Human Reproduction Update, Vol.17, No.6 pp. 848–860, 2011
Advanced Access publication on June 7, 2011 doi:10.1093/humupd/dmr026

human reproduction update

Why do people postpone parenthood? Reasons and social policy incentives

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Submitted on August 16, 2010; resubmitted on April 20, 2011; accepted on May 10, 2011

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BACKGROUND: Never before have parents in most Western societies had their first children as late as in recent decades. What are the central reasons for postponement? What is known about the link between the delay of childbearing and social policy incentives to counter these trends? This review engages in a systematic analysis of existing evidence to extract the maximum amount of knowledge about the reasons for birth postponement and the effectiveness of social policy incentives.

METHODS: The review followed the PRISMA procedure, with literature searches conducted in relevant demographic, social science and medical science databases (SocINDEX, Econlit, PopLine, Medline) and located via other sources. The search focused on subjects related to childbearing behaviour, postponement and family policies. National, international and individual-level data sources were also used to present summary statistics.

RESULTS: There is clear empirical evidence of the postponement of the first child. Central reasons are the rise of effective contraception, increases in women's education and labour market participation, value changes, gender equity, partnership changes, housing conditions, economic uncertainty and the absence of supportive family policies. Evidence shows that some social policies can be effective in countering postponement.

CONCLUSIONS: The postponement of first births has implications on the ability of women to conceive and parents to produce additional offspring. Massive postponement is attributed to the clash between the optimal biological period for women to have children with obtaining additional education and building a career. A growing body of literature shows that female employment and childrearing can be combined when the reduction in work–family conflict is facilitated by policy intervention.

Key words: fertility / maternal age / public policy / infertility

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Introduction

With the introduction of the 'pill' and other reliable, non-coital contraceptive methods in the 1960s, individuals were increasingly able to control their own reproduction (Goldin and Katz, 2002; Bailey, 2006; Leridon, 2006). The availability of these effective contraceptive methods provided a stepping stone for broader female emancipation with women able to depart from unwanted aspects of reproduction and occupying exclusively the mother role (Van de Kaa, 1987; Blossfeld, 1995). As educational, employment and career opportunities opened for women, they could choose between motherhood and other activities, which have fundamentally altered the temporal pattern of reproductive behaviour (Van de Kaa, 1987; Goldin, 2006). As women increasingly left the home to engage in paid labour, dual-earner families arose and deeply altered men's family roles (Hobson, 2002; Hook, 2006). The result has been a massive delay in childbearing in Europe (Kohler *et al*., 2002; Sobotka, 2004a, b) and in certain groups (highly educated) in the USA and elsewhere (Rindfuss *et al*., 1988; Heck *et al*., 1997). This shift from early to late timing of childbearing refers to what Kohler *et al*. (2002) first coined as the 'postponement transition', later elaborated upon by others (Goldstein *et al*., 2009). Sobotka (2004a, b) demonstrated that it is this increasing age at motherhood that resulted in the period of the 'lowest-low' fertility observed in Europe.

In addition to competing with education and employment aspirations, parenthood has increasingly become an issue of personal preference, involving such possibilities as voluntary childlessness and postponement until a period in life when raising children is more consistent with women's chosen career path or other life goals (Blossfeld and Huinink, 1991; Andersson, 2000; Kneale and Joshi, 2008). Low gender equity (McDonald, 2006), changes in partnership behaviour (Baizán *et al*., 2003; Testa, 2007), limited housing availability (Mulder, 2006; Rindfuss and Brauner-Otto, 2008) and economic uncertainty (Adserà, 2004; Mills *et al*., 2005; Kreyenfeld, 2010) are further determinants that drive postponement.

From a strictly biological perspective, however, the postponement transition has resulted in couples having children in a period when women's fecundity is already in decline (te Velde and Pearson, 2002). Using data from so-called 'natural fertility' populations where virtually no birth control is practised, we know that fecundity starts to decline from age 25, with the decline accelerating in the mid-30s (Bongaarts, 1975; Leridon, 1977; Wood, 1989). Previous estimates (e.g. Henry, 1965; Leridon, 2004) have varied in their reporting of the prevalence of sterility by age. More recent estimates by Leridon (2008) show that the prevalence of sterility increases from 1% at the age of 25 to 5% at age 35, 17% at age 40 and up to 55% at age 45. Under natural conditions, 75% of women who try to conceive at age 30 will have a conception ending in a live birth within 1 year; 66% at age 35 and 44% at age 40 (Leridon, 2004). It should be noted, however, that these figures may be misleading since pregnancies in older couples are less likely to result in a live birth. For instance, although only 5% of couples in which the woman is 35 years old are sterile, ~20% of women conceiving at that age will experience spontaneous abortion (Leridon, 2008).

In contrast to what lay people and infertile patients are often inclined to think (Lampic *et al*., 2006), Assisted Reproductive Technologies (ART) such as *in vitro* fertilization (IVF) cannot fully compensate for age-dependent loss of fecundity due to the fact that the success rates of these techniques sharply decrease with age (Leridon, 2004). Fertility awareness studies have demonstrated that men and women are often unaware of the age-related relationship to an increased risk of infertility, involuntarily childless or inability to have as many children as they desire (Schmidt, 2010). Lampic *et al*. (2006) demonstrated that women's fecundity at older ages and the success of IVF treatments is often overestimated. Other studies, such as Tough *et al*. (2007) reported that only just over 50% of respondents were aware that women over the age of 35 had more difficulties conceiving a child and that less than half were cognizant of the relationship between older mothers and higher risks of stillbirths, multiple births and preterm delivery.

Figure 1 demonstrates that individuals often overestimate the age at which a woman is able to have more children. The Figure shows that on average, Europeans report that a woman is only too old to have children after the age of 40 in 20 of the 23 countries. Since the question asks 'after what age would you say a woman is generally too old to consider having any more children?' it might also be that individuals interpret this not only in biological terms, but also in relation to the normative acceptability of older parents.

