

## XX Fertility desires, intentions and behaviour

Ann Berrington

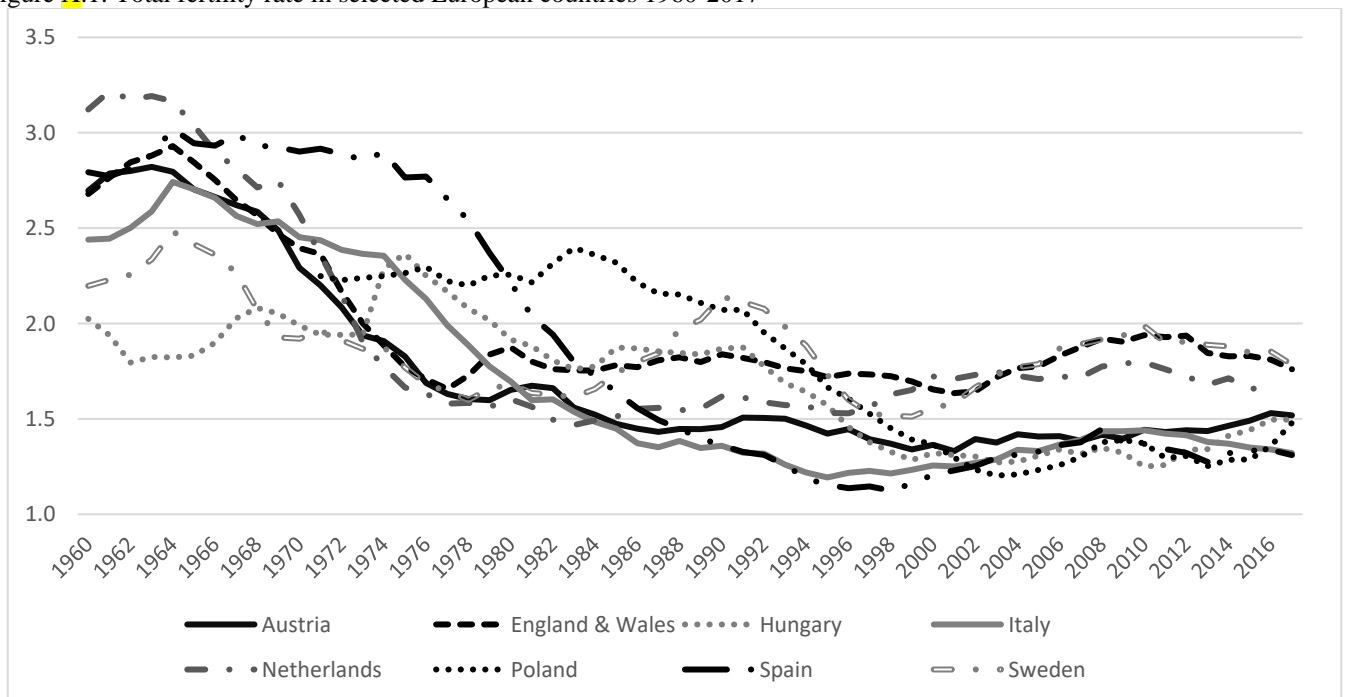
**Abstract** Much research over the past few decades has sought to understand how fertility desires and intentions interact with key biological (e.g. age) and structural (e.g. partnership, employment status) factors to influence childbearing. This chapter first reviews recent trends in European fertility before discussing theoretical frameworks used to understand how childbearing desires and intentions translate into fertility behaviour. The chapter discusses how uncertain and ambivalent intentions arise and the importance of considering couples' joint circumstances. To fully understand the development of motivations and intentions, the adjustment of intentions over the life course, and likelihood of their realisation prospective life course data are required. This would include detailed information on parental background, childhood circumstances and experiences in adulthood, across multiple life course domains. Bio-medical data should be collected to better integrate social and biological studies of fertility. Ideas for future research, for example examining the use of assisted fertility technologies, are explored.

**Keywords:** Fertility intention; uncertainty; postponement childbearing; recuperation fertility

### 1 European fertility trends

In almost all high-income countries period fertility rates are well below replacement level – roughly an average of 2.1 births per woman – that is to say the average number of births required to replace one generation with another in the absence of migration. There remain however, significant differences between and within countries in childbearing behaviour, both in terms of the timing at which entry into parenthood takes place, and the completed family size (Mills et al. 2011). In this chapter we focus on Europe, where following increases in fertility associated with a 1960s baby boom, fertility rates, as measured by the period Total Fertility Rate (TFR), fell significantly, to either low or lowest low (less or equal to 1.3 births per woman) levels. Figure X.1 presents the trends for a number of countries selected to show the diversity across Europe and to include a variety of geographical regions). In Northern and Western Europe, fertility rates fell during the 1970s as individuals started to postpone the age at which they became parents and reduce the overall number of children. The rising mean age at first birth (Figure X.2) and increased childlessness were part of a wider package of changes in family formation (including the delay to partnership formation, decline in marriage and increased separation) coined the Second Demographic Transition (Lesthaeghe 1995). The decline in fertility rates took place later on in southern European countries including Spain where the TFR reduced from 2.2 births per woman to 1.3 births per woman within a single decade (1982-1992).

