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VIENNA INSTITUTE OF DEMOGRAPHY

WORKING PAPERS

14/2017

**WHY HAS THE SHARE OF TWO-CHILD FAMILIES
STOPPED GROWING? TRENDS IN EDUCATION-
SPECIFIC PARITY DISTRIBUTION IN LOW-
FERTILITY COUNTRIES**

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Abstract

During the last four decades, the two-child family ideal has become nearly universal across the low-fertility countries. The proportion of families with two children, which was growing during the baby boom, stopped increasing in the late 1940s and early 1950s birth cohorts, remaining far below the number of people reporting two as their ideal family size. This paper examines how changes in the share of two-child families were linked to trends in the transitions to first, second and third birth. We analyse how the relationship varied over time across countries and education levels using census and large-scale survey data for women born between 1936 and 1970 in 12 European countries, Australia, New Zealand and the United States. The results suggest that in most countries the changes in the share of two-child families were closely linked to the progression to third birth. Increasing childlessness also suppressed the number of two-child families in Western Germany and English-speaking countries. Changes in the transition to second birth played a non-negligible role in Southern Europe, English-speaking countries and, except among the low-educated, in Central-Eastern Europe.

Keywords

Parity distribution, parity progression ratios, fertility and education, fertility trends.

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Acknowledgements

This research was funded by the European Research Council under the European Union's Seventh Framework Programme (FP7/2007-2013) / ERC Grant agreement n° 284238 (EURREP project).

Why Has the Share of Two-Child Families Stopped Growing? Trends in Education-Specific Parity Distribution in Low-Fertility Countries

Zuzanna Brzozowska, Éva Beaujouan, Kryštof Zeman

1 Introduction

For decades, two has been the most common ideal number of children across low-fertility societies (Sobotka and Beaujouan 2014). As a result of the post-war baby boom it has also become the most common family model in Europe and in English-speaking non-European countries (Van Bavel et al. 2015). However, the proportion of population with two children has remained far below the number of people reporting two as their ideal family size, and more recently it has stopped growing; in some countries, it has started to decline (Frejka 2008).

Post-war prosperity, the driving force of the baby boom (Van Bavel et al. 2015, Bonvalet et al. 2014 pp.24–27), largely reduced the variation in family trajectories across social strata: the ideal of happiness and fulfilment was not only universally shared but also, to a large extent, universally attainable. However, such uniformity of life-courses was unique in the history of the industrialised world, observed neither before nor afterwards (Bonvalet et al. 2014). In the late 1960s, the Western Bloc¹ saw the beginning of social changes typically described as the second demographic transition, which involved the rising importance of self-realisation and individualisation (Inglehart 1977, van de Kaa 2001). Together with economic changes they led to an increase in differences between social strata in terms of their lifestyles, family behaviours and, since the 1990s, income (Atkinson et al. 2014, Adserà 2015).

Fertility trends have reflected these developments. In many European countries parity distribution developed increasingly differently across educational groups (Andersson et al. 2009, Beaujouan et al. 2016, Wood et al. 2014). For example, among British women born in the 1950s parity distribution changed in the same direction across educational groups as compared to the 1940s birth cohorts (Berrington et al. 2015). Ten years later, in the 1960s cohorts, changes were very much education-specific: the weakening of the dominance of

¹ The terms *Western Bloc* and *the West* denote countries that between 1945 and 1989/90 were capitalist and stayed on the Western side of the Iron Curtain. The *Eastern Bloc* and *the East* refer to post-socialist countries, which between 1945 and 1989/90 either belonged to the Soviet Union or were its allies, or were part of Yugoslavia.

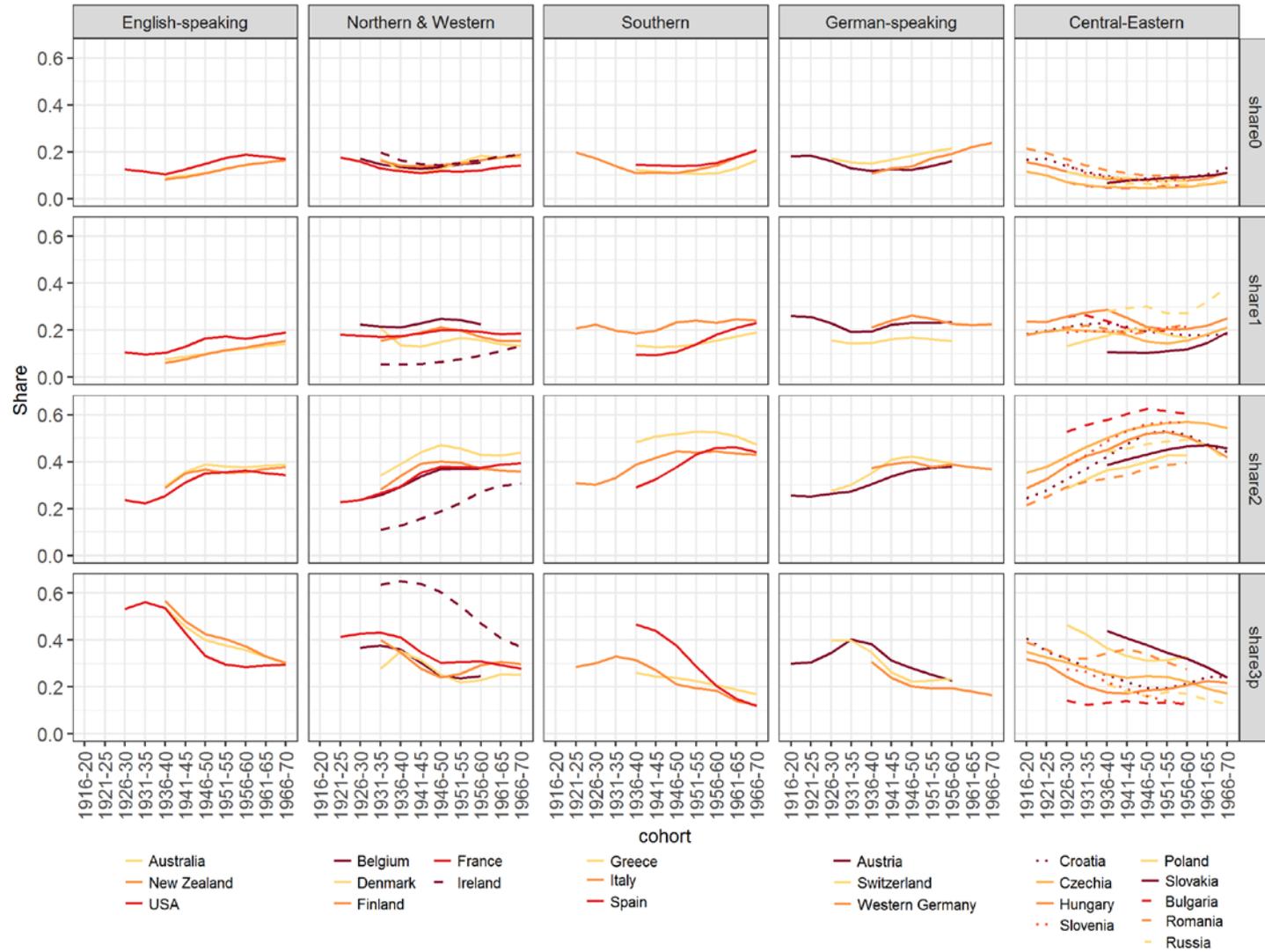
two-child families, seen in the whole population, was driven by an increasing proportion of big families (with three and more children) among the low educated and by rising childlessness rates and one-child families among the highly educated. Such a development is an exact opposite of the process that led to the dominance of the two-child family model during the baby boom when the low-educated were increasingly limiting their family size to two children whereas the medium- and high-educated were more often progressing to first and second child. (Van Bavel et al. 2015). The forces driving the end of the rise in two-child families might have, however, also substantially differed between countries as did fertility trends (Zeman et al. 2017).

This study examines how changes in the share of two-child families were linked to changes in transitions to first, second and third birth in 1916–20 to 1966–70 female birth cohorts. We focus on how the relationship varied over time across countries and education. The country- and education-specific developments during the baby boom have been explored by Van Bavel et al. (2015), and so we pay particular attention to the trends in the post-baby boom cohorts. For our analyses, we use census and large-scale survey data for 12 European countries, Australia, New Zealand and the United States. We first describe the developments in the proportion of women with two children in each educational group. Then we examine how the trends in transition rates to first, second and third birth contributed to the change in the two-child family dominance in these groups. We conduct our analysis first at country level and then at broader regional level.

2 Cultural and Institutional Context of Parity Distribution Trends

Increases in the share of two-child families, seen in Europe and English-speaking non-European countries in the birth cohorts that produced the baby boom (Figure 1 – including countries that did not experience the baby boom), resulted from a rise in transition rates to first and second birth on the one hand and a decline in the progression to third birth on the other hand; the former development was strongest among medium- and high-educated women, and the latter one was most pronounced among low-educated women (Van Bavel et al. 2015). Whereas trends in the proportion of one- and two-child families tended to be similar in all countries analysed by Van Bavel et al. (2015), trends in large families varied systematically across cultural and institutional settings (Figure 1): in Central-Eastern Europe (CEE, i.e. today's post-socialist countries) the share of women with three and more children was continuously shrinking, in Italy it remained stable until the mid-1930s cohorts, whereas in Northern and Western Europe and in Austria it was rising until the mid-1930s birth cohorts; in the United States the rise between the 1920 and 1930 cohort was so strong that it temporarily pushed the proportion of two-child families down (Van Bavel et al. 2015, U.S. Bureau of the Census 1985).

Figure 1 Parity distribution, by country and cohort



Source: CFE database, www.cfe-database.org

Directly after the baby boom, in the 1940s birth cohorts, the share of two-child families peaked at around 35–45% in Northern and Western Europe, in German-speaking countries, in England and Wales and the United States; in Australia it was rising until the 1950s cohorts (Figure 1). Then it either plateaued or shortly fell before levelling-off. In Southern and Central-Eastern Europe the proportion of two-child families continued growing, reaching 45–55% in the 1950s and the early 1960s cohorts, respectively, when it started decreasing. In CEE the dominance of the two-child family was the strongest, resulting from lower childlessness (and thus a bigger population of mothers) on the one hand and rarer transitions to third birth on the other hand (Frejka 2008; Van Bavel et al. 2015).

