

Fertility Postponement, Economic Uncertainty, and the Increasing Income Prerequisites of Parenthood

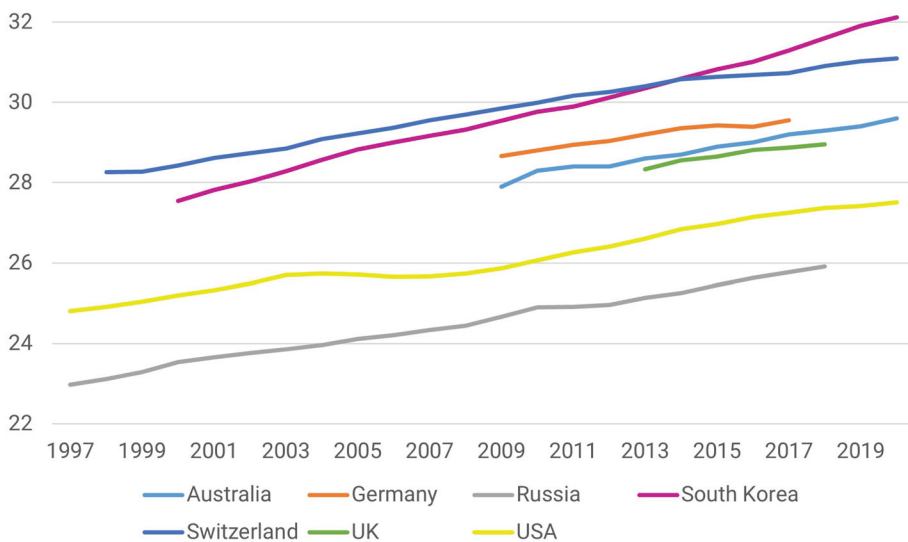
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Rich societies have witnessed a postponement of parenthood over the past two decades, and young adults' economic conditions are often invoked to explain this trend. However, macro-level trends in both "subjective" perceptions of economic uncertainty and "objective" measures of actual income provide no satisfactory explanation for the postponement of parenthood. We propose a potential solution to this puzzle by hypothesizing that the economic prerequisites of parenthood have increased over the past two decades. We expect that this has raised the degree of perceived economic certainty and the level of income that people wish to achieve before having a first child. To test this hypothesis, we draw on individual-level longitudinal data from seven countries from the Comparative Panel File. Our findings show that young adults' perceived economic uncertainty is not consistently associated with the transition to parenthood. Moreover, the effects of perceived economic uncertainty did not change over time. In contrast, we find consistent evidence that the link between income and first birth has become more strongly positive over the past two decades. This is true mainly for women but also for men, and suggests that increasing income prerequisites are a key mechanism behind the postponement of parenthood.

Introduction

Rich societies have witnessed a postponement of parenthood over the past two decades (Guzzo and Hayford 2020; Lebano and Jamieson 2020; Mills et al. 2011). Between the late 1990s and the late 2010s, the average age

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FIGURE 1 Mothers' mean age at first birth

SOURCE: Australian Institute of Health and Welfare 2022 for Australia; Human Fertility Database 2022 for other countries.

of women at first childbirth has increased in surprisingly consistent ways across countries by approximately two to three years (see Figure 1). Data on men's age at first birth are less widely available, but where available they show a similar delay of the transition to parenthood (Destatis 2022; Schweizer 2019). A widespread explanation for this postponement of parenthood argues that globalization, increasing flexibility in the labor market, and increasing economic inequality have deteriorated the economic circumstances of young adults, which has led them to postpone long-term commitments to family life (Blossfeld et al. 2005; Seltzer 2019). More specifically, many authors emphasize the importance of perceived uncertainty about future economic conditions, which they assume is a major influence on the decision to have a first child (Blossfeld et al. 2005; Vignoli et al. 2020). In addition, a competing, even if possibly complementary, explanation focuses on the necessity to achieve a satisfactory income level before starting a family (Easterlin 1975; Van Wijk, De Valk, and Liefbroer 2021).

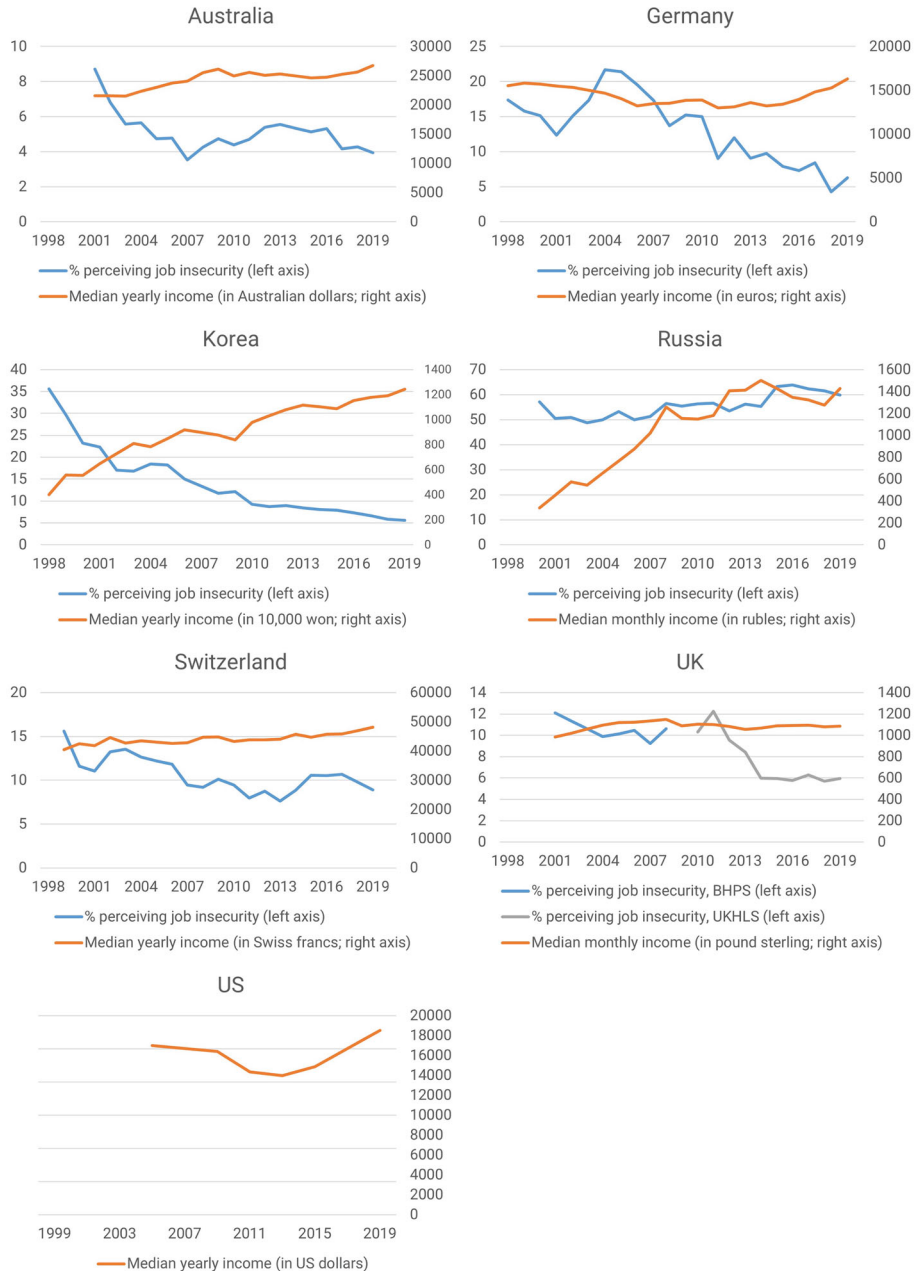
Macro-level trends provide a first indication of the impact that young adults' economic uncertainty and income may have on the postponement of parenthood. However, the way in which macro-economic characteristics developed over the past two decades does not provide a straightforward explanation for the continued postponement of parenthood. First, there is little evidence for a structural increase in young adults' perceived economic uncertainty across all affluent societies (CIPD 2019; Nowzohour and Stracca 2020). Rather, the perceptions of economic uncertainty seem to follow the

business cycle, with higher levels of perceived uncertainty during economic downturns, and lower levels in times of economic prosperity (see Figure 2; details on data and measurement are provided below). Second, trends in young adults' incomes differ widely between countries. Some countries, such as Korea and Russia, have witnessed great increases in income, while other countries, such as Germany and the United Kingdom, have experienced stagnation (see Figure 2).

The common trend of postponement of parenthood amidst differential economic performances between societies raises a puzzle, which we use in this paper as a gateway to social theory (Swedberg 2014). We propose that the perceived economic prerequisites of parenthood are not stable but rather change over time as potential parents' aspired standards of living and investments in children evolve. We build on the following different but related strands of literature: intensive parenting (Gauthier et al. 2021; Hays 1996), increasing investments in child "quality" (Anderson and Kohler 2013; Kornrich and Furstenberg 2013; Schneider, Hastings, and LaBriola 2018), the Second Demographic Transition (SDT; Lesthaeghe 2010), rising material aspirations (Easterlin 1976), and the gender revolution (Esping-Andersen and Billari 2015; Goldscheider, Bernhardt, and Lappegård 2015). Our main hypothesis is that, in affluent societies, the economic prerequisites of parenthood have increased over the past two decades. As a result, the relationship between favorable economic positions and the transition to parenthood has become more strongly positive during this period.

