Research Article

How do educational and occupational resources relate to the timing of family formation? A couple analysis of the Netherlands

Katia Begall

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Katia Begall[1]

Abstract

BACKGROUND
Fertility research often uses data from women only. This can bias the results if the effects of education and occupation on fertility are dependent upon the characteristics of the male partner. Using retrospective life-course information from both partners, this study examines the effects of educational and occupational characteristics on the transition to a first childbirth.

OBJECTIVE
The objective is to examine how the respective earning potential and career dynamics of the male and the female partners in couples influenced the timing of their entry into parenthood from 1960 to 2009 in the Netherlands, as well as the extent to which the characteristics of the two partners were interdependent in terms of their influence on the transition to a first birth.

METHODS
Using couple-period data from four pooled cross-sectional waves (1998-2009) of the Family Survey of the Dutch Population, discrete time event history models accounting for unobserved heterogeneity at the couple level are estimated to predict the birth of the first child, starting from the moment couples started living together.

RESULTS
The results show that a high earning potential of the female partner (based on her educational attainment, the status of her first job, and whether she is in full-time work or has supervisory responsibilities) has delaying effects on her transition to a first childbirth. With regard to the male partner, the only significant predictors of the entry into parenthood are educational attainment and working hours, and there is no evidence of an interdependence of the partners. The comparison of effects over time indicates that the female partner's higher earning potential has become a stronger predictor of

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delayed parenthood over time, while a positive effect for the male partner's higher earning potential is seen only up to 1990.

CONCLUSION
The results suggest that the educational and occupational characteristics and the labor market participation of the female partner are stronger determinants of first-birth timing than the characteristics of the male partner.

1. Introduction

The decision to have a first child is generally made jointly by the two partners in a couple. While this may seem obvious, many studies on the interrelationship between paid work, education, and childbearing focus on women only. Previous research has confirmed that both partners in a couple influence decisions about having children (Beckman 1984; Coombs and Chang 1981; Corijn, Liefbroer, and de Jong Gierveld 1996; Jalovaara and Miettinen 2013; Jansen and Liefbroer 2006; Thomson 1997; Vignoli, Drefahl, and De Santis 2012), but the lack of suitable couple data often causes fertility researchers to focus only on women. This can be problematic because the exclusion of partner information has been shown to lead to an overestimation of the negative effects of women's employment on fertility (Matysiak and Vignoli 2008). A more substantive reason behind the female focus of fertility research is the theoretical notion that women are the driving force behind fertility decisions and the postponement of parenthood. This notion is based on the assumption that having a child involves greater investments of time and energy for women than for men, because even though women's educational attainment and labor force participation levels have increased significantly in recent decades, they continue to perform the majority of childcare and household tasks (Kühhirt 2011; Morgan and Taylor 2006). The birth of the first child is, indeed, associated with indirect and direct costs for women's careers in virtually all industrialized countries (Amuedo-Dorantes and Kimmel 2005; Budig and England 2001; Ellwood, Wilde, and Batchelder 2004; Gangl and Ziefle 2009). How much these anticipated costs affect the decision to have a child is in the current study assumed to also be dependent on the occupational and educational resources of the partner, as well as on the institutional and historical contexts.

This study contributes to the literature on socioeconomic resources and first-birth timing by using detailed longitudinal measurements of the earning potential and career dynamics of both partners to predict the timing of the first childbirth among couples from the Netherlands. Because the data contain symmetrical retrospective life-course information on the educational and occupational trajectories of both partners of each

couple, the relative importance of the female and the male characteristics can be assessed. Furthermore, the relatively long observation period (1960 to 2009) means that the effects of the educational and occupational resources of both partners on the first childbirth can be examined during historical periods that differed strongly with regard to women's labor force participation, policies providing parental leave, and the availability of childcare facilities. Thus, the validity of the theoretical predictions during different historical periods can be tested. The present study therefore contributes to our understanding of the context dependency of the relationship between (female) employment and fertility. The research questions addressed are as follows:

1.   How do the earning potential and the career dynamics of the male and the female partners in a couple influence the (timing of) their entry into parenthood?

2.   To what extent are the earning potential and the career dynamics of the two partners interdependent in terms of their influence on (the timing of) the birth of the first child?

3.   How have the influences of earning potential and career dynamics on the (timing of) the first childbirth changed over time?

