# Second births

## – the consequences of changing family and fertility patterns in the Czech Republic

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**Abstract**

The social, political and economic transformations experienced by the former socialist countries of Central and Eastern Europe since the beginning of the 1990s have resulted in rapid changes in demographic trends the consequences of which, with regard to marriage and fertility, are significant. The period since 1990 has witnessed far-reaching changes in the occurrence and timing of family life transitions among young adults in the Czech Republic. Family formation was postponed in the period 1990 and 1996 and fertility rates declined sharply from 1.89 to 1.18 during this period remaining below the 'lowest-low' threshold (at 1.1-1.2) until 2004.

The study investigates the determinants of having a second child in Czech society during two distinctive political periods characterised by differing demographic behaviour. The study involves a society in which the most characteristic trend in reproductive patterns during the socialist era was a strong orientation towards the two-child family and where the ideal of a two-child family still persists.

An event-history approach is employed to analyse Czech women born from 1951 onwards who could potentially have had a second birth from the beginning of the 1970s. Data has been extracted from the Czech Generations and Gender Survey (2005).

In line with findings in other countries, it was discovered that family background and early life course experiences as well as membership of a religious community are important second birth determinants in Czech society. The study discusses two key variables - education and partnership history – and presents results obtained from a model which employs the unobserved heterogeneity factor.

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## 1. Introduction

The social, political and economic transformations experienced by the former socialist countries of Central and Eastern Europe since the beginning of the 1990s have resulted in rapid changes in demographic trends the consequences of which, with regard to marriage and fertility, are significant. The period since 1990 has witnessed far-reaching changes in the occurrence and timing of family life transitions among young adults in the Czech Republic. Family formation was postponed in the period 1990 and 1996 and fertility rates declined sharply from 1.89 to 1.18 during this period remaining below the 'lowest-low' threshold (at 1.1-1.2) until 2004. Only the most recent data suggests a slight recovery in total fertility with an increase to 1.44 in 2007.

Whereas cohorts born during the 1940s, 50s and 60s are characterised by early (and almost universal) marriage and family formation, the large cohorts of the mid-1970s exhibit more diverse patterns, characterised by a marked postponement of union formation and parenthood as well as higher rates of childlessness, maintaining single status and out-of-wedlock births. The growing diversity in the timing and sequencing of family-related transitions is reflected in an increasing social differentiation in demographic behaviour.

The most characteristic trend in reproductive patterns during the socialist era was a strong orientation towards the two-child family model. Around 72 to 74 per cent of women born in the 1930s had a second child increasing to around 80 per cent for those born in the late 1940s and 1950s. A decline in second order births commenced with the late 1950s generation and, according to estimates, only around 70 per cent of women born in the late 1960s will choose to have a second child (Frejka, Sardon 2004: 159).

According to recent sociological surveys, the ideal of a two-child family still persists and the two-child model has been identified consistently over the long term in various sociological studies (Hamplová 2000, Fialová et al. 2000, Šťastná 2007). Given the currently very low fertility rate, changing fertility and family behaviour and the continued postponement of childbearing to a later age amongst younger cohorts of women and, more particularly, the increase in the interval between the first and second births, the important question is whether the proclaimed aspirations for a two-child family will be fulfilled and whether the tendency will be for women to actually have a second child. Moreover, the question must be asked as to whether women will increasingly choose not to have more children after the first delivery, leading to an increase in the proportion of one-child families in society, or whether two distinctive groups will emerge: one remaining childless with the other perpetuating the two-child family model (merely postponed to a later age).

Consequently, the study investigates the determinants of having a second child in Czech society before the political changes of 1989, during the following period of fundamental

structural change as well as the subsequent ten years or so under the conditions of a relatively established market economy. Using data from the Czech Generations and Gender Survey (2005) the study examines cohorts born from 1951 onwards who could potentially have had a second birth from the beginning of the 1970s.

The study aims to focus on an analysis of the conditions and context surrounding the birth of a second child in the family, on discovering the relationship between the likelihood of the birth of a second child and different micro-level covariates and on an explanation of the processes acting upon second childbearing through interactions with education and partnerships/union dynamics.

## 2. The Czech Republic background – two-child family model

The socialist era was characterised by the universality of a two-child family model and relatively low socio-economic differentiation in completed family size (Rychtaříková 2004). Around 72 to 74 per cent of women born in the 1930s had a second child increasing to around 80 per cent for the generations of the late 1940s and the 1950s. A decline in second order births started with the cohorts of the late 1950s and apparently only around 70 per cent of women will have a second child in the cohorts of the late 1960s. Other feature related to a second child is cohort change in parity distribution; the proportion of two child family increased from under 40 per cent for the cohorts of the late 1920s to around 55 per cent in the cohorts of the 1950s and early 1960s (Frejka, Sardon 2004: 159).

Demographic changes of the 1990s were not connected only with delaying of entry into marriage and first childbearing but are characterised by prolongation of the interval between first and second birth (from 3,7 years in 1990 to 5,1 years in 2005; Zeman 2006) and delaying of childbirth within the frame of marriage as well. Due to postponing of a second childbirth within marriage, the decrease in second parity marital fertility rate during the 1990-1997 period was more significant (from 531 second children per 1 000 marriages in 1990 to 386 in 1997, i.e. 27 per cent). Since 1998 second parity total marital fertility rate has started to increase (in 2000 second parity total marital fertility rate reached 426 children per 1 000 marriage and till 2005 this value has increased to 486 children). Average interval between wedding and second childbirth grew from 4.3 years to 5.5 years throughout the 1990s and this increase continued to 5.9 years in 2005 (Kantorová 2002; own calculation based on the vital statistics data).