Figure X.1: Total fertility rate in selected European countries 1960-2017



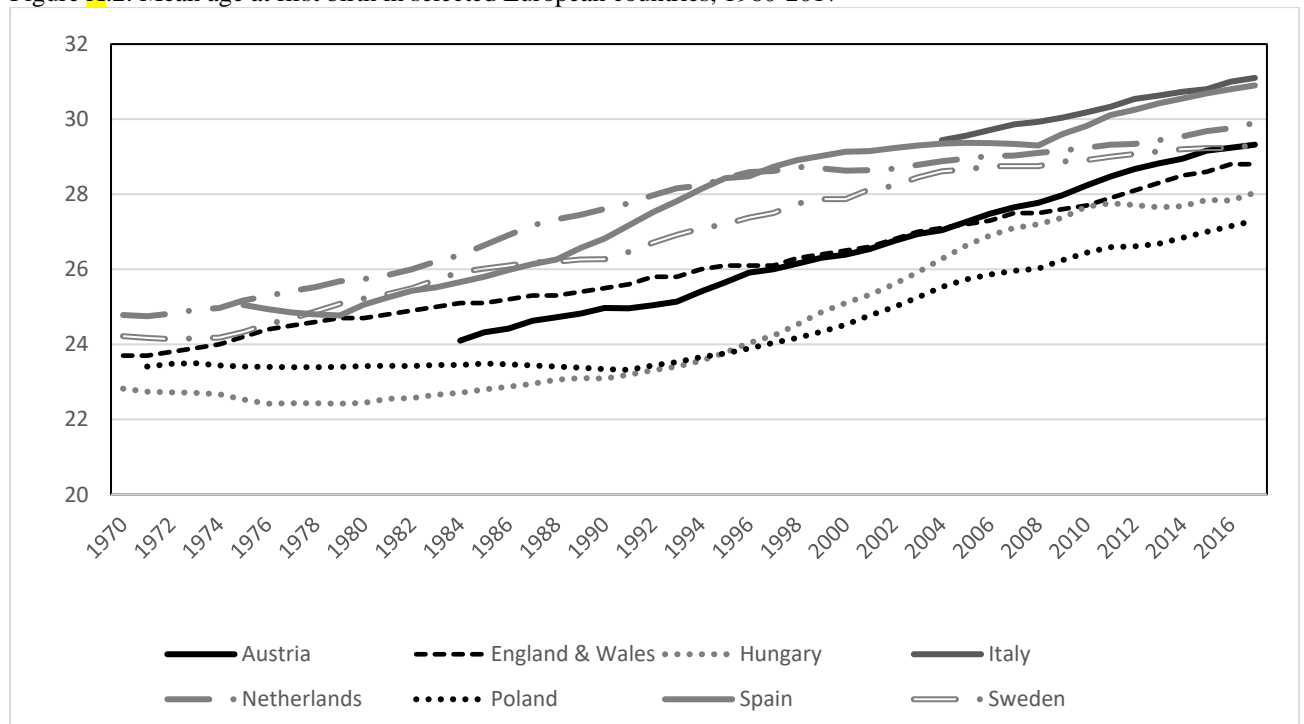
Source: Eurostat (2019); HFD (2019)

Lowest low fertility spread rapidly within Europe during the 1990s. In many eastern European countries fertility rates dropped following the collapse of socialism, partly as a result of tempo distortions in the total fertility rate due to the postponement of childbearing among young adults as a consequence of increased economic uncertainty and delays in the age at leaving full-time education (Kohler et al. 2002), but also due to the removal of various institutional and financial supports for high fertility that had been present during the Socialist era.

Interpretation of the socio-economic and cultural drivers of lowest low fertility is made complex by the fact that period rates of fertility such as the TFR can be affected by tempo distortions in childbearing behaviour – that is to say changes among cohorts in the age at which childbearing takes place (Bongaarts and Feeney 1998). Generally, when childbearing starts to be postponed (delayed to later ages) among young cohorts, period indices of fertility are depressed; when cohorts recuperate (catch up) their fertility at older ages, the TFR rises once again. Thus it is possible that a population could maintain a steady completed family size of an average of two births per woman, but still exhibit substantial fluctuations in fertility. However, period fertility rates have been significantly below replacement level for over three decades in countries such as Austria, Germany, Italy and Spain and are thus associated with significant falls in completed family size. Completed family size, or cohort fertility refers to the average number of children women will give birth to by age 45. Low average completed family size at a population level can be achieved in different ways, depending upon how many women end up with zero, one, two, three or more births. By examining parity-specific trends, recent research has shown however that the route to lowest low fertility in recent decades differs regionally (Zeman et al. 2018). In Southern Europe fertility postponement has been pronounced (Figure X.2) and there has been a significant increase in levels of childlessness. In Eastern Europe entry into motherhood generally takes place at slightly younger ages, but there has been a marked decrease in second birth rates with more one-child families prevalent. In Northern and Western Europe there has been more modest postponement, and more evidence of fertility recuperation. From the late 1990s a clear polarisation within Europe emerged, whereby many Northern and Western European countries had Total Fertility Rates around 1.7-1.9, whereas many central e.g. Austria, southern and eastern European countries had fertility rates at or below 1.3 births per woman.

During the early 2000s period fertility rates increased in many countries. Post 2010, however, trends have been more mixed, with Northern and Western countries exhibiting falls in period fertility at the same time as many southern and eastern countries are experiencing a rise. The outcome is a slight convergence of levels around 1.4-1.7 births per woman. Increases in period fertility in some eastern European countries such as Hungary are likely to be associated with the slowing down or cessation of postponement. However, no such recovery in period fertility can be seen for Spain, where the mean age at becoming a mother has continued to increase to an average of 30.9 years in 2017 (Figure x2).

Figure X.2: Mean age at first birth in selected European countries, 1960-2017



## 2 Ideal family size and the fertility gap

Whilst fertility rates have declined, stated ideal family size preferences among women in most European countries have remained near or above replacement level<sup>1</sup> (Goldstein et al. 2003; Testa 2012; Sobotka and Beaujouan 2014). This disparity between aggregate fertility desires and achieved fertility has been described as a “fertility gap” (Philipov 2009) or “unmet demand for children” (Brinton et al. 2018). In the context of rapid population ageing caused in part by declines in fertility rates, evidence for a “fertility gap” was enthusiastically taken up by European policy makers who assumed that given the right family policies individuals would be able to have the number of children that they desired (Philipov 2009). In order to inform such policy development, academic researchers intensified their efforts using individual data to investigate reasons why fertility intentions can remain unrealised. A number of theoretical frameworks were developed and applied e.g. within the EU 7<sup>th</sup> Framework Funded REPRO project (Liefbroer et al. 2015) as discussed in more detail in the next section.

The “fertility gap” concept has been critiqued on a number of grounds (Goldstein et al. 2003). Firstly, it has been suggested that responses to questions relating to ideal and desired fertility merely reflect existing societal norms (e.g. for two-child family). Others have questioned whether individuals have sufficient information about their future ability to reproduce and future socio-economic circumstances (Westoff and Ryder 1977) and argue that childbearing decisions are not fixed but made sequentially. The concept has also been critiqued on methodological grounds; the usual way in which the “fertility gap” is constructed e.g. from cross-sectional Eurobarometer Survey data, does not allow for comparison of the fertility desires and behaviour of the *same cohorts* of women, but instead compares the intentions of women currently having children, with the achieved fertility of past cohorts (Beaujouan and Berghammer 2019). Furthermore, we cannot infer relationships between desires and fertility outcomes at the individual level from macro-level analyses. Studies using individual longitudinal data find that some women under-achieve and some over-achieve earlier stated desires and intentions (Berrington 2017; Berrington and Pattaro 2014; Morgan and Rackin 2010; Quesnel-Vallée and Morgan 2003). Notwithstanding these important criticisms, the existence of the “fertility gap” renewed interest during the 2000s into factors which affect the realisation of fertility desires and intentions and the rest of this chapter reviews some of the key theoretical approaches and findings from this work, and puts forwards ideas for future research.

