"The ProperAge for Parenthood" and Second Birth Rates in Europe

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Introduction

Age is a salient structuring feature of the life course, and the notions of age norms and age expectations are particularly important in life course research. Generally speaking, the idea of age norms means that social norms exist on an appropriate age for the occurrence of specific life course events, and that they influence behaviour.Age norms can come in at least three forms: (1) timing norms, directed toward the appropriate age at particular life course events;(2) sequencing norms, preoccupied with a specific order of events; and(3) quantum norms, concerned with how often an event should occur within a certain age range or life course window (Settersten, 1997; Settersten and Mayer, 1997; Liefbroer and Billari, 2010).

Both in sociological life course research (Settersten 1997, Settersten and Mayer 1997) and in psychology (Heckenhausen, 1999), age norms are argued to fulfil important functions in structuring the life course, providing guidance to individuals in maneuvering their lives through the institutions of society (Liefbroer and Billari, 2010). They can be both enabling and restrictive: they help individuals to find their way, but also force them to abide by the mainstream pattern (Settersten and Mayer, 1997). Within developmental psychology, the enabling, "positive" role of age norms is emphasized: they help to regulate individual life courses, to provide a frame which helps individuals to “psychologically manage their life courses” without being overburdened in making their decisions, and to ensure that life course patterns remain predictable (Heckhausen, 1999: 31).

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In demography, age norms have not been discussed much. This is surprising since, first, age has always played a prominent role in demographic analysis and, second, there is an important body of literature arguing that insight into social norms is crucial for understanding demographic behaviour and demographic change, particularly with respect to fertility and fertility transitions (Rindfuss and Bumpass, 1976; Lesthaege, 1980, 1983; Blossfeld and Huinink, 1991).Liefbroer and Billari (2010) observe that more recent research on fertility behaviour and change tends to downplay the role of social norms. They suggest that this is due to the prevalent perceptionthat, in modern societies, decision making has become more individualized and less normative, as for example reflected in the observation that life course pathways in modern societies have become more diverse(Brückner and Mayer, 2005). Liefbroer and Billari (2010) make the case that norms should be brought back into explaining demographic phenomena. In the present paper, we take up the argument for the importance of age norms and investigatetheir role in the interaction between fertility timing and fertility quantum in Europe.

European men and women now tend to have their first child at a later age than the generation of their parents. This postponement of parenthood has played a crucial role in the emergence of (very) low fertility during the past decades in Europe (Kohler, Billari and Ortega, 2002; Billari and Kohler, 2004; Sobotka, 2003; 2004; Morgan and Taylor, 2006; Prskawetz, Mamolo and Engelhardt, 2010). Postponement has a direct negative effect on the yearly number of births and, hence, on period total fertility. This pure timing effect has been coming to an end since the beginning of the 21st century, resulting in a recovery of period total fertility rates(Goldstein et al., 2009). Yet, in addition to the pure timing effect on period fertility, later childbearing also affects the number of children eventually born per cohort, because people who have their first child at a later age tend to have a smaller final family size, on average. Demographers have found that this effect of fertility timing on fertility quantum differs by country and social group: in some countries and groups, a later age at childbearing is to a large extent recuperated by a higher subsequent rate of childbearing; in other countries and groups, this is much less the case. In the first case, with high recuperation, total fertility is relatively high; in the second condition, total fertility is relatively low (Billari and Kohler 2004;Frejka et al. 2008; Van Bavel and Różańska-Putek2010).

Therefore, second birth rates have become of central interest for European cross-country fertility differences: in countries with relatively high fertility, first birth postponement is

to a large extent recuperated at higher ages with fast progression to a second child (like in Sweden or France). This is less the case in countries with very low fertility, where people more oftenend up with one only child[2](like in Spain and many post-communist countries) (Sobotka 2008).Thus, focusing on the transition to second births and understanding factors that are linked to the likelihood of catching up with the second birth after initial postponement of the first birth (cf. Brodman, Esping-Andersen and Guell 2007)is crucial for understanding low European fertility rates (Van Bavel and Różańska-Putek2010).

In examining interactions between timing and quantum,the emphasis in the literature has been on the biological feature of age, i.e. on the limited time window of female fecundity: if a woman has her first child later in life, fewer years remain before reaching the biological limits of fertility. This time squeeze effect (Kreyenfeld 2002) implies that fewer births will take place due to declining female fecundity with increasing biological age, thus reducing quantumpermanently for cohorts that postpone childbearing (Kohler et al. 2002, Morgan and Taylor 2006). The cross-country variation in the postponement effect suggests, however, that social and cultural factors also play arole in timing-quantum interactions. Indeed, earlier research has found that the postponement effect on second birth rates differs not only by social group (e.g. education) but also by country or geographic region: in some social groups and countries, a higher age at first birth strongly depresses second birth rates, in other groups and countries, the postponement effect is much more limited (Kreyenfeld 2002; Gerster et al. 2007; Van Bavel and Różańska-Putek2010; Bratti and Tatsiramos 2010).