Overall, the after-baby-boom trends in parity distribution varied markedly across developed countries. The technological and social developments – spread of modern contraception, rising desire for self-realisation, growing educational attainment and female employment – made the cultural and institutional environment more important than ever for fertility decisions. As institutional changes were going in different directions in different regions, parity-specific fertility became more region-specific (Figure 1).

Below we describe how and why the distribution of parity zero, one and three plus, and the transition rates to first, second and third birth were changing across developed countries and regions. We discuss how these changes might have affected the share of women with two children and how much the trends varied by education in different cultural and institutional contexts.

2.1 Childlessness

In the Western Bloc, childlessness started increasing just after the end of the baby boom (Figure 1), reaching in the 1972 birth cohort between 11% in Norway and 24% in Western Germany (Sobotka et al. 2015). In Northern and Western Europe the rise was weaker, whereas in Southern Europe and German- and English-speaking countries it was stronger. In post-socialist countries childlessness remained low (around 7%) until the 1960s birth cohorts when it began rising (Figure 1); in the 1970s birth cohorts it still tended to lie below the average observed in the former Western Bloc (Sobotka et al. 2015). Both in the East and the West, childlessness rates varied strongly by education, with better educated women staying childless more often than the less educated (Beaujouan et al. 2016, Wood et al. 2014). Over time, the difference between the low- and medium-educated narrowed, but that between the high- and medium-educated did not diminish (Beaujouan et al. 2016).

The beginning of the increase in childlessness went hand in hand with the end of the rise in the share of two-child families. This is not surprising: all else being equal, rising childlessness decreases the share of mothers, including those having two children. We expect the relationship to have been strongest among highly educated women born in the 1960s in Southern Europe and German-speaking countries (Frejka 2008). The two regions have adhered to a traditional family setting, with mothers taking care of children at home and fathers providing for their families. The pressure on women to quit the labour market once her child is born has been very strong (Klüsener et al. 2013), and has been reinforced

by the scarce institutional childcare facilities (De Rose et al. 2008). Consequently, women who did not wish to sacrifice their professional career for family life, stayed childless more often than in other countries: for the German-speaking countries, the “child-free lifestyle” and the “culture of childlessness” have been more spread than anywhere else in Europe (Sobotka and Testa 2008, Klüsener et al. 2013).

Northern and Western Europe, and, to a lesser extent, English-speaking countries, offer better opportunities for women to combine employment and family life: access to institutional childcare tends to be easier, labour market to be more family-friendly and the relations within the family to be more gender-equal. Thus, increases in childlessness, though substantial in most countries, might have been counterbalanced by more stable transition rates to second and further births (see section 2.2 and 2.3 for more detail). Even there, however, combining professional career and family life is “easier, not easy” (Rindfuss et al. 2016 p.1). Therefore, the negative relationship between childlessness and the share of two children has probably been steeper for university graduates than the less educated ones as the former are usually more work-oriented than the latter.

In Central-Eastern Europe, childlessness did not contribute to the decline in the share of two-child families before the late 1950s cohorts when it started to rise. Even then, however, it is likely that progression ratios to second birth played a far more important role as we discuss in section 2.2.

2.2 One-Child Families

The share of one-child families has increased dramatically since the early 1940s and the 1950s cohorts in Southern and Central-Eastern Europe, respectively, reaching in the 1960s cohorts over 15% in Greece, 25% in Italy and Spain, and between 20 and 30% in Central-Eastern Europe (Frejka 2008, Breton and Prioux 2009). In German-speaking countries it had been rising for around ten years, in the cohorts born between the mid-1930s and the mid-1940s, before it stabilised at around 20-25% (Sobotka et al. 2011). In Northern and Western Europe, and English-speaking countries the values usually ranged from 15 to 20% (Figure 1). After the baby boom the proportion of women having one child was growing in the United States, the Netherlands and, until around the 1950 cohort, in France; it was decreasing in Sweden and France since the 1945 and 1950 cohort, respectively, while in England and Wales it was bouncing up and down (Frejka 2008, Frejka and Sardon 2007).

Breton and Prioux (2009) have shown a negative relationship between the proportion of childless women and that of one-child families: in countries, in which childlessness is relatively low the share of one-child families tends to be relatively high. This connection is best visible in post-socialist countries where childlessness has been lower than elsewhere as it has been little socially accepted, and so non-children-oriented women tend to have one child in order to comply with social norms. Under state socialism, the pressure on becoming a parent was very strong, and augmented by pronatalist measures (e.g. easier access to own flat for families with children, or special taxes for childless adults in Romania) (Frejka 1980, Stloukal 1999, Haney 2002, Baban 1999). As a result, over nine in ten women were mothers,

regardless of education. However, in response to double burden (traditional division of housework combined with female full-time participation in the labour force) the transition to second birth was strongly stratified by education: university graduates had a second child far less often than the low-educated (Brzozowska 2015). This negative relationship between education and transition to second birth has probably strengthened after 1989, as the labour market became less stable and more demanding towards employees, and so women's opportunity cost of having children increased. Thus, it is likely that the decline in the share of two-child families in the 1960s birth cohorts was associated with the rising proportion of one-child families, which resulted from falling transition rates to second birth, especially among the medium- and high-educated.

We expect a similar link in the 1950s and, especially, 1960s birth cohorts in Southern Europe, although the attitudes towards childlessness have not been as strongly negative as in post-socialist countries, and childlessness rates have been correspondingly higher. However, the economic hardship – high unemployment and low wages compared to Northern and Western Europe – combined with family unfriendly labour market and very gender-unequal relations within the family (Anxo et al. 2007) have made it increasingly difficult to have more children. Frejka and Sardon (2007) have shown that in Italy the transition rates to second birth declined steadily between the 1940 and 1955 birth cohorts, and the decline was likely to continue in the 1960s cohorts. A similar development probably took place also in Spain and Greece as economic and cultural circumstances differed only moderately. Thus, we anticipate that the falling transition rates to second birth in Southern Europe have pushed the share of one-child families up and that of two-child families down. For reasons similar to those described in section 2.1 on childlessness, highly educated women might be the least likely to progress to second child.

For Northern and Western Europe, and English- and German-speaking countries we do not have such clear expectations regarding the relationship between one- and two-child families. The proportion of women having one child has tended to be lower than in Central-Eastern and Southern Europe. The educational gradient in the transition to second birth has been usually non-negative (Wood et al. 2014, Breton and Prioux 2009); for German-speaking countries it has been found that career-oriented women (usually the highly educated ones) tend to remain childless rather than to have one child only (Kreyenfeld 2002, Sobotka et al. 2011). Thus, the selection into motherhood has been stronger than in Central-Eastern Europe. This together with much better economic circumstances than in Southern Europe and post-socialist countries, have probably resulted in much higher progression ratios to second birth in Northern and Western Europe, and English- and German-speaking countries than in other analysed regions.

2.3 Large Families

In developed countries, in which the share of women with three and more children was rising among women born before the mid-1930s, progression ratios from second to third birth were declining (Van Bavel et al. 2015). Thus, the increase in the proportion of large

families resulted from a rise in the population at risk, i.e. the number of women having two children. When the expansion of the two-child family halted or turned into a decrease, the proportion of women with three or more children started to fall, displaying temporary upturns in the 1940s and 1950s birth cohorts in Northern and Western Europe, and in England and Wales (Frejka 2008; Figure 1). The number of large families plateaued in the United States, Switzerland, Belgium, and France, while in Denmark, Finland, Croatia and Hungary the figures first increased and then levelled off (Figure 1). Progression ratios from second to third birth continued declining in the East, in Southern Europe and in Austria, but not in Northern and Western Europe, where they tended to rise in the 1950s cohorts and to mildly decrease afterwards (Frejka 2008). Since the 1950s cohorts the figures have tended to be lower in the East than in the West, which resulted in lower proportions of large families in the East (Frejka 2008, Frejka and Sardon 2007).

The relationship between education and the transition to third birth tended to be negative in Southern and Central-Eastern Europe among women born between 1940 and 1961 (Van Bavel et al. 2015, Wood et al. 2014). In post-socialist countries the educational gradient usually became steeper in most recent cohorts, when transition to third child increased among low-educated women while it had been remaining low since the 1940s birth cohorts among the secondary school and university diploma holders (Wood et al. 2014). Therefore, the relationship between the share of two-child families and transition rates to third child was probably rather weak among the high- and medium-educated, but stronger and negative among the low-educated.

Among Italian and Spanish women born between 1940 and 1961 the educational differences in progression ratio to third birth were weaker than in the East (Wood et al. 2014). Transition rates were falling across the board, but the extent of the decline differed considerably between the two countries: whereas in Italy the progression ratio to third birth changed only moderately as it was already relatively low in the 1940s birth cohorts, in Spain it dropped in the 1940s cohorts from rather high levels and decreased mildly in the 1950s cohorts (Wood et al. 2014); Greece experienced a dramatic decline in the 1900–40 birth cohorts (Van Bavel et al. 2015). Among women born before the 1950s in Southern Europe, the share of two-child families was increasing while the share of those progressing to third birth tended to decrease more substantially. Thus, the two proportions were linked negatively to each other. However, among women born since the 1950s the relationship was likely to weaken as the decline in the progression to third birth slowed down considerably.

For Northern and Western Europe and English speaking countries we expect a strictly negative relationship between the share of two-child and transition rates to large families: when one proportion was rising, the other one was declining (Wood et al. 2014, Frejka 2008). The educational gradient mostly resembled a U-shape, with low- and high-educated women progressing to third birth most frequently. Transition rates seem to have been changing in the same direction and to a similar extent in all educational groups, so the relationship between them and the share of two-child families probably did not vary much by education.

2.4 Summary of the Expectations

In post-socialist countries, the two-child family has been most probably weakened by the one-child family model (especially among medium and high educated women) as voluntary childlessness is still rarely accepted. In countries, in which opportunity costs of having children are high for women (e.g. German-speaking countries and Southern Europe), the reason is likely to lie in childlessness rising most steeply among university graduates. In Northern and Western Europe the increase in large families (with three and more children) might have played a role, particularly in the lower social strata, whereas in English-speaking countries the decrease in large families probably helped stabilise the proportion of two-child families in the 1960s cohorts.