The detrimental individual consequences of involuntary childlessness are considerable, with individuals shown to have higher levels of clinical depression and relationship dissolution, lower levels of self-esteem, guilt and isolation (Meller *et al*., 2002). Older mothers also have considerably more problems during gestation and delivery, have a higher risk of birth defects and have more complications after delivery, all resulting in higher morbidity and health-care costs (Allen *et al*., 2006; Luke and Brown, 2007). Delay of childbearing also leads to more breast cancer. From age 20 to 25 onwards, the relative risk of breast cancer increases by 3% for every year a woman delays having her first child (Collaborative Group on Hormonal Factors in Breast Cancer, 2001).

Longitudinal studies have also demonstrated numerous positive aspects related to childbearing at a later age, such as better family functioning, higher family stability and a more stable economic position of parents. Children born to parents over the age of 25 have been shown to have significantly greater odds having a more favourable home environment, which leads to better long-term outcomes such as higher self-sufficiency in adulthood (Hardy *et al*., 1998). In comparison with mothers over the age of 30, children of teenage mothers have been shown to have less favourable educational and psychosocial outcomes (Fergusson and Woodward, 1999). This is associated with the fact that older parents are more likely to raise children in environments that are more supportive and stable. The delay of motherhood also has a significant and positive impact on women's wages and career paths, particularly for the higher educated (Taniguchi, 1999; Miller, 2010).

The aim of this paper is to provide a comprehensive overview of the underlying reasons of why women and their partners postpone having children. We also ask if specific social policy incentives have been effective in countering postponement trends. This focus extends existing research due to that fact that the majority of researchers and policy-makers have largely focused on increasing the number of children at the expense of considering policies that might counter the delay of childbearing.

The terms fertility and infertility take on different meanings in demography and reproductive medicine (Habbema *et al*., 2004). In

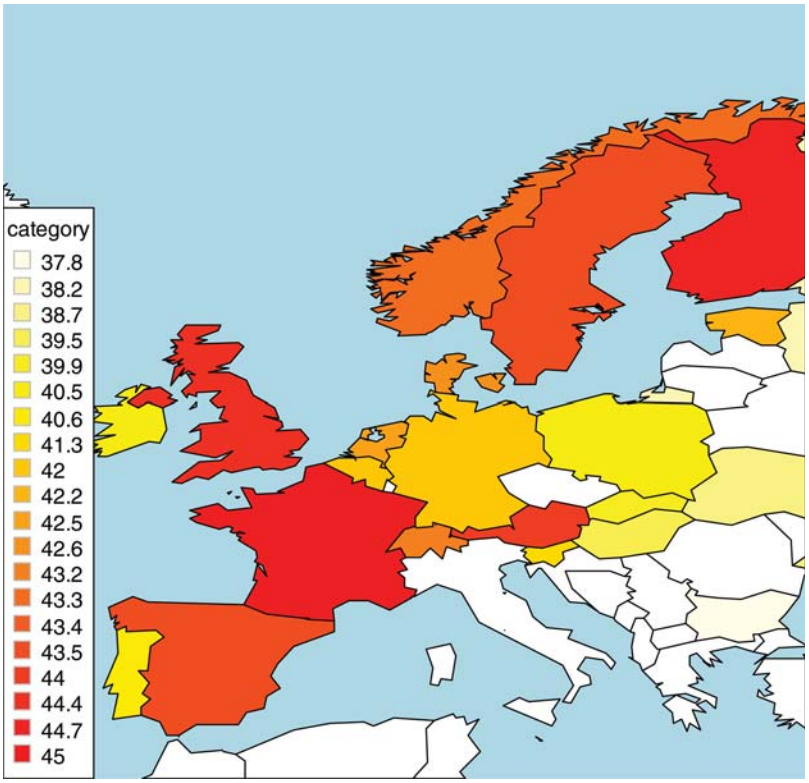

Figure 1 Reported age that a woman is too old to consider having more children, respondents aged 25–42 years old, selected European countries. *Source:* Created by authors using Wave 3 of the European Social Survey, collected in 2006 in 23 countries. *Notes:* Analysis restricted to individuals aged 25-42 years old at the time of the survey. The specific question (38a) asked: After what age would you say a woman is generally too old to consider having any more children?

reproductive medicine, the term infertility denotes the ability/inability of couples, women or men, to conceive and have children given unprotected intercourse (Joffe, 2010), while in demography this is signified by the terms (in)fecundity or sterility. In demography, fertility refers to performance, the bearing of live births and demographers talk about two interrelated aspects of the *tempo* of childbearing and the *quantum* or actual number of children that women have during a certain period (Bongaarts and Feeney, 1998). Postponement of fertility, which is the central topic of this review, refers to tempo and the shift to a later age at first birth. Postponement is obviously highly related to quantum since the delaying of first births may result in a lower quantum, or number of children. To avoid confusion, we do not use the term 'fertility' in the remainder of this paper except when it is part of a technical term.

Methods

As a basis for this review, we followed the PRISMA 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses' procedure (Moher *et al.*, 2009), which includes the stages of identification, screening, eligibility and finally the included material for the review. The selection process is outlined in Fig. 2. In the first phase, we were able to identify 307 records through literature searches conducted in relevant demographic, social science and medical science databases (SocINDEX, Econlit, PopLine, Medline). During this search, we focused on subjects related to childbearing behaviour, postponement, delay and family policies (maternity, parental-leave, child-care, family law and policy areas where family is incorporated including taxation, housing, social security, heath care, civil law).

