children. For example, in countries in which young adults have unrealistically high reported fertility intentions, the gap will be large even if the level of completed fertility is moderate. This could appear in contexts where fertility was high in earlier cohorts but declined quickly over cohorts so that cultural expectations to have a large family have not yet gone down, orienting young adults' intentions (Bachrach and Morgan 2013).

While fertility intentions, in particular early in life, are affected by childhood family experiences and culturally shared schemas, actual childbearing is, in addition, mainly influenced by fertility intentions themselves but also competing goals (with regard to education, employment and leisure), unanticipated circumstances (e.g. unwanted births) and infecundity (Bongaarts 2001; Morgan 2003). These factors described by Bongaarts are not inconsistent with the possibility that reported intentions change and evolve – especially Bongaarts' competition factor might work either through leading to changes in intentions or through not meeting intentions. Mismatches between early intentions and eventual behaviors should not necessarily be thought of as a problem but may reflect changing intentions and goals. In addition, contextual factors (e.g., health and family policies, employment patterns, gender attitudes and family structure) could influence the relationship between intentions and fertility (Bachrach and Morgan 2013), notably by making family plans and competing goals more or less difficult to achieve.

Empirical evidence on the cohort fertility gap is rather limited. The predictive value of aggregate intentions reported early on in adult life for final parity has been investigated in single country studies for the United States (Freedman, Freedman and Thornton 1980; Morgan and Rackin 2010), the United Kingdom (Berrington and Pattaro 2014; Smallwood and Jefferies 2003) and Norway (Noack and Ostby 2002). Those studies have found a gap of around 0.2-0.3 children per woman between intended and actual numbers of children for cohorts born in the mid-1950s to the early 1960s.[1] In the United States the gap between intentions at age 24 and completed fertility amounted to 0.25 births per woman (difference between 2.22 and 1.97; birth cohorts 1957-64) (Morgan and Rackin 2010). In the United Kingdom, a gap of 0.2-0.3 births per woman was reported between stated intentions at age 21-23 and final parity (mean intended family size of 2.25; birth cohorts 1957-59) (Smallwood and Jefferies 2003). In Norway, women aged 20-24 (cohorts 1953-1957) intended to have on average 2.4 children but had reached 2.1 children by their forties (Noack and Ostby 2002). A small number of studies also investigated how intentions – both short-term and lifetime – and their realization differ by educational attainment. They consistently showed a weak link between intentions articulated in early adulthood and educational level (Berrington and Pattaro 2014; Sobotka 2009). However, highly educated women reached a smaller completed family size than their lower educated counterparts. This educational contrast in completed fertility is apparent throughout countries, although it tends to be larger in Central and Eastern European (CEE) countries and in more familialistic welfare states – where the families receive little institutional support for caring for their members – such as Italy, Spain, Germany or Austria (Neyer and Hoem 2008). The education differences in completed cohort fertility between low and highly educated women are smallest in the Nordic countries (Sobotka et al. 2015). This implies that in most countries highly educated women fall short of the number of children they wanted in their early adult years more often than low educated (Berrington and Pattaro 2014; Musick et al. 2009; Smallwood and Jefferies 2003).

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[1] An earlier study on the United States showed that the gap was 1.0 child for women who were first interviewed in 1962 in early adulthood (difference between 3.67 and 2.67 children) (Freedman, Freedman and Thornton 1980).

We study the women born in the mid- to late-1960s, who were born in later stages of the baby boom in Western countries or thereafter. These birth cohorts are several years younger than those covered in previous studies (Morgan and Rackin 2010; Noack and Ostby 2002; Smallwood and Jefferies 2003). In most Western countries, there was no marked drop in cohort fertility between the cohorts under investigation and the preceding cohorts. In Central and Eastern and Southern European countries, however, the cohorts studied here had fewer children compared to the ones before (see next section). Women born in the mid- to late-1960s obtained higher education than the prior cohorts and the gap to men's educational attainment shrank (Eurostat 2001). More women participated in the labor force and the motherhood effect on employment decreased (Nieuwenhuis, Need and Van Der Kolk 2012). The process of decoupling childbearing and marriage had started before this cohort reached adult age and was continuing unabated thereafter (Sobotka and Toulemon 2008).

2.2. Country-Specific Expectations

In this study, we do not only estimate the gap between intended and realized fertility, but also aim to provide a story line for why this gap varies across developed countries, identifying potentially important contextual factors influencing its size and educational gradient. The level of fertility intentions is compared to the fertility level of cohorts born in 1950-54 (i.e. around 15 years earlier to represent family structure while growing up), as a proxy for cultural norms of childbearing (Appendix Table 1). With respect to actual cohort fertility, we focus on country differences in employment conditions and work-family reconciliation (to represent other competing goals) as well as on contraceptive use and abortion (as unanticipated circumstances). In contemporary developed societies, we consider that infecundity as well as sex preferences and replacement of deceased children expressed in Bongaarts' framework will act at about the same level in all countries, which allows disregarding them in our comparison.[2] Given our cohort approach, the rising age at childbearing that biased the comparison of periods indicators can be ignored. Based on these factors, we then formulate country specific expectations on the size of the fertility gap.

The fertility rate of earlier cohorts may be taken as a proxy for prevailing childbearing norms during childhood and adolescence (Bachrach and Morgan 2013). Where previous cohorts had higher numbers of children, cultural norms of large families prevail (Testa and Grilli 2006), and if people experienced growing up with many siblings, their fertility intentions tend to be higher too (Axinn, Clarkberg and Thornton 1994; Kotte and Ludwig 2011; Régnier-Loilier 2006). More specifically, in countries with a strong decline of fertility over cohorts, a marked gap between intentions and behavior is likely to arise. Fertility decline was most pronounced in the Southern European countries (Greece, Spain, Italy

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[2] Te Velde and colleagues (2012), show that postponement increased somewhat involuntary childlessness in six European countries, but the overall impact on the TFR was relatively small and similar across countries.

and Portugal) as well as in Bulgaria and Poland (see Appendix Table 1). While Central-Eastern and Southern regions are at first sight similar in terms of their fertility declines, changes were much more sudden in the East. The completed cohort fertility rate declined very slowly in Central and Eastern Europe among women born between 1940 and 1960, followed by a significant drop in the late-1960s and early 1970s cohorts, while the cohort fertility decline was steep but steady in Southern European countries (Frejka and Calot 2001). Childlessness intentions deserve specific mention. Previous studies revealed a clear East-West divide in childlessness with Eastern European populations clearly opposing childlessness (Merz and Liefbroer 2012). During state socialism childlessness was strongly discouraged and it remained infrequent until recently (Beaujouan, Brzozowska and Zeman 2016).

On the side of the actual number of children, we discuss three explanatory factors: economic situation, work-family reconciliation and unplanned births. Past studies confirmed that economic conditions are central for men's and women's fertility behaviors. A negative correlation between the unemployment rate and the total fertility rate has been documented for the period since the mid-1990s (D'Addio and Mira d'Ercole 2005). In line with this finding, individual-level research showed that unemployment may lead couples to delay or forgo births (Adsera 2011b; Kreyenfeld and Andersson 2014) and temporary employment can result in postponing childbearing until a more stable position is reached (Adsera 2011a; Vignoli, Drefahl and De Santis 2012). Appendix Table 1 depicts the unemployment rate for 1995-99 and 2000-05 (when the majority of the study population was aged 25 to 40). During these periods, Western Europe and the United States were least affected by unemployment, although the unemployment levels were substantial in France, Belgium and Germany. The unemployment rate was particularly high in some Southern European countries (notably Spain and Italy) and some parts of the East (Bulgaria, Poland and the Baltic states). Southern Europe is known for its insider-outsider labor markets that make it especially hard for young persons to enter the labor market and reach a permanent position, especially in Spain (Dolado, García-Serrano and Jimeno 2002). After 1989 when the women studied here were typically in their early 20s, countries in Central and Eastern Europe experienced sudden increases in unemployment and economic downturns, which were accompanied by plummeting fertility rates and a starkly rising age at childbearing (Philipov and Kohler 2001; Sobotka 2011). Fertility of childless individuals is particularly sensitive to economic downturns, which tend to affect young people most strongly (Sobotka, Skirbekk and Philipov 2011).