2. Theoretical background

In recent decades, the lives of men and women have changed substantially. Alongside the unprecedented expansion of educational and professional opportunities, new and diverse relationship and family structures have evolved which have effectively turned marriage and parenthood into a subset of many possible life choices (Mills, Blossfeld, and Klijzing 2005). Although the great majority of people still aspire—and ultimately choose—to live with a partner and have children, the trajectory leading to this major life course transition has become more flexible, and is influenced by individual educational and occupational choices and aspirations (Billari 2004). This study examines specific aspects of these educational and occupational choices; namely, earning potential and career dynamics. Earning potential is determined by educational attainment, the occupational status of the first job, the level of supervisory responsibilities, and weekly working hours. Career dynamics refer to the experience of upward and downward job mobility in the previous year.

     Because the compatibility of paid employment with fertility is, especially for women, dependent on the institutional context (Matysiak and Vignoli 2008; Nieuwenhuis, Need, and Van der Kolk 2012), the next section introduces the Netherlands as the institutional and cultural background of this study. The theoretical

expectations with regard to the effects of earning potential and career dynamics on the timing of the first birth are then discussed.

2.1 Couple employment and fertility in the context of the Netherlands, 1960-2009

Before the onset of fertility postponement in the 1970s, fertility rates in the Netherlands were among the highest in Europe, at just over three children per woman (Coleman and Garssen 2002). Between 1965 and 1975, the total fertility rate fell to 1.66. Thereafter, the fertility rate recovered slightly, and has been at approximately 1.7 children per woman in the last two decades, which is relatively high in the European context (Fokkema et al. 2008).

This study covers the time period from approximately 1960 to 2009, a period characterized by educational expansion and increasing female labor force participation. The proportion of women completing higher education increased from approximately 15% in the generation born in the 1940s to approximately 35% in the cohort born after 1970, with Dutch women born after the 1970s surpassing the men in their cohort in terms of higher education attainment (Eurostat 2012). In the Netherlands, women began to enter the labor force comparatively late, and the male breadwinner/female homemaker constellation was the predominant family model until the 1970s (Van Gils and Kraaykamp 2008). Since then, the labor market participation rates of Dutch women have gradually increased, reaching approximately 80% in 2009, which is above the European average (women aged 25-54; Eurostat, 2012). However, the great majority of women in the Netherlands work part time, especially after the birth of the first child, making the so-called "combination," or one-and-a-half earner model, the new standard arrangement for couples in the Netherlands (Plantenga 2002; Van Gils and Kraaykamp 2008; Verbakel and De Graaf 2009). The reasons for this persistent pattern are both institutional and cultural: the Dutch tax system heavily favored single-earning couples[2], and male wages are comparatively high (Kremer 2005; Van Gils and Kraaykamp 2008). Additionally, unemployment in the Netherlands has been low in recent decades, with the exception of the economic crisis in the 1980s, and workers are well-protected by labor laws and social insurance benefits (Fouarge and Baaijens 2009). Furthermore, childcare availability was very low until the end of the 1990s, and there are strong cultural barriers to full-time childcare use (Clerkx and Van Ijzendoorn 1992; Portegijs et al. 2006).

The combination of relatively high male wages, low unemployment, a high rate of part-time female employment, and poor childcare availability implies that in the period

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[2] Until 2001, when individual credits replaced the system of allowances that were transferable between partners; see Kremer 2005, page 93-96.

under study, mothers faced relatively large barriers to full-time employment and the pursuit of higher level professional careers. This constellation of factors also suggests that men were generally the main providers of household income.

In this study, three distinct historical periods are identified to describe changes in the effects of educational and occupational resources on the transition to a first childbirth over time. The first period, 1960 to 1975, was characterized by low levels of female employment and low institutional support for combining motherhood and work. The second period, 1976 to 1990, was characterized by increases in female employment, as well as by high levels of (youth) unemployment and the broader emergence of part-time jobs during the economic crisis of the 1980s. Finally, during the period from 1991 to 2009, most women continued to work (part-time) after the birth of their first child, and parents were entitled to (part-time unpaid) parental leave.

2.2 Earning potential and the transition to parenthood

According to economic approaches to family formation, (first) childbirth is delayed when a woman's human capital is high, because the opportunity costs of childbearing increase if the female partner in a couple has a higher earning potential (Becker 1991). Conversely, for men, higher earnings facilitate family formation, as the comparative advantage among men lies in securing the material standard of living through paid work, and should be associated with a faster transition to a first birth (income effect). These contrasting predictions with regard to the relative influences of the male and the female partners' earning potential are based on the assumption that there is a high degree of role specialization between the sexes, with women focusing on household and family responsibilities and men specializing in paid work—a notion that has been heavily criticized (Oppenheimer 1994). Moreover, as childless women now have an earning potential similar to that of men, sex-specific specialization within couples no longer constitutes the most efficient division of labor (Winkler-Dworak and Toulemon 2007). Paid work by both partners, albeit not necessarily full time, is increasingly an economic necessity, as well as a preference of couples; many strive to share the paid and the domestic work so that both partners are, to varying degrees, involved in both market and household work (Grunow, Schulz, and Blossfeld 2012; van Wel and Knijn 2006; Verbakel 2010). Dual-earning couples with a high earning potential who do not want to decrease their labor supply can, alternatively, choose to outsource household and childcare tasks. Whether the sharing or outsourcing of tasks is possible and whether both parents are able to continue to work after having a child depend on the partners' wages, as well as on the degree to which the state and market provide facilities that make work and childrearing more compatible; thus, the institutional context and the