Using the third round of the European Social Survey, this paper investigates the extent to which a delay of the transition to parenthood depresses the transition rate to a second child. We focus on the role played by the sociologicalrather than the biological dimension of age in this process. We test the hypothesis that the country gradient can to some extent be explained by country-specific, culturalideals concerning the appropriate timing of the transition to parenthood. Our basic thesisis that if individuals don't comply with the normative age expectation at the transition to parenthood, they will be less likely to have a subsequent birth than individuals who have their first birth closer to the expected age. For example, in some countries, people are expectedto have their first child at a relatively young age. Typically, these will be countries close

[2]Levels of childlessness have been increasing, but they have not been a major driving force behind very low fertility levels, except in the German speaking countries (Sobotka 2008;Prskawetz et al. 2008;Frejka et al. 2008).

tothe historical Hajnal line, or even be east of that line. The Hajnal line refers to a virtual stripe running roughly from St.Petersburg in Russia to Trieste in North-East Italy. East of that line, family formation has been relatively early at least since the Early Modern period. West of that line, family formation has traditionally been relatively late (Hajnal 1982). In Eastern European countries, a high age at first birth runs against the norm. We expect that this will be associated with lower second birth rates (and, hence, lower final family size). In contrast, in countries where late childbearing is the norm, we expect that the effect of first birth postponement on subsequent childbearing will be more limited.

Age Norms and Childbearing

Childbearing is closely tied to age. As mentioned, the first and obvious reason is that female fecundity is biologically limited to a certain age span. The second, sociologically relevant reason is that cultures include normative ideas about the proper age for parenthood, the sequencing of life course events, and parity outcomes at given ages. Sociologists working in the field of demography argue that these normative beliefseffectively influence childbearing behavior (Rindfuss and Bumpass 1976, Blossfeld and Huinink 1991,Settersten and Hagestad 1996, Liefbroer and Billari 2010).

Previous survey research on age norms of several life course transitions has shown that age norms concerning childbearing are among those that are most often explicitly perceived, while other transitions like leaving or returning to the parental household were less often believed to be prescribed by specific age norms (Settersten 1997, Settersten and Hagestad 1996). For example, Liefbroer and Billari(2010) have conducted a nationally representative survey concerning age norms in the Netherlands. They found that over 97% of respondents perceived a lower age limit for childbearing (mean 19 years) and that about the same percentage perceived an upper age limit (mean 42 for women and 47 for men). In contrast, only about 57% perceived that there was a normative upper limit for number of children in place.

It has been argued that the definition of social norms necessarily implies social consequences or sanctions in case of norm violations, for example in form of gossip or the erosion of social ties (Settersten 2003: 86). Others, however, have argued that the internalization

of norms represents a very effective form of social control and might turn social sanctions obsolete orhas made them less relevant for norm adherence, especially in societieswith de-institutionalization tendencies (Heckhausen 1999; Liefbroer and Billari 2010).

In this study, we use reported ideal ages for parenthood as indicator for the normative age to have a first child in 25 European countries.We work on the assumption that dominant ideas about the ideal age for parenthood express ideas about the expected age for parenthood and exert a normative influence. We do not have direct evidence regarding perceived consequences in the case of non-adherence to the norm. Our working assumption implies that major deviations from the expected age would either be sanctioned by things like gossiping, being considered odd,and maybe mild forms of social isolation, or that the timing norm is internalized and influences behaviour even though no immediate social sanctions would follow transgression. We empirically investigatewhether ideal ages for parenthoodaffect actual childbearing.

Ideal age at first birth and second birth rates

We hypothesize that the effect of the age at first birth on the transition to a second child depends on cultural ideas about the expected age for parenthood. Our hypothesis is that there is a sociological mechanism involved in the effects of fertility timing on fertility quantum, in addition to the biological mechanism related to declining fecundity with age: the effect of the timing of the first child on the second birth rate does not only depend on biological age as a proxy for female fecundity but also on the prevalent age norm. We expect depressed second birth rates for people who live in a region with a low expected age for parenthood but who themselves have a high age at first childbearing; or, vice versa, we expect low second birth rates for individuals who were young at their first birth but who live in regions with relatively old age norms for the transition to parenthood. The first of these expectations could still be explained by biological processes, but the latter expectation, if confirmed by the data, runs against a purely biological mechanism. What are the sociological reasons for expecting an effect of cultural ideas about the proper age for parenthood on second birth rates?

In societies with a young normative age at first childbearing, women who have their first child late might feel too old to have a second baby and therefore refrain from doing so, even if they are physiologically still capable to have a second child. In those societies, the increasing

health risks for mother and child associated with pregnancies at later ages may be highlightedmore than in societies with older normatively expected ages at first birth, thus discouraging women from having (additional) children later in life (Rindfuss and Bumpass 1976). East European countries which traditionally exhibit young ages at first birth might fit this description. For example, a qualitative study in Poland (Mynarska 2010)finds that respondents perceive a social pressure for having children early, ideally in their mid 20s. Age 30 is an often mentioned deadline for the transition to parenthood. Mynarska notes that many of her respondents associate this age limit with biological factors, which underscores Rindfuss and Bumpass' (1976) argument that the perception of unrealistically young age limits for fecundity mightbe one aspect of a young age norm for the transition to parenthood and subsequently play a role in refraining from late (second) childbearing.