We test this hypothesis by using both "subjective" perceptions of economic uncertainty and "objective" measures of actual income. Although of key importance to fertility research, the available empirical evidence on the topic remains scarce and fragmented. Many macro-level studies suggest a link between currently adverse economic conditions and fertility postponement (Adsera 2011; Schneider 2015; Sobotka, Skirbekk, and Philipov 2011). However, these studies provide little insight into the actual micro-founded mechanisms that explain these associations. These macro-level studies have been complemented by studies that have been conducted at the individual level, which have generally found a reduced probability of first birth among men and women in more precarious economic positions (Laß 2020; Miettinen and Jalovaara 2020; Pailhé and Solaz 2012; Van Wijk et al. 2021; Wood and Neels 2017). However, most individual-level studies include only objective indicators of economic conditions, such as unemployment or temporary employment. Furthermore, most studies do not investigate change over time, and many of them are limited to only one country. We address these gaps in the scholarly literature by using data from the Comparative Panel File (CPF), a recent open science project that harmonizes individual-level data gathered from household panel surveys in Australia, Germany, Russia, the Republic of Korea (termed Korea from now on), Switzerland, the United Kingdom, and the United States (Turek,

FIGURE 2 Perceived job insecurity and median total personal income among adults aged 18–45, by interview year



NOTE: See “Data and methods” section for data sources and operationalization. Incomes were corrected for inflation to 1998 prices using the OECD’s (2022a) consumer price indices.

Kalmijn, and Leopold 2021). This strategy allows us to examine how the relationship between perceived economic uncertainty and income on the one hand and the transition to parenthood on the other has changed over a period of two decades in a variety of countries. Overall, we emphasize commonalities rather than differences between countries. This synthetic approach provides a broad overview from which to determine whether rising economic prerequisites of parenthood have contributed to the postponement of fertility.

Using a set of event-history models, we show that although young adults' perceived economic uncertainty is related to the transition to parenthood in some contexts, in the majority of cases perceived economic uncertainty is not associated with the transition to parenthood. Moreover, the relationship between perceived economic uncertainty and the transition to parenthood did not change over time. Based on these results and on the absence of a structural increase in perceived uncertainty described above, we conclude that perceived economic uncertainty may explain differences between groups in fertility behavior, but contrary to the prevailing view (e.g., Seltzer 2019; Vignoli et al. 2020), our findings suggest that perceived economic uncertainty is less helpful in explaining macro-level trends of fertility postponement. In contrast, we find evidence that the income prerequisites of parenthood are increasing: over the past two decades, income has become a stronger predictor of parenthood. The effects of income have increased more strongly and consistently across countries for women but also for men in several countries. This trend indicates the simultaneous occurrence of a gender convergence in the way economic resources contribute to family formation and a more general increase in the income prerequisites of parenthood.

Our study has implications for several areas of sociological and demographic research. First, we contribute to the vast literature on fertility postponement both by challenging the dominant economic uncertainty hypothesis and by proposing a new explanation that focuses rather on the increasing income prerequisites of parenthood. Our findings suggest that couples will wait to have children until the perceived income prerequisites of parenthood are met. In a context of increasing income prerequisites of parenthood, this could result in a delay of childbearing even in cases where young adults' incomes themselves have changed relatively little or have even increased with respect to previous cohorts. The increasing income prerequisites of parenthood thus explain at least part of the macro-level puzzle of fertility postponement in affluent societies amidst differential economic developments. Second, changes in the links between income and fertility contribute to long-term patterns of social stratification by shaping the timing of and access to reproduction of different socioeconomic groups. On the one hand, postponing parenthood until incomes have improved likely has favorable consequences for children's development, as it increases

the economic resources children have at their disposal when growing up (cf. McLanahan 2004). On the other hand, increasing income prerequisites may raise levels of childlessness among more disadvantaged groups in society because they lack economic resources, thus increasing social inequalities in the access to reproduction. This may deprive men and women with lower incomes of the meaning and identity they can derive from parenthood (Edin and Kefalas [2005] 2011). Finally, our study emphasizes the dynamic nature of norms regarding fertility behavior and investments in children. We show that important changes can take place in the course of only two decades, highlighting the need to critically examine the extent to which existing theories remain relevant as societies develop.

The remainder of the paper is structured as follows. We start by reviewing the existing literature on fertility postponement and the relationships between economic uncertainty and fertility, and income and fertility. We then discuss the rationale for our expectation that the economic prerequisites of parenthood have increased. The “Data and methods” section introduces the Comparative Panel File and describes the variables and models that we use. The “Results” section discusses our results, and finally the paper ends with a conclusion.

The postponement of parenthood: Theoretical background

The postponement of parenthood has received much attention in the academic literature (for reviews, see Basten, Sobotka, and Zeman 2014; Guzzo and Hayford 2020; Kohler, Billari, and Ortega 2002; Mills et al. 2011). Fertility postponement has important consequences for individual life courses and is a key driver of recent declines in period fertility, which reinforces the importance of identifying its causes.

The postponement of parenthood can be seen as part of a broader demographic development since the 1960s known as the SDT. In addition to postponed childbearing, SDT includes the postponement of marriage, an increase in premarital cohabitation, and rising divorce rates (Lesthaeghe 2010; Lesthaeghe and Van de Kaa 1986; Van de Kaa 2001). As causes of these trends, proponents of the SDT theory often point to ideational or value changes, such as a move away from traditional family values toward an emphasis on individual autonomy and self-actualization. For example, young adults may increasingly decide to postpone childbearing because they seek to enjoy their “child-free” years, during which they can travel, maintain independence, and experience a high standard of living. Yet such cultural changes alone cannot explain the postponement of parenthood, and the SDT theory “fully recognizes the effects of macro-level structural changes and of micro-level economic calculus” (Lesthaeghe 2010, 242).

A significant socioeconomic factor in this regard is the expansion of formal education, which offers a “mechanical” explanation of fertility

postponement. As educational enrolment is strongly and consistently correlated with a lower probability of becoming parents, prolonged participation in education by young adults—particularly women—likely explains an important part of the postponement of parenthood among adults who are in their early 20s (Blossfeld and Huinink 1991; Ní Bhrolcháin and Beaujouan 2012). At the same time, however, the largest part of the observed delay in parenthood happens among adults who are in their late 20s or early 30s, for whom the direct effect of increasing educational enrolment is less relevant (Kohler et al. 2002). An indirect effect of educational expansion—running, for example, through increases in the age at leaving education or the levels of educational attainment—might explain fertility postponement at later ages (Ní Bhrolcháin and Beaujouan 2012). Such an indirect effect of educational expansion, however, does not necessarily compete with explanations that focus on the role of economic uncertainty and income, to which we now turn our attention.

Economic uncertainty and fertility

Fertility decisions are influenced both by perceived prerequisites regarding the current situation and the recent past, and by expectations about the future (Billari 2009). Recent fertility research emphasizes the importance of the latter, with a particular focus on how the subjective experiences of economic uncertainty may impact fertility (Lappegård et al. 2022; Vignoli et al. 2020). For example, Mills and Blossfeld (2005) have argued that globalization has accelerated market dynamics and increased the impact of “random” events on economies, thus making it more difficult for individuals to predict future economic conditions. This context of inherent or “radical” uncertainty (Beckert and Bronk 2018) poses challenges to assigning reliable probabilities to the outcomes of present actions. The result is that young adults are finding it increasingly difficult to make long-term decisions about the future (Mills and Blossfeld 2005). Most scholars maintain that young adults will postpone major family commitments when they perceive their economic future as uncertain, as uncertainty makes it difficult to make and commit to long-term plans (Blossfeld et al. 2005; Oppenheimer 1988; Vignoli et al. 2020; Manning et al. 2022; but see Friedman, Hechter, and Kanazawa 1994 for a different expectation regarding the impact of uncertainty on family formation). This may particularly be the case for the transition to parenthood (i.e., the birth of the first child), which is basically an irreversible event that causes major changes in lifestyle and is at the same time more easily postponed than later births (Wood and Neels 2017). Based on these arguments, we hypothesize that (H1a) *individuals who are more uncertain about their economic future are less likely to conceive a first child.*

In the literature on fertility, “economic uncertainty” is generally interpreted as referring to a situation in which the economic future is

expected to be bleak, and is often operationalized using concepts such as job insecurity, economic or financial worries, or the lack of consumer confidence (Brauner-Otto and Geist 2018; Hofmann and Hohmeyer 2013; Kreyenfeld 2010). By contrast, economists have more often referred to economic uncertainty as a situation in which there is either a large range of possible future economic outcomes, or one in which the probability distribution of future economic developments is unknown (Nowzohour and Stracca 2020; see also Knight 1921). In the subsequent sections, we follow fertility scholars by employing their conception of economic uncertainty as expected economic hardship, but we get back to this important point in the “Discussion” section.