3 Data and Method

We analysed census and large-scale survey data covering five-year female cohorts from 1936–40 to 1966–70 (who were between the ages of 40 and 76 at the time of the data collection) in 12 European countries and 3 English-speaking non-European ones: Australia (2011 census), Croatia (1991, 2001 and 2011 censuses), Czechia (1980, 2001, and 2011 censuses), Denmark (register-based data for native Danish women), Greece (2011 census), Finland (10-percent sample of the Finnish population resident in Finland during 1970–2010), France (1982, 1990, 1999, and 2011 censuses), the territory of former West Germany (2008 and 2012 micro-censuses; data for former East Germany were not included due to the low number of respondents in some educational and cohort categories), Hungary (1990, 2001 and 2011 censuses), Italy (Family and Social Subjects surveys of 2003 and 2009), New Zealand (2013 census), Russia (2010 census), Slovakia (2011 census), Spain (2011 census), and the United States (1990–2012 Current Population Surveys). Data for Hungary 1990 and 2001 (5-percent census sample) were derived from IPUMS International (Minnesota Population Center 2015). We grouped the countries into four regions, corresponding to countries' geographical, institutional and cultural similarities: Northern and Western Europe (Denmark, Finland and France), Southern Europe (Greece, Italy and Spain), Central-Eastern Europe (or CEE: Czechia, Croatia, Hungary, Slovakia, Russia), English-speaking countries (Australia, New Zealand, the United States). The territory of former West Germany (hereinafter referred to as Western Germany) constitutes a fifth region.

To ensure cross-country comparability, we used a three-category classification of education mostly corresponding to ISCED-97 levels (see UNESCO 2006 for a description of the International Standard Classification of Education): low (levels 0–2), medium (levels 3–4) and high (levels 5–6). Figure 9 in the Appendix shows how the educational attainment of women expanded over cohorts in all analysed countries. Data were collected within the EURREP project, and are part of the publically available Cohort Fertility and Education database (CFE database) (Zeman et al. 2014).

In addition to quality checks conducted during the construction of the database, we carried out specific checks to see whether the general and education-specific trends in

fertility (including parity distribution and parity progression ratios) in the countries covered were consistent across various data sources. Data for the United States were validated against the National Survey of Family Growth (waves 1995 to 2011–13) and the Human Fertility Database. Data for Australia and New Zealand were given in five-year cohorts, starting from the 1937–41 and 1938–42 birth cohorts and finishing with 1967–71 and 1968–72 ones, respectively. Thus, the analysed five-year birth cohorts for these two countries are one or two years younger than the respective birth cohorts for other countries. For Finland and Denmark, women are in fact one year older than the five-year cohort labels say, e.g. the birth cohort 1946–50 corresponds to women born between 1945 and 1949.

Furthermore, in France the ISCED grouping that we adopted does not seem to match the grouping usually displayed in OECD studies: the share of the highly educated is here half the usual size (OECD 2014). However, the definition and levels displayed are comparable to those of the other countries in this study. Finally, in the Australian and New Zealand data, there was a considerable proportion (around 11%) of cases with unknown education. In New Zealand, the fertility trends in this group indicated that it consisted of very low-educated women (certainly corresponding to ISCED 01). Therefore, we recoded the unknown education category into low education. In Australia, we excluded women with unknown education from the analysis as their fertility was not specific to any educational stratum.

Our analysis consists of the following steps. First, for each country we show the education-specific trends in the share of two-child families and in the progression ratios to first (PPR 01)², second (PPR 12) and third birth (PPR 23). Then, we bring the analysis to a broader regional level. The regional indicators are computed as means of the country-specific indicators, so that the regional averages are not affected by the country population or sample sizes. We present the trends in the PPR 01, 12 and 23 by education in relation to the share of women with two children: in a scatter diagram we display both the levels of the respective PPRs (on the y-axis) and the normalised share of two-child families (size of the circle). The latter one is computed as follows:

$$\frac{p2_{erc}}{p2_{er}} \tag{1}$$

where $p2_{erc}$ signifies the share of women with two children in educational group e , region r and cohort c . Thus, within each region and educational group the normalised share of two-child families denotes the share of two-child families in a given cohort relative to the average from all the cohorts covered by the analysis.

² Parity progression ratio to first birth and childlessness are complementary so we use the terms “declining parity progression ratio to first birth” and “increasing childlessness” interchangeably. In place of “parity progression ratios” we also use the term “parity-specific transition rates”.

Next, in order to assess the effect of changes in parity progression ratios we developed three scenarios of the region- and education-specific trends in the share of two-child families. Noticing that the share of two-child families can be calculated as:

$$p2_{erc} = PPR01_{erc} PPR12_{erc} - PPR01_{erc} PPR12_{erc} PPR23_{erc} = PPR01_{erc} PPR12_{erc} (1 - PPR23_{erc}), \quad (2)$$

we computed three hypothetical types of $p2_{erc}$ each time ‘freezing’ one component at the level observed in the 1936–40 cohort. In this way we obtained:

$$p2_{fixed} PPR01_{erc} = PPR01_{er1936-40} PPR12_{erc} (1 - PPR23_{erc}) \quad (3a)$$

$$p2_{fixed} PPR12_{erc} = PPR01_{erc} PPR12_{er1936-40} (1 - PPR23_{erc}) \quad (3b)$$

$$p2_{fixed} PPR23_{erc} = PPR01_{erc} PPR12_{erc} (1 - PPR23_{er1936-40}), \quad (3c)$$

which allowed us to assess the effect of the cohort-specific changes in PPR 01 (3a), PPR 12 (3b) and PPR 23 (3c) on the share of two-child families in each region and educational group.

4 Results

4.1 Trends in Two-Child Families by Education

Trends in the education-specific shares of two-child families show systematic regional patterns (Figure 2). In English-speaking countries, Southern Europe (except Italy) and Western Germany the proportion of women with two children changed in the same direction across the board. In Southern Europe and in Western Germany the figures varied substantially by education, with medium-educated women reaching the highest values and university graduates (together with the least educated in Western Germany and Spain) the lowest. The United States also showed considerable educational differences, but the gradient there was negative: high- and medium-educated women had two children more often than the low-educated; in Australia and New Zealand the relationship had the same sign, but was weaker. A similar pattern to the United States one was found in Northern and Western Europe, where figures among the least educated stayed below those for the better-educated. The proportion of two-child families started to decline among women with low education when it was increasing or remained stable among university graduates (in Denmark it grew also among the medium- educated).

In CEE the educational gradient in the proportion of women with two children resembled that in Northern and Western Europe and English-speaking countries, but it tended to be steeper (except in Croatia): the distance between the low-educated and the medium- and high-educated surpassed 20 percentage points. The consistently bigger educational differences can be clearly seen on Figure 3, which shows the regional means of the proportion of two-child families in each educational group. Until the early 1960s birth cohorts, the values among women with tertiary and secondary education remained considerably higher in the East than in the West, peaking at 50–60% in the 1950s cohorts;

they headed down to around 45% in the 1966–70 cohort. The medium educated in the South however slowly reached the same share of two-child families as in the East. For the low-educated in CEE, the share of two-child families did not exceed 45% and until the mid-1950s cohorts was similar to that among the low-educated in Southern Europe. Afterwards, it declined steeply, reaching the levels of Northern and Western Europe, Western Germany and English-speaking countries in the 1966–70 birth cohort (around 30%). In Southern Europe, the proportion of two-child families was gradually increasing among the least educated reaching values about 20 percentage points higher than elsewhere.

Figure 2 Trends in the education-specific shares of women with 2 children, by country and cohort