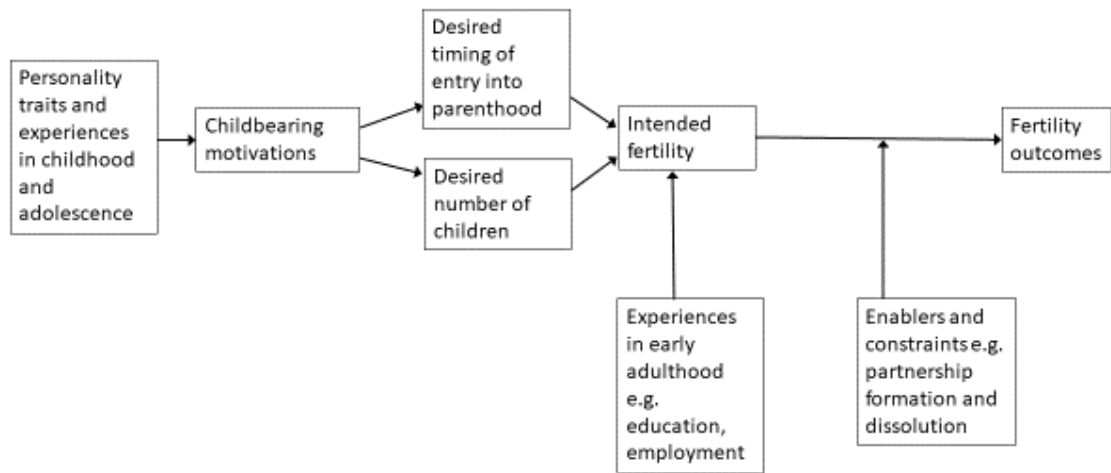
## 3 Theoretical approaches to understanding fertility intentions and their realisation

A number of different theoretical approaches, each with different emphases, have been applied to examine the link between fertility desires, intentions and fertility outcomes. Miller’s -Desires-Intentions-Behaviour (TDIB) model (Miller 1994) shown in Figure X3 assumes that individuals have motivational traits (which could be genetic or psychological in origin) that endure over time. “During growth and development, biologically based, largely hereditary characteristics of the individual interact with the individual’s childhood and adolescent social environments, leading to the formation of a motivational substrate for childbearing” (Miller et al. 2010, p 394). These motivations are generally not observed but, when activated, are experienced as childbearing desires. Only after an assessment of perceived situational constraints, e.g. in terms of partnership status or employment situation, are desires then converted into intentions. The latter are deemed to imply some degree of personal commitment to act, albeit within an unspecified time frame (Miller 1994). The TDIB model has been used with behavioural genetic analyses of siblings in the National Longitudinal Study of Youth to demonstrate the importance of genetic precursors to fertility motivations which then act through desires to influence intentions and ultimately outcomes (Miller et al. 2010). The TDIB model is sometimes not used because of its demanding data requirements. Where detailed prospective information is available, such as in the 1958 British Birth Cohort Study (Berrington and Pattaro 2014) which followed up participants from birth to age 46, collecting detailed information on parental fertility trends, childhood circumstances, fertility desires in adolescence (at age 16) and intentions in adulthood (at age 23), it has provided new insight.

---

<sup>1</sup> Exceptions to this included younger cohorts in Germany and Austria who were seen in the 2001 Eurobarometer Survey to be the first groups to declare ideal family size preference of around 1.7 (Goldstein et al. 2003).

Figure X3: Traits-Desires-Intentions-Behaviour (TDIB) framework based on Miller (1994)

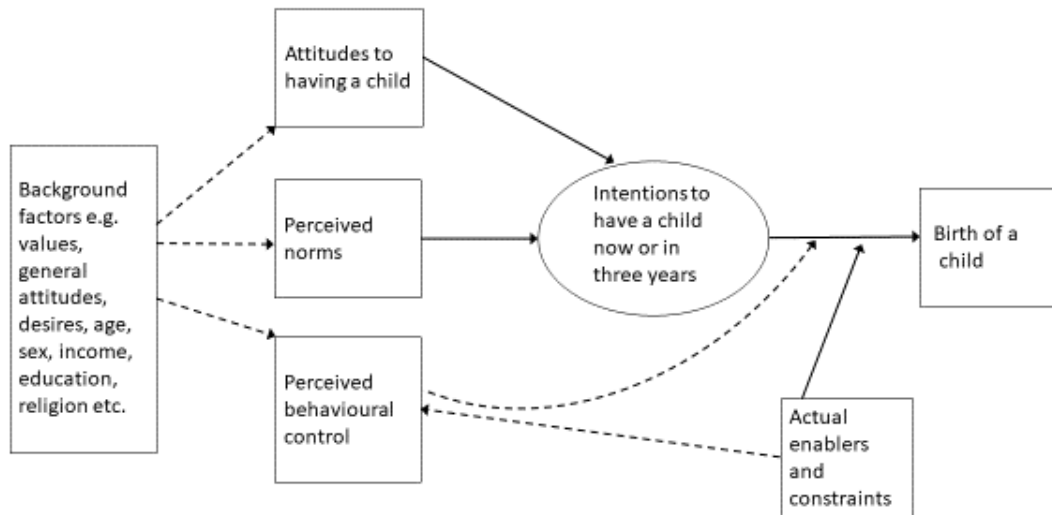


Berrington and Pattaro (2014) found that parental characteristics (e.g. maternal age at first birth) and socialisation in childhood (e.g. sibling group size, parental expectations for the respondent's education) affected the desired timing of family formation differently to the desired number of children. Consistent with the TDIB framework, family size intentions as reported at age 23 were revised downwards in young adulthood as individuals experienced more of life, entering the labour market and seeing for themselves the economic and non-economic opportunity costs that childbearing entailed. At age 46, mean completed family size (1.76 and 1.91 for men and women respectively) was significantly lower than that intended at age 23 (2.23 and 2.30 respectively). In total, just 36 per cent of men and 43 per cent of women achieved their intended number of children, with correspondence greatest for those who wished to remain childless and those who intended two births. Consistent with evidence from the US (Morgan and Rackin 2010; Quesnel-Vallee and Morgan 2003), there is a tendency to under achieve fertility intentions, especially among those who originally intended larger families.