Although rising economic uncertainty is often enlisted as an explanation for the postponement of parenthood in the first two decades of the twenty-first century, the available empirical evidence correlating perceptions of economic uncertainty to fertility is fragmented, and the few studies that are available provide at best mixed support. Several studies have reported cross-sectional associations between perceived economic uncertainty and fertility intentions, at least in some subpopulations. For example, using data from the European Social Survey, Fahlén and Oláh (2018) found that women under 30 who perceived their job as insecure were less likely to have short-term first childbearing intentions than women under 30 who reported having a secure job, whereas the perception of job insecurity was found to have no consequence for older women or men. Brauner-Otto and Geist (2018) demonstrated that worries about future employment increased women’s uncertainty about parenthood in the United States but not men’s. On the other hand, worries about future employment increased the probability that men would expect to have a first child after age 30 (rather than at or before 30) but had no effect on women (Brauner-Otto and Geist 2018). However, these cross-sectional associations between economic uncertainty and fertility intentions provide only indirect evidence that economic uncertainty reduces fertility. Longitudinal studies that examine fertility behavior provide a stronger test of this expectation. Most longitudinal studies have found little evidence for an effect of economic uncertainty on fertility in the general population. For example, perceptions of job insecurity were found to have no effect on the first birth rate in Canada (Glavin, Young, and Schieffman 2020), Finland (Sutela 2012), Germany (Kreyenfeld 2010), and the Netherlands (Van Wijk et al. 2021).¹ A study in Germany by Hofmann and Hohmeyer (2013) did report reduced fertility among women who worried about their economic situation, whereas no effects were found among men. Likewise, Bhaumik and Nugent (2011) found that women’s concerns about their household’s financial prospects had a marginally significant negative effect on fertility in East Germany, but had no effect in West Germany. Finally, Lappegård et al. (2022) conducted an experimental study in Oslo and found that couples who were asked to imagine experiencing a negative

economic scenario reported lower fertility intentions, whereas couples who read a positive economic scenario reported higher fertility intentions. Most of these studies, however, were conducted in countries with low unemployment and protective welfare states. The much wider range of countries included in the CPF allows us to examine whether the impact of perceived economic uncertainty on fertility behavior depends on the macro-level context.

Income and fertility

Norms about the appropriate sequence of major life events structure perceptions of the preconditions of parenthood (Liefbroer and Billari 2010), perhaps guided by simple heuristics that facilitate decision-making (Todd, Hills, and Hendrickson 2013). A key precondition of parenthood is earning a sufficient income, which provides the economic resources that are perceived to be necessary to invest in children as well as to fulfill other prerequisites of parenthood, such as marriage and housing.

The links between income and fertility have been studied for a long time. Traditional economic models of fertility (Becker 1981; Butz and Ward 1979) expect that a man's income increases while a woman's decreases the demand for children. These expectations derive from assumptions about the gendered division of labor in the family, according to which men specialize in market work and women in childrearing and household labor. As a result, following standard economic theory, a higher income on the man's part would increase the ability to cover the economic costs of childrearing and thus increase the demand for children. The woman's income also adds to the available household resources and may thus increase fertility. However, traditional economic theories expect that the woman's income simultaneously increases the cost of children, insofar as women with higher incomes face higher opportunity costs as they tend to shift some of their time and energy away from employment to childrearing. As a result, women's income has traditionally been considered an obstacle to parenthood. However, continuing gains in gender equality, female educational attainment, and maternal employment over the past decades—combined with changes in institutional arrangements that support the combination of female employment and childrearing—have made this traditional family model increasingly outdated (Esping-Andersen and Billari 2015; Goldscheider et al. 2015; Oppenheimer 1988; Sweeney 2002). As a result, most recent studies now suppose that the economic resources of both men and women increase fertility (Miettinen and Jalovaara 2020; Van Wijk et al. 2021). In line with this expectation, we hypothesize that (H2a) *individuals who earn a higher income are more likely to conceive a first child.*

Recent research has shown that men with higher incomes have a higher probability of having a first child in a variety of rich societies,

including in Finland (Miettinen and Jalovaara 2020), Italy (Vignoli, Drefahl, and De Santis 2012), the Netherlands (Van Wijk et al. 2021), Norway (Hart 2015), and the United States (Yu and Sun 2018). Most studies have also found that women's incomes facilitate their transition to motherhood, for example, in Finland (Miettinen and Jalovaara 2020), the Netherlands (Van Wijk et al. 2021), Norway (Hart 2015), and the United States (Yu and Sun 2018). However, the finding of a positive income effect has been less consistent for women than for men, as studies found no effect of women's income in Germany (Schmitt 2012) and Italy (Vignoli et al. 2012).

Increasing economic prerequisites of parenthood

Most studies assume that the links between economic conditions and the transition to parenthood remain stable over time. However, the role that individuals' economic positions play in the fertility decision-making process depends on what they perceive as the economic prerequisites of parenthood. These prerequisites are likely to change over time as they are shaped by the preferences and expectations of potential parents regarding investments in children (Easterlin 1975; 1976). We expect that several different but related societal trends have caused an increase in the perceived economic prerequisites of parenthood in the first decades of the twenty-first century.

First, many studies show that parental financial (and other) investments in children have increased. For example, a study done in Korea has drawn attention to the enormous investments that parents are making in the (private) education of their children, which the authors argue is one of the prime reasons parents have decreased their fertility (Anderson and Kohler 2013). Likewise, American research shows that the financial investments parents make in their children have increased over the past decades at a faster rate than other expenses (Bandelj and Grigoryeva 2021; Kornrich and Furstenberg 2013), and this increase in spending has been driven mostly by higher income families (Kornrich and Furstenberg 2013; Schneider et al. 2018). The increasing amount of resources spent by parents may be driven by a sense of rising inequality and concerns about children's future prospects, which increase the importance of parental investment in the human capital of their children (Schneider et al. 2018). In addition, a recent qualitative study done in Canada and the United States suggests that such increased spending is also motivated by strong social pressure to "be a good parent" by investing in one's children (Gauthier and De Jong 2021). This aligns well with the notion of intensive parenting, which refers to a new standard of parenting that is child-centered, expert-guided, emotionally absorbing, labor intensive, and—particularly important to our study—financially expensive (Hays 1996; see also Gauthier et al. 2021; Ishizuka 2019; Lareau 2002).² The increasing prevalence of (financially)

intensive parenting norms in turn likely increases the economic conditions that parents want to satisfy before having a first child.³

A second potential driver of increasing economic prerequisites of parenthood can be found in the ongoing process of individualization. Proponents of the SDT theory have argued that having and investing in children has increasingly become part of parents' strategies for personal growth (Lesthaeghe 2010; Van de Kaa 2001). As such, investing in children may well contribute to parents' feeling of self-fulfillment in a time of rising individualism (Gauthier and De Jong 2021). In a similar vein, Beck and Beck-Gernsheim (2002) have argued that the ongoing process of individualization increasingly renders fertility decisions the object of conscious planning and calculation. What used to be considered a natural or intuitive process now requires the careful consideration of the tensions, dangers, and insecurities of parenthood. At the same time, individualization has shifted the responsibility of investing in and taking care of children from the community and the state to parents. Parents' need to carefully plan their life course and their increasing responsibility have likely augmented the importance of achieving a stable economic foundation before becoming a parent (Bodin et al. 2021). These developments may in particular have increased the importance of economic certainty in fertility decision-making, as economic certainty facilitates the planning of future life courses, particularly in times when potential parents have less of a safety net available (Guzzo and Hayford 2020).

Third, Easterlin (1976) has argued that the economic prerequisites of parenthood depend on potential parents' material aspirations, and these material aspirations are in turn shaped by their economic circumstances as children. Although many young adults who are currently in their childbearing years grew up in relatively prosperous times, the economic position of young adults in most affluent societies has improved relatively little or even declined since then (Sironi and Furstenberg 2012; Hammer, Spitzer, and Prskawetz 2022; see also Figure 2). As a consequence, following Easterlin's (1976) argument, young adults who are deciding whether to have children increasingly face a combination of relatively high material aspirations and relatively poor economic conditions. The likely result is a postponement of parenthood among young adults whose economic position lags behind the perceived economic prerequisites of parenthood.

Fourth, the ability to find stable housing of a high quality has often been linked to higher fertility (Öst 2012; Florida, Mellander, and King 2021). Developments in the housing market and changes to housing preferences may therefore also alter the way economic conditions affect fertility. The cost of housing has increased in many rich societies, making it increasingly difficult for young adults to purchase a home, particularly if they lack intergenerational financial support and wealth accumulated in the housing market. For example, the house price to income ratio—a

measure of the affordability of homeownership—has generally increased in OECD countries between the late 1990s and the late 2010s, although the ratio dropped a little following the 2008/2009 financial crisis (OECD 2022b). Real rent prices also increased in most countries over the same period (OECD 2022b). At the same time, the perceived prerequisite of finding—and preferably owning—a home with certain characteristics that are perceived as beneficial for children (e.g., a spare room for each child; a garden) before becoming a parent may have become stronger over the past decades (Lauster 2010; Mulder 2013). Such a development is consistent with the trend toward intensive parenting and the increased emphasis on life course planning outlined above. Moreover, applying Easterlin's arguments to housing suggests that the relatively favorable housing conditions of the previous generation may have set a high standard regarding the type of housing that young adults wish to attain before having children, but rising prices may prevent them from fulfilling this aspiration. Together, these trends imply that recent developments may have made a favorable economic position a stronger prerequisite for achieving housing that is perceived as being of sufficient quality to have and raise children, which further increases the economic prerequisites of parenthood.