historical period must also be considered (Lewis et al. 2008; Matysiak and Vignoli 2008). In addition, cultural norms and expectations about the importance of maternal care for young children and the prevailing "gender culture" may encourage or constrain mothers' paid work, and may therefore influence the evaluation of behavioral options after the transition to parenthood (Pfau-Effinger 2012).

In the Netherlands, the institutional context has generally favored a sex-specific division of labor, at least until the end of the 1990s (see Section 2.1); and the standard strategy of work-family compatibility still consists of women working part-time after becoming mothers. In this context, a woman with a high earning potential may be expected to delay the birth of her first child, as it is assumed that she will be reluctant to reduce her work commitments after becoming a mother. Conversely, for a man, having a higher earning potential should be associated with a faster entry into parenthood, as men's earnings provide the majority of household income after the first child is born. But because Dutch couples tend to be homogenous with regard to educational attainment and occupational status (Kalmijn 1998; Verbakel and De Graaf 2009; Verbakel, Luijkx, and de Graaf 2008), the opportunity cost effect for the female partner likely has a greater influence than the income effect that is hypothesized for the male partner. When both partners in a couple have a high earning potential, the first birth is likely to be postponed, even if the man's income is sufficient to support the transition to parenthood. Thus, the effect of the male partner's higher earning potential should be dependent on the employment status of the female partner: the fact that the male partner has a high income may positively influence fertility decisions only in situations in which the female partner does not face high career costs of parenthood. The higher earning potential of the male partner should therefore be associated with a faster transition to parenthood in one-and-a-half earner (female partner works part time) and male breadwinner (female partner does not work) couples.

Furthermore, as women's levels of educational attainment and commitment to the labor market have increased continuously in recent decades, the positive effect of the higher male earning potential is expected to have diminished over time. Conversely, for female partners, the delaying effect of the higher earning potential is expected to have remained stable over time, as combining full-time employment and motherhood remains difficult in the Netherlands. However, the delaying effect of a woman being in paid employment on the probability of a having a first child is expected to have weakened in more recent periods, as the opportunities for engaging in part-time work have improved substantially over the last 20 years.

2.3 Career dynamics and the transition to parenthood

In addition to the characteristics of the current and the first job, occupational changes are considered in the analysis. Investments in the female partner's professional careers increase the opportunity costs of childbirth for the couple, and an upward career move often involves taking on additional responsibilities and new tasks. In this situation, temporary withdrawal from the job due to pregnancy and childbirth can signal a lack of commitment or a low level of career ambition (Gangl and Ziefle 2009). A recent move to a job with higher status by the female partner is therefore expected to delay the transition to parenthood in the first year after the job change. According to the logic of the economic theory, an upward job move by the male partner should be associated with a faster transition to parenthood because it increases the household income. However, this effect can be expected to have weakened—or even to have disappeared—in recent years because men and women have become less specialized in their roles, both inside and outside of the home (Van der Lippe 2006). As the birth of a first child is associated with new time-intensive care tasks for the male partner as well, the decision to have a child might be postponed in response to a recent upward job change.

As women are the main caregivers of small children, their working conditions are of critical importance when determining the compatibility of paid work and family life (Begall and Mills 2011; Matysiak and Vignoli 2008). Because the focus of this study is on the transition to the first childbirth, the dual pressures that working mothers experience play a role only in the form of anticipation effects. In neoclassical theory, it has been argued that women who anticipate that they will reduce their commitments to the labor market after childbirth tend to select jobs characterized by higher starting wages and lower wage growth, as well as less depreciation of wages in the case of discontinuous employment (Polachek 1981; Trappe and Rosenfeld 2004). Furthermore, working conditions, such as the opportunity to work part time or on a flexible schedule, are assumed to be chosen by women with actual or prospective family responsibilities, even at the expense of earnings or career prospects (Filer 1985). In line with this "anticipation" thesis, a recent transition to a job with lower occupational status by the female partner is expected to result in a faster transition to parenthood, as it signals reduced commitment to the labor market. A downward job move can, of course, also be interpreted as a sign of labor market uncertainty or instability, as it may not be clear whether the change was voluntary or employer driven. However, based on the assumption that a woman in a lower level job experiences reduced opportunity costs of childbirth, even an involuntary downward career move would lead to a faster transition to parenthood (Kreyenfeld 2010; Schmitt 2012). For the male partner, on the other hand, a downward job move is assumed to be a sign of his inability to provide the stable income that is commonly seen as a prerequisite for family formation, especially in

countries where men are the main providers of household income, such as the Netherlands (Schmitt 2012; Vignoli, Drefahl, and De Santis 2012). A downward job move by the male partner should therefore be associated with a lower first birth probability.