Work-family reconciliation is another important factor affecting fertility levels. Cross-national research found that the correlation between the female labor force participation rate and the fertility rate has turned positive since the late 1980s (Ahn and Mira 2002; Engelhardt, Kögel and Prskawetz 2004). This changing correlation has been interpreted in light of social policies that facilitated women's employment. Well-paid parental leave of moderate length and a well-developed child-care infrastructure are two key policies that strengthen women's ties to the labor market (Dearing 2016) and are related to higher fertility rates (Luci-Greulich and Thévenon 2013). Family support environment is also essential to the transition to higher order births (Harknett, Billari and Medalia 2014). As

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shown in Appendix Table 1, mothers' employment rates, with mothers on maternity leave or parental leave coded as non-employed, are particularly low in the Southern European countries (with the exception of Portugal), which are characterized by weak family support policies, low availability of part-time work and high unemployment rates (Adsera 2005; Adsera 2004; Del Boca, Pasqua and Pronzato 2009). Some Central and Eastern European countries report low employment rates of mothers (especially Hungary and Poland) or a shortage of childcare places for children below age three (the Czech Republic, Bulgaria, Hungary and Poland). In some of these countries – especially in the Czech Republic and Hungary – mothers take rather long leaves after childbirth. The CEE countries are similar to the South of Europe in their labor market structures (full-time work, high unemployment), but have higher public spending on family benefits (OECD 2014). In Germany and Austria, mothers' labor force participation rates are comparatively high while childcare enrolment rates of children below age three are much lower than in the other Western European countries covered. In Germany and Austria, mothers commonly take long employment breaks after the birth of a child and tend to return back to the workplace on a part-time basis (Berghammer 2014; Konietzka and Kreyenfeld 2010). Switzerland differs in that the early childcare enrolment rate is high, whereas kindergarten opening hours are very short. In general, the literature on work-family reconciliation finds that fertility is higher in countries that foster the reconciliation between childbearing and women's careers (Engelhardt and Prskawetz 2004; Luci-Greulich and Thévenon 2013). In this regard, family policies in the German-speaking countries, Southern European countries and most of Central and Eastern Europe were less favorable to realizing fertility intentions. In the United Kingdom and the Netherlands, women tended to re-enter the labor market rather fast after the birth of a child, although mostly on a part-time basis. Other countries including France, Belgium, the United States and the Nordic countries enabled women better to combine employment with childrearing duties.

Finally, we refer to the prevalence of unwanted births due to contraceptive failures and restricted access to abortion. While variation in the rate of contraceptive use was modest across countries in the 1990s (when the women in our sample were around age 20 to 30), there were major differences with regard to the reliability of the contraceptive methods used. Couples in Western European countries and several more affluent countries of Central and Eastern Europe used highly effective means of contraception (pill, IUD and condom), while less reliable methods (rhythm and coitus interruptus) were more widespread in less prosperous and more Catholic Central and Eastern European countries (see Appendix Table 1). The pill and effective contraception were already widespread in Hungary, Slovenia and Eastern Germany during state socialism, and in the 1990s the pill took off rapidly in the Czech Republic as well and with some delay in Estonia, Slovakia (Sobotka 2016). Poland, Lithuania and Bulgaria report the lowest use of effective contraception, in the first two countries arguably related to the Catholic Church's opposition to artificial methods of contraception (Stloukal 1999) and in Bulgaria to the high costs of access (Vassilev 1999). In Bulgaria and elsewhere across the CEE region, the low prevalence and limited supply of effective contraception were partly compensated for

by resorting to abortion; rates of legally induced abortion were overall much higher in the East than in the West of Europe (Appendix Table 1). In Italy and Greece, though contraception was used in general, effective contraception was less used than in most other Western European countries. A high prevalence of unplanned and unwanted births is expected to reduce the gap between intentions and realized fertility.

In conclusion, based on these factors, we formulate the following country and region specific expectations.

(1) *Southern Europe:* Large fertility gaps are predicated for Italy, Spain and Greece (but less so for Portugal where mothers' employment rate is much higher) where difficult labor market conditions and low support for reconciling work and family life prevail. Women in all four Southern European countries are, moreover, expected to have unrealistically high fertility intentions as they still grew up in environments where large families were the norm.

(2) *Central and Eastern Europe:* In these countries, women were surveyed several years after the political regime changes around 1989, namely between 1991/1992 in Poland and Hungary and 1997 in Bulgaria and the Czech Republic. After the regime change, there was a rapid and dynamic societal transformation which included labor market reforms, social benefits and family policies (Frejka and Gietel-Basten 2016). This region also experienced the onset of fertility postponement though early childbearing remained prevalent and access to contraception unequal between countries. We observe two groups of countries: the less economically advanced in the 1990s with a poor economic and labor market situation and low use of reliable contraception (Bulgaria, Lithuania, Poland, and Latvia) and more affluent countries with higher use of contraception (the Czech Republic, Estonia, Hungary and Slovenia). The women studied here grew up under state socialism, when fertility was around replacement levels, but mostly had their children after the collapse of the socialist regimes, when fertility had declined to lower levels. Childcare services for small children are very little used in comparison with the West, but mothers' labor market participation is at equivalent levels. While predictions as to the relative importance of these factors are difficult, we expect overall lower fertility gaps than in the South or German speaking countries. Where use of reliable contraception is very poor we presume the gap to be even lower, although these are also the countries that have experienced more economic hardship so we could expect them to have fewer children than expected. In addition, we anticipate particularly low childlessness intentions and actual childlessness (i.e. a small gap) across Central and Eastern Europe based on social norms disapproving of childlessness.

(3) *Western Europe and the United States:* Based on economic situation, reconciliation policies, reliability of contraception and moderate downward trends in fertility, Belgium, France, Netherlands, Norway, Great Britain and the United States are expected to display a moderate gap in both number of children and level of childlessness. Germany, Austria and Switzerland are characterized by a weak support of work-family reconciliation which is why we expect lower fertility, but also lower intentions – given their long-term history of low fertility – and thus a moderate gap as well.

2.3. Education-Specific Expectations

The second aim of our study is to better understand the variation in the fertility gap between women with different educational attainment. Education is a central indicator of a society's stratification. Women with different educational attainment vary greatly with respect to the timing of their life courses, their family events, work careers and resources. Highly educated complete their education much later than their lower educated counterparts (mostly in their mid- to late-twenties; see Appendix Table 2), they thus enter the labor market later and form families later. When comparing young women age 25-29 by educational level, we therefore have to consider that they are typically in very different stages of their (family) life courses. Prior research found no clear pattern between education and lifetime fertility intentions (Testa 2014). Highly educated women, however, more frequently revise their intentions downwards over the course of their lives (Heiland, Prskawetz and Sanderson 2008; Liefbroer 2009). Due to data constraints, we perform the education-specific analysis for a subset of countries only. Those countries cover different regions and show variation with regard to family policy regimes and fertility levels: Austria, Belgium, Czech Republic, Great Britain, Hungary, the Netherlands, Norway, Italy, Spain, Switzerland and the United States.

We base our expectations on the magnitude of the fertility gap by education on education-specific labor market opportunities. This factor pertains to the realization side; as prior studies have not shown a clear education-specific pattern of fertility intentions we refrain from formulating expectations on the intentions side.

Highly educated women enjoy more favorable labor market outcomes than their lower educated peers including higher-status jobs, higher earnings, and a lower risk of unemployment. They have shorter interruptions in their work careers as they return back to their workplace faster after the birth of a child (Steiber, Berghammer and Haas 2015). They also articulate a higher preference for work (Hakim 2003) and tend to have higher intrinsic motivation to perform their jobs. The degree to which labor market outcomes differ varies on a country level. Opportunities are particularly unequally distributed in Italy, Spain, Belgium, the United States and the Netherlands with respect to mothers' employment rates and in the Czech Republic, Hungary, Belgium and France with respect to unemployment risks (Appendix Table 2). Norway and Switzerland are the most equal countries in terms of mothers' employment rates and Norway, Switzerland, Austria as well as the Netherlands and Italy with regard to unemployment risks. Gender equity theory has suggested that the effect of women's employment opportunities on fertility depends on their responsibility for family work. If family policies are designed to support women's employment through institutions and re-distribution of family work to fathers, fertility is expected to be higher (McDonald 2000). This argument applies even more to highly educated women whose labor market opportunities are more favorable. We therefore expect a smaller educational gradient in final parity in countries which support work-family reconciliation (see Appendix Table 1 for childcare indicators).

Based on these factors, we formulate the following expectations:

(1) *Southern Europe:* Moderate education-based fertility (and childlessness) gaps are expected in Italy and Spain, where, on the one hand, highly educated women participate in the labor market but receive limited support for reconciliation, and where, on the other hand, lower educated families face high work insecurity (particularly in Spain). These mechanisms could curtail the realized numbers of children of both groups, although for different reasons.

(2) *Western Europe and the United States:* Among these countries, we expect the smallest gap in fertility and childlessness in Norway, where labor market behavior and risks are the most similar and reconciliation policies support mothers' employment. Moreover, we expect that the fertility gap by education is more pronounced in Austria and Switzerland compared to Belgium, the Netherlands and France, because women participate in the labor market but family policies are not geared towards the reconciliation of work and family. Given the strong educational differences in fertility in Great Britain and the United States (Berrington, Stone and Beaujouan 2015), which are predominantly driven by high teenage fertility and unplanned births among the low educated (Morgan and Rackin 2010), we also expect lower educated women to display a smaller fertility gap than their higher educated peers.