Another indicator of postponing second childbirth within marriage is the increasing difference of average time span between first and second childbirth from 3.1 years in 1990 to

3.9 years in 2000. This level remains also in 2005 (Kantorová 2002; own calculation based on the vital statistics data).

The recuperation of delayed childbearing among cohorts experiencing strong fertility postponement is firstly perceivable within the transition into first birth and afterwards becomes apparent in the progression into second birth (and higher order births). Therefore the catching up effects has been so far less pronounced in the case of second birth in the Czech Republic. The reduction of cohort parity progression ratio was higher in the case of parity two than in the case of transition to first child (Rychtaříková 2004). However, even if part of the second children will be probably delivered even later (Rychtaříková 2004) it is very likely that the proportion of women with only one child will increase more rapidly than the proportion of childless (Sobotka et al. 2008).

## 3. Theoretical background

Analyses of the transition to the second child, based on the theoretical concept of the life course, point to other factors influencing the likelihood of the birth of a second child. Among them are the woman's age at first birth, socio-economic status, marital status, number of children in the orientation family and religious affiliation (Prskawetz, Zagaglia 2005; Köppen 2006). An additional issue is the question of the influence that education has on the probability of higher order births. In several countries in recent years, analyses have suggested that education has a positive influence on the higher order births – for example, such a correlation has been demonstrated for Western Germany (Kreyenfeld 2002; Alich 2006), Austria (Hoem et al. 2001) and the Scandinavian countries (Kravdal 1992; Oláh 2003). This phenomenon has been explained by some as the income effect, since women who are better educated tend to work in better paid jobs, contributing substantially to the family budget, meaning that financing a larger family is not problematic for them. Other hypotheses have been voiced as well, however. The risk of the birth of a second child in Western Germany, for instance, is considerably influenced by the characteristics associated with the woman's partner: primarily his education (which fits in with the Western German context, where the employment situation of the male "breadwinner" is crucial for the decision to have a larger family) (Kreyenfeld 2002). Apart from a strong effect of the parent's characteristics, there have also been proved the "selection hypothesis", which is based on the idea that the fact that certain women with the highest level of education have decide to become mothers is evidence of the pro-familial orientation of those women. Hence family-oriented colleges graduated are more likely to select themselves into the group of women at risk of second birth (Kreyenfeld 2002).

From the perspective of a life-course approach, compared to the transition to parenthood, i.e. the birth of the first child, the birth of a second child is considered to be an independent and specific life transition in which the "normative parental imperative" does not play a role (Rindfuss, Morgan, Swicegood 1987). Under that imperative, every (healthy) adult member of society should become a parent, but one child suffices for a person to realize the desire to become a parent (Presser 2001). Experience with the first child, though, provides the individual with a better idea of the challenges associated with childcare and its impacts on occupational and non-occupational arenas. This experience can result in a situation in which parents postpone or completely give up the idea of having an additional child; for some women, the social costs (primarily, the value of free time) associated with a second child compared to the first might outweigh the benefits associated with another childbirth (Presser 2001).

## 4. Research questions

Given the currently very low fertility rate, changing fertility and family behaviour and the continued postponement of childbearing to a later age amongst younger cohorts of women and, more particularly, the increase in the interval between the first and second birth, the important question is whether the proclaimed aspirations for a two-child family will be fulfilled and whether the tendency will be for women to actually have a second child. Moreover, the question must be asked as to whether women will increasingly choose not to have more children after the first delivery, leading to an increase in the proportion of one-child families in society, or whether two distinctive groups will emerge: one remaining childless with the other perpetuating the two-child family model (merely postponed to a later age).

The permanent childlessness among Czech women is relatively low (childlessness at 7.5 per cent reached among women born in 1965) and it is likely to remain below the levels recorded or projected in other countries of Central Europe. According to estimates 13-14 per cent of women born in 1975-1978 may remain permanently childless (Sobotka 2006: 66).

Entry into motherhood was one of the many life events that witnessed profound changes after 1990. Moreover, specific questions arose which might be studied not only for the first birth, but also with regard to higher birth orders:

- How do characteristics of the parental home, such as number of siblings or the family situation of the parents influence the risk of the second birth?
- How important roles do women's characteristics, such as education and partnership history, play in planning and timing childbirth?

- How do changes in population/family policy and the socio-economic changes of the 1990s influence real family behaviour and how the risk of second birth has been changing over the last 35 years?

## 5. Data, method and covariates

The data used in this study comes from the Generations and Gender Survey (GGS) conducted in the Czech Republic in 2005 in the framework of the international project Generation and Gender Programme coordinated by United Nations Economic Commission for Europe. The GGS is a panel survey of a nationally representative sample of 18-79 year-old resident population in each participating country with at least three panel waves and an interval of three years between each wave. The Czech first wave survey sample contains data on a total of 10,006 subjects consisting of 4798 men (48%) and 5208 women (52%) from cohorts born during the period 1926-1987. Data is restricted to the Czech nationality only and was collected in face-to-face interview.

Analysis is restricted to respondent women no older than 54 years at the time of the interview. Selected cohorts consist of women who had already had a first child and who could, therefore, potentially have had a second conception in the 1970s, 1980s and from the beginning of the 1990s.