3. Methods

3.1 Data

The data used combined four waves of the Family Survey of the Dutch Population (Familie-enquête Nederlandse Bevolking, FNB), collected in 1998, 2000, 2003, and 2009. The FNB is a large-scale repeated cross-sectional survey administered in the Netherlands (De Graaf, De Graaf, Kraaykamp, and Ultee 1998, 2000, 2003; Kraaykamp, Ruiter, and Wolbers 2009). The surveys cover the Dutch population between the ages of 18 and 70, with an overrepresentation of couples. The survey data are collected through structured face-to-face interviews and self-completed questionnaires administered to both partners. The FNB registers the complete life courses of the primary respondents and their partners with respect to education, occupation, religion, mobility, and partnership formation through retrospective questioning. Using this information, a couple-period file containing information about couples' transitions to the first childbirth, as well as information about both partners' educational and occupational trajectories, was constructed.

Sample selection: The four waves of the FNB contain information about 4,490 female and 4,368 male respondents born between 1914 and 1999, of whom 3,866 were living in a shared household. The analysis was restricted to respondents born after 1945 in order to capture enough variability in women's occupational status (n= 3,115). The sample was further restricted to couples who did not report a first childbirth with a partner other than their current one. This means that the 332 couples (11%) in which one of the partners reported having had a child with a previous partner were not included[3]. The final analytical sample consisted of 2,783 couples, of whom 2,215 (80%) had a child. After omitting cases with missing values, 2,534 couples and 1,975 birth events are analyzed.

To ascertain that the selection of (stable) couples did not lead to selection bias, the probability of transitioning to a first birth was also estimated for a less restricted sample of all men and women born after 1945 (including respondents who were never

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[3] A common child was defined as the first child of both partners for whom the same date of birth was reported by both partners, and who was born after the couple had formed a common household by either cohabitation or marriage.

partnered or divorced/widowed, or 3,549 women and 3,489 men). The analyses are presented in Appendix B, and show that all of the results were robust against the selection of the analytical sample.

3.2 Analytical strategy

To analyze couples' transitions to a first childbirth, we estimated a discrete time event history model with random effects in which the couple constituted the unit of analysis (Allison 1982; Jenkins 2005; Mills 2011; Steele 2008). The data were organized in a couple-period format, with each row of the dataset corresponding to a time period of three months in the relationship and containing information about both partners[4]. The period of observation began when each couple started living together (or got married, whichever happened first; referred to as household formation). The observation period ended at the date of the conception of the first child, or was censored at the date of the interview or when the female partner reached age 45 (whichever happened first). Table 1 presents by time period the mean ages of the participants at the point of household formation and at the first birth. The time before both partners had reached age 15 was regarded as censored; couples entered the analysis at age 15 or older.

Table 1:   Sample descriptive statistics

Period			Female	Male
1960-75	Mean age at household formation		21.9	23.5
	Mean age at first birth		24.9	26.4
	N Couples	439		
	N Births	402		
1976-89	Mean age at household formation		22.6	24.9
	Mean age at first birth		27.2	29.5
	N Couples	1,017		
	N Births	928		
1990-09	Mean age at household formation		24.8	27.1
	Mean age at first birth		28.4	30.7
	N Couples	1,078		
	N Births	645		
Total	Mean age at household formation		23.5	25.6
	Mean age at first birth		27.1	29.2
	N Couples	2,534		
	N Births	1,975		

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[4] The aggregation of time periods into blocks of three months was performed to reduce the number of observations; the results did not differ from a monthly specification (results available upon request).