Fifth, economic research has drawn attention to the marketization or outsourcing of household work and childrearing and the role this plays in fertility decision-making (Bar et al. 2018; Raz-Yurovich, 2014; Siegel 2017). There is some evidence that the extent to which households outsource key tasks to the market has increased over time. For example, data from the HILDA survey show that the share of household income spent on child-care increased greatly in Australia between 2002 and 2017. This increase resulted from increases in both the uptake and the hourly cost of child-care (Melbourne Institute of Applied Economic and Social Research 2019). Likewise, Kornrich and Roberts (2018) show that spending on day care—as well as on gardening and lawn services and on pre-prepared foods—by married households in the United States increased between 1980 and 2010, although this increase could largely be explained by increases in income and changes in other household characteristics. This marketization decreases parents' need to shift some of their time away from market work to household work and childrearing, thus reducing the opportunity costs of parenthood (Bar et al. 2018). At the same time, marketization comes at a great—and possibly increasing—cost, which requires a substantial income. As a consequence, marketization increases the economic prerequisites of parenthood, while reducing the opportunity costs of parenthood by making it easier to combine higher incomes with childrearing.

Finally, and in line with work on the gender revolution discussed above (Esping-Andersen and Billari 2015; Goldscheider et al. 2015; Sweeney 2002), we expect that the increasing compatibility of female employment and childrearing will have decreased the opportunity costs

women face when having children. As a result, the effects of women's economic circumstances on their fertility will have become more similar to that of men. By running separate analyses for men's and women's income, we are able to distinguish between changing effects of economic conditions that result from gender convergence (which will be found for women only) and more general increasing economic prerequisites of parenthood (which will be found for women and men alike; cf. Hart 2015).

The main idea behind our approach is that we should be able to observe the increasing economic prerequisites of parenthood by investigating changes in the relationship between economic conditions and fertility behavior over the past two decades. Specifically, we hypothesize that (H1b) *the effect of perceptions of economic uncertainty on the probability of having a first child has become more negative between the late 1990s and late 2010s*. Likewise, we expect that (H2b) *the effect of income on the probability of having a first child has become more positive between the late 1990s and late 2010s*.

Some preliminary support for these hypotheses can be found in earlier research. Bodin et al. (2021) conducted a qualitative study in Sweden that directly examined changes in the perceived requirements of parenthood. They found that younger participants voiced higher expectations and greater demands regarding the economic (as well as other) preconditions of parenthood than older participants. Some additional evidence comes from Hart (2015), who has shown that in Norway the positive effect of income on the probability of first birth increased between 1995 and 2010. Furthermore, a recent meta-analysis by Alderotti et al. (2021) has shown that the negative effects of unemployment and time-limited employment on fertility have become stronger over time, and these effects are partly attributable to the lower incomes of the unemployed and of temporary employees. In these studies, similar changes over time were found for men and women, indicating that the results cannot be explained solely by a gender convergence in the effect of economic conditions. Therefore, these studies provide preliminary support for our expectation of a general increase in the economic prerequisites of parenthood.

Data and methods

The Comparative Panel File (CPF) is a recent open-science project that harmonizes household panel surveys from Australia (HILDA), Germany (SOEP), Russia (RLMS), Korea (KLIPS), Switzerland (SHP), the United Kingdom (BHPS and UKHLS), and the United States (PSID) (Turek et al. 2021; see Table 1 for an overview). These surveys started between 1968 and 2001, and at the point of writing data have been harmonized up to the 2019 or 2020 wave. For most surveys, data have been collected on a yearly basis, although after 1997 the PSID switched to two-year intervals between waves.

TABLE 1 Overview of surveys, samples, waves, and data citation for the surveys used in the analyses

Country	Survey	Waves included	Citation
Australia	Household, Income and Labour Dynamics in Australia (HILDA)	Waves 1–20 (2001–2020)	Watson and Wooden (2012), Melbourne Institute of Applied Economic and Social Research (2021)
Germany	German Socio-Economic Panel (SOEP). Samples A, B, C, D, E, F, H, J, and K	Waves 15–36 (1998–2019)	DIW Berlin (2021)
Korea	Korean Labor & Income Panel Study (KLIPS)	Waves 1–22 (1998–2019)	Korea Labor Institute (2021)
Russia	Russia Longitudinal Monitoring Survey (RLMS)	Waves 5–25 (2000–2020) for women, waves 8–25 (2003–2020) for men	Higher School of Economics et al. (2021)
Switzerland	Swiss Household Panel (SHP). Samples SHP_I, SHP_II, and SHP_III	Waves 1–21 (1999–2019)	Swiss Centre of Expertise in the Social Sciences FORS (2021), Tillmann et al. (2022)
United Kingdom	British Household Panel Survey (BHPS) and Understanding Society: The UK Household Longitudinal Study (UKHLS). Main samples from England, Wales, Scotland, and Northern Ireland are included. Immigrant and ethnic minority boost samples are excluded	BHPS waves 11–18 (2001–2008) UKHLS waves 1–10 (2009–2020)	University of Essex (2020)
United States	Panel Study of Income Dynamics (PSID). Household reference persons, their partners, and other family members are included. Immigrant samples added after the start of the observation period in 2005 are excluded	Waves 33–40 (2005–2019)	University of Michigan (2021)

All surveys included in the CPF are representative of the population of households. They continuously renew their samples by adding new household members (e.g., grown-up children or newly married partners) and by following new households established by respondents. Additionally, survey samples are frequently “refreshed” by adding new random probability samples of households (Turek et al. 2021).

We use the CPF code as the basic coding framework for our study, but we extend on the CPF by adding or changing samples and variables to fit the purpose of our study. Our choices regarding sample selection, variable definition, and modeling are guided by the motivation to increase the consistency of the analyses both between countries and over time. Although remaining differences in methodology across surveys inhibit the cross-country comparison of levels of variables at specific points in time, our approach allows for a broad cross-country and cross-period comparison of the impact that economic uncertainty and income have on fertility.

In what follows, we describe our general approach to sample selection and operationalization and the most important deviations from this approach. Readers are referred to tables in Appendix A (Supporting Information) for country-specific details.

Sample selection

We start our observation period in 1998 at the earliest, and we follow respondents up to the latest wave available (2019 or 2020; see Table 1). In some cases, our observation period begins after 1998 or the survey's first wave because of data availability. In the United Kingdom, we use data from 2001 onward because Northern Ireland was not part of the sample before this time. We observe Russian men from 2003 onward because data on male fertility were not available before this wave. Finally, we start observing respondents in the United States in 2005. This choice is dictated by the lack of individual-level income data before that time for the PSID's "other family members" (i.e., respondents who were neither the household reference person nor the reference person's partner, such as children living with their parents), whose inclusion is crucial for obtaining a representative sample of young adults comparable to the samples used in the other countries.

From the remaining samples, we select all respondents who were aged 18–45 years old at the time of the interview and who did not have children (see Table A1 in the Supporting Information for details on how this is measured in each country). Additionally, in most countries we only include respondents who participated in the following two waves of the survey, since information from these waves is required to measure first conceptions (see below). Exceptions to this rule are Switzerland and the United States, where detailed information on childbirth histories allows for somewhat less restrictive selection criteria (see Tables A1 and A2 in the Supporting Information).

First conception

Our dependent variable measures whether a first birth took place after the interview. A time lag is included to ensure that the independent variables are measured before the conception of a first child. In countries where surveys took place annually, the dependent variable measures whether a first child was born between the first wave after the interview (wave $t+1$) and the second wave after the interview (wave $t+2$; see Table A2 in the Supporting Information for country-specific details). In the United States, the two-year time lag between waves and the availability of children's birth dates inspires the choice to instead measure first births between nine months after the current interview and nine months after the next interview. In all analyses, respondents are censored after they conceived a first child that resulted in a birth.

Economic uncertainty

We use several indicators of perceived economic uncertainty, which all measure forward-looking and subjective interpretations of respondents' own economic position. As our main indicator we take perceptions of job insecurity, which measure the perceived threat of job loss and the worries related to that threat (De Witte 2005). This is an indicator that has been used in several previous studies on the links between perceived economic uncertainty and fertility (Glavin et al. 2020; Kreyenfeld 2010; Van Wijk et al. 2021). A variable that measures perceptions of job insecurity is available for all countries except the United States, although it is measured in somewhat different ways across surveys. Table A3 in the Supporting Information gives an overview of the exact wording of questions and the coding of answers for each survey. Because the question about job insecurity changed in the United Kingdom during the transition from the BHPS to the UKHLS, we create separate variables and estimate their effects in separate models for these two surveys.