Also, in societies with young age norms for first births, couples willing to progress to a second parity after a late first birth might face mild forms of social isolation. Theirage peersmight have grown up children already, and they mightfear lacking social support and feelingsocially displaced in case they had another child later in life (Rindfuss and Bumpass 1976). Young women with unplanned pregnancies who decide to keep the child might encounter a more supportive environment in societies with a young age norm, and be subsequently more likely to settle down, welcome their role as a parent, and ultimately expand their family further. Conversely, in regions where the normative age at first birth is older, a young womanwho gives birth to an unplanned child might feel more displaced, too young to settle down, less supported and comfortable with her role as a parent, and thus more reluctant to have a subsequent child.

In societies with later normative ages at childbearing, a specific emphasis on female economic independence and educational attainment might exist (Blossfeld and Huinink 1991:163), which would be in line with the classic explanation for late family formation in North-West Europe given by Hajnal(1982).Here, women who have their first child early might feel social pressure to become more independent in terms of finishing their education, starting a career, and being economically independent before having additional children. They might therefore delay and possibly forgo a second child. They might, furthermore, be perceived by others as too young to be a responsible parent, feel less respectedand supported in their role as a parent and hence less encouraged to have a second child. They could also, if most parents with children of the same age as their own are older than themselves, feel relatively young or too

young to have another child soon. This could trigger postponement and eventually lead toforgoing the birth of the second child, for example because they perceive the age gap to the first child as too large after a certain time has passed.

There are still other scenarios that could link a deviation between the actual and the normative age at first birthto a depressed second birth rate. A young age at marriage has consistently been linked to higher divorce risks, net of many confounders (Booth and Edwards, 1985; Teachman, 2002). If young mothers are hence more likely to separate from their partner after the first birth, they obviously would also be less likely to proceed to parity two. Conversely, the absence of a stable partnership can also be the reason for a late first birth. If a woman is more likely to have a first child with an uncommitted partner once she comes closer to the end of her fertile life span, she might be less likely to have a second birth. If most men in regions with young age norms marry young, this leads to a sparse marriage market for women who have surpassed the average marriage age. In these regions, older women might then be more likely to have a child outside of a committed relationship and be less likely to have a second child than elsewhere. In our analysis, in order to minimize the role played by instable relationships and focus on the role of age norms, we will only include women who are living with a partner and who never experienced a divorce.

Data and methods

We use data from the third round of the European Social Survey (ESS3), with field work carried out in 2006 and 2007. In order to study parity progression from the first to the second child, we selected only respondents who were living with a partner at the time of the survey, who never experienced a divorce and who already had at least one child. This selection yielded a sample of 6456 respondents from 23 countries (see Table 1). Both male and female respondents were included, since the survey includes enough information about the partner of respondents to derive the age at first childbirth and the level of education for the female partner, also when the respondent was a male.

ESS3 asked three questions that are relevant for normative ideas about the timing of motherhood (Billari et al. 2005): 1) “Before what age would you say a woman is generally too young to become a mother?”; 2) “In your opinion, what is the ideal age for a girl or woman to

become a mother?"; and 3) "After what age would you say a woman is generally too old to consider having any more children?". Figure 1 depicts the country specific average ages for each question, along with the median ages at first childbearing actually observed among the female respondents in the European Social Survey, as estimated from the Kaplan-Meier Survivor function. In order to avoid direct endogeneityof ideal ages at parenthood on the one hand and actual age at first birth and transition to second birth on the other hand, we have estimated regional age norms from surveyed individuals who were older than 45 years. Median ages at first childbearing and second birth transitions are measured for individuals who were below age 45 at the time of survey.With this strategy, we assure that our measure of cultural ideal ages does not directly reflect the individual-level behaviour we are modelling.

[Table 1 about here]

In all countries, people tend to say that motherhood should be avoided before age 18. There is very little cross-country variability, with the mean minimal age at motherhood between 18 and 20 years in almost all cases (with Ireland as the only, but mild exception). There is more cross-country variance in the ages at which women are considered too old for further childbearing, but in almost all countries, the mean lies between 40 and 45 years - Hungary being the only, again mild, exception. This maximal age at parenthood lies close to the biological age limit, when female fecundability is decreasing very rapidly (Leridon 2008). We see no interpretable pattern in the minimum and maximum acceptable ages at motherhood.

[Figure 1 about here]

Most of the variance is in the ideal ages at motherhood, and it correlates strongly with the cross-country variance in actual ages at first motherhood (Pearson correlation coefficient is 0.82). In this case, there is a clear pattern: countries that lie more to the east of Europe, i.e. close to the Hajnal line, tend to have lower ideal (and actual) ages at motherhood; countries in Western Europe tend to have higher ideal (and actual) ages at motherhood. In almost all post-communist countries, the ideal age at first childbearing is 24 years at most - Hungary is the only exception. The highest ideal ages are reported in Ireland, the Netherlands, Spain, and Switzerland. The

Kaplan-Meier estimates for the median age at first birth tend to be higher than the ideal ages. This is particularly the case in the countries that have high ideal and actual ages at first childbearing.