The Theory of Planned Behaviour (TPB) is a general theory developed within social psychology (Ajzen 1991) and applied to a wide range of applications, including fertility behaviour (Liefbroer et al. 2015) (Figure X4). The TPB makes explicit how context can affect intentions: through the formation of attitudes (e.g. relating to the advantages and disadvantages of having children); subjective norms (social influences from significant others such as parents, friends) and through the individual's perceived behavioural control, influencing the extent to which intentions may be realised. Moreover, the TPB specifically acknowledges factors e.g. availability of childcare, which may either enable or constraint individuals from carrying out their intention. A raft of empirical analyses of both fertility intentions (e.g. Billari et al. 2009; Dommermuth et al. 2011; Klobas and Ajzen 2015;) and their realisation (e.g. Reiderer et al. 2019; Spéder and Kapitány 2015) at the individual level using TPB have been carried out over the past decade. These studies often used data from the Generations and Gender Surveys (GGS), which included a special adaption of the TPB for the study of fertility decisions. The GGS focuses on a short time horizon – for example intentions to have a birth, now, or within three years. This body of work has found attitudes, subjective norms, and perceived control to all be important in the formation of intentions, but that relationships differ across countries, by age and current parity, making policy formulation in order to reduce the “fertility gap” complex (Klobas et al. 2015). In Norway, for example, Dommermuth et al. (2011, p. 42) found that subjective norms did influence intentions whereby those who felt that their intention to have a child was supported by friends and families were more likely to want a child now, rather than within the next three years. Furthermore, perceived ability to cope with a child (deemed a proxy for behavioural control) was also associated with a positive intention. Billari et al.'s (2009) analyses of Bulgarian GGS data suggest economic constraints and ability to form a partnership are key factors affecting perceived behavioural control, contributing to lower fertility, whilst attitudes were found to be more important than norms when it comes to intentions to have higher order births. The TPB is a useful tool for understanding interactions between the macro and micro level (Klobas and Ajzen 2015). Brinton (2016) uses the TPB and data from a number of GGS countries, some with moderate levels of fertility (e.g. France, Norway) and some with very low levels of fertility (e.g. Italy, Austria, Hungary), to show how social

norms and institutional arrangements affect perceived constraints to childbearing. She finds that in countries with gender-essentialist (male breadwinner, female caregiver), individuals perceive greater financial constraints, and concerns relating to housing and childcare. -She suggests that the cultural and institutional context moderates the impact of economic uncertainty on childbearing. Thus, in southern Europe traditional gender role attitudes mean that childbearing is only considered possible when men are able to fulfil a breadwinning role.

Figure X4: Theory of planned behaviour (TPB) applied to fertility



Source: Figure based on Dommermuth et al. (2011)

The TPB focuses on reasoned action. More recently demographers have developed a Theory of Conjunctural Action (Johnson-Hanks et al. 2011) and a Cognitive Social Model (CSM) of fertility intentions, bringing together ideas from cognitive science and insights about social structure from social theory (Bachrach and Morgan 2013). CSM differs from the previous two theories in that it does not require conscious intentions to precede behaviour, suggesting instead that fertility behaviour is the result both of conscious, deliberative intentions and non-deliberative, automatic cognitions. These cognitions are hypothesised to derive from social structures which are themselves composed of both material (observable) structures and schemas (abstract representations of the meaning of an object or event) (Johnson-Hanks et al. 2011). Depending on, for example, their gender, age, income and geographical location, individuals will be more or less likely to be exposed to, or to identify with particular structures (and their material and schematic components). Schemas are not fixed but shaped by background factors, experience, and life-course transitions such as becoming a parent, or starting a new job (Bachrach and Morgan 2013). The CSM is thus explicit in acknowledging that fertility intentions will change across the life course, and provides suggestions as to likely sources of these changes, for example in terms of life course transitions (Rybinska and Morgan 2018). Moreover, the CSM argues that fertility intentions are formed only when the “circumstances of a situation demand or motivate it” (Morgan and Bachrach 2013, p 468). The idea that intentions are constructed rather than retrieved is also emphasized by Ni Bhrolchain and Beaujouan (2019) who suggest that fertility intentions are assembled when individuals are asked to provide a preference and that these preferences are constructed through personal experiences and life choices, the observation of family formation patterns of peers, and the influence of societal norms. They propose that preferences crystalize over time. “From repeated exposure to reproductive choices, to the wishes of a partner, to the practicalities of family formation, of housing, of combining family and economic activity, people will ultimately arrive at clearer preferences, though these need not be very well articulated and may retain a constructive element” (Ni Bhrolchain and Beaujouan 2019, p. 43). Arguably the CSM reflects more closely real life experiences of childbearing, including unintended fertility. It does not assume that individuals are able to accurately predict their future circumstances, and allows for changes in intentions across the life course (Ni Bhrolchain and Beaujouan 2019; Rackin and Bachrach 2016). The CSM is less exact than either the TDIB model or the TPB in pre-determining the factors that affect childbearing decisions (and hence can be used to analyse a wide variety of quantitative and qualitative data).

The CSM is consistent with numerous empirical studies which highlight the uncertainty in reported intentions (Berrington 2004; Morgan 1981; Ni Bhrolchain and Beaujouan 2019; Trinitapoli and Yeatman 2018), changes in intention, particularly during the early life course (Berrington and Pattaro 2014; Hayford 2009; Iacovou and Tavares 2011; Liefbroer 2009; Rybińska and Morgan 2018) and the mismatch between stated intentions and

fertility outcomes (Berrington 2017; Quesnel-Vallée and Morgan 2003; Rackin and Bachrach 2016). Empirical evidence supports the idea that early exposure to schemas, for example stressing familialistic ideals and traditional gender roles as part of religious upbringing, affect fertility decision-making processes (Pearce and Davis 2016, p. 1433). Other research finds evidence consistent with the hypothesis that fertility intentions become more accurate in their prediction following key life course events such as marriage and motherhood (Rackin and Bachrach 2016).

The importance of considering life course processes is also highlighted by Brehm and Norbert (2019) but a key difference in their approach is the acknowledgement of both partners in fertility decision making. The Model of Dyadic Pathways (MDP) considers the shared experiences of the couple – their joint resources and behaviours and communication within the couple. The MDP allows an individuals' fertility intentions to change as a result of interaction with their partner. Moreover, the MDP aims to bring together existing frameworks (TDIB, TPB and CSM) to consider both reasoned and unreasoned action into studies of childbearing. For example, by allowing motivations to act directly on childbearing behaviour (bypassing intentions) Brehm and Norbert (2019, p. 17) allow for a "laissez-faire pregnancy" where "a child is welcome, but neither intended nor unintended.