We then read through the reference lists of the relevant studies, and were able to locate additional relevant studies, in addition to related material suggested by the anonymous reviewers for a total of 23 additional records. In the second stage of the screening process, we removed duplicate records ($n = 4$) for a total of 326 records. During this screening process, we also removed 29 foreign-language articles (e.g. Croatian, Portuguese, Czech).

In the third stage of our review, we tested for more specific content-related eligibility and excluded a total of 158 records where the content matter was not directly related to our topic of fertility postponement in contemporary societies. Our initial search was as broad as possible and not geographically restricted in order to include as many relevant records as possible. The bulk of the excluded records ($n = 67$), included a large number of articles that focused specifically on Sub-Saharan Africa or non-industrialized societies. This was followed by articles that were more specifically related to marriage and household structures than fertility ($n = 32$), technical, statistical or econometric focus ($n = 19$) or historical studies ($n = 10$). The remaining smaller categories included articles that covered non-related medical aspects (e.g. animal models, fertility preservation), specific ethnic groups and adolescent sexuality. As shown in the previous section, when necessary, we also report summary statistics using national, international and individual-level data sources.

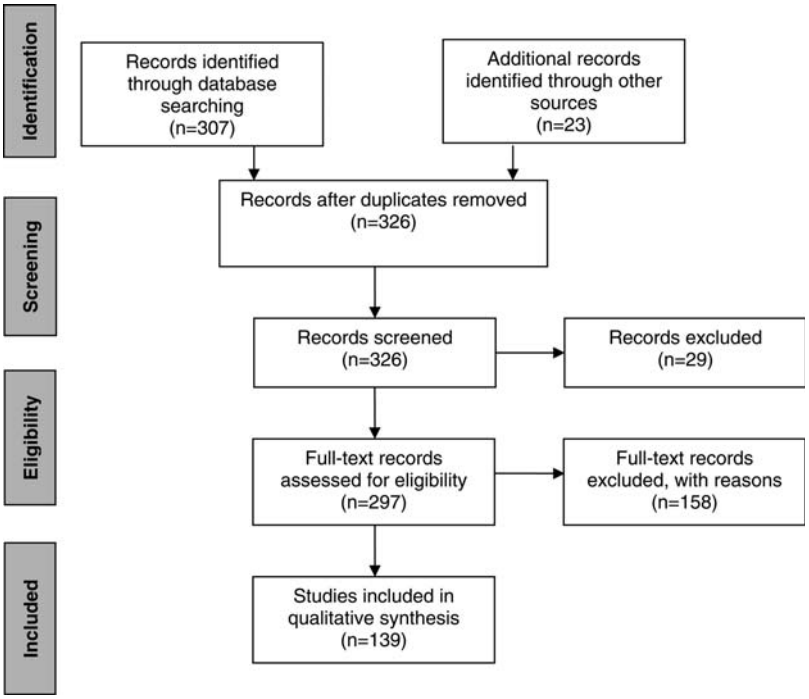

Figure 2 PRISMA flow diagram of review process.

Evidence of fertility postponement

As Table 1 illustrates, with the exception of the USA, the mean age of mothers at first delivery has increased by ~1 year each decade across OECD countries since the 1970s. This is a substantial postponement of parenthood, particularly in European countries and Japan, with the average age of first birth rising by ~4 years from 25 years in 1970 to 29 years in 2008. Iceland has the highest average years of postponement, with women having their first children on average over 5 years later over the span of 40 years. This is closely followed by the Czech Republic, Denmark, Germany, Hungary, the Netherlands, Luxembourg and Switzerland. The lowest level of change is witnessed in the USA, with a relatively marginal difference of 1.5 years. Never before have European women had their first births so late, with many countries nearing the average age of 30 for a first child. We should note that these are general averages and that the age of first birth differs between groups. As Fig. 3 shows, highly educated women are often driving this trend by having their children at a later age, also demonstrated in previous research (e.g. Rindfuss *et al.*, 1996; Goldin and Katz, 2002)

Reasons for postponement

Introduction of contraceptive technology

Efficient and reliable oral contraceptives, commonly known as 'the pill' were introduced in the early 1960s, which revolutionized fertility behaviour in many modern societies. In a detailed econometric analysis, Goldin and Katz (2002) demonstrated how the diffusion of the pill in the late 1960s in the USA resulted in an almost immediate postponement in the age of first marriage for college-educated women. The relaxing of US state laws allowed young, single women to obtain the pill, allowing them to remain longer in education, invest in a longer term labour market career and avoid pregnancy while being sexually active. For the first time, women were able to delay marriage and entry into parenthood without experiencing the penalty of abstinence or the uncertainty of becoming pregnant.

Although contraceptives are generally widely accepted across Western and Northern Europe, their use and the type of method varies widely across Europe. Women in Northern and Western Europe have been shown to use more effective methods of contraception such as oral contraceptives (Spinelli *et al.*, 2000; Skouby, 2004; Cibula, 2008). Less reliable techniques such as periodic abstinence and withdrawal remain relatively common in Southern Europe as well as among older women and those with lower education (Spinelli *et al.*, 2000). Eastern European countries have also been shown to be in a different phase of the contraceptive revolution. Although the oral contraceptive revolution has occurred in many modern societies such as the USA and Western and Northern Europe and is a central factor contributing to fertility postponement, a sizeable number of women in Southern and Eastern Europe continue to either use no contraception or unreliable methods (Skouby, 2004; Cibula, 2008). Since fertility has also dropped in these regions, this suggests that other, more social and culturally-driven factors are related to postponement.

Educational level and field of study

The association between female education and age at becoming a parent is well-documented. Early studies demonstrated a strong inverse relationship between education and fertility, with education

Table 1 Rising mean age of women at first childbirth, 1970–2008, selected OECD countries.