Map 1 shows the ideal age to become a mother on the sub-national level of NUTS1 regions. NUTS is the standard nomenclature for the coding of regions employed by Eurostat, the EU statistical office; NUTS1 is the highest regional level beneath the country level (Różańska-Puteket al. 2009). Most of the variance is on the country rather than the regional level, with one important exception: consistent with the historical pattern pointed out by Hajnal, the Eastern German regions have clearly lower ideal ages at motherhood than the Western German regions. We will therefore employ this indicator on the NUTS1 level.

[Map 1 about here]

The minimal and maximal acceptable ages at motherhood show limited variation (especially the minimum limit) and they are relatively close to the age limits for fertility analysis conventionally used in demography (age 15 and 45 or 49, respectively). They are also relatively close to the "biological" age constraints of female reproduction while they do not show a well-known cultural-historical pattern. In contrast, the cross-country differences in ideal ages do show a pattern that is related to well-known differences in reproductive behaviour with long standing, historical roots. We will therefore use the scores for ideal age at motherhood as the indicator for the age norm, i.e. the "proper" age for parenthood. As should be expected from an effective social norm, the normative age closely correlates with the actual age at first motherhood.

Our empirical hypothesis is that the effect of the age at first birth on the subsequent second birth rate depends on the cultural ideal age at parenthood. We test this hypothesis using multilevel event history analysis. We fit discrete time, logistic hazard models for the time until the occurrence of the second birth, or until the time of the interview if no second child was born before that. Starting time t=0 corresponds to the year of birth of the first child, and since we only have information about children's year of birth, we work on a yearly time scale. Equation (1) gives the setup of the model used to test our hypothesis:

$$\text{logit}(h_{ijk}(t)) = \beta_0 + \beta_1 t + \beta_2 t^2 + \beta_3 f_{ijk} + \beta_4 a_{jk} + \beta_5 f_{ijk} a_{jk} + r_{jk} + c_k \quad (1)$$

with h_{ijk}representing the second birth hazard rate for individual *i* in region *j* of country *k*; *t* is the number of years elapsed since the birth of the first child. The hazard rate is modelled as a second order polynomial function of *t*, since we know that it first rises during the first four to five years after the first birth and then goes down again (Van Bavel and Różańska-Putek2010). The variable f_{ijk}, represents the age at first childbearing on the individual level, while $a_{jk}$is the ideal age for motherhood in region *j*of country *k*. Regional and country level random effects are represented by r_{jk} and c_k, respectively.All parameters are estimated using the Laplace approximation method for fitting generalized linear mixed models, which has the advantage over other, less precise methods that it yields reliable model log-likelihoods that can be used for hypothesis testing (Snijders&Bosker, 1999: 218-220).

Crucial for our hypothesis testing is the interaction term $f_{ijk}a_{jk}$. Our hypothesis implies that the corresponding regression parameter, β_5, is positive. The rationale for this is as follows. We know *a priori*, from the literature and from the general demography of reproduction, that the effect of age at first childbearing on the second birth rate is negative: if women have their first child at a later age, their second birth rate will be lower. Yet, our hypothesis is that this simple age effect interacts with cultural beliefs about the proper age for parenthood: in regions where people are culturally expected to have their first child at a young age, the negative age effect $\beta_3$will be in full force; in regions where people are expected to have their first child at a relatively high age, the negative age effect will be weakened. The weakening of the negative age effect will be *pro rata* of β_5 per extra year higher the ideal age for motherhood in the region of residence.

In our actual modelling, we start with a baseline model that includes, apart from the year and age at first birth, the woman's level of education and marital status (married or not) as individual level covariates - recall that our sample includes only women living with a partner who never experienced a divorce. The level of education is based on the ISCED classification (UNESCO 2003), simplified to three categories: low (ISCED 0-2), medium (3-4), and high education (5-6). Since we know that the effect of level of education on second birth rates strongly differs by country (Van Bavel and Różańska-Putek2010), we include random slopes on the country level for that factor, in addition to the random intercepts on both the country and the regional level. In the second model, we test our hypothesis by including the regional age norms

and their interaction with individual women's ages at first birth. In addition, in order to make sure that our findings are not just due to differences in wealth, the second model controls for regionalGDP per capita, measured in purchasing power standards in 2004 for NUTS1 regions. Table 1 gives basic descriptive statistics for the variables used.

Results

Table 2 presents the parameter estimates for the two fitted models. Baseline model I indicates that, overall, there has been a trend towards lower second birth rates: the calendar year at first birth (centered around its median, i.e. 1996) has a significant negative effect. The two parameters for years elapsed since the first birth imply the expected shape of the hazard function: it first rises for five yearsbefore going down towards zero again. The effect of age at first childbearing on the second birth rate is negative all the way through, but, in line with earlier findings, the negative effect gains in strength with rising age. This gain in strength was modelled by including a second order polynomial for this covariate as well. Furthermore, being married rather than cohabitating, is associated with higher second birth rates: overall, across all the countries included, the odds ratio for having a second child rather than not during a given year past the first birth is 54% higher for married than for unmarried couples, all else equal ($\exp(0.43) = 1.54$). The woman's level of education has no statistically significant effect on the second birth rate - recall that this is a conditional rate, i.e. only people with at least one child are selected. Yet, this fixed effect is a cross-national average, while we suspect from previous research that there is strong international heterogeneity about his, with negative effects in some countries possibly cancelling out positive effects in other countries.