Analysis is interested in the event of second birth (in the data set expressed in month and year of birth). The date of second childbirth is backdated by nine months to obtain an approximate date of conception. Important distinction between an event of second pregnancy and the event under study is that we measure only those pregnancies that resulted it the birth of second child; we have no information about second pregnancies ended by abortions or miscarriages. Backdating by nine months is used because events that occurred after conception might be influenced by conception itself (e.g. changes in partnership status influenced by pregnancy; the end of participation in education, caused by pregnancy; however this could be more frequent in case of first conception).

The event of second conception is studied since birth of the first child (baseline is therefore the age of first child measured in months). We censor cases 15 years after the first child was born or at the age of 50, at the interview or at the date of sterilization if reported, whatever came first.

For the analysis of the second birth only records of female respondents who had at least one surviving child were selected. We excluded all cases where the first conception occurred before the age of 15 or where the respondent was over 40 years at first birth because the childbearing behaviour of those women (both very young and rather old) is likely to be highly

different from others. Furthermore, we excluded cases with missing information on the years of birth of first and second child, on the educational attainment of woman and also those cases where we were not able to reconstruct partnership history. We excluded records where respondent adopted her first child of lived with foster or step children. Finally, we omitted from the multivariate analysis women for whom a first birth was twins, since it was not possible to calculate a positive duration of process time for them.

The remaining second births sample comprises 2066 women who gave birth to 1366 second children. First women in the sample was under risk of event in 1969 (April), this is the date when first child (parity one) was born.

Event-history techniques are employed to estimate the transition to a second birth. We proceed in a manner suggested by Kravdal (2001) and first and second birth probability was estimated from a joint model to which a common unobserved heterogeneity factor was added in order to address the question of whether any selection effect could be detected amongst Czech women. In mathematical terms, the specifications for first (1), and second (2) births are as follows:

$$\ln h_i^{(1)}(t) = y^{(1)}(t) + \sum_j \beta_{1j}^{(1)} x_{ij} + \sum_k \beta_{2k}^{(1)} w_{ik}(t) + \varepsilon_i \qquad \textbf{(1)}$$

$$\ln h_i^{(2)}(t) = y^{(2)}(t) + \sum_j \beta_{1j}^{(2)} x_{ij} + \sum_k \beta_{2k}^{(2)} w_{ik}(t) + \varepsilon_i \qquad \textbf{(2)}$$

For the transition to the **first child** $h^{(1)}(t)$ is the hazard of occurrence at time $t$, $y^{(1)}(t)$ is the baseline hazard. The baseline duration used is age, measured since the women turned age 15. For the transition to the **second child**, $h^{(2)}(t)$ is the hazard of occurrence at time $t$, $y^{(2)}(t)$ is the baseline hazard. The baseline duration is the time since the first birth (i.e. age of the first child).

In both equations, $x_{ij}$ are the time constant covariates and $w_{ik}$ are time varying covariates; $\beta_1$ and $\beta_2$ represent the respective coefficients for the effect of time constant and time varying covariates on the log risk of first and second conception.

The symbol $\varepsilon$ represents the unobserved heterogeneity factor that is the same for both birth parities. $\varepsilon$ is supposed to be normally distributed with mean 0 and a variance of σ2. This means that we examine the correlation between the unobserved heterogeneity components of the transitions to first and second child.

The baseline log-hazard is a piecewise-linear spline (also known as a generalized Gompertz function). The parameters are estimated using aML software (Version 2.09). This software allows inserting continuous covariates (in our case the woman's age at first birth and

period) as a piecewise linear function. A linear spline is a flexible form of representing the effect of a continuous independent variable. Apart from using a log baseline and one or more covariates represented as a linear spline, aML also allows to make an interaction between exploratory variables and to control for unobserved heterogeneity (for more details, see Lillard and Panis 2003). Data preparation was made with the use of Stata statistical software.

Using a set of covariates we developed several analytical models focusing on the determinants of having a second child in Czech society. The controlled variables expected to influence fertility behaviour with regard to a second child are drawn from both theory and empirical research. We introduced several time constants and time varying covariates.

**Time constant covariates**

- **Religion** - Czech society became highly secularised during the twentieth century. Nevertheless, the membership of a religious community is related to the different values and lifestyle maintained within this group of parents and positively influences the number of children in Czech family (Fialová et al. 2000). We assume religious belief to be a stable personal trait and therefore the fact that we have evidence only from the time of the interview should not distort our results. We assume that religiosity has positive impact on the risk of second birth.
- **Number of siblings -** Empirical studies documented, that the size of the family of origin influences fertility behaviour of women and her transition into motherhood. Women who were brought up in larger families enter into motherhood more rapidly while women from smaller families have a lower and delayed transition to first birth (Kantorová 2004). We assume that women having more siblings have also higher tendency to establish larger families and therefore have a higher second birth risk than women with no siblings.
- **Parental break-up** - empirical studies documented an impact of experiencing parental divorce in diverse demographic processes. Children of divorced partners learn more alternatives to marriage; they display a higher propensity to cohabit before marriage than children from intact families do (e.g. Bumpass, Sweet, Cherlin 1989; Thornton 1991; Manting 1994). However the role of parental divorce in the second conception decision-making process is not clear. One assumption could be that women experienced parental discord ending in separation would try to establish own family with satisfying relationship between family members and therefore could have higher propensity to have also more than one child. The counterargument based on the empirical results accents the role of broader forms of partnership and the fact that these women are more likely to and they marriage in divorce (Šťastná 2005). More alternatives to marriage, living in cohabitation

or without partner are supposed to have negative influence on childbearing in general and similarly on the risk of transition to second birth. Therefore we assume that having divorced parents during the childhood reduces risk of transition to second birth.