Mean age of women at first child birth						
Country	**1970**	**1995**	**2000**	**2005[a]**	**2008**	**Years of postponement (1970–2008)[b]**
Austria		25.6	26.4	27.2	27.8	—
Belgium	24.3	27.3		27.4	27.9	3.6
Czech Republic	22.5	23.3	25	26.6	27.3	4.8
Denmark	23.8	27.4	27.7	28.4	28.4	4.6
Finland	24.4	27.2	27.4	27.9	28.2	3.8
France	24.4	28.1	27.9	28.5	27.8	3.4
Germany	24	27.5	28.2	28.1	28.5	4.5
Greece	25	26.6	27.5	28.5	28.7	3.7
Hungary	22.8	23.8	25.1	26.7	27.2	4.4
Iceland	21.3	25	25.5	26.3	26.5	5.2
Ireland		27.3	27.6	28.5	28.7	—
Italy	25	28		28.7		3.7
Japan	25.6	27.5	28	29.1	28.9	3.3
Luxembourg	24.7	27.4	28.4	29		4.3
Netherlands	24.8	28.4	28.6	28.9	29.1	4.3
Norway		26.4	26.9	27.7	27.8	—
Poland	22.8	23.8	24.5	25.8	26	3.2
Portugal		25.8	26.5	27.4	27.7	—
Slovakia	22.6	23	24.2	25.7	26.4	3.8
Spain		28.4	29.1	29.3	29.5	—
Sweden	25.9	27.2	27.9	28.7	28.8	2.9
Switzerland	25.3	28.1	28.7	29.5	29.6	4.3
United Kingdom		28.3	29.1	29.8	27.5	—
United States	24.1	24.5	24.9	25.1	25.6	1.5
Mean all countries[c]	25.6	27.8	28.5	29.3	29.4	3.8

Source: 1970–2005 OECD (2009) and 2008, VID (2010).
[a]2003 for Finland, Greece, Spain and United Kingdom.
[b]If dates were unavailable in 2008, differences were calculated using 2005 dates.
[c]Mean calculated for all countries where data were available.

impacting the timing of first births (Rindfuss *et al*., 1980; Martin, 2000). Women's increased education, such as higher college and University degrees, resulted in a significant shift to later ages of childbearing in the USA (Rindfuss *et al*., 1988, 1996; Martin, 2000). As the cross-sectional snapshot in Fig. 3 illustrates, European women born in the 1960s (ranging from ages 31 to 46 at the time of the interview) with a higher post-secondary or tertiary education had their first child considerably later than those with lower secondary education only.

There are a number of arguments regarding why increasing education might lead to childbearing delay. One of the most important simply involves balancing student and mother roles. Both are time-intensive, making it difficult to do them simultaneously. Hence, women who desire high educational attainment levels are likely to postpone parenthood. Further, better-educated women are likely to pursue careers, that is, a series of job steps that progressively entail more responsibility, higher remuneration and greater authority and autonomy (Amuedo-Dorantes and Kimmel, 2005). Those willing to pursue careers may postpone childbearing until they are well established on their career path (Happel *et al*., 1984; Becker, 1991). A related point is that children are expensive and prospective parents with higher education levels have steeper age-income profiles. Hence, those with higher education levels might delay childbearing until they feel they can 'afford' them. All of these arguments predict a later age at first birth for women with higher educational aspirations and attainment.

Previous research repeatedly demonstrated that a later age at first birth is associated with lower levels of completed childbearing, partly because of the biological reasons discussed above and partly because the longer one remains childless the more likely one might acquire interests that compete with the time required for the parental role (Kohler *et al*., 2002). There are suggestions, however, that this inverse relationship between age at first birth and cumulative childbearing is weakening. For the USA, Martin (2000) demonstrated widening educational differentials in the timing of births. In comparison with women with lower education, both the rate of first and second births after the age of 30 increased during the 1970–1990s for women with a 4-year college degree. Sobotka (2004a, b) also showed that the lowest-low fertility rates observed in Europe were

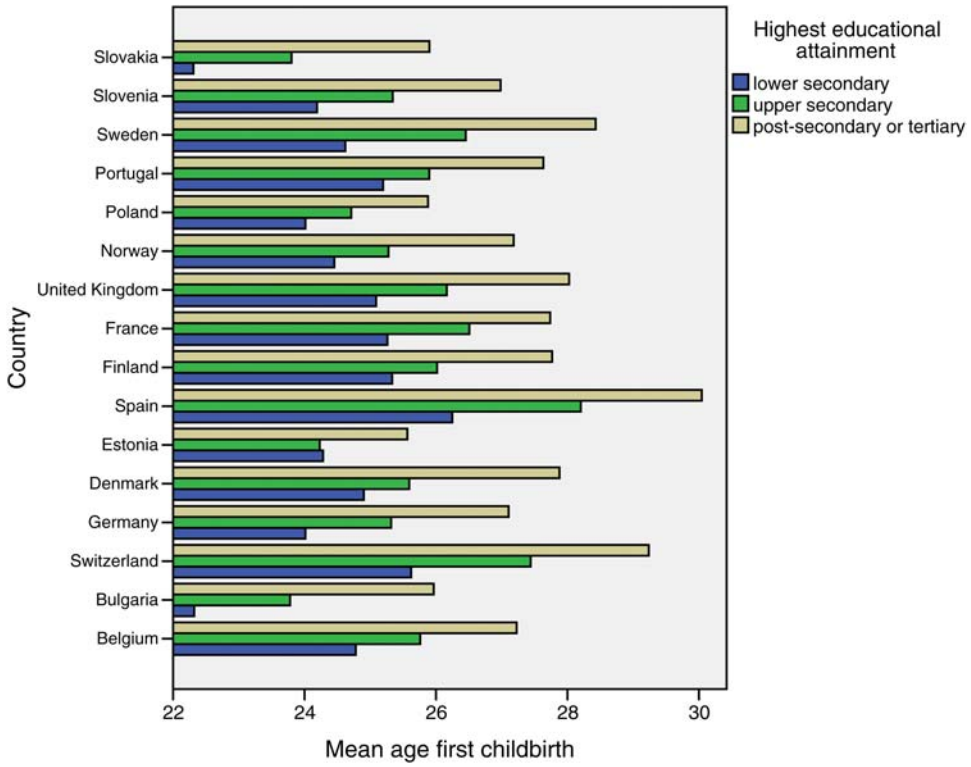

Figure 3 Mean age at first birth by educational level, women born 1960–1969, selected European countries. *Source:* European Social Survey, 2006, women only, born 1960–1969, $n = 7307$, calculations by authors.