(3) *Central and Eastern Europe:* The Czech Republic is characterized by very high unemployment among the low-educated and a rather high female labor force participation rate. However, parental leave policies enacted in the early 1990s motivated mothers to stay at home with their children, partly because this was believed to be better for the children, but also to compensate for the collapsing system of public crèches. The Czech Republic traditionally represents the most wealthy and secular of the CEE countries, distributing generous universal social benefits, which could result in a lower educational gradient than in the rest of the region (Brzozowska 2015). Hungary implemented policies in the early 1990s that encouraged women to leave their employment in order to relieve the labor market (Brzozowska 2015; David 1999). These policies suggest that highly educated women could overall have fewer children and a high level of childlessness, discouraged by the lack of possibility to reconcile a career with childrearing.

3. Data and Methods

In our study, we compare fertility intentions stated at age 25-29 by women born between 1960 and 1974 (with the majority born between 1965 and 1970) to completed fertility at age 40 in the same birth cohorts. The analysis of intentions was mostly based on the Fertility and Family Surveys (FFS), and the exact cohorts studied depended on the survey year. We decided to focus on the age range 25-29 because by then most women and men have finished even college education, and the second part of our study is based on this

grouping (see table A.2 for age at completion of full time education). At this age most women still have a relatively long time horizon to realise their reproductive plans, although in some subgroups (especially among the low educated) a large proportion of women have already initiated childbearing in their early 20s, and could already have reached their completed fertility (Rendall et al. 2010; Rendall and Smallwood 2003). This may be regarded as a drawback of this age definition. It would have also been consistent with our framework to study reported intentions at age 20-24 ("early" intentions), and we hence test whether any substantive difference in the general country comparison arises from that choice (the figures are displayed in the appendix). Indeed, childbearing plans should remain more influenced by fertility norms or family experience at age 20-24 than at older ages, when they become more certain and realistic (Iacovou and Tavares 2011; Ní Bhrolcháin and Beaujouan 2015). Smallwood and Jefferies also reported a lower predictive value for intention questions asked before age 24 based on sensitivity analyses (2003).

The Fertility and Family Surveys were our main data source on fertility intentions: Table 1 provides the survey characteristics; other details on the validity of the FFS data are described by Prioux and Festy (2002). The FFS were conducted during the 1990s under the leadership of the United Nations Economic Commission for Europe. These surveys mostly cover men and women aged between 20 and 49. Compared to the Eurobarometer surveys, which also contain questions on lifetime intentions for many countries, the large sample sizes are a clear advantage of the FFS. Another advantage is that – differently from its successor, the Generations and Gender Surveys – life time intentions questions are identical across country questionnaires (Beaujouan 2013). In the FFS, the question wording was *"(In addition to the child you are now expecting [pregnant]) do you want to have (children of your own [childless]) (another child [parous]) some time? Yes, no, don't know"* followed for those who indicated yes by the question *"(In addition to the child you are now expecting [pregnant]) how many (children of your own [childless]) (more children [parous]) do you want?"*. The share of 'don't know/missing' answers to the first question is provided in Table 1; a distinction between them is not possible in all surveys. We excluded countries with very high shares of missing values and/or don't know answers (more than 30%), namely Canada, Finland and New Zealand. For two countries we used different datasets: for the Netherlands, we used the Onderzoek Gezinsvorming (OG, Survey of Family Formation) data of 1998 (de Graaf and van Duin 2007), and for Great Britain the CPC General Household Survey (GHS) time series of 1989-90 (Beaujouan et al. 2014; Beaujouan, Brown and Ní Bhrolcháin 2011; Beaujouan et al. 2015), which used relatively comparable questions on fertility intentions, particularly because the response categories were the same (yes, no, don't know).[3]

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[3] In OG, *"Do you still expect (more [parous]) children in the future (other than this child [pregnant])?"* Yes, Don't know, No; If "Yes" or "Don't know", *"How many children do you expect at least? And how many at most?"*. In the GHS, *"Do you think that you will have any (more [parous]) children at all (after the one you are expecting [pregnant])?"* Yes, no, don't know; If "Yes" or "Don't know", *"How many children do you think you will have born to you in all (including those you have already [parous]) (who are still alive) (and the one you are expecting [pregnant])?"*

In order to compare the lifetime fertility intentions of women aged 25-29 with their completed number of children, we used fertility estimates at the end of the reproductive life for the same (or about the same) cohorts. Completed cohort fertility and childlessness levels were either reconstructed from the Human Fertility Database (Human Fertility Database 2016; Jasilioniene et al. 2007), from data by national statistical offices, or provided by Tomáš Sobotka (Sobotka 2017; Sobotka et al. 2015) (See detail in Table 2). All analyses were restricted to women because completed cohort fertility was mostly unavailable for men.

The sample sizes of the FFS (more than 500 women aged 25-29 in most surveys) enabled us to decompose observations into three different educational groups (see Table 2 for sample sizes and data sources). We included a subset of countries with, on the one hand, confirmed data quality for intentions and level of education (the German results for intentions by level of education were rather implausible while education categories in Lithuania could not be reconciled with the ISCED classification) and for which, on the other hand, data were available for completed fertility and cohort total childlessness by level of education. Data for all the other countries were disregarded. Data on final parity were either provided in the Cohort Fertility and Education database (Zeman et al. 2014), or recalculated based on the Generations and Gender Surveys that took place in the early 2000s. We used the common classification of educational levels into low (ISCED 0-2; up to lower secondary), medium (ISCED 3-4; upper secondary and post-secondary non-tertiary) and high (ISCED 5-6; tertiary). Since information on the level of education pertains to the time of the interview, we had to make the assumption that, in the cohorts studied, education was stable over time since their mid- to late twenties.

Table 1: Main characteristics of the Fertility and Family Surveys

Country	Survey year	Original sample size (women)	Non-response rate (women)	Proportion missing/don't know fertility intentions	Retained or not?	Cohorts equivalent to age 25-29	Final sample size, women age 25-29 at time of survey
Austria	1995-96	4581	33/18[1]	7	Y	1966-1971	782
Belgium	1991-92	3236	29.8	5	Y	1962-1967	895
Bulgaria	1997-98	2367	9[2]	21	Y	1968-1973	454
Canada	1990 & 1995	4482	24.2[2]	39			
Czech Republic	1997	1735	6.8[2]	17	Y	1968-1972	308
Estonia	1994	5021	15.4	1	Y	1965-1969	332
Finland	1989-90	5105	18.6	37			
France	1994	2944	15.5	8	Y	1965-1969	514
Germany	1992	5976	23.9/29[3]	27	Y	1963-1967	1510
Greece	1999	3031	83.8[4]	6	Y	1970-1974	479
Hungary	1992-93	3554	12.2	14	Y	1963-1968	691
Italy	1995-96	4824	42	10	Y	1966-1971	859
Latvia	1995	2699	23.3	26	Y	1966-1970	370
Lithuania	1994-95	4516	29	21	Y	1965-1970	466
New Zealand	1995	3017	46.4	61			
Norway	1988-89	4019	18.8	22	Y	1959-1964	716
Poland	1991	3902	5.2[5]	25	Y	1962-1966	547
Portugal	1997	5954	5.3	9	Y	1968-1972	875
Slovenia	1994-95	2798	14[2]	13	Y	1965-1970	512
Spain	1994-95	4021	16.4	14	Y	1965-1970	706
Sweden	1992-93	3318	21.6	n.a.			
Switzerland	1994-95	3878	62.2[4]	17	Y	1965-1970	653
US	1995	10847	n.a.	12	Y	1966-1970	1739
Netherlands [x]	1993	4516	10	6	Y	1964-1968	861
GB [xx]	1989-90	14004	n.a.	9	Y	1960-1964	1381

[1] Non-response rate of men and women was 33% in Vienna and 18% in the rest of Austria

[2] Men and women

[3] East and West Germany

[4] High due to special sample selection procedure, see Prioux and Festy (2002) for an explanation.