Analysis of the country level random effects indeed reveals that there are important country differences. First, countries differ in the overall level of parity progression. The standard deviation of the random intercept for country is estimated at almost 0.29 on the logit scale, which is statistically significant according to the likelihood ratio test ($p<0.003$). Second, the level of education has heterogeneous effects on second birth rates: in some countries, a higher level of education is associated with higher second birth rates, in other countries, it is associated with lower ones. Again, the likelihood ratio test indicates that the random slopes for level of education significantly improve the fit of the baseline model ($p<0.001$).

In order to assess the importance of international heterogeneity on a more intuitive scale, we calculated empirical Bayes estimates (Snijders&Bosker, 1999, pp. 58-66) for each of the countries and plugged these into the model equation to get country-specific predicted values for the hazard rates and survivor functions. For each level of education, Figure 2 plots the complement of the survivor function at year five after the birth of the previous child, so the symbols represent the proportion with a second child within five years after the first one. The plot shows, first, that second birth rates are typically higher in Northern and Western European countries and lower in Southern and Eastern countries. Second, in countries with high second birth rates, highly educated women tend to exhibit higher transition rates than lowly educated women. In contrast, in countries with generally low second birth rates, the effect of level of education is negative, i.e. low educated women have higher transition rates than highly educated women. As a result, international heterogeneity in second birth rates is clearly higher for highly educated women than for lowly educated women.

[Table 2 about here]

[Figure 2 about here]

Note that the regional level random intercept is statistically significant in the baseline model ($p<0.03$). Model II adds the regional level variables: GDP per capita and the ideal age of motherhood. GDP has a positive effect on second birth rates: they tend to be higher in richer regions. The regional ideal age for motherhood is interacted with the individual woman's age at first childbirth (centered around age 25) in order to test our hypothesis that the effect of the age at first childbearing depends on cultural norms about the proper timing of motherhood. This cross-level interaction is statistically significant ($p<0.001$) and appeared to be very robust between alternative model formulations.

The estimated interaction effect is in line with our hypothesis: the higher the ideal age at motherhood, the higher the second birth rate after a late first childbirth. Conversely, the lower the ideal age at motherhood, the higher the second birth rate after an early first childbirth. This is implied by the positive sign of the effect of the product term. In order to allow an intuitive interpretation of the interaction, Figure 3 plots predicted second birth hazard rates at year 2 after

the birth of the first child. The horizontal axis represents different ages at which a woman may have had her first child. The vertical axis represents the second birth rate predicted by model II. The different lines refer to predicted values for women who live in regions with different ideal ages at motherhood, ranging from 22 (typical for Easter European countries) to 27 (about the ideal age observed in the Netherlands, Spain, and Switzerland). If the regional ideal age for motherhood is 22, model II predicts the highest second birth rates when the first child was born in the late teens or early twenties. Second birth rates are very low in these countries when the first child was born around age 30 or later. In contrast, if the regional ideal age is 27, second birth rates are higher when the first child was actually born around age 30 or later than when the first child was born when the mother was in her twenties. This finding clearly is at odds with a purely biological effect of the timing of first childbirth on second birth rates.

[Figure 3 about here]

Conclusion

The major trend in reproductive behaviour in Europe during the past decades has been the postponement of parenthood: people tend to have their first child at considerably older ages today than the generation of their parents. On average, the postponement has led to lower total fertility, and this effect of fertility timing on fertility quantum is called the postponement effect. The standard explanation for the negative postponement effect has been biological: female fecundity decreases with age, and decreases rapidly above age 35, so when a woman has her first child at a higher age, fewer years remain before reaching the biological limit of fertility.

Yet, this biological mechanism is only a limited part of the story. Earlier studies have shown that the postponement effect strongly differs by country and that it depends on socio-economic and contextual factors. For example, women with high levels of education have been found to be more likely to have a second child after initially delaying childbearing in France, a country with a TFR close to replacement level (Köppen, 2006). A recent study has confirmed this trend across European countries: a later age at first birth was associated with higher second birth rates for women with high levels of education as compared to lowly educated women in European countries with fertility rates that were closer to replacement. Additionally, for highly educated women, a high enrolment in childcare on the national level was associated with higher

second birth rates (Van Bavel and Rozanska-Putek, 2010).Bratti and Tatsiramos (2010)found that the effect of delayed motherhood differs both across European countries as well as for working versus non-working women. They demonstrated that non-working women with late first births were more likely to forgo a second child; this effect was specifically large in Italy, Portugal, Spain and Greece but also Ireland. Among working women, however, delayed motherhood increased the probability of having a second child, especially in Denmark and France. Those country differences in the transition to second births after initially delayed motherhood indicate that contextual factors play a role in the postponement effect.

This paper has argued that an important contextual factor has been neglected in research so far, i.e. normative beliefs about the "proper age for parenthood". Our main hypothesis is that different regions of Europe have different normative beliefs about what constitutes a "proper age for parenthood" and that these beliefs have an influence on the postponement effect: if people have their first birth at an age in line with the regional age norm, their second birth rate may be expected to be higher; if the age at first childbirth deviates from the norm, the second birth rate may be expected to be depressed.