For each survey we distinguish between three levels of job insecurity. Furthermore, because questions about job insecurity were only asked to the (self-)employed, we create a variable that combines perceptions of job insecurity with respondents' status in the labor market, which is measured by their primary activity at the time of the interview. The resulting variable includes the following categories: (1) (self-)employed and secure (ref. cat.); (2) (self-)employed and somewhat secure; (3) (self-)employed and insecure; (4) unemployed; (5) inactive; and (6) in education.⁴

We create two alternative sets of variables to measure different aspects of perceived economic uncertainty. Even though both indicators are available for only two countries, their inclusion helps us to draw conclusions about the links between economic uncertainty and the transition to parenthood beyond the job insecurity concept. First, we construct a variable that measures the respondent's perceived likelihood of finding a new job similar to their current job were they to become unemployed, which is available for Australia and Russia. As was the case for job insecurity, the questions on which these variables are based were only asked to employed respondents, and therefore they are combined with respondents' primary activity status. We distinguish three categories of employed respondents based on how certain they are that they could find a new job, resulting in the following categories: (1) (self-)employed and certain (ref. cat.); (2) (self-)employed and somewhat certain; (3) (self-)employed and uncertain; (4) unemployed; (5) inactive; and (6) in education (see Table A4 in the Supporting Information for details).

Second, we create a variable that measures concerns about respondents' economic situation, data for which are available for Germany and Russia. Because these questions were posed to all respondents and not only

to the employed, we construct a separate variable that is included in the model in addition to respondents' primary activity status. We group respondents into the following three categories: (1) not concerned (ref. cat.); (2) somewhat concerned; or (3) very concerned (see Table A5 in the Supporting Information for details).

Income

Our preferred measure of income includes the total individual income from all sources. We focus on total individual income (rather than, for example, labor income or household income) because it provides a complete picture of an individual's income, allows the estimation of gender-specific effects, and does not depend (at least not directly) on the type of household to which a respondent belongs. Table A6 in the Supporting Information describes how incomes are measured in each country. For Australia, Russia, Switzerland, and the United Kingdom, a variable that captures total individual income is either available directly from a survey question or has been constructed by the respective survey teams by adding several income components together. For Germany and the United States, we construct a measure of total individual income ourselves by adding together all available income components that can be traced to individuals (e.g., income from labor, unemployment benefits, social security). Such an approach is not possible for Korea, however, because the KLIPS survey measures income from sources other than labor at the household level only. Therefore, our analyses for Korea focus exclusively on labor income, and we exclude the nonemployed from the analyses of the Korean data.

We divide the total individual income by the median income of all respondents aged 18–45 (i.e., before excluding respondents with children and respondents who did not participate in subsequent waves), calculated separately for each country and for each year. The resulting variable measures respondents' relative income position in a given country and year, net of inflation and changes in actual incomes. To account for the skewness of the resulting income variable, we add a 1 to each value and then take the natural logarithm.

Missing income data have been imputed by some survey teams but not by others. When available, imputed values are used, along with a dummy variable that indicates whether incomes were imputed (as well as an interaction effect between this imputation dummy and interview year, see below). If imputed values are not available, we exclude respondents with missing income data from the analyses.

Control variables

All models control for age, educational attainment, interview year, and the length of the observation period in which births were observed. We

measure age using the age of respondents at the time of the interview minus 18 and include both a linear and a squared term in all models. Educational attainment is measured using the harmonized three-category variable from the CPF (Turek 2020). Interview year indicates the year in which the interview was conducted and is included in the models as a continuous variable measuring the number of years that have passed since 2000. Finally, we include a continuous variable that measures the number of months in which respondents were at risk of having a first child. In most surveys, this variable equals the number of months between wave $t + 1$ and wave $t + 2$. This variable is included to control for variation in interview schedules across observations.

Modeling approach

We view the transition to parenthood as the outcome of a sequential decision-making process, during which people make fertility decisions as they move through their life course and deal with changes in life circumstances. To model this process, we estimate separate discrete-time event history models for each country and gender using logistic regression.⁵ In Model 1, we include the main effects of respondents' perceived job insecurity, primary activity status, income, and the control variables. In Model 2, we add interaction effects between interview year on the one hand and job insecurity, primary activity, and income on the other. We test the significance of these interaction effects by performing a likelihood-ratio test that compares the full model—Model 2—to a reduced model that excludes the interaction effect of interest, while retaining the other interaction effects.⁶ Furthermore, we calculate predicted probabilities in order to graph the results and illustrate their substantive significance.⁷ In the United Kingdom, the modeling strategy is somewhat complicated because questions about job insecurity were asked in different ways in the BHPS and the UKHLS. We therefore estimate the main effect of job insecurity in separate models for the BHPS and the UKHLS and do not examine changes in this effect over time. In the PSID, no information on job insecurity is available. We thus focus our attention in this country on the income hypotheses. As a consequence, we are not able to control for job insecurity in the models that test income effects in the United Kingdom and the United States, but we do include controls for respondents' primary activity in the models, as well as for the interaction effect between primary activity and interview year in Model 2.

To investigate the impact of using different measures of economic uncertainty, we re-estimate Models 1 and 2 while replacing the job insecurity variables with variables that measure the perceived likelihood of finding a new job (for Australia and Russia) and concerns about one's economic situation (for Germany and Russia).

Results

Full regression tables for each country and gender are included in Appendix B (Supporting Information) for the models that include the job insecurity variables and in Appendix C (Supporting Information) for the other indicators of economic uncertainty. We start by discussing the main effects of perceived economic uncertainty and income on the first birth rate, estimated in Model 1. We find mixed support for the hypothesis (H1a) that respondents who are more uncertain about their economic future are less likely to conceive a first child. The results for job insecurity, depicted in Figure 3, show that Australian women and Korean men are less likely to conceive a first child when they perceive their job to be insecure. There is also some evidence that job insecurity is associated with a decreased probability of becoming a parent among Swiss men, UK men in the UKHLS, and UK women in the BHPS, but the effects do not reach conventional levels of statistical significance.⁸ In addition, Australian men who are somewhat secure about their job become fathers less often than Australian men who perceive their jobs to be secure, whereas no significant differences are found between Australian men who perceived their job to be secure and those who perceived their job as insecure. These results suggest that the effect of job insecurity on fertility is potentially nonlinear. In most models, however, employed respondents who reported job insecurity are as likely to conceive a first child as employed respondents who perceive their job to be secure: this is the case for German men and women, Korean women, Russian men and women, Swiss women, UK men in the BHPS, and UK women in the UKHLS.

This finding of null effects of job insecurity is corroborated by the results for other economic uncertainty indicators. Perceived uncertainty about the ability to find a new job that is similar to one's current job is not associated with the transition to parenthood for Australian men or for Russian men and women, whereas Australian women who report that they are unlikely to find a new job are more likely to become mothers than their counterparts with a high perceived likelihood of finding a new job. These results run contrary to what was expected in hypothesis (H1a). Likewise, no statistically significant associations are found between concerns about one's own economic situation and the transition to parenthood for German men and women or for Russian women. Russian men who are very concerned about their economic situation are more likely to conceive a first child, compared to their counterparts who are not concerned, again running counter to our expectations. Overall, therefore, these results cast doubt on the universality of the link between perceived economic uncertainty and fertility. Rather, they suggest that the relationship depends on the country, gender, and the exact measure of uncertainty used.

The link between income and fertility is found to be more consistent across countries and genders. The findings are depicted in Figure 4, which

FIGURE 3 The predicted probability of conception of a first child by perceived job insecurity