likely temporary, since higher educated women would eventually recuperate and have children at a later age. A recent study of Norwegian men and women by Kravdal and Rindfuss (2008) supported previous findings that better-educated women have later first births. They did, however, find that the relationship between education and overall children ever born, and hence the cumulative impact of late motherhood on higher-order birth rates (i.e. second or third births) has disappeared in Norway. They attributed this to family-friendly ideologies which translate into policies such as better access to high-quality and convenient daycare. Comparable data for education and completed childbearing are not available for most low-fertility countries, making it unclear whether the Norwegian case will be generalizable.

The field of education has also been shown to have consequences for the timing and number of children (Lappegård and Rønsen, 2005; Hoem *et al*., 2006; Martin-Garcia and Baizan, 2006). Van Bavel (2010), for instance, demonstrated that four features of study disciplines were key to reproductive decision-making: the expected starting wage, steepness of the earning profile, attitudes towards gendered family roles and gender composition. Across 21 European countries, the postponement of first birth was the most pronounced for women who had studied in male-dominated disciplines and least postponed by those in the more female-dominated fields. The starting wage and steepness of the earning profile were also associated with postponement. Using the 2006 census of Australia, McDonald and Kippen (2009) found that the level of childbearing is strongly related to the type of tertiary qualification with those in caring and personal services having more children than those with technical, social/humanities or creative arts qualifications. This suggests that there is more than just delay involved. Either women self-select into educational paths that lead to jobs where they are more able to combine motherhood and employment or the difficulty of combining career and children varies by chosen career type.

Women's labour force participation

Women's labour force participation has been linked to the postponement of childbearing in several ways. Within the sociological literature the focus is on the incompatibility between caring for children and participation in the paid labour force (Brewster and Rindfuss, 2000). This topic has been extensively addressed in a large body of 'work-family conflict' literature, which cannot be fully addressed within this review (e.g. see Voydanoff, 1988). Budig (2003) demonstrated that both part- and full-time employment decreased the likelihood that women would become pregnant in the USA. Bernhardt (1993) argues that although the role incompatibility between paid employment and motherhood has weakened over time due to women's ability to work part-time and higher levels of institutionalized child care, unequal gender structures and power relations within marriage continue to inhibit fertility. We will return to the issue of household gender inequality and fertility in a later section. We also address the growing body of research suggesting that female employment and childrearing can be combined when policies and institutions facilitate

the reduction in the role incompatibility of paid work and motherhood (Bernhardt, 1993; Oppenheimer, 1994; Rindfuss *et al.*, 2007).

A second set of arguments, primarily made by economists, links early child bearing to a high motherhood 'wage penalty' and demonstrates that postponement of motherhood results in substantial increases in earnings, particularly for higher educated women and those in professional occupations (Taniguchi, 1999; Gustafsson, 2001; Joshi, 2002; Amuedo-Dorantes and Kimmel, 2005; Gustafsson and Kalwij, 2006; Miller, 2010; O'Donoghue *et al.*, 2011). This literature suggests that young adults who expect a future income increase will delay childbearing until their income actually increases (Happel *et al.*, 1984). In a detailed econometric analysis, for instance, Gustafsson (2001) demonstrated that women's career planning was the main explanation for postponement, a finding replicated in more recent studies in Ireland (O'Donoghue *et al.*, 2011) and the USA (Miller, 2010).

If a woman drops out of the labour force before or soon after giving birth, she will not only lose wages she might otherwise have received (absent a generous maternity benefit), she will also likely lose valuable training opportunities as well as depreciation of her job-specific human capital. The strong impact of the depreciation of women's human capital during career interruptions has been empirically demonstrated in various studies, such as in the USA (Baum, 2002) and Sweden (Albrecht *et al.*, 1999). In the USA, Budig and England (2001) estimated a 7% mother wage penalty per child. In a more recent US study, Miller (2010) demonstrated how a year of delayed motherhood increased women's career earnings by 9%, their work experience by 6% and average wage rates by 3%.

Ideational shifts: norm and value changes

The theory of the second demographic transition is often used to understand changes in fertility since the late 1960s, of which a central component is ideational or value shifts (Van de Kaa, 1987; Lesthaeghe, 1995). The core of this framework links falling fertility rates since the late 1960s in Europe to ideational change in the motivation to have children and a shift to an 'individualistic family model'. This relates to the sociological literature on 'individualization' (Beck and Beck-Gernsheim, 2001). Here, the central argument is that the departure from traditional ideas, values, norms, beliefs and ideologies generates greater individual autonomy in decision-making.

In the second demographic transition framework, ideational and cultural changes, including the emergence of higher desires for self-fulfillment, choice, personal development and emancipation, drive many fertility decisions. Late childbearing is related to a shift in smaller family size preferences, where most couples in modern societies desire to have only two children (Goldstein *et al.*, 2003), and preferably one of each sex (Mills and Begall, 2010). Couples perceive that they can 'afford' to start later due the fact that they only wish to have just two children.

Lesthaeghe and Meekers (1986) demonstrated that entry into first partnership and parenthood is conditioned by ideational changes with individuals and couples increasingly making the transition to parenthood to satisfy their own personal needs. These needs include factors such as personal development, but also having children as an expression and extension of one's self.