To define the event of interest, the conception of the first child, nine months were subtracted from the date of birth of each child to avoid the misspecification of the order of conception and occupational and educational transitions. For this reason, the terms "birth" and "conception" are used interchangeably. The event of interest is thus the probability of a first conception of couple i occurring during the specified interval t, conditional on the fact that it did not occur before time interval t: $p_{ti} = Pr(y_{ti}=1|y_{t-1,i}=0)$ (Steele, 2005). This probability of a first childbirth was modeled as a function of the relationship duration, the observed individual characteristics (time-constant and time-varying), and the unobserved time-invariant characteristics. The discrete-time probability function was defined by a logit link[5]. The probability of conceiving a child for couple i at time t is modeled as:

$$\text{Logit}(h_{ti}) = \log\left(\frac{h_{ti}}{1-h_{ti}}\right) = D_{ti}\alpha + X_{ti}\beta + u_i \tag{1}$$

Where D_{ti} is a quadratic function of the relationship duration interacted with dummies representing a young ($\leq$ 20 years), an average (21 to 23), and a high ($\geq$ 24 years) age of the female partner at the point of household formation to allow for different fertility trajectories among these groups[6]. A quadratic function is chosen to model the temporal dependence in the data because family formation trajectories typically take a hump-shaped form over time (see Figure 1 for a graphical representation). Additionally, X_{ti} denotes a vector of covariates of educational and occupational characteristics of both partners (time-varying or constant) with coefficients β. Furthermore, a normally distributed random effect u_i on the couple level is included, with a mean of zero and a standard deviation to be estimated ($u_i \sim N[0, \sigma_u^2]$). The inclusion of these couple-specific unobserved factors that are constant across episodes ensures that selection effects (due to unobserved heterogeneity), and the fact that episodes from the same couple cannot be regarded as independent observations, are accounted for (Mills, 2011; Steele, 2005).

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[5] To ensure that the choice of link function did not influence the results, the model was estimated with a probit and complimentary log-log link; no substantial differences were found (results available upon request). Because most social scientists are more familiar with the interpretation of logit coefficients, this link function was chosen.

[6] Alternative specifications of the duration dependence—such as including only a quadratic effect of the female partner's age—were tested, but did not improve model fit or lead to different results.

3.3 Measures

The time-varying status of the *main activity* of each of the partners distinguished between periods of paid work, homemaking (female partners only[7]), unemployment/ disability/inactivity, and enrollment in education.

The *educational attainment* of each of the partners was measured as a time-varying indicator, and was coded in four categories: lower secondary or below, short upper secondary/short vocational, upper secondary (vocational and academic tracks), and tertiary (professional and scientific) education.

The *weekly working hours* of each of the partners were measured by a time-varying indicator, and distinguished between part-time (< 38 hours/week), full-time (38-40 hours/week), and long (> 40 hours/week, male partners only[7]) working hours.

The *occupational status* of the first job was measured by the International Socio-Economic Index of Occupational Status (ISEI), which ranges from 16 to 90, with a higher value indicating a higher occupational status (Ganzeboom, De Graaf, and Treiman 1992; Ganzeboom 1996). Information about the first job was included as a time-varying covariate and in a categorical specification to account for non-linear effects, including a control for respondents who had not started a first job. Four categories were distinguished: low status (ISEI between 16 and 30), medium-low status (ISEI between 31 and 45), medium-high status (ISEI between 46 and 60), and high status (ISEI of 61 or higher).

The *supervisory position* of each of the partners was measured by a (time-varying) dummy which indicated whether the respondent was supervising at least one other employee in his or her job (not counting pupils, clients, patients, or residents).

Measures of recent *career dynamics* were constructed for each of the partners. These measures indicated at each point in time whether the respondent had experienced a downward occupational move (that is, a change to a job with an occupational status at least five points lower on the ISEI scale than the previous one) or an upward occupational move (a change to a job with an occupational status at least five points higher than the previous one[8]) in the preceding 12 months.

The *historical period* indicator referred to the calendar year of household formation, defined as the point at which the couple started cohabiting or got married (whichever happened first). Three time periods were distinguished: 1960 to 1975, 1976 to 1989, and 1990 to 2009.

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[7] The case numbers in these categories were too low (< 20 events) for the other partner.

[8] Alternative definitions of the time period in which occupational changes occurred (i.e., an adjustment of nine months rather than 12) and different definitions of downward and upward job moves (any difference in status, eight points on the ISEI scale, 10% on the ISEI scale) did not lead to different results.

The *control variables* consisted of dummies indicating the year of data collection, which were included in all of the models; and a time-varying measure of the relationship status which distinguished between cohabitation and marriage.