[5] Refusals

[x] Onderzoek Gezinsvorming

[xx] CPC General Household survey time series

Table 2: Sample sizes by education and data sources for completed fertility by level of education

| Country	Final sample size, women age 25-29 at time of survey, by education			Data source for completed fertility by level of education
	Low	Medium	High	
Austria	208	418	155	Microcensus 2012
Belgium	186	339	359	Extrapolation 2001 census
Czech Republic	135	139	34	2011 census
Hungary	319	261	111	2011 census
Italy	303	463	93	2009 Famiglia e Sogetti Sociali
Norway	87	208	401	2007-2008 GGS
Spain	393	150	163	2011 census
Switzerland	64	493	96	Swiss Household Panel 2013
US	325	571	843	Current Population Survey 2008/2010/2012
Netherlands	269	431	161	Onderzoek Gezinsvorming 2008
GB	981	267	133	GHS + Understanding Society 2009

4. Results

We first show the findings for the fertility gap and the childlessness gap across countries and then analyze the fertility gap and the childlessness gap by education. Figure 1 depicts the mean intended family size at age 25-29, the completed cohort fertility rate at age 40 in the equivalent birth cohorts and the difference between both measures. Appendix figure 1, showing the equivalent numbers for intentions declared at age 20-24 in cohorts born five years later, displays no major contrast with Figure 1.[4] The fertility gap is negative for all countries except Poland, because completed fertility among these women remained below the mean intended family size measured in young adulthood (Figure 1). A distinct cluster appears for the Southern European countries, where the size of the fertility gap is largest (together with Switzerland). This is driven by a combination of relatively high fertility intentions at younger ages and below-average mean number of children. In Central and Eastern Europe, we find a larger gap in countries with a poorer economic

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[4] We observe an equivalent ordering of the countries by gap, and very close results for intentions. The only substantial difference refers to the United States and Great Britain, who exchange their positions. This is due to relatively lower completed fertility in this younger cohort in Great Britain, and relatively higher reported intentions in this cohort at age 20-24 in the United States.

situation, notably in Bulgaria and the Baltic States but, deviating from this rule, also in Slovenia. Poland and Hungary, on the other hand, display a very small fertility gap, which is even positive in Poland. As expected, Austria and Germany, where both intentions and completed fertility are low, display moderate fertility gaps. Conversely, in Switzerland, intentions are much higher than expected based on the low fertility of the previous cohorts, and consequently the gap is very wide. In the other Western countries, the largest gaps are observed in the Netherlands and Norway, which are among the countries with the highest mean intended family size (resp. 2.31 and 2.45): the size of the gap is explained by high levels of intentions rather than by low fertility levels. The gap is of relatively small size in Great Britain, the US, Belgium and France.

Figure 1: Mean intended family size at age 25-29, completed cohort fertility rate and fertility gap (data sorted by the size of the gap)
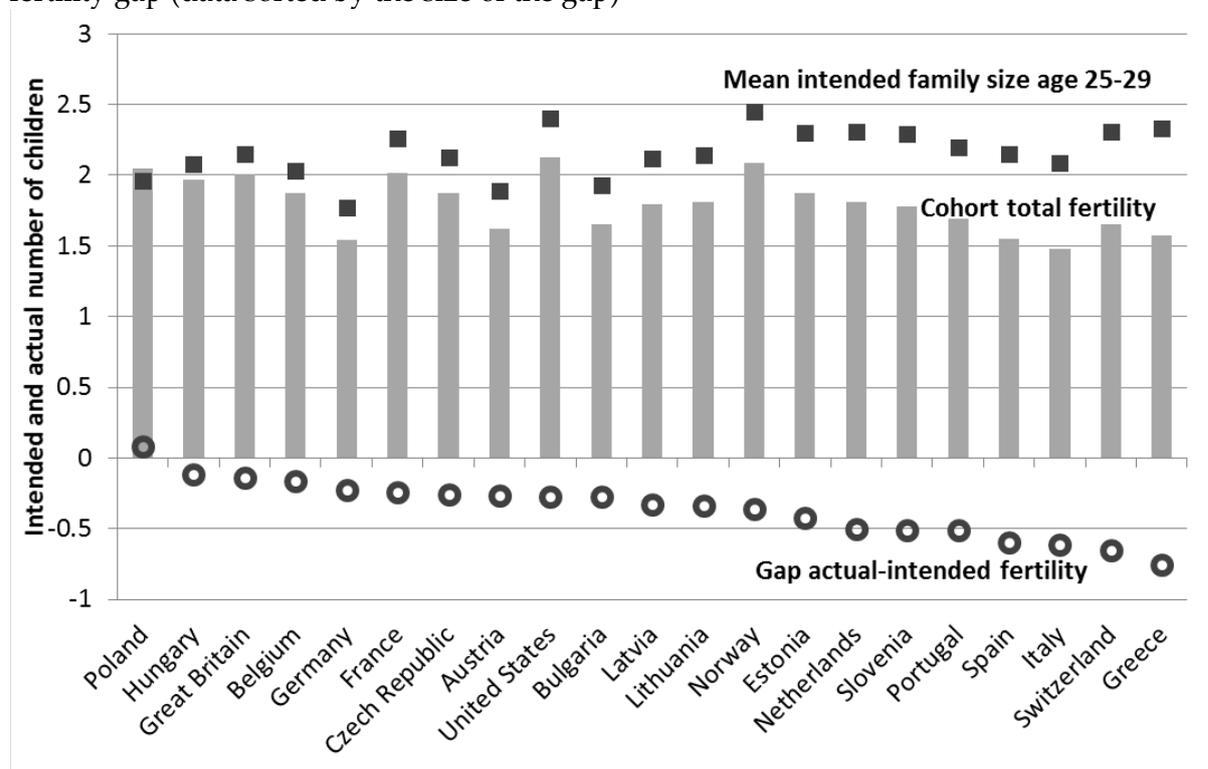
While there was no distinctive Western versus Eastern pattern in the gap between intentions and completed fertility, a very strong East-West divide appears with regard to intended childlessness, cohort childlessness and the childlessness gap (Figure 2): childlessness intentions are almost non-existent in the Central and Eastern European countries and a low level of around 10% of women will eventually remain childless, thus resulting in a low gap. Again, this is in line with the results from later cohorts aged 20-24

at the time of the survey (Appendix Figure 2). In the West, levels of intended childlessness vary but remain in all countries above the levels in the East, with Norway being an exception since the share of women intending to remain childless is lower than in Poland: Norway and France display low intentions but also low childlessness, hence they are the closest to Central and Eastern European countries. Women in the South of Europe indicate a low preference for staying childless, but a significant share in Spain (16%) and Italy (20%) will eventually not have any children, resulting in a large gap. At the other end of the spectrum, many Western European countries display both high childlessness intentions and high rates of childlessness of typically around 20% (e.g. the Netherlands, Great Britain and Germany). All in all, the gap in childlessness seems particularly small where norms speak against childlessness. For instance in Central and Eastern Europe, the strong normative distaste about childlessness appears to be more important for defining intentions and actual fertility than the economic situation or family policies. Also, ultimate childlessness levels appear influenced by long term childlessness levels (Sobotka 2017), as is for instance the case in Switzerland, where women do not intend to remain childless but the proportion of childless women is one of the highest in Europe.

Figure 2: Share of women intending not to have children at age 25-29, share not having children at age 40 and the difference between both indicators ("childlessness gap"); data sorted by the size of the gap

Sources: like in Figure 1.

17
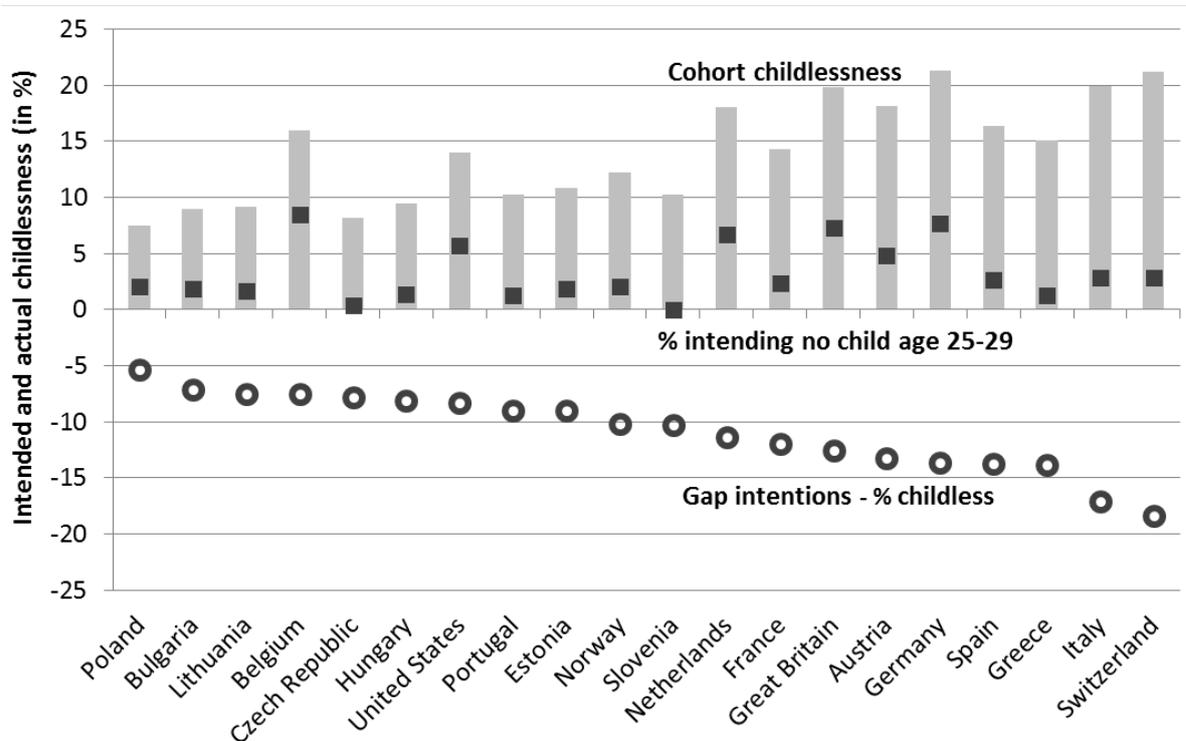
Having discussed the levels of completed fertility and childlessness for all women, we now turn to education-specific findings. Figure 3 compares the intended and actual mean number of children by level of education. Intended family size at age 25-29 is higher than completed fertility after age 40 in all analyzed countries and education groups. There is no consistent educational gradient in mean intended family size, although for most countries it is either U-shaped or negative. However, the educational gradient in completed fertility is clearly negative. As a consequence, highly educated women generally show the largest gap between intended and realized fertility. The educational gradient is, however, small in some countries: the gap amounts to around 0.7 children per woman in all educational groups in Italy, around 0.4-0.5 in the Netherlands and the United States, and is lower than 0.3 in the Czech Republic, Norway and Austria. This is either due to similarly large gradients in intentions and fertility (e.g. in the United States) or to small gradients in both of them (e.g. in Norway). By contrast, the difference between low and highly educated women in the intentions-fertility gap is by far largest in Spain and Switzerland (around 0.6 children per woman) and in both countries the gap is driven by the steep educational gradient in completed fertility while fertility intentions by educational attainment are less varied. Overall, the size of the educational gradient in the gap between intended and realized fertility across countries shows contrasting patterns, which do not seem to depend on economic criteria or regional specificity. This is both because of the variability in educational differences in intentions and the very diverse completed fertility gradients within regions with similar characteristics.