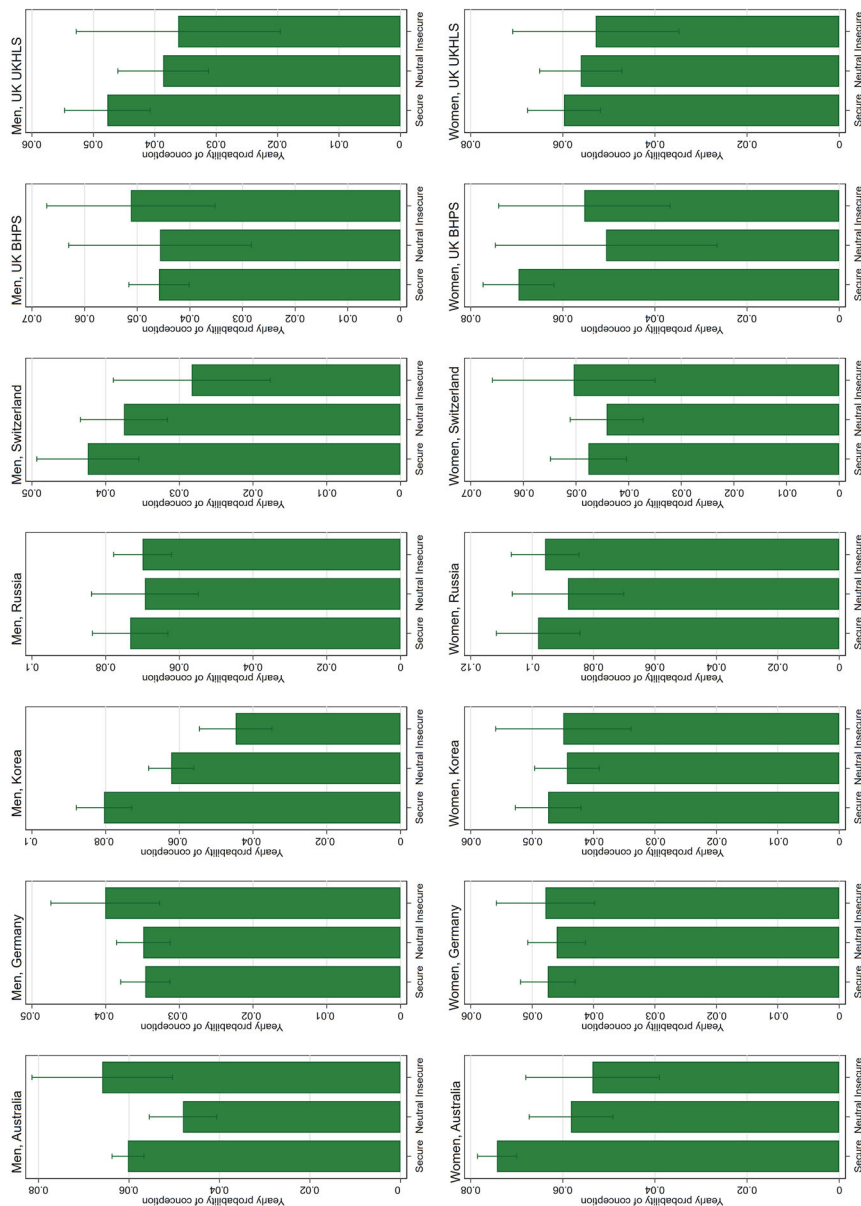
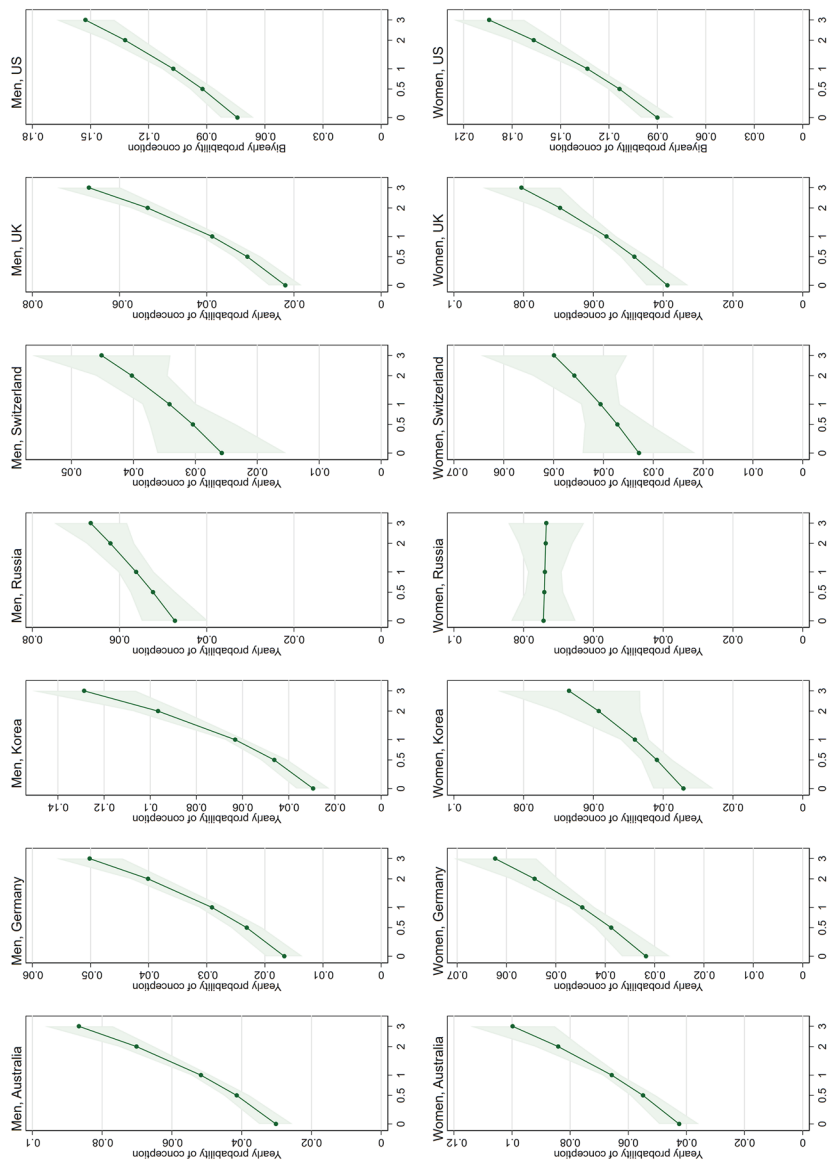


FIGURE 4 The predicted probability of conception of a first child by income. Markers highlight cases with no income (0), half the median income (0.5), the median income (1), twice the median income (2), and three times the median income (3)



shows how the predicted probability of first conception varies by income, with markers highlighting situations in which persons earn no income, half the median income, the median income, twice the median income, and three times the median income. The results reveal that both men and women in Australia, Germany, Korea, the United Kingdom, and the United States are more likely to become parents when they have more income, as are men in Russia. Positive income effects are also found in Switzerland, but here they are not statistically significant ($p = 0.07$ for Swiss men; $p = 0.18$ for Swiss women). Although in some countries, such as Korea and the United Kingdom, income effects are more strongly positive for men than for women, what is most striking is the similarity of income effects between genders. We thus find clear support for the hypothesis (H2a) that individuals with more income are more likely to conceive a first child. An exception to this pattern are Russian women, for whom income does not affect the probability of conceiving a first child.

The effects of the control variables are largely as expected and confirm the findings of other studies.

How did the economic prerequisites of parenthood change over time?

The previous models assume that the effects of economic conditions on the transition to parenthood remain stable throughout the observation period. We test the validity of this assumption in Model 2, which adds interaction effects between primary activity, perceived economic uncertainty, and income on the one hand and interview year on the other. Table 2 summarizes the results of Model 2 by showing the results of likelihood ratio tests that indicate whether adding a specific interaction effect significantly improves model fit. Overall, the results provide little support for the hypothesis (H1b) that the effect of perceptions of economic uncertainty on the probability of having a first child has become more negative between the late 1990s and late 2010s. Including an interaction effect between job insecurity and interview year significantly improves model fit in only one case, and the interaction terms of this model run in the direction opposite to what was expected: compared to their counterparts who perceive their job to be secure, Swiss women who perceive their job as somewhat secure are more likely to conceive a first child in more recent years than at the start of the observation period. No evidence is found that the effect of job insecurity on the transition to parenthood changes throughout the observation period for Australian men and women, German men and women, Korean men and women, Russian men and women, or Swiss men.

Again, these findings for job insecurity are largely confirmed by the results for the other indicators of perceived economic uncertainty. There is no evidence that the effects of the perceived likelihood of finding a new job on the first birth rate changed over time for men and women in

TABLE 2 Likelihood ratio chi-square test statistics, comparing models with and without interaction effects of economic uncertainty and income with interview year