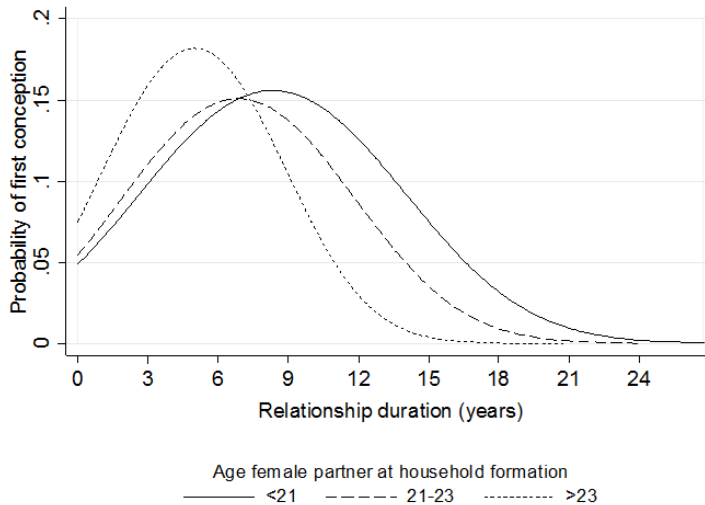Refer to Appendix A for the distribution and number of events in each category for all of the variables used.

To test the hypothesis of couple *interaction effects*, the following interaction terms were included one by one, and were then removed if the model fit did not improve significantly: indicators of the earning potential of the male partner (the occupational status of his first job, his weekly working hours, his educational attainment, and whether he was in a supervisory position) each interacted with the main activity and work hours of the female partner.

4. Results

The results of the analyses are presented in Tables 2 and 3. Before discussing the empirical findings, the shape of the baseline risk is presented in Figure 1. The duration dependence was defined by a quadratic function of relationship duration interacted with the age of the female partner at the point of household formation, categorized as an early age (≤ 20), an average age (21-23), or a high age (≥ 24). Figure 1 shows that couples who formed a common household at comparatively early ages waited longer periods before having a first child than late starters. Additionally, the more compressed risk distribution of the couples who formed common households later than the sample mean is clearly visible. These couples had children sooner, and had a steeper decline at longer durations.

The results of the discrete time random effect model are presented in Table 2 and are discussed in relation to the theoretical expectations. To determine the extent to which the characteristics of each partner influenced the transition to parenthood, Table 2 presents estimations of the effect of indicators of earning potential and career dynamics on the first birth probability separately for the female (Model 1) and the male (Model 2) partners. The full model, in which information about both partners is simultaneously included, is presented in Model 3.

Figure 1: **Probability of a first childbirth by relationship duration and age of the female partner at the household formation**

Note: Predicted probability of a first conception calculated for a married couple, household formation 1976-89, with both partners having a lower secondary level of education, full-time employment, no occupational change in the previous 12 months, no supervisory position, a first job with a medium-low status, $u_i = 0$, see Table 2-Model 3 for estimates.

The first expectation was that if the female partner had a higher earning potential, the transition to parenthood would have been delayed. The indicators of a woman's earning potential are her educational attainment, the occupational status of her first job, her weekly working hours, and whether she held a supervisory position. This expectation was fully confirmed for the female partner, as all four indicators of higher earning potential significantly predicted the transition to parenthood in the expected direction; couples in which the female partner had attained a higher level of education (compared to lower secondary education), had a first job with a medium-high or high occupational status (compared to a medium-low status), held a supervisory position, or worked full-time (compared to part-time), had a lower probability of a first childbirth. Among the male partners, the opposite effect was expected: i.e., a man with a higher earning potential was expected to have transitioned to parenthood more quickly. This expectation was not confirmed, as out of all of the indicators of earning potential, only working more than 40 hours per week was found to have been associated with a significantly higher first birth probability among males. Men with higher educational

attainment were, contrary to the hypothesis, found to have been less likely to have transitioned to first parenthood.

The second expectation focused on role specialization within couples and proposed that male partners with a higher earning potential would have made a faster transition to parenthood, especially those in male breadwinner and one-and-a-half earning couples (i.e., couples in which the female partner was not employed or worked part time). This hypothesis was tested by introducing interaction terms of the indicators of the earning potential of the male partner (his educational attainment, his working hours, whether he was in a supervisory position, and the status of his first job) and the main activity and work hours of the female partner into the model, and then removing them if the model did not improve significantly. The empirical results showed no support for the theoretical expectation that men with a higher earning potential transitioned to a first birth more quickly, even in situations in which the female partner did not face high opportunity costs; none of the interaction terms were found to have significantly predicted the probability of a first birth[9]. However, one form of interdependence of the partners which was visible in the results was homogamy in educational attainment. Among the male partners, the negative effect of higher education (compared to the lowest category) was attenuated once information about both partners was included in the full model (see Table 2, Model 3); this indicates that the lower likelihood of entering parenthood found among highly educated men was driven by their highly educated female partners.