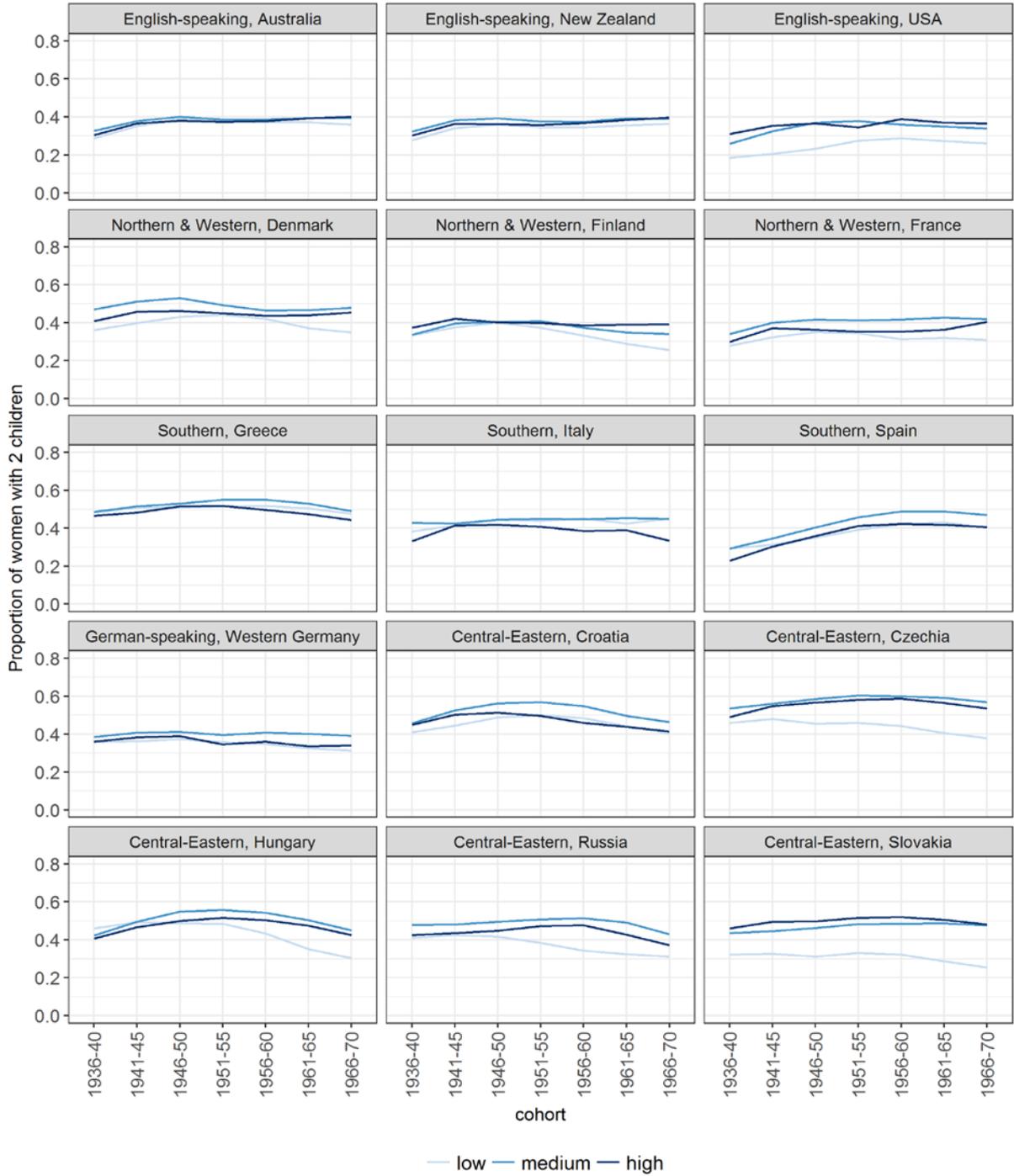
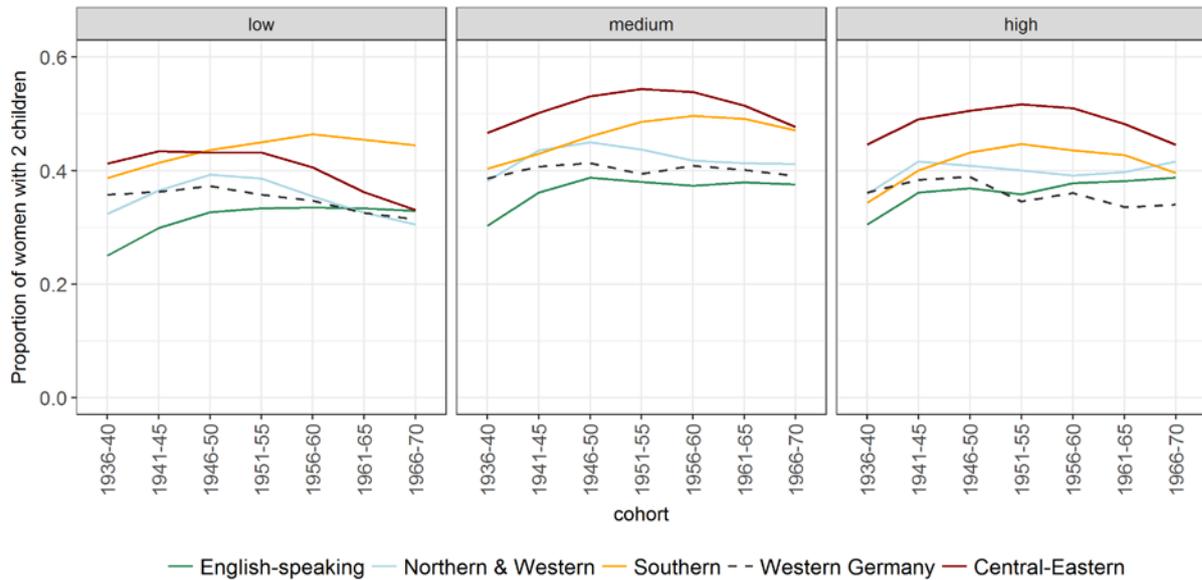


Figure 3 Proportion of women with two children, by education, region and cohort



In the West, a clear division can be seen between Southern Europe and other regions. Trends in the share of women with two children among the medium- and high-educated in Southern Europe resembled very much those seen among their counterparts in the East. For the medium-educated, the figures in these two regions came very close to each other in the youngest cohort, whereas for university graduates the values in the South converged to those in Northern and Western Europe, and English-speaking countries.

In English-speaking countries, the share of women with two children in the 1930s and 1940s cohorts was lower than in other regions, but over time it caught up with levels in Northern and Western Europe and, among the medium- and low-educated, in Western Germany. Among university graduates born in the late 1960s in Western Germany, one in three had two children, whereas among their counterparts in Northern and Western Europe and in English-speaking countries it was four in ten.

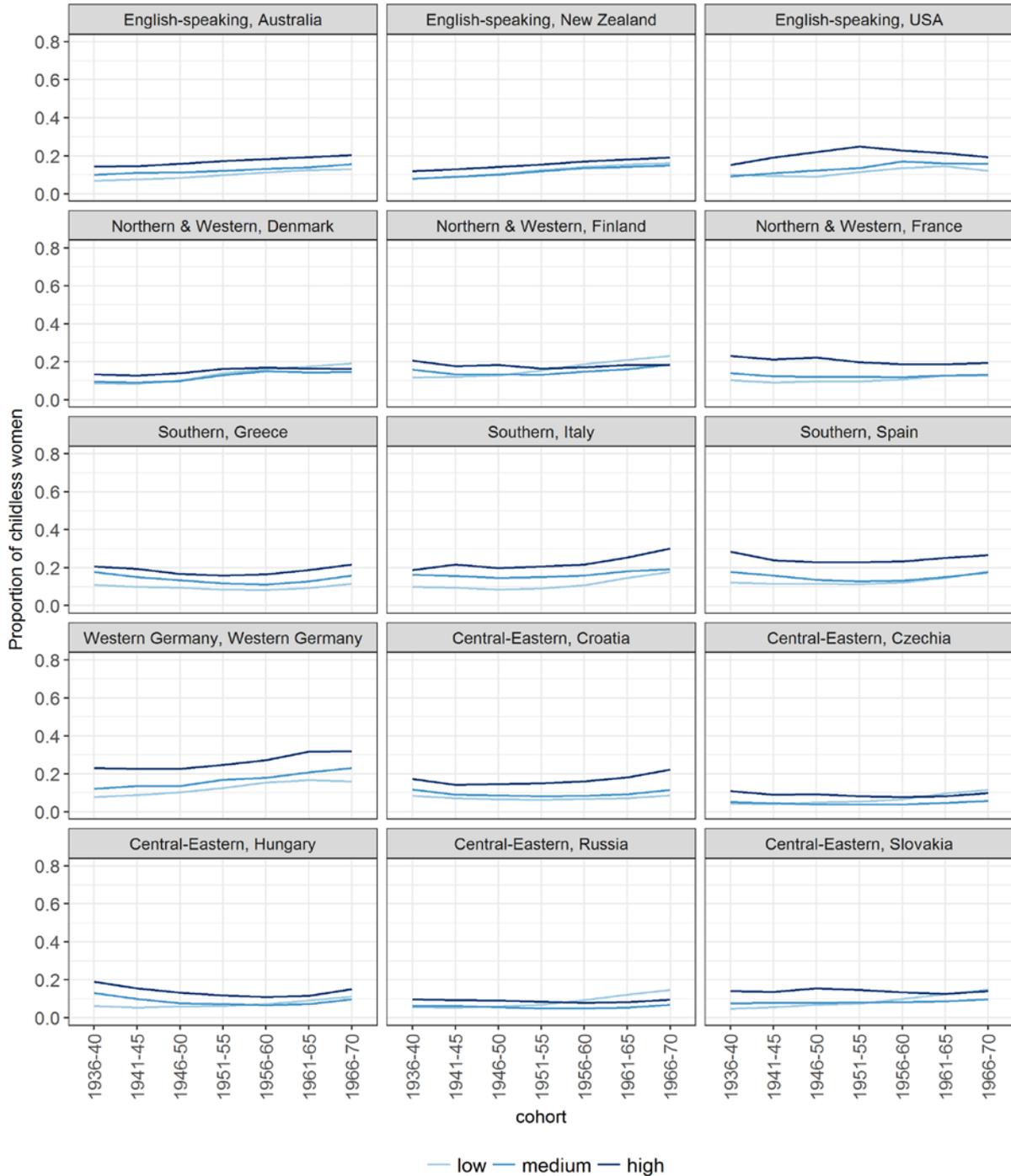
In sum, the trends in the share of two-child families varied considerably by education both within and across regions. In order to find the sources of this variation, we analysed the education-specific trends in the transition rates to first, second and third birth.

4.2 Childlessness

In nearly all countries, childlessness was most spread among university graduates; only among Danish, Finish, Czech and Russian women born in the 1960s was it highest among the low-educated (Figure 4). Neither the direction nor the strength of the education-childlessness relationship did correspond to educational differences in the share of two-child families. In Central-Eastern Europe, the share of two-child families varied greatly by education, whereas the proportion of childless women, as it was low across the board, varied only little in absolute terms (unlike in relative terms, see Beaujouan et al. 2016); the only exception was Croatia which saw moderate educational differences in the share of

two-child families, but substantial ones in childlessness. In Southern Europe, childlessness developed similarly to CEE, but it remained higher.