Figure 3: Mean intended family size at age 25-29, completed cohort fertility rate and fertility gap by level of education. Data sorted from lowest- to highest-fertility countries
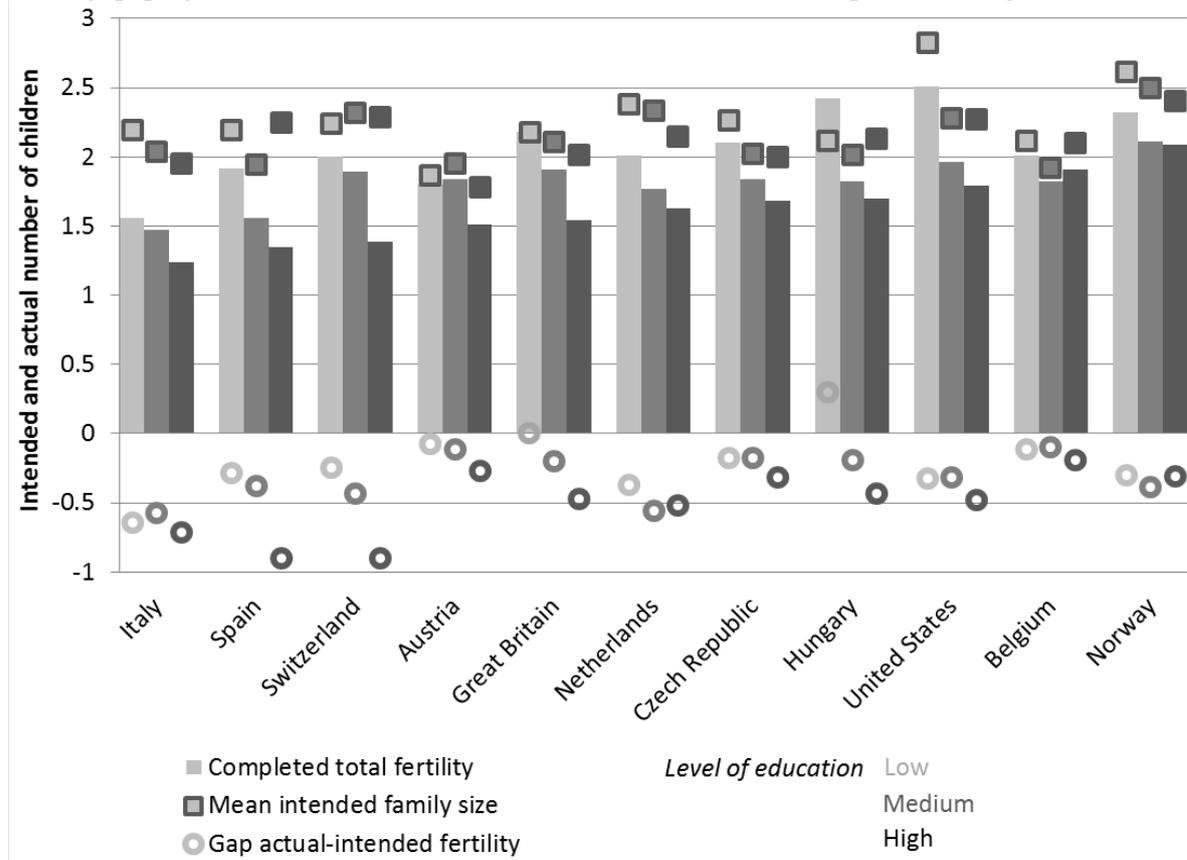
Sources: like in Figure 1.

Finally, Figure 4 summarizes the results for childlessness by level of education. Unlike mean family size which did not show a regional pattern, the Southern European and the German-speaking countries clearly exhibit the largest difference in the childlessness gap between low and highly educated women. The two CEE countries (Czech Republic and Hungary) as well as Norway and Belgium display almost no educational gradient in the childlessness gap, having rather uniform intentions and actual levels by educational attainment. In the countries that exhibit a large gradient, it is almost entirely driven by the strong educational differences in actual childlessness. And clearly, with the exception of Central and Eastern Europe, this gradient is the highest in countries where reconciling a career with children is most difficult. Indeed, as discussed before, Spain and Italy were displaying the widest differential in female labor force participation by education, and in Austria and Switzerland, highly educated women mostly start working part-time after having children (which is strongly supported by family policies) and partly give up their career ambitions.

Figure 4: Share of women intending not to have children at age 25-29, share not having children at age 40 and the difference between both indicators ("childlessness gap") by level of education. Data sorted by level of childlessness in a country
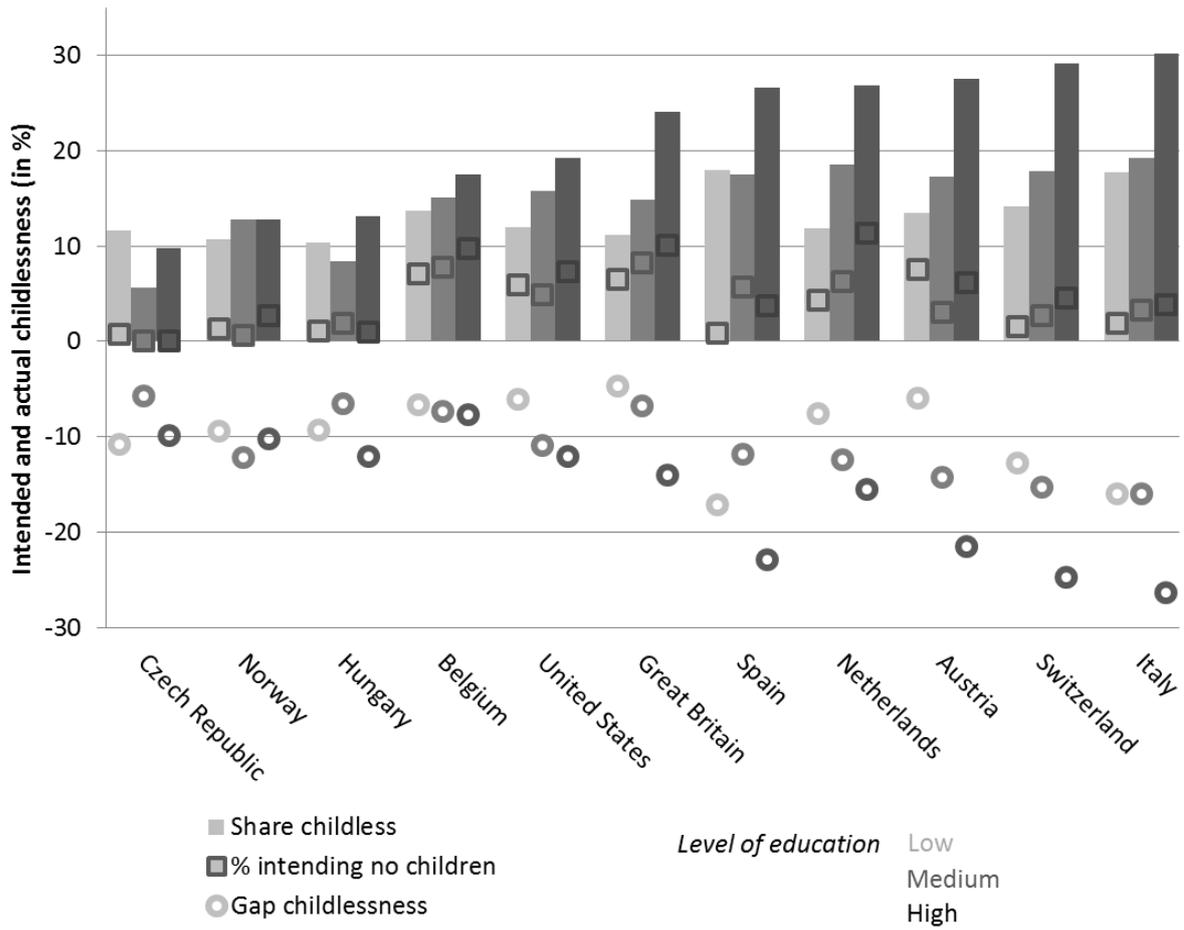
5. Concluding Discussion