A related aspect is the irrevocable change in the role and position of children (Ariès, 1980; Van de Kaa, 1987). In contrast to their need to provide economic support and labour to support parents, the subsequent decline in the birth rate in the late-eighteenth century was related to the child becoming a locus of emotional and financial investment or the 'child-king'. The child, they argued, was increasingly occupying a less central place in couples' lives. Liefbroer (2005) also empirically demonstrates that children have emerged as something to be carefully planned that might influence the partnership, lifestyle and further economic well-being of parents.

Gender equity

Gender equity can be examined at the societal (e.g. political, educational empowerment), household (e.g. division of labor) and individual level (e.g. gender role attitudes). It has been posited by some as a central factor to understand changes in fertility behaviour (Mason and Oppenheim, 1997; McDonald, 2000a, b, 2006; Neyer, 2006).

The 'gender system' at the societal or institutional level in each country constitutes the different rights and obligations afforded to men and women. Core institutional factors of societal gender equity include: level of educational attainment, economic participation and opportunity, health and political empowerment (Jütting *et al.*, 2008). These factors in turn enable or constrain women and couples to combine work and family activities, and hence influence the timing of childbearing. When women are at face value, for example, offered similar educational and employment opportunities of men, but these opportunities are then severely restricted by having children, women will react by having less and later children (Chesnais, 1996). Women's employment leads to postponement of childbearing when institutional constraints are large, such as the lack of childcare, low benefit levels or gender-segregating policies that, as Neyer (2006, p. 16) argues 'signal to women that it might be difficult, if not impossible, to combine employment and motherhood.'

Higher institutional gender equity, such as that witnessed in Scandinavia, enables individuals to combine work and family, thereby either preventing or stopping the process of additional birth postponement (Chesnais, 1996; McDonald, 2000a, b, 2006). Conversely, very low levels of gender equity, combined with individually oriented institutional contexts will result in very low levels of fertility. Few studies have attempted to empirically confirm the impact of societal gender equity on fertility. A recent exploratory study estimated multilevel models to examine the predictive power of five societal-level gender equity indicators on fertility intentions and behaviour across 24 European countries (Mills, 2010). Only the Gender Development Index (GDI), with its emphasis on human (economic) development, adjusted for gender, predicted a significant positive effect of gender equity on fertility intentions. However, since it is highly disputed whether the GDI is actually a measure of gender equality or simply economic security or national prosperity (Jütting *et al.*, 2008), it difficult to draw firm conclusions. These societal-level indices also lack attention to income transfer arrangements that support gender inequality such as occupationally based social insurance, earnings-based benefits, joint taxation rules or availability of affordable and available childcare (Kreyenfeld and Hank, 2000).

A series of empirical studies have also demonstrated that the unequal distribution of household labour impacts fertility, but generally

only focus on higher order fertility transitions (Oláh, 2003; Miller Torr and Short, 2004; Tazi-Preve *et al*., 2004; Mills *et al*., 2008). This is due to the fact that the experience of parenthood often means a crystallization of gender roles, with women increasing time spent in housework and childcare in comparison with men only after the birth of the first child (Bianchi *et al*., 2000; Gershuny, 2000; Hook, 2010) making this aspect less relevant to this current review.

A final body of literature has examined gender at the individual level in relation to the impact of egalitarian gender roles on fertility, producing mixed results, particularly for men (Westoff and Higgins, 2009; Goldscheider *et al*., 2010). Some studies suggest that more egalitarian gender role attitudes of men result in higher fertility (Kaufman, 2000; Puur *et al*., 2008). However, other studies have found that more gender egalitarian roles of men result in lower rather than higher fertility (see Westoff and Higgins, 2009). Recent empirical studies also show that social networks, pressure and capital impact fertility decisions, particularly when there is little institutional support (Balbo and Mills 2011). More empirical research across various contexts are required to understand this relationship.

Partnerships

Over the past decades, individuals are increasingly more likely to have had multiple partners before the birth of their first child (Wu and Schimmele, 2005). This is related to the rise of unstable forms of unions such as unmarried cohabitation (Heuveline and Timberlake, 2004), the 'retreat from marriage' (Gibson-Davis *et al*., 2005) and increases in the level of divorce (Amato, 2000). The rise of cohabitation has been associated with delays of entry into marriage (Bumpass *et al*., 1991; Mills, 2004), which in turn can be related to a delayed entry into parenthood. In many countries, non-marital cohabitation serves as a 'trail stage' before marriage (Manning and Smock, 2002), which likewise increases the time to having a first child. Baizán *et al*. (2003) demonstrated that in Spain, cohabitation, marriage and first births were highly interrelated, with a much smaller likelihood that individuals would conceive while cohabiting in comparison with married individuals. Brown (2000) also reported that almost one-third of all non-marital births in the USA were to formerly married mothers.

In addition to the rise of unstable and multiple partnerships, difficulties in finding a partner may also contribute to delayed fertility or childlessness. In a cross-national European study, Testa (2007) showed that having a supportive partner was the factor deemed second-most important (health of the mother being the first) among childless men and women in the decision to have a child. A delay in childbearing may also mean that women experience a relationship breakdown before having the opportunity to give birth and forming a new relationship takes time. However, it may be that causality is in the opposite direction and that women tend to avoid marriage, particularly in the less gender-equal societies (e.g. Japan) because they do not want to be forced into motherhood and out of employment (Rindfuss *et al*., 2004).