Our results confirm this hypothesis. We find that second birth rates tend to be depressed in two kinds of situations. First, second birth rates are very low if the transition to motherhood occurs relatively late (say at age 27 or later) in regions where the cultural ideal age at motherhood is relatively young (say in the early twenties). Thedirection of this effect is still in line with what might be expected from the purely biological mechanism of declining fecundity with age. Yet, the size of the effect is much more dramatic than what can be explained by the age gradient of fecundity. Second, we also find depressed second birth rates for people who have their first child at an early age (say around age 22) in regions where the cultural ideal age is relatively late (say around age 27). In this kind of regions, women who had their first child around age 30 tend to have higher second birth rates than women who had their first child around age 22. Clearly, this cannot be explained by a biological mechanism; based on the age function of declining fecundability, the opposite would be expected. We conclude from these findings that the strength of the postponement effect is a function of cultural beliefs about what constitutes a "proper" age for parenthood.

Our models contain controls for marital status and level of education on the individual level and wealth on the regional level, as measured by GDP per capita. In line with well

established earlier findings, women who were married at the time of their first birth had higher second birth rates than unmarried, cohabiting women. Ever divorced and single-living women were not included in our sample. The effect of the level of education differs by country, as indicated by the random slopes included in our models. In line with earlier findings, in countries with relatively high total fertility, high education tends to be associated with high second birth rates. In very low fertility countries, in contrast, high education tends to be associated with low second birth rates. Finally, a high GDP is associated with higher second birth rates, but this cannot explain away our main finding about the role of age norms.

While we have demonstrated a significant and robust effect of the interaction of regional age norms and actual ages at first birth on second birth rates, our research does not uncover the underlying social mechanisms. We have suggested social scenarios which may explain this relationship; if those or other mechanisms are at work, however, remains an open question for further research.

Also, it remains to be seen whether beliefs about what constitutes a proper age for parenthood will remain persistent or whether they will follow suit with the increased actual ages at first birth. Since it is especially the higher educated who are now postponing parenthood in traditionally early-motherhood countries, we speculate that the age norms will change in the coming years. If age norms will continue to play the role as suggested by this paper, it will imply that the negative postponement effect will weaken and that we will be seeing more catching up at later ages. Yearly total fertility rates are already increasing in European countries that formerly exhibited very low fertility (Goldstein, Sobotka and Jasilioniene, 2009), and our hypothesis is that upward shifting age norms and therefore weakening postponement effects play an important role in this process.

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Tables, Figures, and Map

Table 1. Descriptive statistics of the sample and variables used in the analysis

Country	Code	N	Variable	N	%	Mean	SD
Austria	AT	328					
Belgium	BE	288	*Individual level*				
Bulgaria	BG	214	Year of first childbirth	6186		1997.18	5.91
Cyprus	CY	156	Age at first childbirth	6186		25.65	4.63
Denmark	DK	223					
Estonia	EE	197	Married				
Finland	FI	265	- Yes	5266	85.1		
France	FR	362	- No	920	14.9		
Germany	DE	348					
Great Britain	GB	270	Level of education				
Hungary	HU	191	- Low	1462	23.6		
Ireland	IE	266	- Medium	2879	46.5		
Latvia	LV	234	- High	1800	29.1		
Netherlands	NL	290	- Unknown	45	0.7		
Norway	NO	258					
Poland	PL	325					
Portugal	PT	306					
Romania	RO	295					
Slovakia	SK	326					
Slovenia	SI	220	*Regional level (Nuts 1)*				
Spain	ES	294	GDP per capita in 2004	82		21786	8634
Sweden	SE	265	Idealage at motherhood	82		24.66	1.05
Switzerland	CH	265					
Total N women		6186					

Table 2. Discrete time logistic hazard models of transition from first to second birth

	Model I			Model II		
	b	se	p	b	se	p
FIXED EFFECTS						
Intercept	-3.375	0.103	<0.001	-5.021	0.692	<0.001
Year of birth first child - 1996	-0.027	0.004	<0.001	-0.026	0.004	<0.001
Years elapsed since first birth	0.740	0.022	<0.001	0.717	0.022	<0.001
Yearselapsed… squared	-0.073	0.002	<0.001	-0.072	0.002	<0.001
Age at first childbirth - 25	-0.009	0.005	0.084	-0.494	0.101	<0.001
Age at first childbirth - 25 squared	-0.001	0.001	0.044	-0.002	0.001	0.012
Married (ref.=unmarried)	0.433	0.059	<0.001	0.345	0.057	<0.001
Level of education (ref.= low)						
- medium educated	-0.073	0.076	0.337	0.022	0.047	0.636
- highlyeducated	0.030	0.100	0.760	0.180	0.056	0.001
GDP/capita 2004 (/1000)				0.035	0.004	<0.001
Regional ideal age at motherhood				0.038	0.030	0.197
Regional Ideal age … X actual age at first birth				0.019	0.004	<0.001
RANDOM EFFECTS	st.dev.		p	st.dev		p
Nuts1 regionintercept	0.142		0.027 °	0.0812		<0.001 °
Country intercept	0.288		0.002 °	0.043		0.008 °
Country slope for medium educated	0.275		<0.001 °	0.0615		0.014 °
Country slope for highly educated	0.146		<0.001 °	0.0848		0.014 °
Deviance (-2LL)	23225		<0.001	23279		<0.001
Number of person years	33177			33177		
N countries / regions	23 / 82			23 / 82		