The notion that there may be a degree of ambivalence in intentions for children is related to the fact that significant proportions of the population are uncertain of their fertility intentions i.e. they answer "do not know" to fertility intention questions (see e.g. Berrington, 2004; Morgan 1981; Ni Bhrolchain and Beaujouan 2019). What is less clear is how to interpret this uncertainty. In answer to a simple fertility intentions questions such as "Do you intend to have (any more) children?" respondents are likely to lie on a continuum from a definite "no" to a definite "yes", and the proportion who are uncertain is often related to age and current parity. Ni Bhrolchain and Beaujouan (2019) argue that whilst some individuals may well be uncertain about their underlying preferences for childbearing, those who have a positive preference for further children may provide an uncertain answer because of ambiguity in the likelihood of these intentions being realised. Individuals may be unsure about their biological ability to have children, whether they will have a suitable partner and so on.

Evidence from the US suggests that young adults have generalised intentions based on for example fertility ideals developed through socialisation. As people move into the main reproductive ages, uncertainty tends to increase, but then as individuals reach the end of their reproductive lives, uncertainty is reduced once again as they become "too old" to have additional children (Morgan 1981). Evidence for the UK suggests a slightly different pattern whereby women aged under 35 all have similar, relatively high proportions who are uncertain, but that this drops once age 35 is reached (Ni Bhrolchain and Beaujouan 2019). The proportions who provide an uncertain answer can be large and it is important that this category of response is not ignored by analysts (Morgan 1981). Among childless men and women aged 30 in the UK, around 20 per cent of both men and women reported "don't know" when asked whether they were going to have children at some point in the future (Berrington 2017).

#### **4 Fertility intentions dynamics over the life course**

The availability of prospective longitudinal data, including repeated measurements of individuals' fertility intentions, allowed demographers to examine how intentions change over the life course. Data from the National Longitudinal Study of Youth 1979 (NLSY79) have been used to examine trajectories of fertility intentions among US women. Hayford (2009) demonstrated that expected family size at age 18 was relatively homogenous across groups, but that differences gradually emerged, producing larger differences in expected (and completed) fertility by age 40. Rybinska and Morgan (2019, p. 1571) showed that women from NLSY79 who ultimately remained childless followed two trajectories of intention: "(1) repeated postponement of childbearing and the subsequent adoption of a childless expectation at older ages or (2) indecision about parenthood signalled through vacillating reports of childless expectations across various ages." This fluctuation in intended fertility is also highlighted by Gemmil (2019) who found that most permanently childless women had reported a positive expectation for children at some point in their life course. The instability of intentions across the life course is likely to relate to the uncertainty in intentions as discussed in the previous section.

In the UK, two types of prospective longitudinal data have been used to examine the dynamics of fertility intentions across the life course. Consistent with Hayford's (2009) US findings, British birth cohort data also showed how intended family size drops between adolescence and young adulthood, and becomes more differentiated according to individuals' early life course experiences such as age at leaving full time education and employment experiences in young adulthood (Berrington and Pattaro 2014). Repeated measures of fertility intentions are also collected with UK national household panel surveys. Berrington (2004) and Iacovou and Travares (2011) utilized data from the British Household Panel Survey and showed, for both men and women, that whilst some people make upward revisions to their intentions, more often they report downward revisions. The proportions who revise their intention can be sizeable: Only half of women aged 18-24 reported the same intention six years later –almost a third had reduced their intended family size, and one fifth had increased it (Berrington 2004). Iacovou and Travares (2011, p. 116) found that individuals often revised their intentions after separation and repartnering, after entering parenthood, and in response to their partner's expectations for childbearing. "People whose partners expect more children than they do are more likely to revise upward; people whose partners expect fewer children than they do are more likely to revise downward." At older ages, as individuals approach the end of the reproductive lifespan, intentions tend to be revised downwards. However,

there remains a significant group of childless men and women who report positive fertility intentions well into their thirties, and as discussed below, many of these remain childless, leading to the suggestion that such individuals are “perpetual postponers” (Berrington 2004 2017).

## 5 Predictive validity of fertility intentions

The value of intentions as predictors of fertility has long been debated. At the individual level, stated intentions are significant statistical predictors of behaviour and often have the largest association with fertility outcomes, net of other factors (Berrington 2004; Regnier-Lollier et al. 2011; Schoen et al. 1999). However, data, e.g. from NLSY 79 (Bachrach and Morgan 2016; Morgan and Rackin 2010; Quesnel-Vallée and Morgan 2003), the British Birth Cohort Studies (Berrington, 2017; Berrington and Pattaro, 2014), and repeated panels e.g. BHPS (Berrington, 2004) and GGS (Spéder and Kapitány 2015) have provided ample evidence of the mis-match between earlier stated fertility intentions and subsequent behaviour. Whilst some individuals exceed their intended family size, more often intentions remain unrealised. For example, almost one third of childless British women born in 1970 who intended a child at age 30, remained childless at age 42 (Berrington 2017). Social scientists have understood this mis-match, either by questioning the validity of the stated intention, or by discussing potential barriers to childbearing. According to Westoff and Ryder (1977) social desirability may prompt people who are uncertain to give a definite answer. Another explanation is that, especially where there is a long gap between intention and outcome, intentions are modified in response to changing contingencies (Gemmil 2019; Trinitapoli and Yeatman 2018). Whilst it has repeatedly been shown that intended family size decreases over the life course, it is unclear whether such revisions result from changes in underlying preferences, or whether intentions are modified as a result of external constraints. If the latter, then desires remain unfulfilled. The absence of a (suitable) partner has consistently been shown to be a key factor affecting the realisation of expectations (e.g. Berrington 2004; Berrington and Pattaro 2014; Hayford 2009; Quesnel-Vallée and Morgan 2003). Partnership formation, like childbearing has been postponed to later ages. This postponement makes it harder for individuals to reach their reproductive goals, particularly as a result of declining fecundability with age (Habbema et al. 2015). Women who start their childbearing at later ages on average have smaller completed family sizes (Berrington et al. 2015) as a result of this “tempo-quantum” interaction (Kohler et al. 2002).