**Time varying covariates**

- **Educational level** plays an important role in determining preferences, values and social behaviour and reflecting the socioeconomic and cultural capital of the individual. The highest educational level achieved is constructed as a time varying covariate - respondents who were studying at the time of interview were coded as being in education. In other cases respondents were coded as being in education throughout the time before they attained the reported educational level. After the date of education completion, respondents were coded as being out of education and according to the degree they completed divided into four groups. We make distinction between respondents with "elementary degree" (uncompleted or primary education), "lower-secondary degree" (apprenticeship and secondary education without *maturita*), "secondary degree" (completed upper-secondary education with *maturita* including follow-up courses) and respondents with "post-secondary degree" (higher technical schools including conservatoire, university graduated).

- **Marital status/partnership status -** Having a partner is one of the determinate influencing the second conception decision-making process. Moreover marriage remains an important indicator of values and family-oriented life style. Therefore we include a covariate to control whether the women lived out of union (single or divorced/separated) or in a marital or nonmarital union in each month of observation. We expect the second birth risk for married women to be higher than for cohabiting women and for women in union to be higher than for those living alone without partner.

  To take into account that fertility in higher-order unions may differ from fertility in a first union we control for the order of the current union. In former Czechoslovakia the fertility of remarried women was studied already in 1980s by Kučera (1984) who argued, that total fertility of repeatedly married women was higher than of first married women because of relatively frequent additional delivery with a new partner. The highest fertility in the second marriage had women who had entered this marriage childless or with only one child. A first shared child may dispense several functions to the parents. In literature the parenthood effect for a new partner, a union-commitment effect for both partners and a sibling effect is discussed (Griffith et al. 1985, Vikat, Thomson, Hoem 1999; Buber, Prskawetz 2000). We expect that living in higher order union and having a new partner increases the risk of the second birth.

- **Period** - In an attempt to capture the effect of different periods in which the women were at risk of second birth, one has to take into account changes in related domains namely changes in population/family policy and profound changes introduced by the labour market economy in the early 1990s. Therefore we include the calendar-time period as a time-varying covariate and we split it into five distinct periods (1969-1975, 1976-1979, 1980-1989, 1990-1996, and 1997-2005). This splitting corresponds with major changes in family policy and tries to capture economic changes and changes in whole Czech society in the period of transition. The effect of current calendar time is controlled by introducing additional duration spline.

Another important covariate in fertility studies is **age** of women. Age at first birth and its changes are particularly important because of the potential room or lack therefore that is left for higher order births (Frejka, Sardon 2006). In the model we include current age of women as a regressor spline, which is more flexible type of modelling[1].

## 6. Findings

### 6.1. Second births and influence of demographic and social background characteristics

In Table 1 we compare estimates obtained from a traditional, separate modelling of first and second birth with those obtained from a joint model. The joint model for first and second birth, including an unobserved factor allowed to influence all of these rates, was applied by Kravdal (2001) as a more direct way to capture the importance of unobserved heterogeneity[2]. He estimates the transition to the first, second and third child within a joint model and adds a common unobserved heterogeneity factor. Similar to Kravdal (2001), we estimate first and second birth risks within a joint model and we insert a common **unobserved heterogeneity** factor to the model.

The results show that the common unobserved heterogeneity factor in the joint model is positive and significantly different from zero. This means that there are unobserved factors, respondent-specific characteristics, which affect fertility decisions. The interpretation that is proposed for unobserved heterogeneity factor is the concept of the part of population that is

[1] AML offers the capability of allowing the hazard to be a function of other durations. Thus we could capture age effects through a continuously changing function of age (piecewise-linear). This is better solution than using time varying covariates. By definition, time varying covariates change discretely from one sub-interval to the next, and their effect on a hazard thus consist of discrete jumps (Lillard, Panis 2003: 180)

[2] Concept of unobserved heterogeneity is based on the fact that individuals may experience several family and fertility events over their life-course and it is not possible to assume that the events for the same individual are independent. Therefore we suppose unobserved individual-specific factors which affect the hazard of all events of an individual. We thus need to control for the dependence of events of an individual. If repeated events (e.g. first and second birth) are available for individuals we can easily identify and control for individual-level heterogeneity.

more “family-prone” than the other (Kreyenfeld 2002, Kravdal 2001). These two groups of people, those with high-family proness and those with low-family proness cannot be distinguished in the data by any question; however they probably display different fertility behaviour over their life-course.

Results for the Czech Republic show that contrary to the positive effects of upper-secondary education on second-birth rates (seen in the separate model) there is no significant effect of upper-secondary education after having included an unobserved factor in the joint model. Being a student after first birth lowers the risk of having another child. The incompatibility of education enrolment and parenthood could be caused by several factors – economical (no income or very limited income to pay for child-related expenses, lack of appropriate housing etc.), normative (finishing education is seen as one of the important step for entering parenthood – Blossfeld, Huinink 1991), or available time (dual burden of being student and mother could cause conflicting time commitments).