This exploration of the aggregate gap between fertility and childlessness intentions at age 25-29 and completed family size and final childlessness at ages 40 and over in the same birth cohorts for 20 countries in Europe and the United States brings new insights to the discussion on the "fertility gap". Inspired by Bachrach and Morgan's approach, we took the perspective that intentions at young ages were defined by the early fertility norms and the family context to which individuals are exposed, and that the actual institutional conditions in peak childbearing years would have a large impact on the capacity to realize intentions. For a subset of these countries, we also studied the fertility gap by level of education. Our comparative approach allowed us to suggest explanations why the size of the fertility gap differs across countries and educational groups. While such an aggregate

approach is suitable for addressing cross-country differences in the fertility gap, it naturally precludes any statements about the realization of intentions on an individual level. That is, we cannot know about the extent to which women over- or under-achieve their fertility intentions and how this differs across countries.

Our results reveal quite distinctive regional patterns among women born in the late 1960s to early 1970s. We observe the largest fertility gaps of around 0.5-0.7 children per woman in the Southern European countries and in Switzerland. This is in line with our expectations: we anticipated low completed fertility in the South based on unstable labor market situation and low support for reconciling work and family life. The fertility gap was expected to be boosted by relatively high fertility intentions linked to higher fertility in the parents' cohorts that was shaping fertility intentions in young adulthood. For CEE countries, we had identified countervailing forces that might influence the fertility gap: poor economic situation, difficult work-family reconciliation (both being conducive to a low family size), partly counterbalanced by a high prevalence of unplanned births. The intended family size was rather low in this region (around two children per woman in most countries), corresponding to relatively low fertility achieved already in the parental cohort (except in Poland). Although we found rather small gaps in most Central and Eastern European countries, in line with our expectations, higher fertility gaps of 0.3-0.4 children per woman were displayed in the region's weaker economies (Bulgaria and the Baltic States). Among the Western countries, in Great Britain, the United States, Belgium and France, rather high fertility together with higher fertility intentions (in line with previous cohorts' fertility levels) resulted in a small to medium gap. In the German-speaking countries we could have expected larger gaps for reasons of weakly developed work-family support, but we found that this only applies to Switzerland. Germany and Austria exhibit the lowest mean intended family sizes of all the countries studied, in line with their long history of low fertility, which resulted in moderate gaps. Switzerland, however, had persistently high fertility intentions, despite its long term low fertility.

How do these results compare to previous research? Studies on the United Kingdom and the United States had indicated fertility gaps of a magnitude of 0.2-0.3 children per woman for similar cohorts as studied here (Morgan and Rackin 2010; Smallwood and Jefferies 2003). In a European comparison, these gaps are relatively moderate. Depending on the region, fertility gaps may be significantly higher: they are, for instance, around twice as large in the Southern European countries. Based on the intended number of children and the tempo-adjusted total fertility rate, gaps of around 0.3-0.4 children per woman had been reported as a European average which closely correspond to the mean of all the countries we included (Sobotka and Lutz 2010). However, the regional pattern obtained with this less rigorous method clearly diverged from ours as moderate gaps were noted for Southern Europe and large gaps for Central and Eastern Europe (Sobotka and Lutz 2010).

In addition to the mean number of children, we presented evidence on childlessness. This gives a different perspective and allows us exploring the factors decisive for entering parenthood rather than those affecting the overall family size. The assumption that both

childlessness intentions and actual childlessness would be particularly low in the CEE countries (resulting in a small gap) is confirmed by our results. Indeed, the cohorts under study grew up under state socialism (until their late teenage years), when there were very strong norms against voluntary childlessness and policies supporting early and almost universal entry into parenthood, and women would rather have one child only than no child at all (Frejka and Gietel-Basten 2016; Merz and Liefbroer 2012; Sobotka 2011). Very low childlessness levels continued long after the fall of communism (Beaujouan, Brzozowska and Zeman 2016). In addition, we identified two distinct country clusters that featured the largest childlessness gap: the Southern European countries (Italy and Spain) and the German-speaking countries (Germany, Austria and Switzerland), closely followed by the United Kingdom. Despite the expectations of moderate gaps in the rest of the Western countries due to well established reconciliation policies, only Belgium displayed a gap which was smaller than 10 percentage points.

The education-specific analyses refined some of our general results. In accordance with prior research we observe small differences in fertility and childlessness intentions by education, without clear-cut pattern (Testa 2014). However, our analysis confirmed that highly educated women end up with a lower mean number of children (except for Belgium and Norway) and a higher level of childlessness (except for the Czech Republic and Norway), leading to a larger gap between intentions and final parity than for the other groups.

Overall, the size of the educational gradient of the gap in mean family size did not seem predicted by economic criteria or welfare regimes. For instance, we had expected moderate education-based fertility (and childlessness) gradients in Italy and Spain because childbearing of the low educated is curtailed by high economic insecurity, while childbearing of the highly educated is constrained especially by limited support for combining employment and family. This seemed to apply only to Italy, whereas in Spain the fertility gap was much larger for highly educated. In line with previous findings for the United States, in Great Britain we observed almost no fertility gap among low educated women, but a marked gap among their highly educated peers (Morgan and Rackin 2010; Quesnel-Vallée and Morgan 2003). Unintended fertility among the low educated women, linked to low contraceptive use and high rates of teenage pregnancies, could partly explain this result. The sensitivity test on the overall gap confirms that in these two countries with high rates of teenage fertility, results might have been different if we had used the reported intentions of the 20-24 age group.

Differently from the mean number of children, the educational gradient by the childlessness gap displayed a clear regional pattern: the gradient was the largest in countries where the reconciliation of work and family is rather difficult, namely the German speaking countries and Southern Europe, as well as the Netherlands and Great Britain where most mothers work part-time. Due to well-established reconciliation policies and similar labor market outcomes between educational groups, we had expected the smallest gradient in the gap in fertility and childlessness in Norway. This is confirmed by our data: in fact, the educational gradient in final childlessness is the lowest of all the

countries studied. We had, moreover, assumed the educational gradient to be more pronounced in Austria and Switzerland than in the other Western European countries because weak work-family reconciliation policies tend to affect highly educated women the most. While this is only partly corroborated by the results on mean family size, the results clearly confirm this expected pattern for the childlessness gap. In contrast, in Hungary and the Czech Republic we found a rather small childlessness gap with a distinct U-shape pattern: childlessness levels among medium-educated women are the closest to their initial childlessness intentions. This suggests that insufficient possibilities of reconciling work and family were impeding entry into parenthood especially among the highly educated. This did not appear so strongly for the completed fertility gap.

Our analysis was informed by Bongaarts' gap model and the social-cognitive model of fertility intentions. The rather large gaps we find between fertility intentions and actual behavior reinforce the assumption of these models that intentions stated in early adult life and behavior later in life are distinctive and influenced by different factors and processes. Smallwood and Jefferies argue that the fertility gap "should not necessarily be interpreted as an unmet need for fertility. The disparity is as likely to be a result of the uncertain nature of many women's intentions and the tendency of intentions to be modified according to circumstances." (Smallwood and Jefferies 2003: 24). This applies even more when we compare low and highly educated women who are in a different stage of the life course at a given age, requiring different interpretations of the fertility gap. The social-cognitive model of fertility intentions argues that "reported intentions" are predominantly influenced by family and cultural context. We operationalized this context at the macro level by using previous cohorts' fertility behavior, to approximate social norms and experience of family size at young ages. Based on our exploratory analysis fertility of the past cohorts seemed to matter both for level of intentions and the size of the gap, though results for some countries were against this expectation. Clearly, the fertility of previous cohorts is only one possible indicator of family and cultural context and future research may consider other factors including social norms about childbearing during the teenage years more explicitly. In addition, we need to interpret the measure of aggregate fertility intentions cautiously, particularly in comparative research where even small deviations in question wording may lead to different results. Differences in survey protocols and quality (e.g. high non-response rates) may also affect these results (Beaujouan 2013). With respect to actual fertility behavior we have emphasized their relationship to competing goals (education and employment), unanticipated circumstances (e.g. unwanted births) and contextual factors (difficulties in reconciling childrearing and career life) (Bachrach and Morgan 2013; Bongaarts 2001). Although some of the country results did not follow an expected pattern, overall we did find evidence for the important role of these factors.