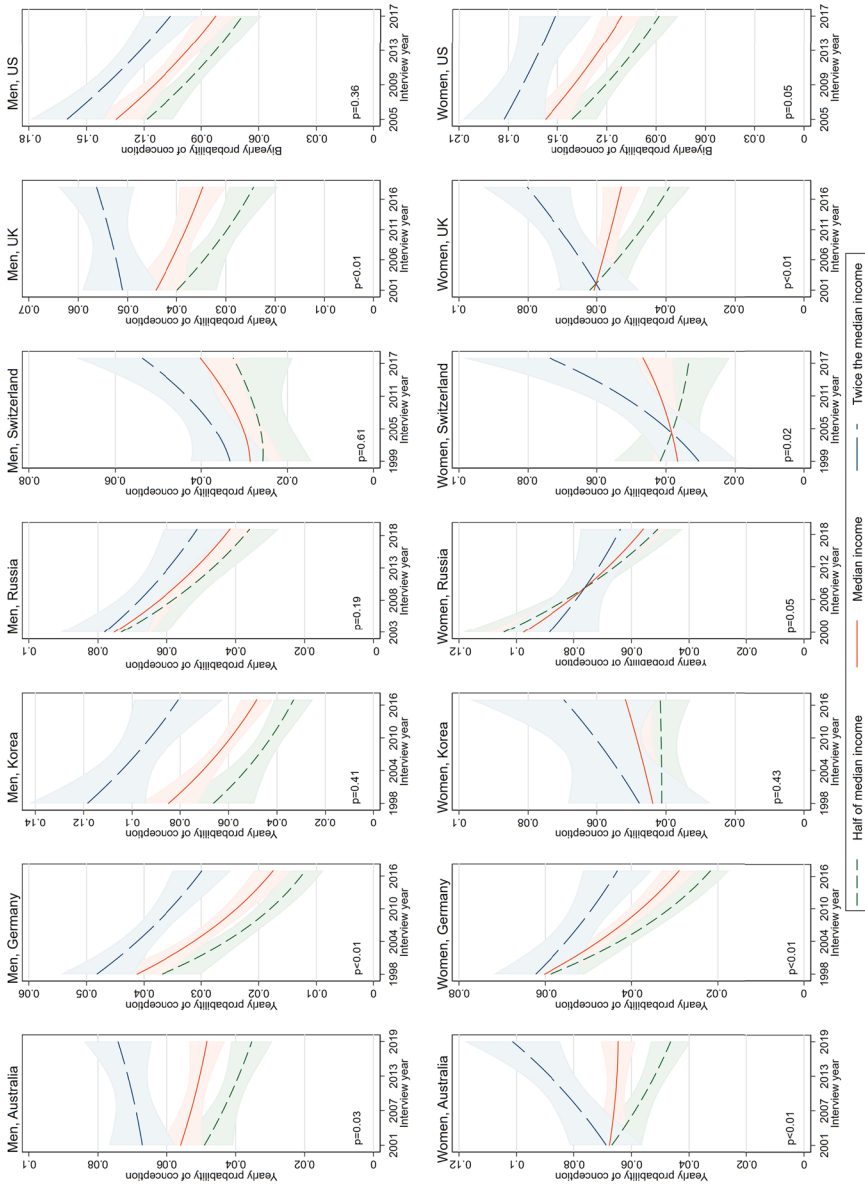
	Job insecurity (df = 2)	Perceived likelihood of finding a new job (df = 2)	Concerns about the own economic situation (df = 2)	Income (df = 1)
Men, Australia	4.73	0.29		4.64*
Women, Australia	2.99	3.87		11.20**
Men, Germany	3.21		6.10*	9.15**
Women, Germany	3.52		1.06	8.94**
Men, Korea	3.96			0.69
Women, Korea	1.32			0.62
Men, Russia	1.36	1.22	1.28	1.75
Women, Russia	1.13	1.63	0.12	3.77
Men, Switzerland	0.22			0.26
Women, Switzerland	6.23*			5.21*
Men, UK				7.41**
Women, UK				11.94**
Men, US				0.84
Women, US				3.98*

**p < 0.01, *p < 0.05 (two-tailed tests).

Australia and Russia. Likewise, the relationship between concerns about one's own economic situation and the transition to parenthood did not change over time for German women or for Russian men and women. The results conform to hypothesis (H1b) only for German men concerned about their economic situation: German men's concerns about their own economic situation are associated with a lower probability of becoming fathers only later in the observation period (i.e., in the 2010s), and the inclusion of an interaction effect between interview year and economic concerns significantly improves model fit ($p = 0.047$).

The last column in Table 2 shows that model fit improves considerably, and often significantly, when the interaction effect between income and interview year is added to the model. The relationship between income and the transition to parenthood varies significantly across the observation period for Australian men and women, German men and women, Swiss women, UK men and women, and US women. Furthermore, model improvement is almost statistically significant for Russian women ($p = 0.052$). In all models, the interaction effect between income and interview year is positive, providing clear support for the hypothesis (H2b) that the effect of income on the probability of having a first child has become more positive from the late 1990s to the late 2010s. Figure 5 illustrates the substantive meaning of this finding. It shows how the predicted probability that respondents will have a first child changes over time if they earn half the median

FIGURE 5 Changes in income effects over time



income, a median income, or twice the median income. Additionally, the significance levels included in Figure 5 show the results of the likelihood ratio tests reported in Table 2. Because the income variable is created by dividing respondents' income by the median income in each interview year, Figure 5 shows changes in the relationship between respondents' relative income position and the transition to parenthood over time. In almost all countries, the probability to become a parent decreased over time among respondents who earn a median income or lower, which aligns well with the macro-level trend toward postponement of parenthood. But the probability of first conception generally declined less, or even increased, among respondents who earn more than the median income. The resulting pattern that emerges from Figure 5 is one of divergence in the probability of becoming a parent by income. The interaction effects are strongest, and most consistent across countries, for women. Figure 5 shows that the probability of becoming a mother increased over the past two decades among women with high incomes relative to women with incomes below the median in all countries. In most countries, women's income toward the end of the 2010s was strongly and positively correlated with the probability of becoming a mother.

There is some evidence for increasing income effects for men, too, although the patterns in Figure 5 are less consistent across countries than they are for women. In Australia, Germany, and the United Kingdom, the relationship between men's income and the probability of first birth became more positive over time as it did for women in the same countries, and adding an interaction effect between income and interview year significantly improves the model. These results show that even in a period of increasingly positive income effects for women—likely paired with women's increasing contribution to the economic resources of the family—the income prerequisites of parenthood among men also seem to have increased in some countries. This observation supports hypothesis (H2b) and suggests that increasing income effects are not exclusively the result of a gender convergence in the effect of income on fertility. At the same time, however, Figure 5 shows no clear changes in income effects over time among men in Korea, Russia, Switzerland, and the United States. In Korea and the United States, men's income is strongly and positively associated with the probability of first conception, but this relationship did not change during the observation period. Income effects are smaller among Russian and Swiss men, and there is a high degree of uncertainty surrounding the estimates of changes in income effects across time for these groups. This variation in the changing correlation between men's income and fertility across countries may result both from actual country differences and from methodological differences between surveys, a point we reflect on in the "Discussion" section that follows.⁹

Discussion

Across affluent societies, men and women are becoming parents at increasingly older ages. In the search for explanations of this macro-level trend of fertility postponement, many scholars have pointed to the structural economic positions of young adults (Blossfeld et al. 2005; Brauner-Otto and Geist 2018; Seltzer 2019; Sobotka et al. 2011; Vignoli et al. 2020). However, the precise micro-level mechanisms or processes by which structural conditions bring about the macro-level postponement of childbearing remain unclear, as empirical research tends to focus on “objective” employment conditions in single countries while neglecting changes over time. We addressed these issues by studying trends in perceived economic uncertainty, income, and their relationship to fertility in a diverse set of countries. Our aim was to provide a broad overview of the changing relationship between economic positions and fertility decision-making over the past two decades.

In contrast to what is often assumed but has not been tested directly (e.g., Seltzer 2019; Vignoli et al. 2020), our findings suggest that young adults’ perceived economic uncertainty contributed little, if at all, to the macro-level trend of fertility postponement. First, perceptions of economic uncertainty did not show a structural increase over the past decades; rather, they seemed to follow the business cycle. Second, we found little evidence for an increase in the impact that perceptions of economic uncertainty have on the first birth rate over the past two decades, indicating that the importance of perceived economic security or stability as a prerequisite of parenthood has not increased. Third, perceived economic uncertainty was not associated with the probability of having a first child in most cases (i.e., the majority of combinations of gender, country, and uncertainty indicator). Moreover, in those cases where significant correlations between perceived economic uncertainty and the transition to parenthood were found, the direction of the effects seems to depend on the indicator of economic uncertainty used. On the one hand, perceptions of job insecurity deterred men and women in some countries from becoming parents. As a result, heightened perceptions of job insecurity may be one of the reasons for observed declines in fertility during economic downturns (Sobotka et al. 2011). Because the measurement of job insecurity in our data differs between countries, we can only draw tentative conclusions about the pattern of cross-national differences in the impact of job insecurity on the transition to parenthood. While keeping in mind this limitation, it seems from our findings that perceived job insecurity is most strongly associated with reduced fertility in liberal welfare states with strong economies but limited social security spending (e.g., Australia, Korea, the United Kingdom). One explanation may be that in these countries economic uncertainty is not so widespread that it is normalized (as may be the case in Russia), while at the same time there is no strong safety net that may mitigate the negative

effects that perceptions of job insecurity may have on fertility decisions (as may be the case in Germany).

On the other hand, we found a higher probability of becoming parents among Australian women who reported a lower confidence of finding a new job as well as among Russian men who were concerned about their economic situation. One explanation for this observation may be that some individuals wish to counter uncertain economic conditions by increasing certainty in the family domain (Friedman et al. 1994). Alternatively, anticipatory effects may be at play here, insofar as the expectation of having a child in the future may increase concerns about being able to provide for the future family.

Our findings do provide strong support for the expectation that the relationship between income and the transition to parenthood has become more strongly positive over the past decades. This is consistent with the theoretical argument that the income prerequisites of parenthood have increased over time as a result of changes in the (perceived) costs, practices, and norms regarding fertility, childrearing, and gender roles. The evidence is most consistent across countries for women: in affluent societies there seems to have been a general increase in the importance of women's income as a precondition for parenthood. In the late 2010s, the relationship between women's income and the first birth rate had turned positive in most rich societies, indicating that in recent years it were particularly women with high incomes who were becoming mothers. This finding fits well within the gender revolution framework (Esping-Andersen and Billari 2015; Goldscheider et al. 2015), indicating that with ongoing increases in maternal labor force participation and the rising compatibility of (full-time) female employment and childrearing, higher female incomes have come to facilitate rather than inhibit the transition to parenthood. Yet the enhanced compatibility of female employment and childrearing spurred by the gender revolution alone cannot account for the increasingly positive relationship between income and the transition to parenthood observed in our study. In several countries, we found that even in times of increasing economic contributions to the family by women, income effects on the first birth rate also became more strongly positive for men. This finding suggests that other processes have contributed to a more general increase in the income prerequisites of parenthood among men and women alike. We argue that a combination of a shift to more intensive parenting norms and practices, an emphasis on the careful planning of the life course, and the stagnating incomes of young adults compared to previous cohorts have increased the income prerequisites of parenthood over the past two decades. Taken together, these developments underscore the dynamic nature of norms and practices regarding fertility, childrearing, and gender, suggesting that established findings and theories are in need of constant revision.