To measure the impact of family background and early life-course experiences we included covariates describing the size of the family of origin and parental divorce. Membership of a religious community is included in order to measure different values and lifestyle within one specific group of mothers.

As we see in table 1 having siblings positively influences transition to second birth. Being the only child reduces the risk of having the second child by 35 per cent, risk for women from families with more children increases with the increasing number of siblings. Positive impact on the risk of second birth is associated also with the religiosity of women, i.e. whether she regularly attends religious services at least once per month. Impact of religion affiliation corresponds to results of study focused on the third child (Pikálková 2003); different norms connected with a religiosity play important role also in case of second order birth even if the selectivity within the transition to larger family (three and higher order child) would be probably stronger.

Model confirms the assumption that having divorced parents in the childhood reduces risk of transition to second birth. However the effect of parental divorce disappears after controlling for the effect of partnership status and union order (model not shown). In the Czech Republic parental divorce has the effect of lowering the age at which a child leaves home and the age at which a child begins living with a partner in a shared household (Šťastná 2005). Similarly, parental divorce increases the occurrence of cohabitation prior to marriage (Šťastná 2005; Zeman 2003). The daughters of divorced parents significantly more often lived with their partner in cohabitation than women who grew up in two-parent families. Therefore in the case of second birth the effect of parental divorce is probably mediated through the form of partnership.

Effect of calendar period corresponds with the main fertility trends during last 40 years in the Czech Republic. After the increase of intensity in the first half of 1970s (during the period of pro-natalist policy), there was long period of decline with the beginning in 1976. Especially between 1990 and 1996 period fertility rates declined sharply from 1.89 to 1.18. Recent years show turning point in the mid 1990s; total fertility rate had been stabilized below the 'lowest-low' threshold (at 1.1-1.2) until 2004. However the effect of calendar period for the last decade changes after controlling for the effect of partnership status and union order (model not shown). In that case the second birth risk increases slightly again since 1996.

**Table 1: Transition to first and second child, event-history models for each transition and joint model with unobserved heterogeneity factor**

| | First conception | | | | | |
|---|---|---|---|---|---|---|
| | **Separate model** | | | **Joint model with unobserved heterogeneity factor** | | |
| **Age** | | | | | | |
| intercept | -4.7490 | | *** | -5.5156 | | *** |
| slopes: | | | | | | |
| 15-19 | 0.6066 | | *** | 0.6648 | | *** |
| 19-22 | 0.0520 | | * | 0.1878 | | *** |
| 22-25 | -0.0138 | | | 0.0949 | | ** |
| 25-28 | -0.0146 | | | 0.0744 | | |
| 28-32 | -0.2508 | | *** | -0.1932 | | *** |
| 32+ | -0.0977 | | ** | -0.0691 | | |
| **Period (spline)** | | | | | | |
| 1966-1975 | 0.0683 | | ** | 0.0961 | | *** |
| 1975-1979 | -0.0603 | | ** | -0.0574 | | * |
| 1980-1989 | 0.0300 | | *** | 0.0197 | | * |
| 1990-1995 | -0.1208 | | *** | -0.1290 | | *** |
| 1996-2004 | -0.0331 | | ** | -0.0572 | | *** |
| | **β** | **exp(β)** | | **β** | **exp(β)** | |
| **Education** | | | | | | |
| In education | -1.1103 | 0.33 | *** | -1.2075 | 0.30 | *** |
| Out of education: | | | | | | |
| elementary | -0.0386 | 0.96 | | 0.1536 | 1.17 | |
| lower-secondary | 0.0012 | 1.00 | | 0.0524 | 1.05 | |
| *secondary* | | 1 | | | 1 | |
| post-secondary | 0.1822 | **1.20** | * | -0.0811 | **0.92** | |
| Missing | -0.2369 | 0.79 | * | -0.1102 | 0.90 | |
| **Number of siblings** | | | | | | |
| None | -0.1598 | 0.85 | ** | -0.171 | 0.84 | * |
| *1 sibling* | | 1 | | | 1 | |
| 2 siblings | 0.1491 | 1.16 | *** | 0.2136 | 1.24 | *** |
| 3 and more siblings | 0.3193 | 1.38 | *** | 0.4921 | 1.64 | *** |
| **Log-likelihood** | -11670.8 | | | x | | |