Housing and economic uncertainty

The housing market is an example of a social structural factor that can inadvertently impact age at first birth (Rindfuss and Brauner-Otto, 2008). In Italy, mortgage lenders require large (as high as 50%) down-payments when purchasing a house (Mulder, 2006), partly because credit histories are not as widely available as in other countries and partly because foreclosures cannot be enforced until 48 months after mortgage payments have ceased—in contrast to as little as 2.5 months in the Netherlands (Chiuri and Jappelli, 2003). Under these circumstances, it is more difficult for young Italians to purchase a house, and this undoubtedly leads to the postponement of parenthood. In countries where it is easier to obtain a mortgage or enter the public rental market, individuals are more able to establish themselves and enter into family formation earlier (Mulder, 2006).

A growing number of studies have linked economic uncertainty, in the form of unemployment, temporary contacts and unstable labour market situations to first birth postponement due to the inability to make long-term binding decisions. In an examination of 23 OECD countries, Adserà (2004) demonstrated how high unemployment and unstable contracts depressed fertility. This was particularly the case for young women and in Southern European countries. In these contexts, early-skill acquisition was essential to establish oneself in the labour market, resulting in many young women either postponing or abandoning childbearing. In a 14-country comparison, Mills *et al*. (2005) concluded that when youth were in an uncertain labour market position, such as having a temporary contract, experienced job instability or being unemployed, they were significantly more likely to postpone first births. The impact of economic uncertainty on postponement was also influenced by whether there was a stronger social safety net to cushion individuals from economic uncertainty. In countries with a strong safety net such as Sweden and Norway, there were considerably weaker effects of economic uncertainty on first birth postponement (also see Adserà, 2004).

There were also clear gender-specific strategies with women who were in uncertain labour market positions in male-breadwinner countries (Germany, Spain, Netherlands) more likely to have children, suggesting an alternative mechanism such as lower attachment to the labour market or lack of opportunities for women within these countries. In a recent study of women in Germany, Kreyenfeld (2010) adds more nuanced findings. In this study, economic measures of uncertainty in the form of unemployment and subjective measures about the perception of the economic situation (i.e. worried about job security) prompted highly educated women to postpone first births and lower educated women to respond by becoming mothers.

Additional studies have specifically linked unemployment to fertility and fertility postponement. Whereas Santow and Bracher (2001) concluded that both individual and aggregate-level economic indicators influenced fertility postponement in Sweden, Kravdal (2002) concluded that individual-effects had a negligible effect on the postponement of first births in Norway. Rather, the aggregate-level effects of living in a region with high unemployment rates had a stronger impact on fertility. In a Swedish study, Hoem (2000) concluded that unemployed women did not have considerably lower first birth rates but that first birth rates were highly dependent on municipal economic cycles. Examining the fluctuating fertility trends in the 1980s and 1990s in Sweden, Andersson (2000) demonstrated that women in more economically uncertain positions with low levels of income and students had lower and postponed fertility. He concludes, however, in line with related studies, that it is not merely individual factors, but important societal factors and specifically social policy that impacted fertility, a topic to which we turn to now.

Social policy incentives

To what extent can social policies affect the timing of the first birth? This question is important both with respect to the ability to use ART to allow couples to have the children they want and to broader issues facing countries with below replacement level fertility. We first briefly address the empirical difficulties of establishing policy effects to provide the reader with an intuitive understanding that the conclusions from reviewing the existing research literature must be viewed as tentative (also see Björklund, 2006; Hoem, 2008), and we note that experimental designs have yet to be used in evaluating policy effectiveness. We then summarize results of studies examining four different types of policies: direct cash payments, indirect transfers, improving work-family compatibility and inadvertent policy effects.

Establishing empirical policy effects on childbearing

A central debate within the social policy literature surrounds methodological difficulties in directly measuring policy impacts on childbearing postponement (Neyer and Andersson, 2008; Letablier *et al.*, 2009). First, the broad range of policy instruments that can potentially influence childbearing makes it difficult to isolate the effects of any specific policy. A second problem is that it is difficult to establish whether a specific policy instrument has been successful due to the temporal lag between the initiation and take-up of a policy. A third difficulty is the problem of the endogeneity of policies. Policies may not only impact fertility and induce change, but are often a reaction to changes in fertility and are an integral feature of these changes. In other words, an increase in fertility levels might not only be a unidirectional consequence of policies, but the causal relation could also work in the reverse direction. A fourth issue is that it is difficult to distinguish between policy effects on the level (quantum) of fertility and on birth timing in the period-based studies.

Three approaches have been used to assess the impact of policies aimed at influencing age at first birth (or overall levels of childbearing): (i) time-series variation within a country using macro-level data, (ii) micro-level (individuals or couples) studies where the policy variable is one of the independent (predictor) variables and (iii) cross-national studies involving nations with differing policies. Each approach has drawbacks (for a detailed discussion see Neyer and Andersson, 2008).

Direct cash payments

Among the marked increase in policies to influence childbearing (United Nations, 2008), a prominent option has been *direct cash payments*, such as baby bonus payments and family allowances (Laroque and Salanié, 2004; Aassve *et al.*, 2006). Research examining the effects of direct cash payments has tended to focus on childbearing quantum rather than timing. Nevertheless, given the positive association between age at first birth and children ever born, it is worth considering the results from this literature. Existing empirical evidence of the impacts of cash payments has generally adopted an aggregated approach which compares how country-level policies impact the country-level total fertility rate (e.g. Blanchet and Ekert-Jaffé, 1994; Gauthier and Hatzius, 1997). These studies generally find no or weak effects, although, more recently, Björklund (2006) does find support comparing Sweden to a variety of neighbouring countries.