Explanations for the postponement of childbearing (see Mills et al. 2011 for a review) are also explanations for the unfulfillment of fertility intentions. Following postponement childbearing plans “can be easily diverted or superseded by other intentions drawing on other structures” (Bachrach and Morgan 2013, p 472). The gap between intended and realised fertility is often largest among the most educated women (Berrington and Pattaro 2014). Increased female education raises the age at leaving education and results in women preferring to postpone parenthood until they are more established in their careers. Women’s earnings increase the economic opportunity costs of reduced participation in the labour force to look after children. Institutional arrangements, e.g. subsidized childcare or family-friendly employment policies allowing part-time work, reduce role incompatibility between work and childrearing (Esping-Andersen and Billari 2015; Goldscheider et al. 2015; McDonald 2000). Greater gender equity in Scandinavian countries is associated with higher fertility, despite high levels of participation by women in the labour market. In contrast, in Italy and Spain, gender equity in the public sphere, e.g. in higher education and employment, is not matched by gender equity in the home, with women expected to take on the bulk of childcare and domestic work. Thus women postpone childbearing and often limit their family size to no, or just one child. Qualitative research examining the reasons that high-educated women in low fertility countries give for their fertility intentions finds partial support for the gender equity theory (Brinton et al. 2018). Men and women living in Spain did not talk about gender inequity directly. Instead, they highlighted how poor economic conditions demanded women’s labour force participation in order to contribute to household income. Because men were unable to fulfil the breadwinning role, childbearing is postponed.

When asked about their reasons for childlessness, few permanently childless women in Britain cited career reasons for not having had any children (Berrington 2017). Ill-health, both related to infertility, as well as more general health reasons, were more commonly cited as reasons for childlessness. This raises the possibility that delaying childbearing, e.g. in order to focus on educational and career opportunities may indirectly affect women’s and (to a lesser extent) men’s ability to fulfil their fertility intentions due to the increasing chances of poor health and sub-fecundity associated with age.

## 6 Future research directions

There are a number of areas where further insight is needed to understand the relationship between fertility intentions and their realisation at the micro and macro level. Firstly, a gendered perspective is needed. Only a few studies have examined whether men’s and women’s intentions differ, or whether the factors affecting childbearing decision making vary by gender (e.g. Berrington 2017; Brinton et al. 2018; Iacovou and Travares 2011; Okun and Yurovich 2019; Puur et al. 2010). To examine whether gender inequity is a key factor in promoting the very low fertility levels seen in Europe, we need to be able to analyse information from men and women about gender roles

in the public and private sphere, and work-family conflicts. Prospective data are required to examine whether the introduction of policies designed to reduce gender inequity actually have an impact on fertility. Moreover, future research needs to recognise the role of both partners in reproductive decisions (Brehm & Norbert, 2019). Where data availability has allowed a “couple approach”, greater understanding has emerged, for example showing how women’s intentions can be revised in response to a new partner’s intentions (Iacovou and Travares 2011), or how divergences in men’s and women’s intentions can constrain childbearing (Berrington 2004; Voas 2003).

Future studies of fertility behaviour should adopt a life course approach. This requires new prospective longitudinal data to be collected, providing repeated measures of intention, perceived barriers to achieving these intentions, and multiple observations regarding other life circumstances; including health, partnership, employment and housing dynamics. It is only with such nuanced data that analysts can understand the effects of uncertainty and change in other life course domains on childbearing intentions and their realisation. Ideally, cohorts should be followed from birth, collecting information, for example, about parental socio-economic circumstances, parental demographic behaviour, childhood socialisation, experiences in early adulthood and so on. Such data allow analysts to examine the inter-generational transmission of fertility behaviour, and the role of early life course experiences on later intentions (Berrington and Pattaro 2014). Longitudinal studies such as NLSY with annual or biennial measures of childbearing intentions have allowed researchers to model and predict longitudinal trajectories of childbearing intentions across the life course (Gemmil, 2019; Rybinska and Morgan 2018).

Future studies need to better integrate the biological and social approach to fertility analyses (Mills et al. 2015). Family studies, particularly twin studies, have demonstrated the heritability of childbearing behaviour. Motivations to have children are influenced by biological predispositions, i.e. genetics, hormones, neurological structures as well as social factors (Miller et al. 2010). Relevant biomarker and genetic data should therefore be collected /linked in future surveys, alongside social science indicators. Moreover, given the salience of health issues as reported barriers to the recuperation of fertility among childless postponers in the UK (Berrington 2017), more attention should be paid to the role of physical and mental health on childbearing patterns.

Whilst, on average, fecundability declines with age, especially after age 35, there is significant individual heterogeneity in the likelihood of conceiving at older ages (Habbema et al. 2015). It is therefore difficult for individuals and couples to predict the likelihood of future problems they may have in conceiving when planning their families. Ovarian reserve assessments are now offered by fertility clinics in many countries, and can be used for women with no known fertility problem to provide estimates of their remaining reproductive lifespan (Birch Petersen et al. 2015). More research is required to explore the characteristics of women and couples who seek fertility assessments, their motivations for so doing, and how this information alters their childbearing intentions and behaviour. New technologies such as oocyte freezing and changing legislation such as that permitting the use of donor sperm in single women have extended the reproductive choices available in many countries (Birch Petersen et al. 2015). Baldwin (2018) argues that social egg freezing is being encouraged by neoliberal ideology whereby women feel responsible for their own fertility; egg freezing is used as a way of managing the risk of ovarian ageing. Studies highlight how women are keen to find the right partner to have a(nother) child with, and social egg freezing can be used to take pressure off new relationships, and to avoid “panic partnering” (Inhorn et al. 2018). More research on the use of oocyte freezing and of the use of reproductive technologies such as IVF by unpartnered men and women, and by same sex couples is required.

Finally, within demography, the majority of extant studies of fertility intentions and childbearing outcomes are based on the analysis of quantitative data. More qualitative studies where individuals’ voices are heard are needed if we are to understand the reasons underlying for example the postponement of childbearing (Bernardi et al. 2008; Brinton et al. 2018) or decisions to use reproductive technology (Baldwin 2018; Inhorn et al. 2018).

## Acknowledgement

Ann Berrington’s research is partly funded by the Economic and Social Research Council (Grant Ref: ES/R009139/1).

## References

- Ajzen, I. (1991), ‘The theory of planned behaviour’, *Organizational Behaviour and Human Decision Processes*, **50**(2), 179–211. DOI: 10.1016/0749-5978(91)90020-T
- Bachrach, C.A. and S.P. Morgan (2013), ‘A cognitive–social model of fertility intentions’, *Population and Development Review*, **39**(3), 459–85. DOI: 10.1111/j.1728-4457.2013.00612.x
- Baldwin, K. (2018), ‘Conceptualising women’s motivations for social egg freezing and experience of reproductive delay’, *Sociology of Health and Illness*, **40**(5), 859–873. DOI: 10.1111/1467-9566.12728
- Beaujouan, É. and C. Berghammer (2019), ‘The gap between lifetime fertility intentions and completed fertility in Europe and the United States: a cohort approach’, *Population Research and Policy Review*, **38**(4), 507–535. DOI: 10.1007/s11113-019-09516-3