*continuation*

| | Second conception | | | | | |
|---|---|---|---|---|---|---|
| | **Separate model** | | | **Joint model with unobserved heterogeneity factor** | | |
| **Age of first child** | | | | | | |
| intercept | -2.2224 | | *** | -3.3921 | | *** |
| slopes: | | | | | | |
| 0-1.5 years | 0.8153 | | *** | 0.8316 | | *** |
| 1.5-4 years | -0.1214 | | *** | -0.1301 | | *** |
| 4-6 years | -0.1952 | | *** | -0.2421 | | *** |
| 6+ years | -0.0465 | | | -0.0944 | | *** |
| **Age (spline)** | | | | | | |
| 18-25 | -0.0312 | | | 0.1249 | | ** |
| 25-30 | -0.0420 | | * | 0.0717 | | ** |
| 30-35 | -0.1652 | | *** | -0.0842 | | * |
| 35-40 | -0.2645 | | ** | -0.2295 | | * |
| 40+ | -0.2605 | | | -0.1862 | | |
| **Period (spline)** | | | | | | |
| 1969-1975 | 0.0399 | | | 0.0295 | | |
| 1976-1979 | -0.0463 | | | -0.0433 | | |
| 1980-1989 | -0.0355 | | *** | -0.0447 | | *** |
| 1990-1995 | -0.0305 | | | -0.0439 | | ** |
| 1996-2005 | 0.0236 | | | -0.0052 | | |
| | **β** | **exp(β)** | | **β** | **exp(β)** | |
| **Education** | | | | | | |
| In education | -0.389 | 0.68 | *** | -0.6774 | 0.51 | *** |
| Out of education: | | | | | | |
| elementary | -0.1116 | 0.89 | | 0.0681 | 1.07 | |
| lower-secondary | 0.0052 | 1.01 | | 0.0876 | 1.09 | |
| *secondary* | | 1 | | | 1 | |
| post-secondary | 0.2054 | **1.23** | ** | -0.0211 | **0.98** | |
| **Number of siblings** | | | | | | |
| None | -0.3200 | 0.73 | *** | -0.4290 | 0.65 | *** |
| *1 sibling* | | 1 | | | 1 | |
| 2 siblings | 0.1323 | 1.14 | ** | 0.2556 | 1.29 | *** |
| 3 and more siblings | 0.2474 | 1.28 | *** | 0.4835 | 1.62 | *** |
| **Divorce of parents before age 16** | | | | | | |
| *No* | | 1 | | | 1 | |
| Yes | -0.1802 | 0.84 | ** | -0.2566 | 0.77 | ** |
| Other/Missing | 0.1001 | 1.11 | | 0.1586 | 1.17 | |
| **Religion** | | | | | | |
| Participation at religion services at least once per month | 0.1909 | 1.21 | ** | 0.2819 | 1.33 | *** |
| *Participation less often/ no participation* | | 1 | | | 1 | |
| **sigma** | **x** | | | **0.9220** | | *** |
| **Log-likelihood** | -7298.74 | | | -18949.4 | | |

Notes: (1) Method: event-history model (generalized Gompertz)
(2) Dependent time variable for the model of first conception: time since the age of 15 as piecewise-linear spline. Dependent time variable for the model of second conception: time since the birth of first child as piecewise-linear spline. (3) Significance: *** p<0.01; ** p<0.05; * p<0.1
Source: GGS Czech Republic 2005

### 6.2. Partnership status and union order

In order to control for richer set of covariates we applied second type of modelling and we model the second birth risk separately. We include partnership status and union order in the model. Having a partner is one of the key determinate influencing the second conception decision-making process. The relative risk of second conception is lower for mothers who cohabit or stay in no union at all (Table 2). An interaction between the covariate "union order" and "new union" indicates that the elevated risk for a second conception is associated with a new partner in the family.

**Table 2: Transition to second child, effect of partnership status and union order**

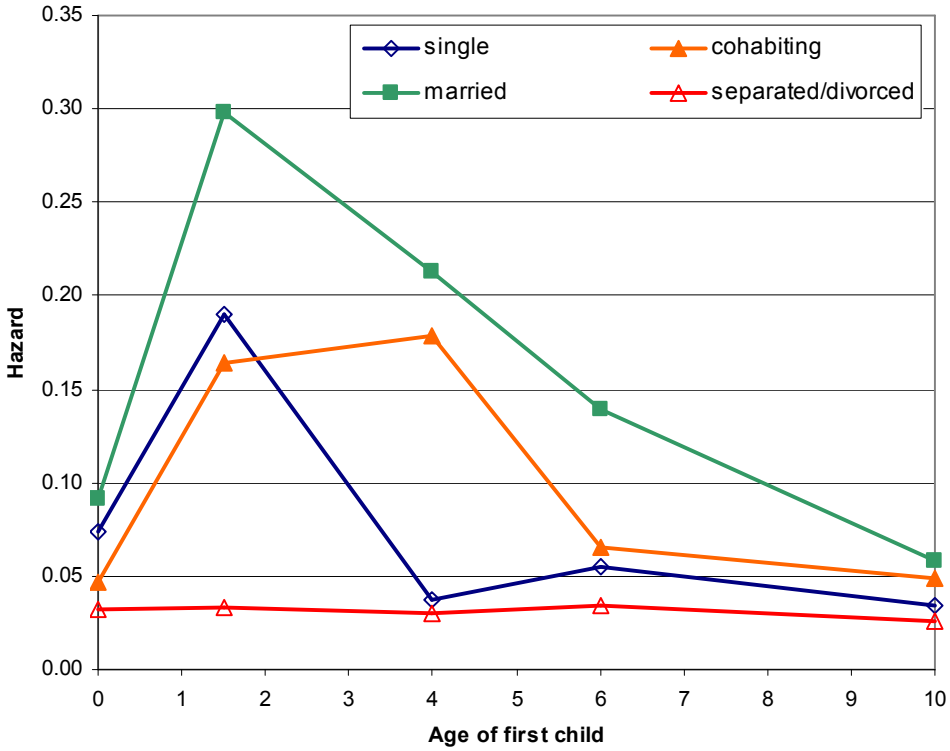
| | MODEL 2 | | |
|---|---|---|---|
| | **β** | **exp(β)** | |
| **Partnership** | | | |
| Cohabitation | -0.4721 | 0.62 | *** |
| *Marriage* | | 1 | |
| Out of union | -0.9732 | 0.38 | *** |
| | **New partner - exp(β)** | | |
| **Number of union** | no | yes | |
| 1 | 1 | 1.18 | |
| 2+ | 0.91 | **1.92** | *** |