Two recent studies use individual-level data for Israel and Quebec, Canada, and find some support for a positive effect of direct cash payments. Cohen *et al.* (2007), examining Israel, matched childbearing histories to detailed individual-level explanatory variables over a 7-year period from 1999 to 2005, a period where there were significant changes in child subsidy benefits. They found a significant and positive effect of child subsidies on childbearing within all religious and ethnic subgroups. The only group not influenced by the child subsidy was, as they anticipated, the high-income group. In the 1990s, Quebec introduced a pro-natalistic monetary policy to pay families up to $8000 Canadian to have a child and Milligan (2005) finds that the introduction of a child subsidy had a significant and positive effect on childbearing. Since neither of these studies controls convincingly for unmeasured, individual-level factors (such as fecundity) and since Israel and Quebec have some unique aspects as case studies, we are reluctant to generalize their findings. So for now it is best to conclude that the evidence is mixed on the effect of direct cash payments on overall levels of childbearing, and, logic extended, the same conclusion applies to age at first birth.

Indirect transfers

There is also mixed evidence about the influence of indirect transfers on childbearing, which include policies such as tax exemptions, housing policies, health care or child tax credits. In Hungary, Aassve *et al.* (2006) found that dramatic policy changes in 1995 that switched family allowance from a universal to means-tested system had an impact on the transition to first birth. Individuals with a higher education and income suddenly became ineligible for benefits, and consequently postponed entry into first birth. Another body of economic literature has examined tax provisions that benefit families with children, but has shown these factors tend to have modest or no effects (e.g. Whittington, 1992; Zhang *et al.*, 1994; Kearny, 2004; Gauthier, 2007).

Improving work–family compatibility

Another type of policy are those aimed at improving work–family compatibility, which include maternity and paternity leave with or without salary-maintenance benefits (Rønsen, 2004; Datta Gupta *et al.*, 2008), the availability, acceptability, accessibility, quality and cost of child care (Rindfuss *et al.*, 2007), and childcare subsidies and early education (Datta Gupta *et al.*, 2008; Letablier *et al.*, 2009). Castles (2003) found that the existence of childcare facilities for children under the age of three was a crucial factor in the labour force re-entry of women and thus served to facilitate the combination of parenthood and employment. Di Prete *et al.* (2003) and Del Boca (2002) established that childbearing was positively influenced by reduced childcare costs and increased childcare availability. In a study in the 1980s and 1990s in Germany, Hank and Kreyenfeld (2003) likewise demonstrated that access to informal child care arrangements significantly increased the transition to first birth and also concluded that availability and not affordability of child care was central. Rindfuss *et al.* (2007) revealed that the increased availability of child care in Norway clearly and consistently led to a younger age at first birth. Zabel (2009) has also shown higher transition rates to first births in Britain for those who had acquired sufficient employment tenure to qualify for maternity leave. In short, the evidence is tending

to suggest that policies which reduce the incompatibility between work and mother roles lead to younger ages at first birth.

Inadvertent policies

In addition to policies that have been adapted explicitly to influence childbearing levels or designed to make it easier for mothers to be in the paid labour force, there are a wide variety of policies and institutional arrangements in the educational system, labour market and housing market that likely *inadvertently* affect the timing of parenthood (see Rindfuss and Brauner-Otto, 2008 for a more extensive discussion). For example, in Japan the 'new graduate recruitment system' has been the principal mechanism whereby young people find regular jobs—that is jobs that are full-time, offer fringe benefits and fall under the lifetime employment model (Inui, 2003). In this system, schools act as go-betweens in the recruitment process and employers prefer hiring recent graduates. Women who drop out of the labour force have a very difficult time finding a regular job if they wish to re-enter the labour force—providing a strong disincentive to childbearing for women desiring careers. Even though employers are moving away from the lifetime employment model (Adserà, 2004), the influence of schools in the recruitment system is still present.

Conclusions

This paper describes current trends and reasons for the postponement of first births and evaluated the effectiveness of various types of social policy incentives to counter these trends. Women's increased education is linked to later ages at childbearing, which is attributed to difficulties in balancing student and mother roles as well as the fact that better-educated women are more likely to pursue careers that entail a steeper career ladder and more investment in human capital. Women's labour force participation is linked with postponement largely due to the incompatibility between caring for children and participation in the paid labour force. Young adults may also delay childbearing until their income increases and they can 'afford' children, but also to avoid the 'wage penalty' of early motherhood. A growing body of literature has shown that female employment and childrearing can be combined when the reduction in work–family conflict is facilitated by state or policy intervention, such as in some Scandinavian countries. Studies also show that societal-level gender inequity in institutions (e.g. tax or labour market institutions), an unequal household division of labour and individual-level attitudes about egalitarian roles can operate to influence the timing of first births. Ideational shifts in the norms and values regarding parenthood, smaller family sizes and the value of children are likewise attributed to fertility postponement. We also provided evidence that multiple partnerships, the rise of more unstable forms of unions, higher levels of dissolution of non-marital cohabiting and marital unions and the inability to find a partner contribute to later births. Finally, a tight housing market and inability to establish oneself due to the economic uncertainty of having an unstable job, temporary contract or sub-optimal employment further contributes to fertility postponement.

This study also provided an evaluation of social policy incentives. We first acknowledged the empirical difficulties of establishing policy effects due to the broad range of policy instruments, temporal lags between policy initiation and take-up, endogeneity issues and difficulties in distinguishing between policy effects on the level or timing of fertility. There are mixed empirical results regarding the effectiveness of cash and indirect benefits. The evidence suggests that policies aimed at reducing the incompatibility between work and mother roles (e.g. maternity leaves, childcare, early education) are more effective and lead to younger ages at first birth. Like Hoem (2008), we also conclude that it is not only the availability of economic-based incentives that shape the timing of childbearing, but also the broader culture and attitudes such as the level of family-friendliness of a society. Policies cannot be considered in exclusion, but are part of a wider message sent to individuals about whether they can have and sustain parenthood in the longer term.

Funding

The research of M.M. is supported by a grant from the NWO/Dutch Science Foundation (VIDI Grant 452-10-012).

Conflict of interest

None declared

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