With regard to career dynamics, the expectation was that recent upward and downward occupational changes would affect the fertility decisions of couples over and above current employment and career status. In the case of an upward job move, defined as moving (in the preceding 12 months) to a job that is at least five points higher in occupational status (measured by ISEI), an increased probability of a first childbirth was expected in couples in which the male partner had experienced this kind of mobility, while a decreased probability of having a child was predicted if the female partner moved up. The results of the empirical analyses showed only partial support for this expectation. A recent upward job move by the female partner indeed delayed the transition to parenthood, but no significant effect of upward career mobility was found for the male partner. Conversely, a recent downward job move was expected to have increased the probability of childbirth if the female partner was involved, but to have delayed the birth if the male partner was undergoing the transition. The results of the analyses showed no difference in the probability of a first childbirth between the couples in which one of the partners experienced downward mobility in the previous year, and the couples who did not experience a job move.

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[9] Results not shown; available upon request.

Table 2: **Estimates from a discrete time random effect logit model of the transition to a first birth**

	Model 1: Female				Model 2: Male partner				Model 3: Both partners			
	B	SE	OR		B	SE	OR		B	SE	OR	
Cohabiting (ref married)	-1.43	0.08	0.24	***	-1.44	0.08	0.24	***	-1.42	0.08	0.24	***
Period of household formation (ref 1976-89)												
1960-75	0.17	0.08	1.19	*	0.21	0.08	1.24	**	0.15	0.08	1.16	†
1990-09	0.08	0.07	1.08		0.05	0.07	1.05		0.07	0.07	1.08	
Main activity of female partner (ref paid work)												
Household	0.76	0.11	2.13	***					0.73	0.11	2.08	***
Unemployed / disabled / inactive	-0.01	0.16	0.99						0.01	0.16	1.01	
Enrolled in education	-0.87	0.27	0.42	***					-0.81	0.27	0.44	***
Educational attainment female partner (ref lower												
Short vocational / short upper secondary	-0.17	0.09	0.84	†					-0.17	0.09	0.85	†
Full vocational / upper secondary	-0.27	0.09	0.77	***					-0.25	0.09	0.78	**
Higher professional / tertiary	-0.21	0.10	0.81	*					-0.21	0.11	0.81	*
Work hours female partner (ref ≥ 38 hours / week)[1]												
< 38 hours / week	0.13	0.06	1.14	*					0.12	0.06	1.13	*
Female partner in supervisory position (ref no)[1]	-0.35	0.08	0.71	***					-0.35	0.08	0.70	***
Career dynamics female partner (ref no												
Downward move	-0.28	0.19	0.76						-0.29	0.19	0.75	
Upward move	-0.38	0.16	0.69	*					-0.39	0.16	0.68	*
Occupational status of first job female partner												
Not started working	0.18	0.22	1.20						0.15	0.22	1.16	
Low (ISEI < 30)	0.02	0.09	1.02						0.01	0.09	1.01	
Medium low (ISEI 30-45)	ref		1.00						ref		1.00	
Medium high (ISEI 46-60)	-0.17	0.07	0.84	*					-0.17	0.07	0.84	*
High (ISEI > 60)	-0.29	0.11	0.75	*					-0.30	0.11	0.74	**
Main activity of male partner (ref paid work)												
Unemployed / disabled / inactive					-0.12	0.18	0.89		-0.11	0.19	0.90	
Enrolled in education					-0.48	0.31	0.62		-0.48	0.31	0.62	
Educational attainment male partner (ref lower												
Short vocational / short upper secondary					-0.30	0.09	0.74	***	-0.23	0.10	0.79	*
Full vocational / upper secondary					-0.29	0.08	0.75	***	-0.21	0.09	0.81	**
Higher professional / tertiary					-0.21	0.09	0.81	*	-0.08	0.10	0.93	
Work hours male partner (ref 38-40 hours / week)[1]												
< 38 hours / week					0.05	0.09	1.05		0.03	0.09	1.03	
> 40 hours / week					0.22	0.08	1.24	***	0.19	0.08	1.21	*
Male partner in supervisory position (ref no)[1]					0.06	0.06	1.06		0.08	0.06	1.09	
Career dynamics male partner (ref no job move)												
Downward move					-0.11	0.16	0.90		-0.07	0.16	0.93	
Upward move					-0.13	0.12	0.88		-0.12	0.13	0.88	
Occupational status of first job male partner												
Not started working					0.09	0.28	1.09		0.21	0.29	1.23	
Low (ISEI < 30)					0.07	0.08	1.07		0.06	0.08	1.06	
Medium low (ISEI 30-45)					ref		1.00		ref		1.00	
Medium high (ISEI 46-60)					0.05	0.07	1.06		0.09	0.08	1.10	
High (ISEI > 60)					-0.02	0.09	0.98		0.06	0.10	1.06	
Constant	-2.31	0.12	0.10	***	-2.44	0.10	0.09	***	-2.26	0.14	0.10	***