Notes: (1) Method: event-history model (generalized Gompertz)
(2) Dependent time variable: time since the birth of first child as piecewise-linear spline
(3) Significance: *** p<0.01; ** p<0.05; * p<0.1
Source: GGS Czech Republic 2005

An interaction between the partnership status and the age of the first child (Figure 1) indicates, for mothers in marital union the intensity of second births peaks early after the first birth, for cohabiting women stays high until the age of 4 of the first child (however for the entire time the intensity is lower than the marital intensity). Intensity of second order births for mothers living out of union after disruption, divorce or widowhood stays extremely low, single mothers have similar intensity as cohabiting women at very young age of first child. When the child is older than four years mothers' behaviour is similar as for separated/ divorced women. One can hypothesise that being single with very small child does not necessarily mean to have no partner[3] (father of the child), those who have a partner could exhibit similar behaviour as women already cohabiting with their partners and even later they could form partnership (cohabitation or marriage). Those who remain single for longer period of time live probably without having a not-cohabiting partner and therefore express similar intensity as separated or divorced women.

[3] In such kind of survey as GGS the questions about partnership history are focused on partners living in the same household for certain amount of time, therefore we do not have any information about partners being in relationship with women for a certain time but not sharing the same household.

**Figure 1: Intensity of second child by partnership status**



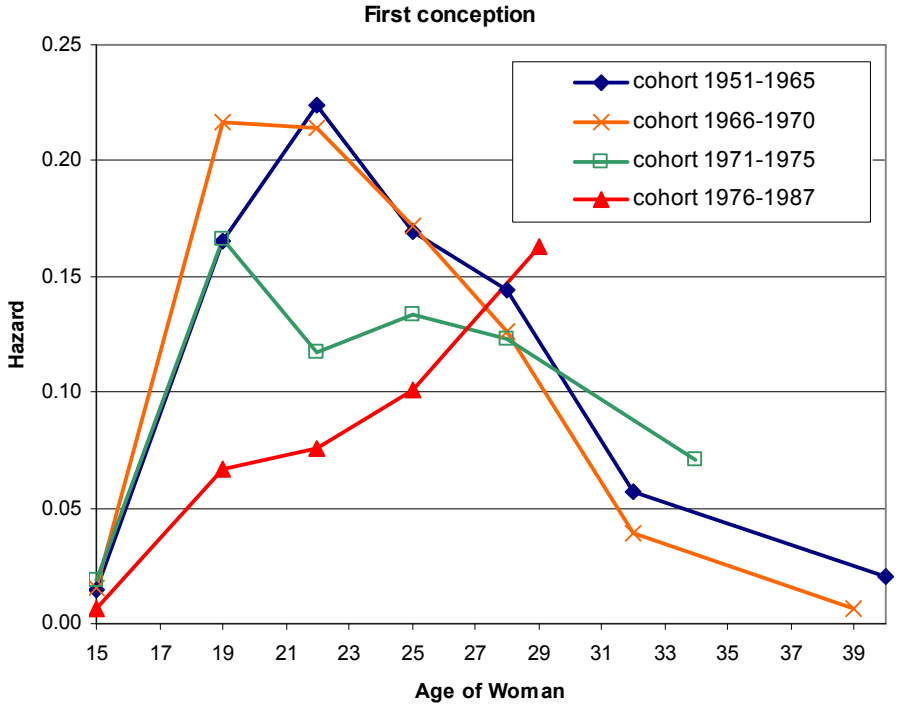

Notes: Model is controlled for current calendar year, education, number of siblings, parental divorce, religiousness, relative age at first birth, order of union and new partner.
Source: GGS Czech Republic 2005

### 6.3. Differences in birth patterns across generations

In addition to the calendar time perspective used so far in our analytical approach we applied the cohort perspective to analyze the postponement of family related events among young Czech women. A continuous postponement of childbearing of first and second parity can be observed from figures 2 and 3. Started from the cohorts born in the first half of 1970s a large decline of first birth intensity was observed. Those women were it the adolescence when the transition to the market economy started, we can see that till their early 20s they showed similar intensity of first conception as older cohorts. For those women remaining childless at the time of the revolution in November 1989 pronounced shift in intensity and timing of their transition into motherhood was observed in the subsequent period. Compared to older cohort, the intensity of first conception of 1971-1975 women cohort was notably lower at ages 21 to 26 and it remained relatively higher after age 27. The youngest cohorts exhibit entirely different pattern of first childbearing characterised by low intensity of first conception in the adolescence and continuously increasing intensity up to the late 20s. Influence of efficient

birth control methods[4] widely spread after 1990 can be seen in the sharp decline of teen-age pregnancies.