° LLR tests with random components deleted from the restricted model

Figure 1. Ideal age to become a mother, Kaplan-Meier estimate of actual median age at first motherhood, minimal age for motherhood, and maximal age for further childbearing

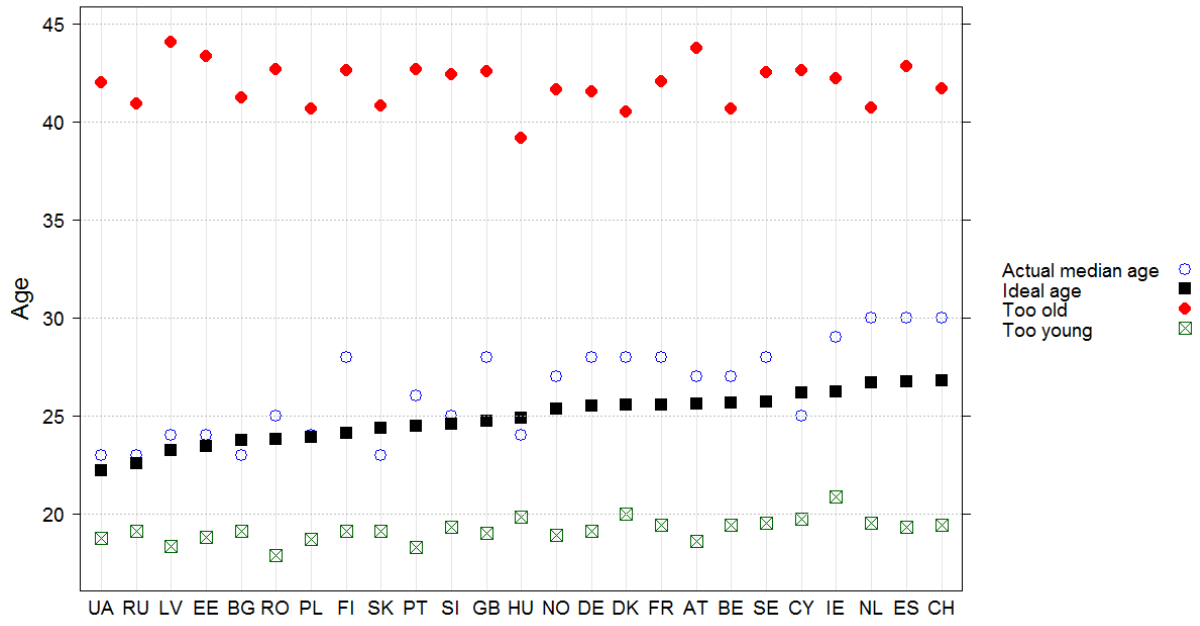
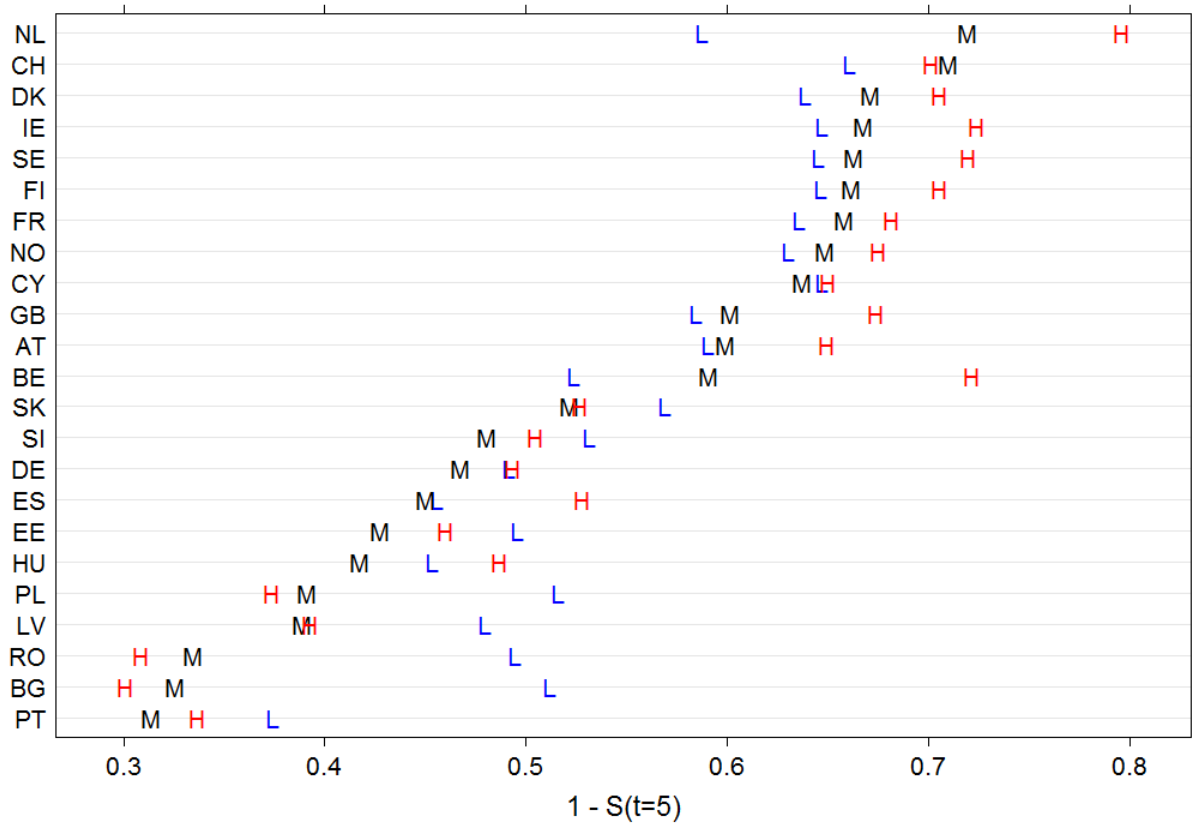
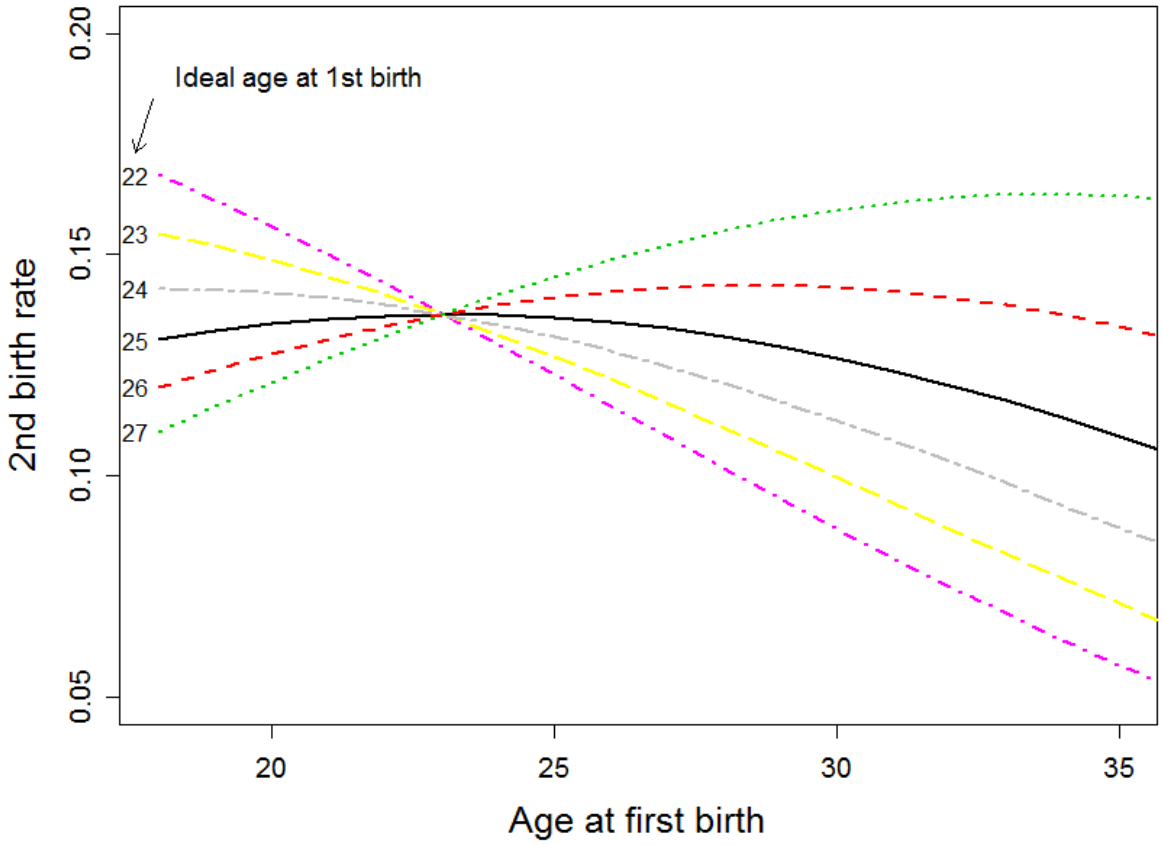


Figure 2. Proportion with a second child within five years after the birth of their first child, by country and level of education (L=low, M=medium, H=highly educated)*



* Predicted proportions are the complement of the baseline model survival function, calculated for married couples whose first child was born in 1996 when the wife 25 years old

Figure 3. Discrete time second birth hazard rate in year 2 after the transition to motherhood, by regional ideal age at becoming a mother and by actual age at first birth*



* predicted hazard rates for married women of medium education, in a country with a GDP per capita of 20.000 PPS Euros.

Map 1. Ideal age to become a mother according to ESS3 respondents, by NUTS1 region