- Bernardi, L., A. Klärner and H. von der Lippe (2008), 'Job insecurity and the timing of parenthood: A comparison between Eastern and Western Germany,' *European Journal of Population*, **24**(3), 287–313. DOI: 10.1007/s10680-007-9127-5
- Berrington A. (2004), 'Perpetual postponers? Women's, men's and couple's fertility intentions and subsequent fertility behaviour,' *Population Trends*, **117** (Autumn Issue), 9–19. Accessed 1 January 2020 from <http://eprints.soton.ac.uk/id/eprint/34148>
- Berrington A. (2017), 'Childlessness in the UK', in M. Kreyenfeld and D. Konietzka (eds), *Childlessness in Europe: Contexts, Causes, and Consequences*, Demographic Research Monographs (A series of the Max Planck Institute for Demographic Research): Springer, Cham, pp. 57-76.
- Berrington, A. and S. Pattaro (2014), 'Educational differences in fertility desires, intentions and behaviour: A life course perspective', *Advances in Life Course Research*, **21**, 10–27. DOI: 10.1016/j.alcr.2013.12.003
- Berrington, A., J. Stone and E. Beaujouan (2015), 'Educational differentials in timing and quantum of fertility: Evidence from 1940–1969 cohorts', *Demographic Research*, **33** (26), 733-754. DOI: 10.4054/DemRes.2015.33.26
- Billari, F.C., D. Philipov, and M.R. Testa (2009), 'Attitudes, norms and perceived behavioural control: Explaining fertility intentions in Bulgaria', *European Journal of Population*, **25**(4), 439–465. DOI: 10.1007/s10680-009-9187-9
- Birch Petersen, K., H.W. Hvidman, R. Sylvest, A. Pinborg, E. C. Larsen, K.T. Macklon, A. Nyboe Andersen and L. Schmidt (2015), 'Family intentions and personal considerations on postponing childbearing in childless cohabiting and single women aged 35–43 seeking fertility assessment and counselling', *Human Reproduction*, **30**(11), 2563–2574. DOI: 10.1093/humrep/dev237
- Bongaarts, J. and G. Feeney (1998), 'On the quantum and tempo of fertility'. *Population and Development Review*, **24**(2), 271–291. DOI: 10.2307/2807974
- Brehm, U., & N. F. Schneider (2019), 'Towards a Comprehensive Understanding of Fertility: The Model of Dyadic Pathways', *Comparative Population Studies*, **44**, 3-36. DOI: 10.12765/CPoS-2019-01en
- Brinton, M. C. (2016), 'Intentions into actions: Norms as mechanisms linking macro-and micro-levels. *American Behavioral Scientist*', **60**(10), 1146–1167. DOI: 10.1177/0002764216643130
- Brinton, M.C., X. Bueno, L. Oláh, and M. Hellum (2018), 'Postindustrial fertility ideals, intentions, and gender inequality: A comparative qualitative analysis', *Population and Development Review*, **44**(2), 281–309. DOI: 10.1111/padr.12128
- Dommermuth, L., J. Klobas, and T. Lappegård (2011), 'Now or later? The theory of planned behaviour and timing of fertility intentions', *Advances in Life Course Research*, **16**(1), 42–53. DOI: 10.1016/j.alcr.2011.01.002
- Esping-Andersen, G. and F.C. Billari (2015), 'Re-theorizing family demographics', *Population and Development Review*, **41**(1), 1–31. DOI: 10.1111/j.1728-4457.2015.00024.x
- Eurostat (2019). Total Fertility Rate, accessed 1 January 2020 at <https://ec.europa.eu/eurostat/databrowser/view/tps00199/default/table?lang=en>.
- Gemmill, A. (2019), 'From some to none? Fertility expectation dynamics of permanently childless women,' *Demography*, **56**(1), 129–149. DOI: 10.1007/s13524-018-0739-7
- Goldscheider, F., E. Bernhardt, and T. Lappegård (2015), 'The gender revolution: A framework for understanding changing family and demographic behavior', *Population and Development Review*, **41**(2), 207–239. DOI: 10.1111/j.1728-4457.2015.00045.x
- Goldstein, J., W. Lutz, and M. R. Testa (2003), 'The emergence of sub-replacement family size ideals in Europe', *Population Research and Policy Review*, **22**(5), 479–496. DOI: 10.1023/B:POPU.0000020962.80895.4a
- Habbema, J.D.F., M.J. Eijkemans, H. Leridon, and E.R. te Velde (2015), 'Realizing a desired family size: When should couples start?', *Human Reproduction*, **30**(9), 2215–2221. DOI: 10.1093/humrep/dev148
- Hayford, S. R. (2009), 'The evolution of fertility expectations over the life course', *Demography*, **46**(4), 765–783. DOI: 10.1353/dem.0.0073
- HFD (2019). *Human Fertility Database*. Accessed 1 Jan 2020 at [www.humanfertility.org](http://www.humanfertility.org).
- Iacovou, M. and L.P. Tavares (2011), 'Yearning, learning, and conceding: reasons men and women change their childbearing intentions', *Population and Development Review*, **37**(1), 89–123. DOI: 10.1111/j.1728-4457.2011.00391.x
- Inhorn, M. C., D. Birenbaum-Carmeli, J. Birger, L.M. Westphal, J. Doyle, N. Gleicher, ...and P. Patrizio (2018), 'Elective egg freezing and its underlying socio-demography: a binational analysis with global implications', *Reproductive Biology and Endocrinology*, **16**(1), 70. DOI: 10.1186/s12958-018-0389-z
- Johnson-Hanks, J.A., C.A. Bachrach, S.P. Morgan, and H.P. Kohler (eds) (2011), *Understanding Family Change and Variation: Toward a Theory of Conjunctural Action*: Springer, New York.
- Klobas, J.E. and I. Ajzen (2015), 'Making the decision to have a child', in D. Philipov, A.C. Liefbroer, and K.E. Klobas, (eds), *Reproductive Decision-Making in a Macro-Micro Perspective*: Springer, Dordrecht, pp. 41–78.
- Kohler, H.P., F.C. Billari, and J.A. Ortega (2002), 'The emergence of lowest-low fertility in Europe during the 1990s', *Population and Development Review*, **28**(4), 641–680. DOI: 10.1111/j.1728-4457.2002.00641.x