**Figure 2: Intensity of first conception by selected birth cohorts**




Notes: (1) Method: event-history model (generalized Gompertz)
(2) Dependent time variable: time since the age of 15 as piecewise-linear spline.
(3) Model is controlled for education and number of siblings.
Source: GGS Czech Republic 2005

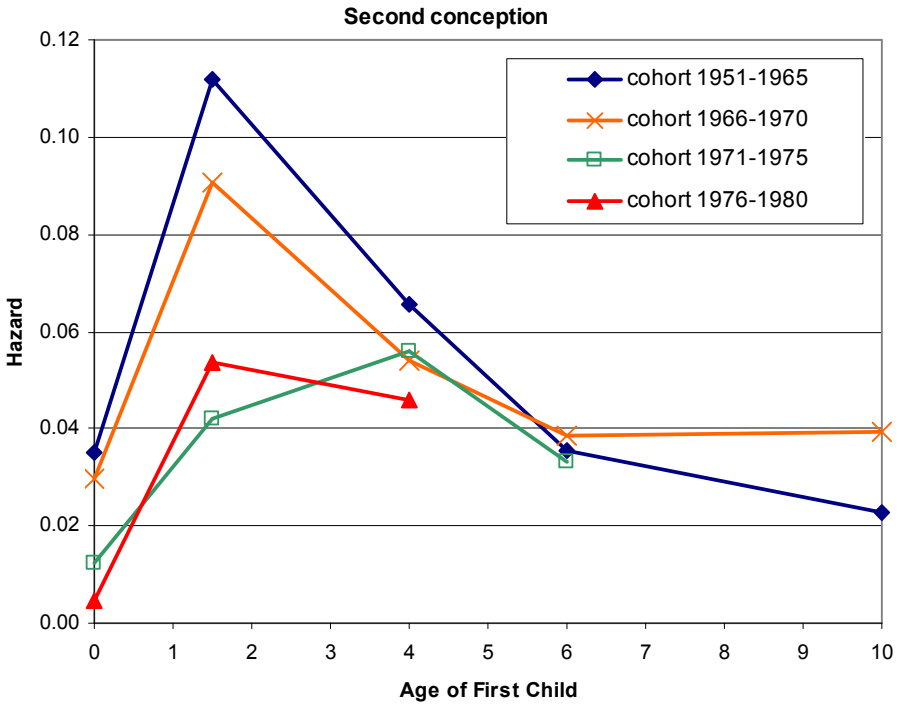
Cohort shift in fertility behaviour is evident also in the case of second conception. If we introduce the interaction between cohorts[5] and the baseline (controlling for selected covariates and for personal residuals/selectivity factor) we see shift in timing and reduction of second conception intensity in cohorts 1971 and younger. Women from cohort 1971-1975 were the first who reacted to the political changes in 1989 with changing pattern of their transition to the first child (Figure 2), but they also shows different pattern of transition to the second child (Figure 3). The second conception is postponed, the highest intensity occurs when the first

[4] Most men and women nowadays use effective contraceptive methods since the start of their sexual life and first pregnancy involves a carefully planned discontinuation of contraceptive use (Sobotka et al. 2008). The proportion of women aged 15-49 who were prescribed oral contraception has increased ten-fold from 4.2 percent in 1990 to 44.7 percent in 2005 (UZIS 2006).

[5] In this case the youngest cohort (1981-1987) is omitted because of too few cases and exposures. Even for the cohort 1976-1980 the selection effect of more family prone persons is important, however after introducing unobserved heterogeneity factor the intensity for this cohort is closer to reality.

child is around the age of four. In older cohorts the highest intensity was at about two years after the first birth and this intensity was also substantially higher.

**Figure 3: Intensity of second conception by selected birth cohorts**




Notes: (1) Method: event-history model (generalized Gompertz)
(2) Dependent time variable time since the birth of first child as piecewise-linear spline.
(3) Model is controlled for education, number of siblings, parental divorce, religiousness, age at first birth and selectivity effect (common unobserved heterogeneity factor).
Source: GGS Czech Republic 2005

## 7. Summary and conclusions

In this paper we have presented an analysis of second-birth intensities for Czech women of birth cohorts 1951 to 1987. We investigate determinants of having a second child in Czech society during two distinctive political periods characterised by different demographic behaviour. We have studied the society, in which the most characteristic trend in reproductive patterns during the socialist era was a strong orientation towards the two-child family and where the ideal of a two-child family still persists.

In line with findings for second birth intensity in other countries we found that family background and early life course experiences as well as membership of a religious community constitute important second birth determinants in Czech society. Women having more siblings have also higher tendency to establish larger families and have a higher second birth

risk than women with no siblings. Positive impact on the risk of second birth is associated also with the religiosity of women, i.e. whether she regularly attends religions services at least once a month.

The study included a discussion of two key fertility study variables - education and partnership history. Education is a key sociological and demographic characteristic playing an important role in determining preferences, values and social behaviour and reflecting the socioeconomic and cultural capital of the individual. Nevertheless from the life course perspective there were not proved any significant differences in the risk of second conception according to the highest educational level achieved among women being out of education (controlling for other personal characteristics) in the Czech Republic.

Having a partner is one of the determinate influencing the second conception; the second conception risk for married women is higher than for mothers that cohabit or stay in no union at all. In line with previous findings the elevated risk of a second conception is associated with a new partner in the family.

Effect of calendar period corresponds with the main socio-economic changes in the Czech Republic during the last 15 years and with important incentives in the family policy aimed to slow down the decline of fertility in the beginning of 1970s. This is evident from the increase of the second birth intensity in the first half of 1970s (during the period of pro-natalist policy). Later, the long period of decline of fertility levels is reflected in lowering of the second birth intensities (with the beginning in 1976).

A continuing postponement of childbearing of first and second parity can be seen in different birth cohorts. Started from the cohorts born in the first half of 1970s a large decline of first childbearing was observed. The youngest cohorts exhibit entirely different pattern of first childbearing and a cohort shift in timing and intensity is evident also in the case of second conception in cohorts 1971 and younger.

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