Figure 4 Trends in education-specific shares of childless women, by country and cohort



As mentioned before, the 1960s birth cohorts in Denmark and Finland experienced an educational reversal in childlessness. It resulted from a development seen since the 1950s birth cohorts: childlessness rates had been rising more steeply among the low educated than

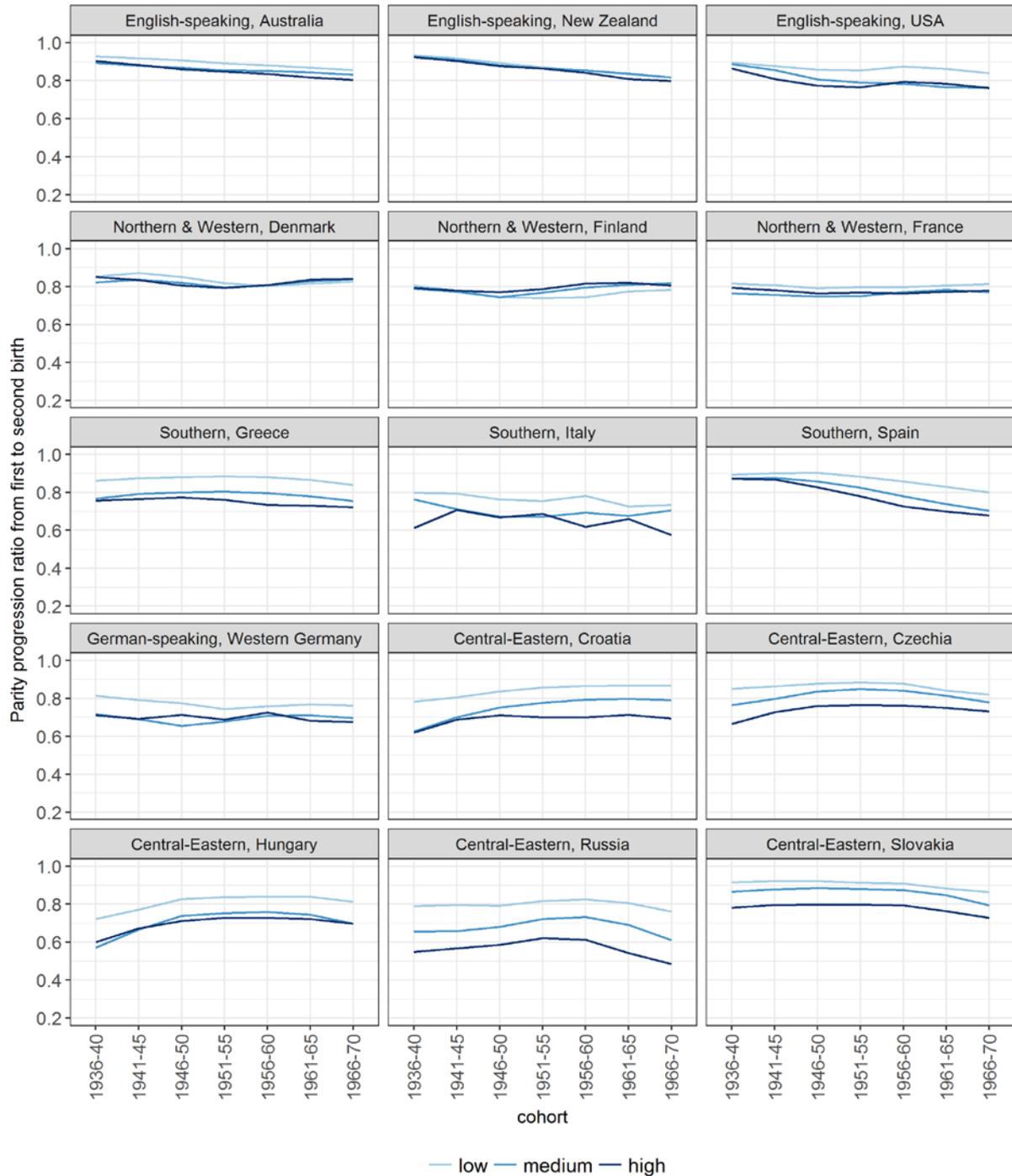
among the high- and medium-educated. France on the other hand, witnessed very stable trends both in childlessness and in its educational gradient, with university graduates remaining childless persistently more often than others, though the distance between the two education groups narrowed since the late 1950s cohorts. Outside Europe, in Australia and New Zealand childlessness varied little by education with highly educated women reaching the highest values. By contrast, in the United States the strongly positive educational gradient in childlessness became weaker in the late 1950s cohorts, as the figures had declined more steeply among the university graduates than among others.

4.3 Progression to Second Birth

Within each of the analysed countries, transition rates to second birth tended to develop similarly across educational groups (Figure 5). However, in Southern and Central-Eastern Europe the nexus between education and PPR 12 was strictly negative, whereas in Northern-Western Europe and English-speaking countries it was weak (except in the United States). In terms of trends, in Australia and New Zealand the PPR 12 fell linearly from over 0.9 to 0.8, and in the United States the development resembled the one in Western Germany despite substantial differences in the levels: figures tended to decline (to 0.75–0.85 in the United States and 0.70–0.75 in Western Germany). In Northern and Western Europe the PPR 12 went down and up only to reach a similar level in the youngest cohort to that in the oldest one, around 0.8.

In Greece and Spain PPR 12 was rising gently until the mid-1950s cohorts and then fell to 0.8 among the low-educated and to 0.7 among the better-educated; in Italy it was decreasing continuously. Finally, in CEE the transition rates to second birth kept increasing until around the mid-1950s cohorts, starting from values as low as 0.6 for the university graduates (except in Slovakia, where the starting level was 0.75). The figures for the low-educated tended to be 15–20 percentage points higher than for university graduates. In all countries in the region, PPR 12 have been falling since the late 1950s cohorts (except in Croatia where it remained stable), varying in the 1966–70 birth cohort between 0.7 and 0.8 among the high- and the low-educated, respectively.

Figure 5 Trends in education-specific parity progression ratios to second birth, by country and cohort

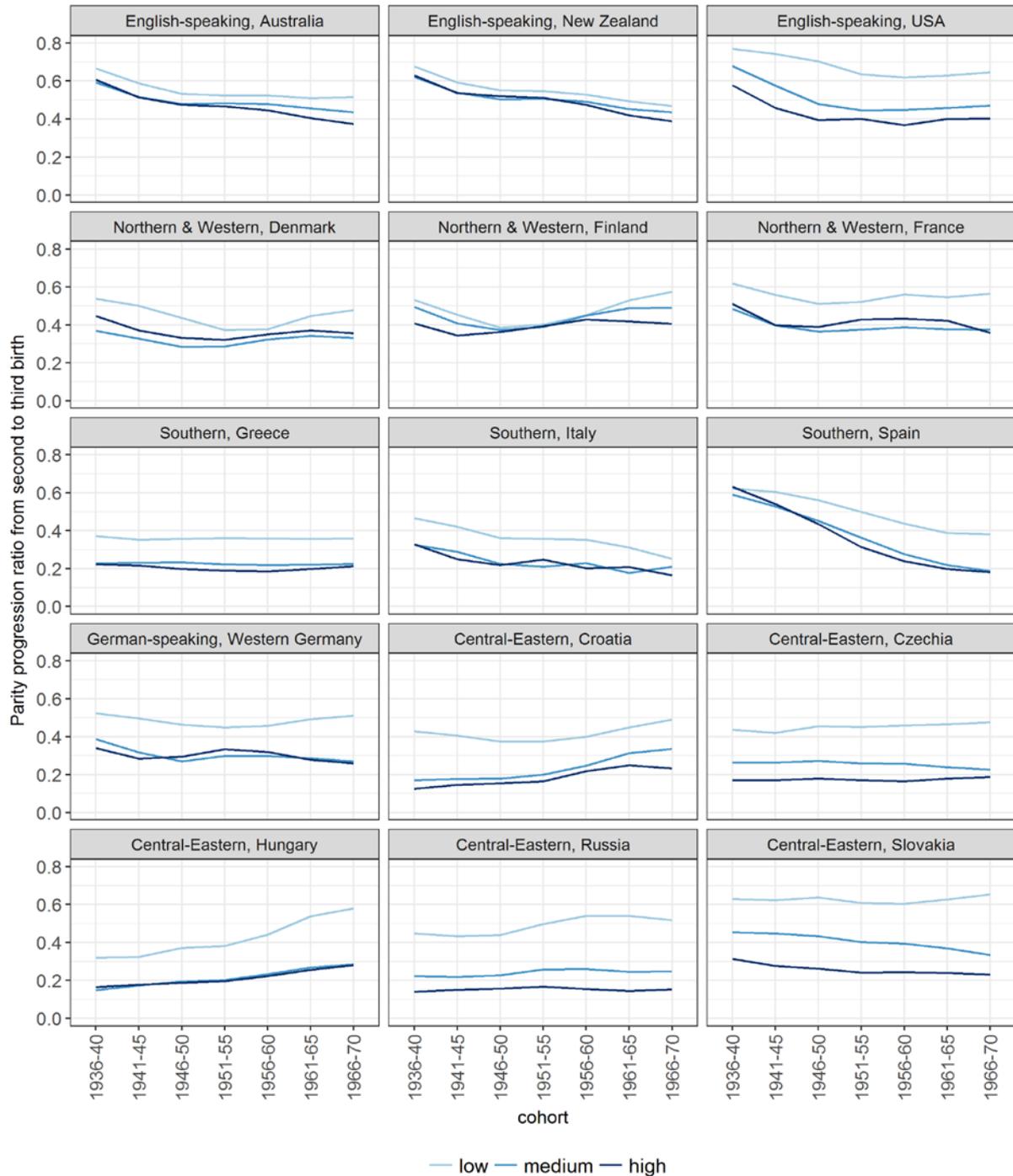


4.4 Progression to Third Birth

In almost all countries low-educated women progressed to third child far more often than women with medium and high education (Figure 6); only in Australia, New Zealand and,

in the 1950s birth cohorts, Finland were the educational differences in PPR 23 small. Figures usually did not vary much between the medium- and the high-educated, with the exception of Russia, Slovakia, the United States, Croatia (among the 1960s cohorts) and Finland (among the 1940s and 1960s cohorts), where the educational gradient in the transition to third birth was strictly negative.

Figure 6 Trends in the education-specific parity progression ratios to third birth, by country and cohort



In the late 1930s and in the 1940s birth cohorts, PPR 23 was declining across the board in the West, from between 0.5 and 0.7 in English-speaking countries, Northern-Western Europe and Spain, and 0.2–0.4 in Greece, Italy and Western Germany. Afterwards it continued falling in Australia and New Zealand, reaching between 0.4 and 0.5 in the 1966–70 cohorts; in the United States it plateaued at rather high levels (0.6 for the low-educated and around 0.5 for the better educated). It also levelled off in France (only in the last cohort did it decrease among the highly educated), but at a lower level (0.4 and 0.5 among the better and the least educated, respectively). In Italy and Spain the transition rates to third birth kept declining, reaching 0.2 among the secondary school and university graduates, and 0.3 and 0.4 among the low-educated in Italy and Spain, respectively. In Greece figures remained stable in all educational groups throughout the analysed cohorts, but in terms of the level they were similar to that of the last cohort in Italy.

In Denmark and Finland PPR 23 increased in the 1950s birth cohorts and then levelled off among women with medium and high education, and continued rising among low-educated women. In the oldest and the youngest cohorts education-specific values resembled those in France, only in the 1950s birth cohorts were they somewhat lower in the two Nordic countries.