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Appendix

Appendix Figure 1: Mean intended family size at age 20-24, cohort total fertility rate and fertility gap
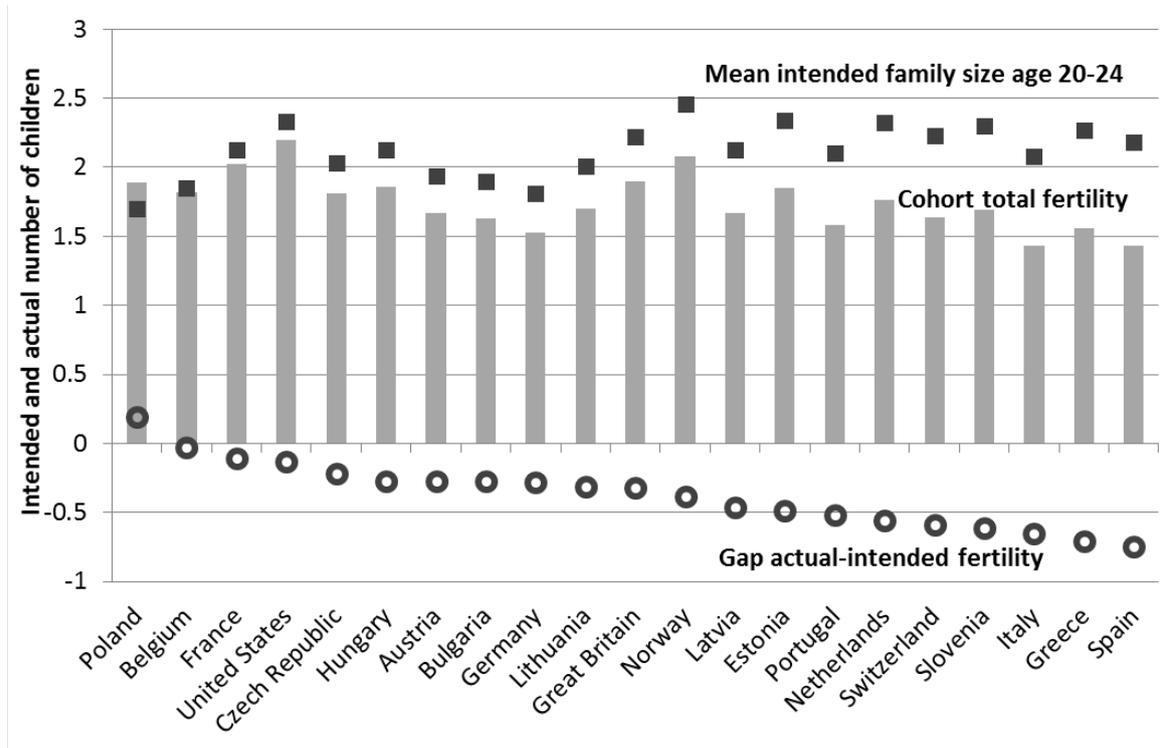
Note: the number of countries displayed is not the same as in the original figures for age 25-29, because completed fertility and/or proportion of childless women were not available for the most recent cohorts in many countries.

Sources: like in Figure 1.

Appendix Figure 2: Share of women intending not to have children at age 20-24, share not having children at age 40 and difference between both measures ("childlessness gap")
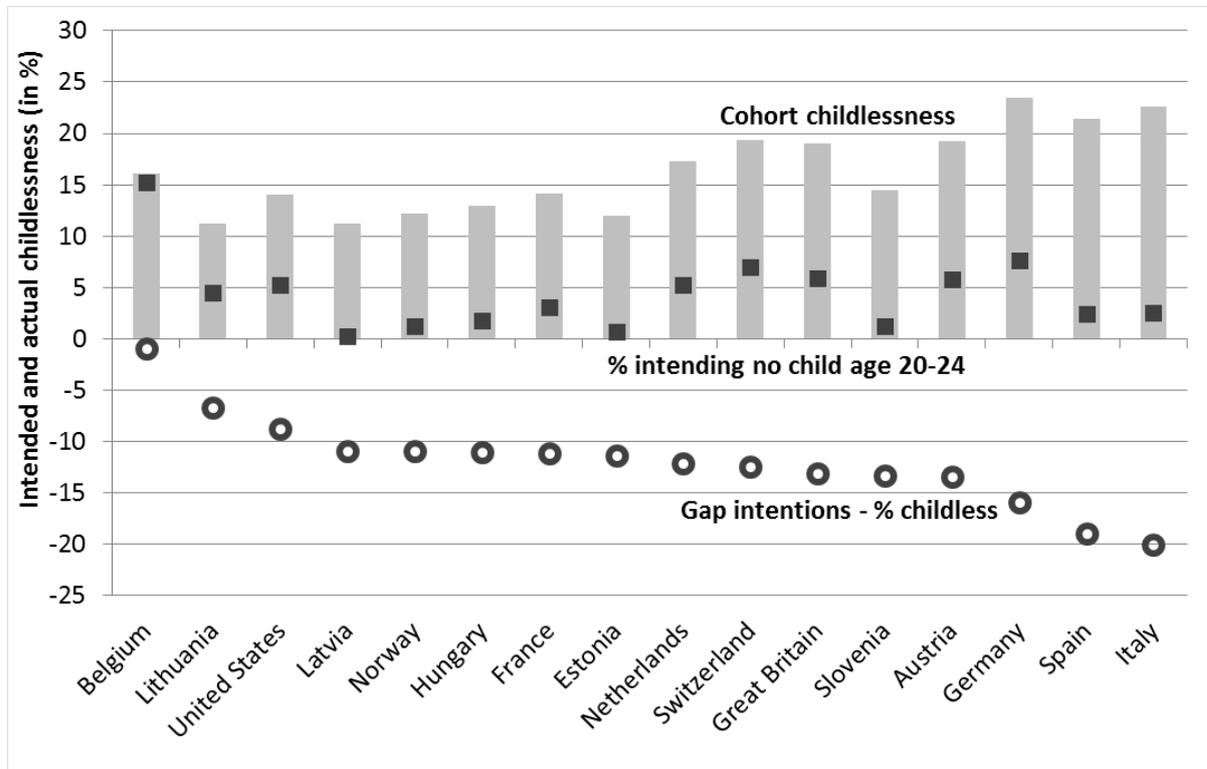
Note: the number of countries displayed is not the same as in the original figures for age 25-29, because completed fertility and/or proportion of childless women were not available for the most recent cohorts in many countries.

Sources: like in Figure 1.

Appendix Table 1: Country characteristics

	Completed cohort fertility (1)			Total unemployment rate, age 25-49 (2)		Employment rate of mothers with children < 15 years, age 25-44 (3)		Childcare participation rate < 3 years (4)	Average number of weekly hours in childcare < 3 years (5)	Use of reliable contraception (6)	Rates of legally induced abortion (7)	% don't know on question of intended number of children (8)	% strongly disapprove if a woman chooses never to have children (9)
	1950-54	1965-69	Diff.	1995-99[1]	2000-04	1995-99[1]	2000-04	2004 or 2005[2]	2005[3]	1990-1999	1995	1990-1999	2006
Age of study population, in years (approx.)				25-35	30-40	25-35	30-40	35-40	35-40	25-35		25-29	35-40
Western and Northern Europe													
Belgium	1.82	1.82	0.00	8	7	66.5	67.0	39	28	64.3	6.2	1.0	4.0
France	2.12	2.02	-0.10	11	8	64.6	65.0	41	27	67.4	12.4*	8.9	10.6
Netherlands	1.88	1.77	-0.11	5	3	68.2	67.3	43	16	X	6.1	X	3.6
Norway	2.07	2.08	0.01	3	3	74.6	75.1	33	31	52.9	14.9	14.7	1.4
GB/UK	2.05	1.91	-0.14	6	4	66.2	63.0	37	17	X	14.4 (England & Wales)	X	1.2
United States	2.03	2.13	0.1	4	4	69.7	72.9	27	-	X		7.8	
German-speaking countries													
Austria	1.82	1.63	-0.19	5	4	67.4	64.3	11	16	58.2	X	0	11.0
Germany	1.69	1.51	-0.18	8	8	63.2	57.4	10	25	61.2	7.6**	30	4.5