- Lesthaeghe, R. (1995), 'The second demographic transition in western countries: An interpretation', in K.O. Mason, and A.M. Jensen (eds), *Gender and Family Change in Industrialized Countries*: Clarendon Press, Oxford, pp. 17–62.
- Liefbroer, A.C. (2009), 'Changes in family size intentions across young adulthood: A life course perspective', *European Journal of Population*, **25**(4), 365–386. DOI: 10.1007/s10680-008-9173-7
- Liefbroer, A.C., Klobas, K.E., Philipov, D., and Ajzen, I. (2015), 'Reproductive decision making in a macro-micro perspective: A conceptual framework', in D. Philipov, A.C. Liefbroer, K.E. Klobas (eds), *Reproductive Decision-Making in a Macro-Micro Perspective*: Springer, Dordrecht, pp. 1–15.
- McDonald, P. (2000), 'Gender equity in theories of fertility transition', *Population and Development Review*, **26**(3), 427–439. DOI: 10.1111/j.1728-4457.2000.00427.x
- Miller, W. B. (1994), 'Childbearing motivations, desires, and intentions: A theoretical framework', *Genetic, Social, and General Psychology Monographs*, **120**(2), 223–258.
- Miller, W.B., D.E. Bard, D.J. Pasta, and J.L. Rodgers (2010), 'Biodemographic modeling of the links between fertility motivation and fertility outcomes in the NLSY79', *Demography*, **47**(2), 393–414. DOI: 10.1353/dem.0.0107
- Mills, M., R.R. Rindfuss, P. McDonald, and E. te Velde, (2011), 'Why do people postpone parenthood? Reasons and social policy incentives', *Human Reproduction Update*, **17**(6), 848–860. DOI: 10.1093/humupd/dmr026
- Mills, M.C., and F.C. Tropic, (2015), 'The biodemography of fertility: a review and future research frontiers', *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*, **67**(1), 397–424. DOI: 10.1007/s11577-015-0319-4
- Morgan, S.P. (1981), 'Intention and uncertainty at later stages of childbearing: The United States 1965 and 1970', *Demography*, **18**(3), 267–285. DOI: 10.2307/2060997
- Morgan, S.P. and H. Rackin (2010), 'The correspondence between fertility intentions and behavior in the United States. *Population and Development Review*, ' **36**(1), 91–118. DOI: 10.1111/j.1728-4457.2010.00319.x
- Ni Bhrolcháin, M. and É. Beaujouan (2019), 'Do people have reproductive goals? Constructive preferences and the discovery of desired family size', in R. Schoen (ed), *Analytical Family Demography*: Springer, Cham., pp. 27–56.
- ONS (2017). *Data Set. Births by Parents' Characteristic*, accessed 1 January 2020 at [www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsbyparentscharacteristics](http://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsbyparentscharacteristics)
- Okun, B.S. and L. Raz-Yurovich (2019), 'Housework, gender role attitudes, and couples' fertility intentions: Reconsidering men's roles in gender theories of family change', *Population and Development Review*, **45**(1), 169–196. DOI: 10.1111/padr.12207
- Pearce, L.D. and S.N. Davis (2016), 'How early life religious exposure relates to the timing of first birth', *Journal of Marriage and Family*, **78**(5), 1422–1438. DOI: 10.1111/jomf.12364
- Philipov, D. (2009), 'Fertility intentions and outcomes: The role of policies to close the gap', *European Journal of Population*, **25**(4), 355–361. DOI: 10.1007/s10680-009-9202-1
- Puur, A., L.S. Oláh, M.I. Tazi-Preve, and J. Dorbritz (2010), 'Men's childbearing desires and views of the male role in Europe at the dawn of the 21st century', *Demographic Research*, **19**(56), 1883–1912. DOI: 10.4054/DemRes.2008.19.56
- Quesnel-Vallée, A. and S.P. Morgan (2003), 'Missing the target? Correspondence of fertility intentions and behavior', *U.S. Population Research and Policy Review*, **22**(5-6), 497–525. DOI: 10.1023/B:POPU.0000021074.33415.c1
- Rackin, H.M. and C.A. Bachrach (2016), 'Assessing the predictive value of fertility expectations through a cognitive–social model', *Population Research and Policy Review*, **35**(4), 527–551. DOI: 10.1007/s11113-016-9395-z
- Régnier-Loilier, A., D. Vignoli, and C. Dutreuilh (2011), 'Fertility intentions and obstacles to their realization in France and Italy', *Population*, **66**(2), 361–389. Accessed 1 January 2020 from [muse.jhu.edu/article/463107](http://muse.jhu.edu/article/463107).
- Riederer, B., I. Buber-Ennser, and Z. Brzozowska (2019), 'Fertility intentions and their realization in couples: how the division of household chores matters', *Journal of Family Issues*, **40**(13), 1–23. DOI: 10.1177/0192513X19848794
- Rybińska, A., and S.P. Morgan (2018), 'Childless expectations and childlessness over the life course', *Social Forces*, **97**(4), 1571–1602. DOI: 10.1093/sf/soy098
- Schoen, R., N.M. Astone, Y.J. Kim, C.A. Nathanson, and J.M. Fields (1999), 'Do fertility intentions affect fertility behavior?', *Journal of Marriage and Family*, **61**(3), 790–799. DOI: 10.2307/353578
- Sobotka, T. and É. Beaujouan (2014), 'Two is best? The persistence of a two-child family ideal in Europe', *Population and Development Review*, **40**(3), 391–419. DOI: 10.1111/j.1728-4457.2014.00691.x
- Spéder, Z. and B. Kapitány (2015), 'Influences on the link between fertility intentions and behavioural outcomes', in A.C. Liefbroer, K.E. Klobas, and D. Philipov (eds) *Reproductive Decision-Making in a Macro-Micro Perspective*: Springer, Dordrecht, pp. 79–112.
- Testa, M. R. (2012), 'Family sizes in Europe: Evidence from the 2011 Eurobarometer survey', European Demographic Research Papers 2012, No. 2. Vienna Institute of Demography, Austrian Academy of Sciences.

- Trinitapoli, J. and Yeatman, S. (2018), 'The flexibility of fertility preferences in a context of uncertainty', *Population and Development Review*, **44**(1), 87–116. DOI: 10.1111/padr.12114
- Voas, D. (2003), 'Conflicting preferences: A reason fertility tends to be too high or too low', *Population and Development Review*, **29**(4), 627–46. DOI: 10.1111/j.1728-4457.2003.00627.x
- Westoff, C.F. and N.B. Ryder (1977), 'The predictive validity of reproductive intentions', *Demography*, **14**(4), 431–453. DOI: 10.2307/2060589
- Zeman, K., É. Beaujouan, Z. Brzozowska, and T. Sobotka (2018), 'Cohort fertility decline in low fertility countries: Decomposition using parity progression ratios', *Demographic Research*, **38**(1), 651–690. DOI: 10.4054/DemRes.2018.38.25