CEE countries saw the largest educational differences in PPR23. For the low-educated the transition rates to third birth tended to rise, so that in the 1966–70 cohort they were higher than in the 1936–40 cohort, reaching between 0.5 and 0.6. Trends among women with medium and high education were less homogeneous: Figures increased in Croatia and Hungary from below 0.2 to 0.3, remained stable at around 0.2 in Czechia and Russia, and declined in Slovakia from 0.3 and 0.5 to 0.2 and 0.3 among the high- and medium-educated, respectively.

4.5 The Link between the Share of Two-Child Families and Transition Rates to First, Second and Third Birth

Figure 7 presents the education-specific trends in PPR 01, 12 and 23 in each region, and relates them to the trends in the share of women with two children. On each graph, the position of a circle on the y-axis indicates the proportion of women progressing to first, second and third child in a respective cohort (drawn on the x-axis) and educational group (marked by the circle colour). The size of each circle denotes the normalised share of two-child families in a respective educational group and cohort in each region as described by equation (1). If the PPR decreases while the size of the bullets increases, then there is a negative correlation between that PPR and the share of women with two children across cohorts.

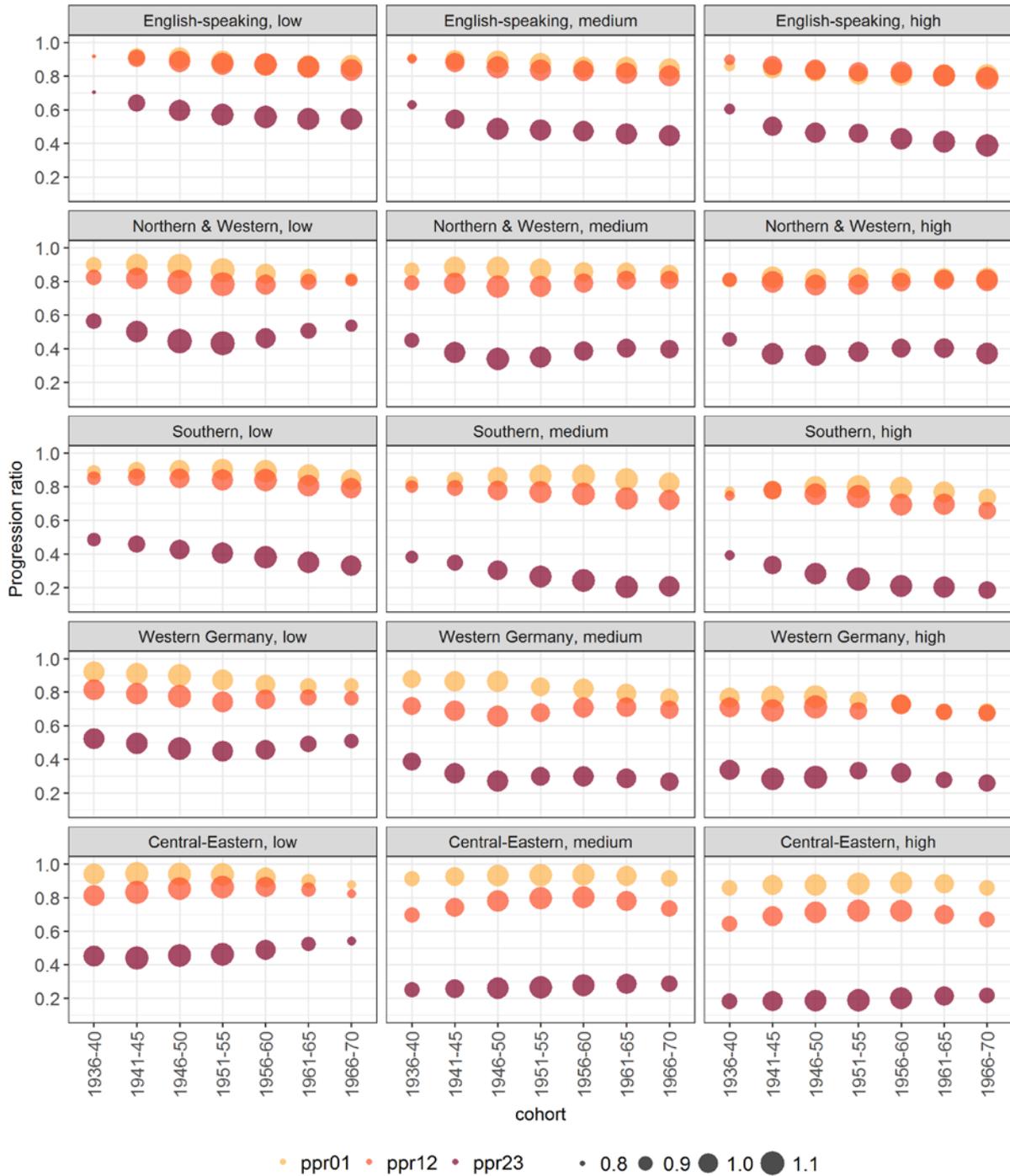
In English-speaking countries the sharp increase in the share of two-child families seen in the early 1940s birth cohorts, coincided with a slight decline in PPR 01 and PPR 12, and a plunge in transition rates to third birth. Thus, the substantial rise in the proportion of women with two children in the early 1940s cohorts resulted from rarer progression to third birth across all educational groups. This observation can be also made when inspecting

Figure 8. It shows the observed share of two-child families and its three different scenarios, i.e. the share of two-child families that would have been if transition rates to first (fixed PPR 01), second (fixed PPR 12) or third (fixed PPR 23) birth had not changed since the 1936–40 birth cohort. Under the scenario of fixed PPR 23, the proportion of women with two children would have been over 10 percentage points lower in the last analysed cohort. Most of the gap between the real and the hypothetical value arose in the 1940s birth cohorts, as later the fall in the transition rates to third birth slowed down and the share of two-child families remained rather stable. The progression ratios to first and second birth continued decreasing, too. Over time, they pushed down the share of women with two children more substantially, especially for the university graduates among whom the transition to first and second birth fell slightly more than among less educated women (Figure 10 in Appendix). In the 1966–70 birth cohort there would have been three and five percentage points more two-child families among the high-educated, if progression to first and second birth, respectively, had not changed since the 1936–40 cohort.

In Northern and Western Europe, the share of two-child families tended to rise when PPR 23 was falling (mostly in the 1940s birth cohorts) and to shrink when PPR 23 was rising (Figure 7). Consequently, decreasing transition rates to third birth pushed the share of two-child families up in the 1940s and 1950s cohorts. Later PPR 23 started growing and reached similar levels as in the reference cohort, and so the difference between the observed share of two-child families and that under a fixed PPR 23 scenario faded away in the youngest cohorts (Figure 8). In contrast to other regions, the progression ratios to first and second birth changed so little that they did not have any effect on the share of two-child families. Moreover, the only educational stratum in which childlessness reached higher levels in the youngest than in the oldest cohort were the low-educated: the share of two-child families would have been three percentage points higher among them had childlessness not changed since the 1936-40 birth cohort.

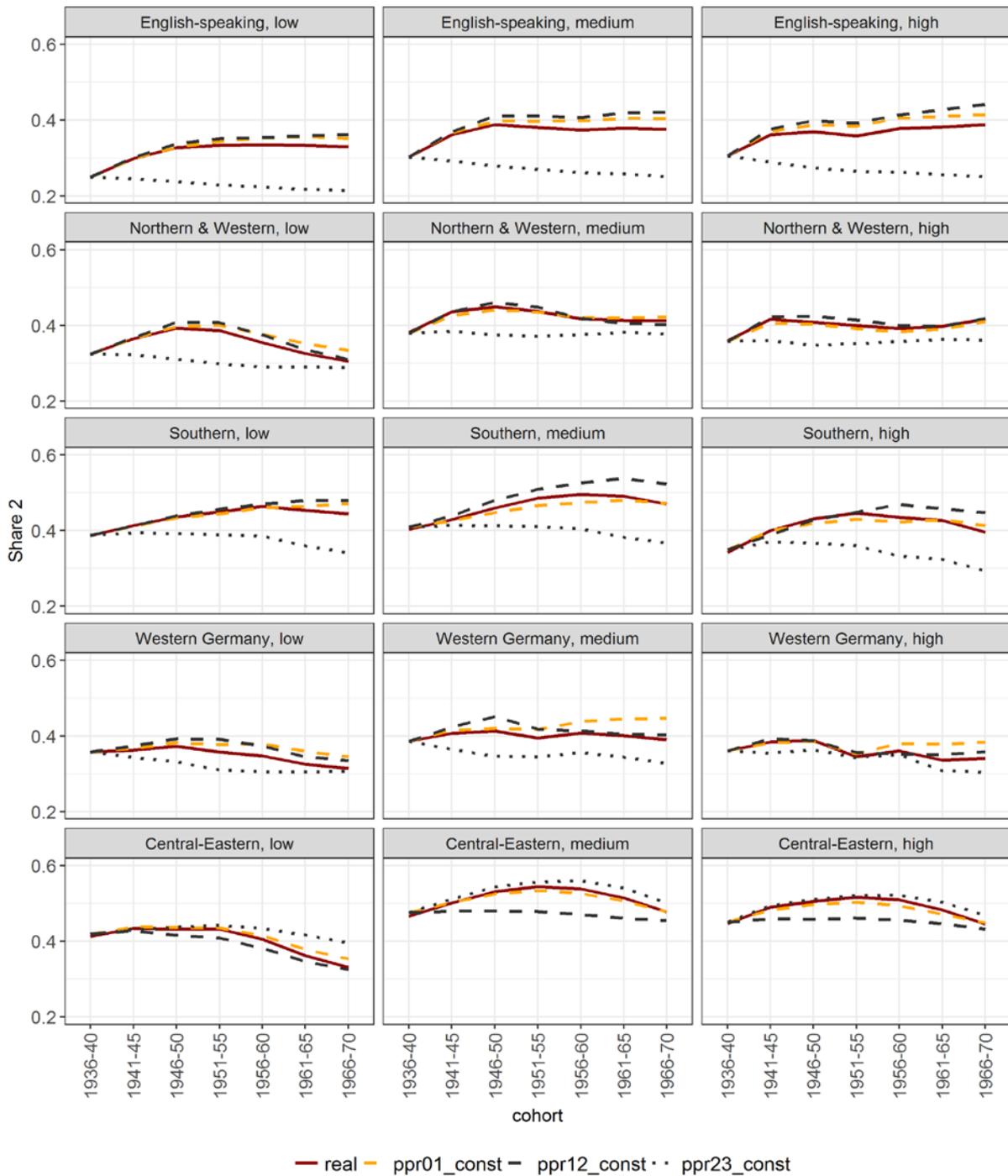
Surprisingly, in Southern Europe high childlessness rates hardly depressed the share of two-child families in any educational group (Figure 8). The fact that childlessness remained constant or was slightly falling until the late 1950s cohorts and started to rise only later accounts for this finding. Decreases in transition rates to second birth played a more important role, especially among the medium-educated, who experienced a continuous decline: in their youngest cohort there would have been five percentage points more two-child families had the PPR 12 stayed the same as in the oldest cohort. However, this effect seems modest when compared to that of the falling transition rates to third birth. In all educational groups they elevated the share of two-child families by 10 percentage points between the 1936–40 and 1966–70 cohorts.