Increases in the income prerequisites of parenthood most likely emerge from a combination of a growing tendency to have children at a point in the life course at which incomes are higher (tempo effect) and a relative shift of eventual childlessness from high-income to low-income individuals (quantum effect), although under the current study design we are unable to determine the relative importance of these two effects. Both tempo and quantum effects have important implications for the wider sociological and demographic literature. Regarding tempo effects, increasing income prerequisites provide an alternative explanation for the consistent postponement of parenthood in rich societies that has not received much attention so far. When the income prerequisites of parenthood increase, while the actual incomes of young adults improve relatively little or not at all, fertility postponement becomes an attractive strategy for young adults who wish to achieve a high income before having a first child, particularly since incomes generally increase with age. Although postponed births may be recuperated at later ages—when incomes have improved or income requirements have been eased—it seems likely that fertility postponement will in some cases result in forgone births (Kohler et al. 2002), also suggesting a link between increased income prerequisites and decreased completed fertility. Such quantum effects have implications for long-term processes of social stratification and the intergenerational transmission of (dis)advantage. On the one hand, a stronger link between income and fertility may have favorable consequences for children, as it increases the economic resources that can be invested in children's human capital. As such, our findings indicate a shift toward a life course trajectory that increases the resources available to children (cf. McLanahan 2004). On the other hand, increasing income prerequisites of parenthood raise important questions about the access to reproduction of different groups. As it becomes more common for young adults to postpone parenthood—and possibly forgo it entirely—when they do not have the economic resources perceived as necessary for starting a family, low-income groups may increasingly feel like they cannot afford to have children. Where previous research has shown a link between socioeconomic disadvantage and childlessness for men (Berrington and Pattaro 2014; Parr 2010), our findings suggest that this link may both strengthen and begin expanding to women in the years to come, thus depriving low-income groups of the meaning and identity they can derive from parenthood (see Edin and Kefalas 2011 [2005]).

Our study also has implications for policy makers in the governments of affluent societies who wish to increase fertility and facilitate the fulfillment of childbearing desires. An obvious approach to combating postponed fertility due to increasing income prerequisites of parenthood would be to increase the incomes of young adults. This may be done by increasing young adults' earnings from labor, but also by raising levels of public transfers (Aksoy and Billari 2018; Cowan and Douds 2022). Alternatively,

policies that decrease the (perceived) cost of fertility and childrearing likely help to increase fertility by decreasing the income prerequisites of parenthood. This strategy is in line with research that shows how expansions of public childcare and generous parental leave policies can increase fertility (see Bergsvik, Fauske, and Hart 2021 for a review).

However, it should be noted that we did not find support for our expectation of increasing income prerequisites of parenthood in all countries that we studied. Particularly for men, the findings seem to depend on the national context. On the one hand, specific country characteristics may prevent some or all of the mechanisms that we described in our theoretical framework from increasing the income prerequisites of parenthood. For example, the large growth in the incomes of young adults in Korea and Russia during the observation period (see Figure 2) may have prevented an increase in the prerequisites of men's income because of a large increase in relative income compared to previous cohorts in all income groups (East-erlin 1976). Furthermore, intensive parenting norms and rising individualism may have increased the income prerequisites of parenthood among US men already before the start of our observation period in the United States in 2005, which may explain the strong but stable relationship between the income of US men and the first birth rate throughout the observation period. On the other hand, differences in findings by national context may be a result of methodological differences between surveys. The countries in which we found no support or statistically insignificant support for the hypothesis that income effects on the transition to parenthood became more strongly positive over the past two decades also tend to be those with the smallest sample sizes, the shortest observation period, and the least encompassing income measure. In particular, the results for Switzerland should be interpreted with care, not only because of the relatively small sample size but also because in contrast to official statistics (see Figure 1) the SHP data did not show a postponement of parenthood during the observation period, but rather a shift of first childbearing to younger ages.

Our findings point to several fruitful avenues for future research. First, although we improved on previous studies that have often measured economic uncertainty using only "objective" characteristics, much more progress is possible in the operationalization of economic uncertainty. Confined by the questions that were asked about uncertainty in the panel surveys in our data, we focused on measures that capture respondents' expectations of future economic hardships rather than the perceived uncertainty surrounding these expectations. Future studies would benefit from additional measures that gauge respondents' perceived predictability of their (economic) future, which fits well with theoretical arguments on the links between uncertainty and family formation (Mills and Blossfeld 2005; Oppenheimer 1988). Some indications about the relevance of this approach are provided by the finding that Australian men who were somewhat

insecure—rather than very insecure—had the lowest probability of becoming parents, since it is they whose future may be most unpredictable.

Second, more research is needed to investigate the mechanisms behind the strengthening link between income and the transition to parenthood. One way forward would be to directly measure (changes in) the perceived economic prerequisites of parenthood, for example by using vignette studies to reveal norms and attitudes regarding perceived preconditions of childbearing. Alternatively, studies could utilize variation in childrearing costs and costs that are indirectly related to fertility, such as housing, to investigate their impact on the relationship between income and fertility. Furthermore, future work could examine the role of potentially changing relationships between income and union formation and stability. Given that greater income may increasingly be viewed as a desirable characteristic on the marriage market for men and women alike (Sweeney 2002), union formation and dissolution may play important roles as mediators in the changing relationship between income and fertility described in the present study.

Third, our sample size did not allow us to investigate differences between subgroups in the changing economic prerequisites of parenthood. Previous studies have shown a weaker relationship between economic conditions and fertility among disadvantaged groups, such as the less educated (Kreyenfeld 2010; Miettinen and Jalovaara 2020; Yu and Sun 2018) and migrants (Wood and Neels 2017), but it is unknown how differential fertility reactions to economic conditions change over time. These lines of inquiry are important, as variation in the way in which different groups change their fertility behavior in response to economic circumstances contributes to (changing) patterns in the intergenerational transmission of (dis)advantage by shaping the resources that are available to children.

Finally, our study presents one of the first empirical applications of the Comparative Panel File. We show how—despite differences in survey design and questionnaires between countries—these data can be fruitfully employed to uncover similarities and differences in longitudinal relationships across countries as well as to give a broad overview of the generality of empirical relationships and trends. The CPF is thus a promising source of cross-national longitudinal data, and our study will hopefully serve as a motivating force for the expansion of these data through the addition and harmonization of new survey waves, variables, and countries.

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Data availability statement

The data that were used in this study are available free of charge after registration at the websites of the surveys.

Notes

1 Many studies did find effects of job insecurity in specific subgroups, showing, for example, that job insecurity decreases fertility among higher educated women (Glavin et al. 2020; Kreyenfeld 2010) or in regions with low unemployment rates (Glavin et al. 2020).

2 Hays (1996) originally coined the term “intensive mothering,” but it has since been changed to “intensive parenting” to also reflect its relevance to fathers (Gauthier et al. 2021).

3 It should be noted, however, that the shift to intensive parenting may also result in a weakening of the economic preconditions

of parenthood, as the increase in parents’ time investments in children may force them to take more time off to care for children and therefore raise the opportunity costs of parenthood.

4 Additional analyses show that results change only marginally when including a separate category for the self-employed.

5 The results of complementary log–log models are very similar to those reported here.

6 Specifically, when testing the significance of the interaction effect between job insecurity and interview year, the reduced

model includes interaction effects between interview year on the one hand and primary activity, income, and—if included in that country—an income imputation dummy on the other hand. Likewise, when testing the significance of the interaction effect between income and interview year, the reduced model includes interaction effects between interview year on the one hand and job insecurity, primary activity, and—if included in that country—an income imputation dummy on the other hand.

7 Given that the birth of a first child is a nonrepeatable event, a correction of the dependence of observations within the same individual is not required in our study (Allison 2014).

8 The effects of women's job insecurity in the BHPS are significantly negative when we change the categorization by including a separate category for women who are completely satisfied with their job security. In ad-

dition, Swiss men who perceive their jobs to be insecure are significantly less likely to conceive a first child than their secure counterparts when the self-employed are included in a separate category.

9 As a robustness check, we estimated additional models that replaced the quadratic specification of the age effects with separate age dummies for each year. This was done to ensure that the results are not influenced by age effects that are not captured by the quadratic specification. The results of these models are generally very similar to those reported in the paper, indicating that our quadratic specification captures the age patterns in our data well. However, when age dummies are included in the model, the inclusion of an interaction effect between income and interview year no longer leads to a significant improvement of model fit for women in the United States, whereas the improvement of model fit turns significant for Russian women.

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