	Completed cohort fertility (1)			Total unemployment rate, age 25-49 (2)		Employment rate of mothers with children < 15 years, age 25-44 (3)		Childcare participation rate < 3 years (4)	Average number of weekly hours in childcare < 3 years (5)	Use of reliable contraception (6)	Rates of legally induced abortion (7)	% don't know on question of intended number of children (8)	% strongly disapprove if a woman chooses never to have children (9)
	1950-54	1965-69	Diff.	1995-99[1]	2000-04	1995-99[1]	2000-04	2004 or 2005[2]	2005[3]	1990-1999	1995	1990-1999	2006
Age of study population, in years (approx.)				*25-35*	*30-40*	*25-35*	*30-40*	*35-40*	*35-40*	*25-35*		*25-29*	*35-40*
Switzerland	1.77	1.66	-0.11	4	3	73.5	76.1	33	15	70.3	8.4**	17.8	4.2
Southern Europe													
Greece	2.01	1.75	-0.26	9	10	53.0	52.8	12	32	35.9	X	3.9	-
Italy	1.85	1.50	-0.35	10	8	47.9	47.9	26	30	40.8	11.2*	5.6	-
Portugal	2.04	1.78	-0.26	5	5	73.1	75.5	37	38	N.A.	X	9	4.9
Spain	2.08	1.57	-0.51	18	11	44.1	49.0	39	24	66.4	5.5*	6.5	4.8
Central and Eastern Europe													
Bulgaria	2.05	1.71	-0.34	-	15	-	63.0	9	40	30.4	50.0	11.9	66.8
Czech Republic	2.10	1.92	-0.18	6	7	67.2	59.6	3	11	54.5	21.4	21.5	-
Estonia	1.97	1.87	-0.10	11	10	70.5	65.5	13	34	65.5	55.8	0	24.4
Hungary	1.95	1.94	-	8	6	61.9	56.6	8	31	68.6	34.7	16.0	21.4

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	Completed cohort fertility (1)			Total unemployment rate, age 25-49 (2)		Employment rate of mothers with children < 15 years, age 25-44 (3)		Childcare participation rate < 3 years (4)	Average number of weekly hours in childcare < 3 years (5)	Use of reliable contraception (6)	Rates of legally induced abortion (7)	% don't know on question of intended number of children (8)	% strongly disapprove if a woman chooses never to have children (9)
	1950-54	1965-69	Diff.	1995-99[1]	2000-04	1995-99[1]	2000-04	2004 or 2005[2]	2005[3]	1990-1999	1995	1990-1999	2006
Age of study population, in years (approx.)				*25-35*	*30-40*	*25-35*	*30-40*	*35-40*	*35-40*	*25-35*		*25-29*	*35-40*
			0.01										
Latvia	1.86	1.82	-0.04	-	12	-	71.6	17	39	50.7	46.7	17.3	-
Lithuania	1.97	1.81	-0.16	-	13	-	73.4	17	38	38.4	38.2*	18	-
Poland	2.17	1.95	-0.22	10	17	67.4	61.4	8	37	20.6	X	21.1	11.3
Slovenia	1.90	1.79	-0.11	6	5	82.0	81.0	27	37	60.3	23.2	11.2	8.4

Notes: A dash indicates that no data is available.

[1] CH & HU & SI: 1996-99; CZ & EE & PL: 1997-99; US: 1995 and 2000 (refers to mothers with children < 18 years)

[2] No earlier comparative data available; BG: 2007; DE: 2003; CH: 2009; US: 2006

[3] BG: 2006; CH: 2009

Sources:

(1) Tomáš Sobotka from various sources. 1950-54: Human Fertility Database (except for BE, ES, GR, IT, LV, NO, PL, SI, UK (UK: 1951-54): data provided by Tomáš Sobotka); 1965-69: data provided by Tomáš Sobotka (except for EE (1965-68): HFD); US from the European Demographic datasheet 2010 (birth cohort 1968) and the European Fertility datasheet 2015 (birth cohort 1950).

(2) Eurostat database: Unemployment rates by sex, age and nationality (lfsa_urgan); United States: Unemployment rate 25 years and over (Labor Force Statistics from the Current Population Survey; United States Department of Labor).

(3) Own computations based on the EU Labour Force Surveys. Mothers on maternity leave or parental leave are coded as inactive.

(4) OECD Family database: Enrolment in childcare and pre-school (PF3.2).

(5) Eurostat database: Average number of weekly hours of formal care by age group (ilc_camnforg0).

(6) Use of reliable contraception if sexual intercourse in the last 4 weeks; calculated using the FFS, 1990-1999 depending on the country. Question: "Which contraceptive method

or combination of contraceptive methods have you and/or your partner used in the last 4 weeks?" (among those who have had a sexual intercourse in the last four weeks). Sterilisation, pill, intra uterine, injection, diaphragm, condom were classified as reliable contraception. Other = …

(7) Henshaw et al. 1999

* Incomplete

** 1996

 (8) FFS Women aged 25-29

(9) Own computations based on the European Social Survey 2006 (round 3).

Appendix Table 2: Country characteristics by education

	Age at completing education (1)				Women's employment rate, age 25-49 (2)								Total unemployment rate, age 25-49 (3)							
	1990-1999				1995-99[1]				2000-04				1995-99[1]				2000-04			
Age of study population (approx.)	*25-29*				*25-35*				*30-40*				*25-35*				*30-40*			
	L	M	H	*Diff.*	L	M	H	*Diff.*	L	M	H	*Diff.*	L	M	H	*Diff.*	L	M	H	*Diff.*
Western and Northern Europe																				
Belgium	15.6	18.3	21.2	*5.6*	45.9	68.7	84.2	*38.3*	49.2	71.9	85.6	*36.4*	14.1	7.6	3.5	*10.6*	11.5	5.9	3.2	*8.3*
France	16.7	18.8	22.6	*5.9*	55.7	70.5	78.7	*23.0*	57.7	73.4	80.9	*23.2*	16.2	9.8	6.7	*9.5*	13.1	7.2	5.5	*7.6*
Netherlands	NA	NA	NA	*NA*	51.4	72.6	84.4	*33.0*	58.0	77.5	85.8	*27.8*	7.2	3.6	2.8	*4.4*	4.2	2.4	2.0	*2.2*
Norway	16.3	18.0	21.2	*4.9*	65.4	76.4	81.5	*16.1*	63.0	76.4	80.3	*17.3*	4.4	3.0	2.4	*2.0*	4.9	3.1	2.8	*2.1*
GB/UK	16.5	19.0	21.6	*5.1*	61.1	73.9	84.2	*23.1*	60.6	76.4	85.0	*24.4*	9.3	5.9	3.1	*6.2*	6.7	3.5	2.2	*4.5*
United States[2]	NA	NA	NA	*NA*	43.2	65.7	80.8	*37.6*	45.8	68.6	80.8	*35.0*	10.0	5.2	2.5	*7.5*	7.9	3.8	1.5	*6.4*
German-speaking countries																				
Austria	NA	NA	NA	*NA*	61.3	71.6	82.2	*20.9*	61.4	73.3	82.7	*21.3*	7.8	4.0	2.6	*5.2*	8.2	3.8	2.3	*5.9*
Switzerland	16.0	19.3	22.6	*6.6*	66.5	74.9	79.9	*13.4*	66.9	77.2	83.7	*16.8*	6.8	3.0	3.0	*3.8*	6.0	2.7	2.2	*3.8*
Southern Europe																				
Italy	15.3	19.9	25.0	*9.7*	36.7	60.5	75.4	*38.7*	40.0	63.8	77.2	*37.2*	11.3	8.6	8.4	*2.9*	10.1	7.0	6.6	*3.5*
Spain	16.0	19.4	23.0	*7.0*	34.5	52.0	67.4	*32.9*	43.5	60.7	74.4	*30.9*	20.7	17.3	14.2	*6.5*	12.6	9.9	8.3	*4.3*
Central and Eastern Europe																				
Czech Republic	17.0	18.1	22.0	*5.0*	-	-	-	*-*	57.3	73.0	80.0	*22.7*	-	-	-	*-*	22.8	6.5	2.0	*20.8*
Hungary	16.2	18.3	21.1	*4.9*	48.7	68.8	82.2	*33.5*	47.2	70.5	82.7	*35.5*	14.5	7.1	1.5	*13.0*	12.5	5.0	1.4	*11.1*

Notes: A dash indicates that no data is available[.] [1] CH & NL & NO: 1996-99; HU: 1997-99; [2] US: Employment to population ratios of females 25 to 64 years old, refers to 1995 and 2000 (Source: National Center for Education Statistics, Table 501.70.: Employment to population ratios of females 16 to 64 years old, by age group and highest level of educational attainment: Selected years, 1975 through 2015); Unemployment rates of persons 25 to 64 years old, refers to 1995 and 2000 (Source: National Center for Education Statistics, Table 501.80.: Unemployment rates of persons 16 to 64 years old, by age group and highest level of educational attainment: Selected years, 1975 through 2015); education definition: low (less than high school completion)/ medium (high school completion)/ high (Bachelor's or higher degree)

Sources: (1) FFS; (2) Own computations based on the EU Labour Force Surveys. Mothers on maternity leave or parental leave are coded as non-employed;

(3) Eurostat database: Unemployment rates by sex, age and educational attainment level (%) (lfsa_urgaed)

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