Figure 7 PPR 01, 12 and 23 (y-axis) in relation to the share of women with two children normalised across cohorts (circle size), by education, cohort and region



Note: The size of each circle denotes the share of two-child families in a given cohort relative to the average share of two-child families in the 1936–40 and 1966–70 cohorts in a given educational group and region.

Figure 8 Observed share of two-child families and its different scenarios



In Western Germany, the share of two-child families and the parity progression ratios changed in the analysed cohorts less dramatically than in other regions (Figure 8). Interestingly, among the medium-educated, the stratum in which the proportion of women with two children stayed almost constant, parity progression ratios changed most visibly: the rise in childlessness and the decline in the transition to third birth depressed the share of two-child families by six percentage points each when comparing the oldest and the

youngest cohort. Figure 7 shows some intriguing developments for the low- and high-educated: in the 1960s birth cohorts, when the progression to first and second birth plateaued and the transition to third birth increased considerably among women with the lowest education, the proportion of those with two children fell below the level of the 1936–40 cohort. In contrast, among the university graduates, the proportion of two-child families shrank along with falling progression to third birth and, in the 1961–65 cohort, to first and second birth; in the 1966–70 birth cohort the transition rates to first and second birth levelled-off. Thus, among women born in the 1960s in Western Germany trends in the share of two-child families were driven by two opposite forces in the low- and high-educated strata: by outflow (transition to third birth) and by inflow (transition to first and second birth), respectively.

Finally, in Central-Eastern Europe, the progression to third birth played the least important role in the developments of the two-child families of all the analysed regions (Figure 8): only among the low-educated did the increases in PPR 23 in the 1950s and 1960s cohorts substantially depress the proportion of those with two children. Changes in small families were irrelevant for the number of two child-families in this stratum, but among the medium- and high-educated the progression to second birth played an important role. Until the late 1950s cohorts, it was increasing, and thus pushing up the proportion of two-child families by five to six percentage points in the 1950s cohorts. Women with high and medium education born in the 1960s progressed to second child less often; in the youngest cohorts PPR 12 reached a similarly low level as in the 1936–40 birth cohort. This decline in the transition to second birth induced a decrease in the share of two-child families. Throughout the analysed cohorts Central-Eastern Europe had largest gap between the progression ratio to first and second birth of all analysed regions, with the former remaining far above the latter.

5 Conclusions

Our analysis documents how the proportion of women having two children changed over time and across education in low fertility countries. It shows the diversity of the forces driving the changes in the share of two-child families in different regions, educational groups and cohorts. It seems that the decrease in the progression to third birth had the strongest effect on the number of families with two children, but its size varied substantially by region and education. On the inflow side, parity progression ratios to first and second births played a more modest role, also because they changed much less in the analysed cohorts than transition rates to third birth. Their importance seems to have risen in the most recent cohorts.

Most of the findings met our expectations. As predicted, the share of two-child families was negatively related to the progression ratios to third birth: the declines in the latter in the 1940s cohorts elevated the number of women with two children across regions and education. The developments in the 1960s were less universal. In English-speaking

countries and Northern and Western Europe the proportion of two-child families decreased among the low-educated and increased or did not change among the better-educated, which to a large extent resulted from rises and falls, respectively, in the transition rates to third birth. The effect of PPR 23 was strongest in Southern Europe, where it declined almost linearly, and weakest in Central-Eastern Europe, where it remained stable and low until the mid-1950s cohorts and then tended to rise, especially among low-educated women. We elaborate on this unanticipated trend below.

In line with our expectations, the first increasing and then decreasing progression ratios to second birth affected the share of two-child families in Central-Eastern Europe particularly strongly. In the 1950s and 1960s cohorts declines played also an important depressing role in Southern Europe and, to a much lesser extent, in English-speaking countries. In Northern and Western Europe transition rates to second birth counterbalanced those to first birth: when one was rising, the other one was falling, so that they did not trigger any significant changes in the number of women with at least two children.

Not surprisingly, childlessness was most closely connected to the share of women with two children in Western Germany, where, unlike in other regions, it had a stronger effect than the parity progression ratio to second birth. The rising childlessness rates depressed the proportion of two-child families also in English-speaking countries, but not in Southern Europe as the increases began only in the 1960s birth cohorts. In the Southern European countries, like in the Central-European ones, the proportion of ultimately childless women stayed stable for much longer than in other parts of Europe and in English-speaking countries. However, unlike in CEE, it remained at a relatively high level. Thus, when the figures started growing in the 1960s cohorts, Southern Europe became a new 'hotspot' of childlessness (Beaujouan et al. 2017): in the 1972 birth cohort, Italy and Spain were among the three countries with the highest childlessness rates in Europe, right after Germany (Sobotka et al. 2015).

Long before the rises in childlessness, in the late 1940s and early 1950s birth cohorts, the transition rates to second birth began declining in Southern Europe. Reductions, which depressed the share of two-child families, were particularly visible among women with medium education. This corroborates our belief that these declines had similar roots as the relatively low progression ratios to second birth in CEE: easing the double burden (sometimes combined with an economic hardship) while complying with social norms. The medium-educated rarely belong to the avant-garde, usually constituted by the intellectual elites ready to challenge the social norms in order to follow new ideas or behaviour. On the other hand, however, the medium-educated are usually more able to control their fertility than the low-educated, especially in conservative countries like in Southern Europe with very short, if any, tradition of comprehensive sex education at school (Donati et al. 2000, Martínez et al. 2012, Kakavoulis 2001).

In Denmark, Finland and France trends in the progression to first and second birth had no effect on the share of two-child families, which we did not expect. In the earlier cohorts, both childlessness and the transition to second birth declined mildly. In the most recent cohorts, childlessness started increasing, and so did the number of women progressing

from first to second child. Thus, the effects of the changes in the transition rates to first and second birth on the share of two-child families cancelled each other out. This shows that increases in childlessness do not necessarily lead to lower fertility: it seems that in Northern and Western Europe a stronger selection into motherhood resulted in more mothers opting for a second child.

A similar mechanism was observed in Western Germany, where after years of decreases in the progression ratios to first and second births, the latter ones went up in the 1950s cohorts and remained stable at a higher level in the 1960s cohorts among the low- and medium-educated; among the high-educated they fell back to the values from before the increase. The rise in PPR 12 was not large enough to make up for the long-term continuous decrease in PPR 01, but, like in Northern and Western Europe, it also suggests a growing polarisation of fertility. The number of childless women (and possibly men) increased, but those who decided for parenthood usually had at least two children. This hypothesis is strengthened by rising progression ratios to third birth in the 1960s cohorts in Northern and Western Europe, especially among low-educated women (in Western Germany the PPR 23 increased among the low-educated and decreased among the medium- and high educated).

It seems that in Western Germany university graduates born in the 1960s found it particularly difficult to become mothers. Their transition rates to first birth equalled those to second birth, amounting to 0.68 – the lowest PPR 01 of all the analysed countries and the only one as low as PPR 12. Their parity-specific fertility trends went in opposite direction compared to those of the low-educated. In the 1960s cohorts, all parity progression ratios were declining among the highly educated, whereas among low-educated women the transition rates to first and second birth remained stable and those to third birth were clearly increasing. This resulted in the share of two-child families being driven by opposite forces among the high- and low-educated: by shrinking inflow (i.e. decreasing PPR 01 and PPR 12) among the former and by growing outflow (i.e. rising PPR 23) among the latter. In our analysis, Western Germany was the only country, in which the number of two-child families arose from opposite developments in different educational strata. However, with the low-educated group shrinking and becoming more selective, there might be more such countries in the future, especially in settings, which make it difficult for women to combine professional career and family.

The rises in the transition rates to third birth among women born in the 1960s, seen not only among the low-educated in Western Germany, but also in Northern, Western and Central-Eastern Europe, might have partly resulted from the spread of stepfamilies. Indeed, for those who re-partner, the new union often stimulates the desire for an additional child (Breton and Prioux 2005, Griffith et al. 1985), which in turn can result in more transitions to third birth (Thomson et al. 2014). In addition, partnerships of the low-educated tend to be less stable than those of the medium- or high-educated (Raley and Bumpass 2003, Graaf and Kalmijn 2006), so that the low-educated are more likely to end up with more children than women with secondary school or university diploma.

In Central-Eastern Europe progression ratios to third birth were increasing not only among the low-educated, but since the late 1950s cohorts also, though to a smaller extent,

among the medium- and high-educated. Among the better-educated, rises coincided with declines in the transition rates to first and second birth. Thus, the growing PPR 23 probably resulted from a more selective, more family-oriented population at risk, that is mothers of two children. What calls for explanation, however, are the very low levels of transition rates to third birth among medium- and high-educated women born already before the 1950s, and so having children before the collapse of communism.

Under state socialism, women had very good reasons for keeping their families small: housework division was very gender unequal and wages were not high enough to adhere to the traditional male-breadwinner family model (Makkai 1994, Stloukal 1999, Matysiak and Szalma 2014). The only way of reducing the double burden was to limit the number of children. Better educated and more career-oriented women might have been particularly motivated to resort to this solution. Unlike the low-educated they were usually able to stop their childbearing at the desired family size as they controlled fertility far more effectively (David 1999, Kapor-Stanulovic and David 1999). In the absence of sexual education at school and with limited access to modern contraceptives, the knowledge on and the usage of effective fertility control methods must have been much more sharply stratified by education than in the West.

Another possibly puzzling finding is the fact that throughout the analysed cohorts the educational gradient in parity-specific fertility was strongest in the East. In contrast to the egalitarian ideology, social inequalities and differences under state socialism remained strong, so that lifestyle, ideals and values varied substantially across social strata (Andorka 1995, Domański 2004, Szelenyi 1978, 1982). The reproduction of social and especially cultural capital had to compensate for the low economic disparities resulting from limited possibilities of wealth transfers (Kraaykamp and Nieuwbeerta 2000) and a generally weak stratification of wages. For these reasons, better educated parents had a strong preference for raising *high-quality* children, and thus were exposed to the classic quality-quantity trade-off. Furthermore, the time needed for a stimulating parenting was eaten up by tedious housework, much more laborious than in the Western market democracies as modern household appliances were scarce. This combined with very traditional gender roles in the family made it difficult for better educated women to wish for a big family.

To conclude, the two-child family remains the most popular family type in low-fertility countries. Its proportion stopped increasing in the 1940s and 1950s birth cohorts usually because the declines in the progression ratios to third birth had ended their steepest phase. In Central-Eastern, Northern and Western Europe the share of two-child families started decreasing earliest among the low-educated as they experienced the earliest increases in the transition rates to third birth. In the late 1950s and in the 1960s cohorts rises in childlessness (Western Germany and English-speaking countries) and decreases in the progression to second birth (Southern Europe and English-speaking countries), especially among the medium- and high-educated, also contributed to the non-increase in the number of two-child families. The two-child family model has been most popular among women with medium education: on the one hand they progress to third birth far less often than the low-

educated and on the other hand their transition rates to first (and sometimes also to second birth) are higher than among the high-educated.

Is the dominance of two-child families threatened? Is it possible that women with one and zero children will outnumber those with two despite the fact that two remains the preferred number of children by most people? For most countries we have the same answer as Frejka (2008) gave almost a decade ago: it does not appear likely in the near future. However, the traditional gender roles and an intense work-family conflict for women combined with a long-lasting economic crisis (Southern Europe) and relatively low wages (Central-Eastern Europe) give an uncertain outlook. On the other hand, the recent halt in cohort fertility decline in Austria and Germany (Zeman et al. 2017, Sobotka 2016) is a good example of how appropriate policy measures (probably together with changing social norms) can reverse even long-lasting trends.

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Appendix

Figure 9 Educational structure, by cohort and country

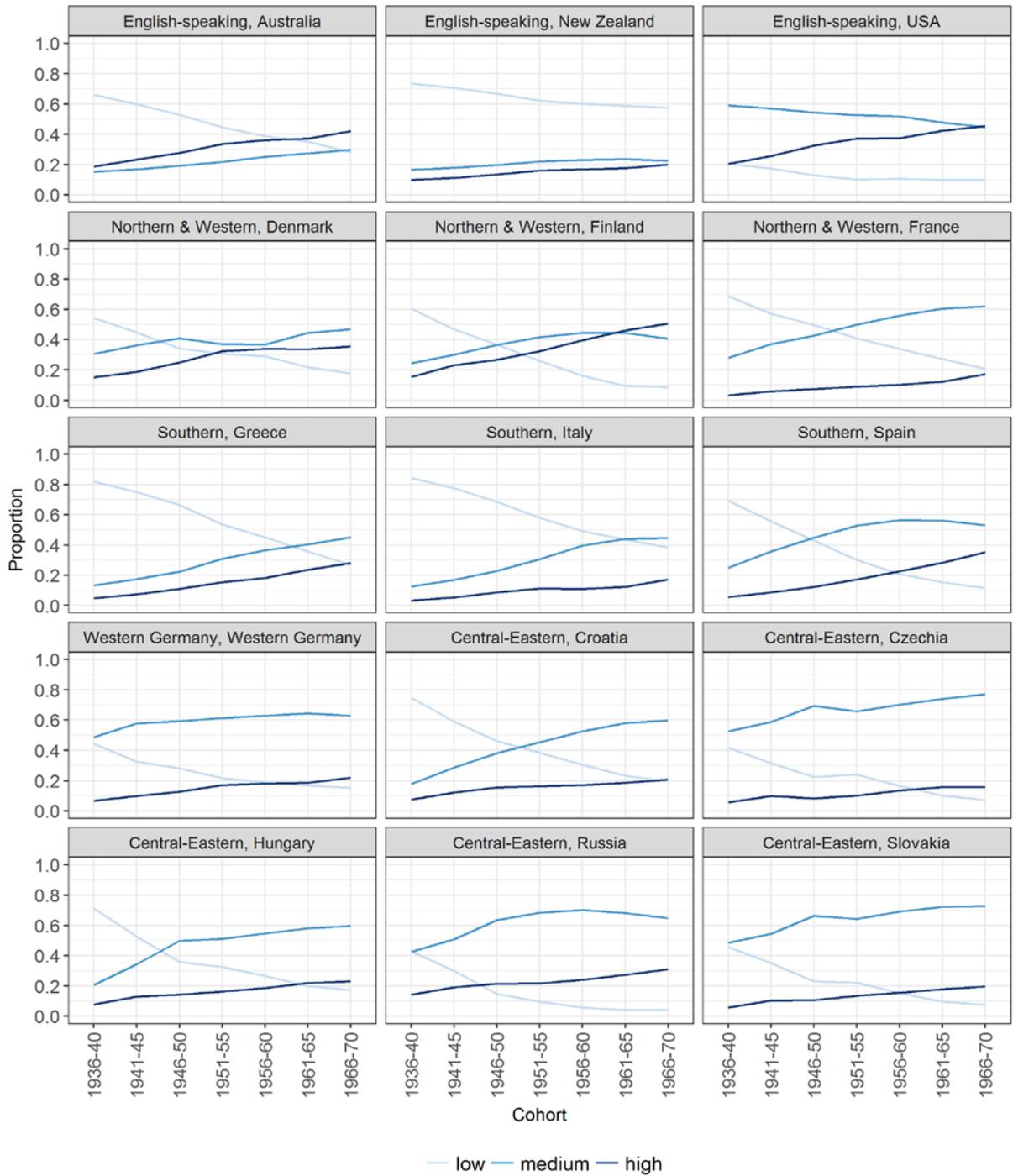
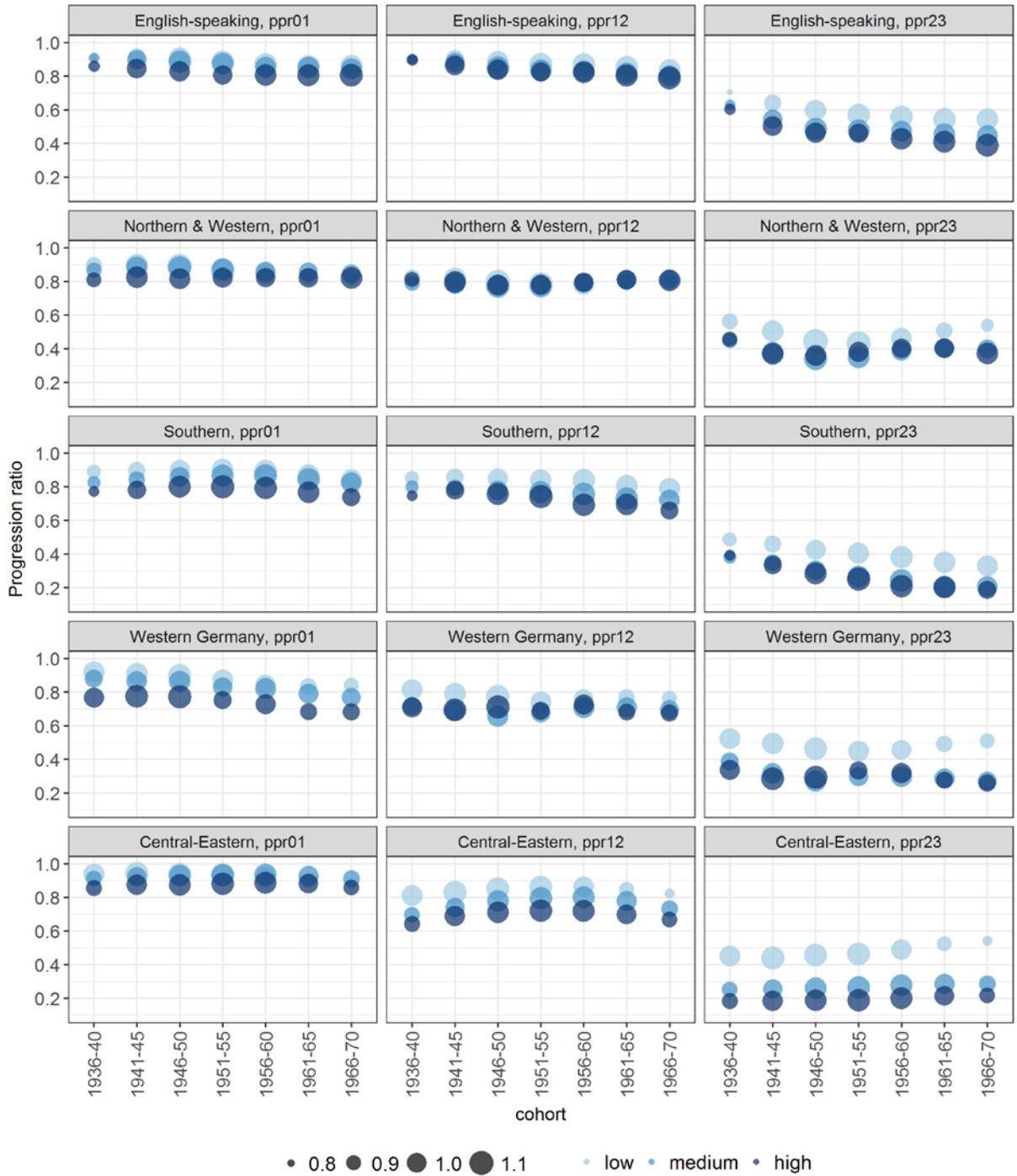


Figure 10 PPR 01, 12 and 23 (y-axis) in relation to the share of women with two children (circle size), by education, cohort and region



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