Table 2:   (Continued)

	Model 1: Female partner			Model 2: Male partner			Model 3: Both partners		
	B	SE	OR	B	SE	OR	B	SE	OR
σ_{ui}(s. e.)	0.67	0.08	***	0.54	0.09	***	0.66	0.08	***
Observations	51,104			51,104			51,104		
Log likelihood (df)	-7,788.7 (28)			-7,844.7 (28)			-7,775.1 (42)		
N couples / N events	2,534	1,975		2,534	1,975		2,534	1,975	

Source: FNB 1998/2000/2003/2009, calculations by author

Note: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed)

B: unstandardized logistic regression coefficient. SE: standard error of coefficient B. OR: Odds Ratio = Exp(B)

Coefficients of duration dependence (age at household formation and relationship duration, see Figure 1) and year of data collection are omitted from the table.

1 Information about work characteristics refers only to work episodes; all non-work episodes are assigned zero and information about non-work episodes is included in the model (household, unemployment/disabled/inactive, enrolled).

With regard to the relative importance of the male and the female partners, the results showed that the occupational resources and the characteristics of the female partner are stronger predictors of the transition to parenthood than those of the male partner. However, adding the characteristics of the male partner to the model with information about the female partner still improved the model fit (likelihood ratio test $Chi^2(14) = 27.2$, $p = 0.02$)[10].

To gain further insight into the changes in the effects of educational and occupational resources on the timing of the first birth over time, the full model presented in Table 3 was estimated separately for the three historical periods examined. Table 3 presents the average marginal effects of all of the covariates[11] for the three periods. In line with the expectations previously noted, the educational level and the earning potential of the female partner were found to have become more important predictors after 1975, and, in the more recent time period, the paid employment of the female partner was not shown to have delayed the first childbirth. While couples with a female partner who was not working were more likely to have entered parenthood until 1990, this effect was no longer significant in more recent years. Conversely, the delaying effects of the female partner's higher educational attainment and supervisory position increased from 1975 onwards. If the woman's first job was of a higher occupational status, the transition to parenthood was delayed from 1976 to 1989, possibly because the opportunity costs of childbirth were especially high in the

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[10] For comparison: LR test when female information was added to the model with only the male partners' information: LR $chi^2(14) = 139.2$, $p < 0.00$.

[11] For the measure of main activity, some categories were collapsed because of low case numbers; career dynamics could not be included because of the low number of job moves per period.

Netherlands during the 1970s and 1980s; i.e., the institutional support for combining motherhood and employment was weak, and unemployment was relatively high. Additionally, working reduced hours before the first birth was found to have been associated with a higher first birth probability from 1975 to 1989, a period in which there was an economic crisis, and part-time work was introduced as a potential remedy for unemployment. In all of the time periods, couples in which the female partner had not yet entered the labor market had significantly lower probabilities of having transitioned to parenthood. This finding is related to the "incompatibility effect" of educational enrollment and motherhood (Blossfeld and Huinink 1991), which was also visible in the combined model when full-time enrollment was controlled for separately (see Table 2, main activity indicators).

Regarding the effects of the earning potential of the male partners, the results indicated that the positive effect of high earning potential generally declined over time. This observation was supported by the finding that the overall contribution of the male characteristics to the model fit was declining, as was shown by the likelihood ratio test reported in Table 3.

In the earliest period, or until 1975, the status of the first job and the educational attainment of the male partner showed U-shaped effects on the first birth probability, with couples in which the male partner had a medium-low status first job or a medium (vocational) level of education showing the lowest first birth probabilities. From 1975 to 1989, men with a higher earning potential, as indicated by a job with supervisory responsibilities and a schedule of more than 40 hours per week, were found to have transitioned to parenthood earlier; while men with a vocational education were, again, shown to have entered parenthood later. In the most recent period, a delaying effect was observed among the male partners who had started their careers in low status jobs. This was also the only period in which non-working male partners seemingly delayed the transition to parenthood (at $p < 0.1$).

Table 3: **Average marginal effects of the educational and occupational resources of both partners on the first birth probability by the period of household formation**

	1960-1975	1976-1989	1990-2009
Cohabiting (ref married)	-0.046 ***	-0.043 ***	-0.047 ***
Female partner not working (ref paid work)	0.024 **	0.031 ***	0.002
Educational attainment female partner (ref lower sec.)			
Short vocational / short upper secondary	-0.004	-0.010 [†]	-0.011
Full vocational / upper secondary	0.002	-0.010 [†]	-0.023 ***
Higher professional / tertiary	-0.005	-0.012 [†]	-0.019 **
Work hours female partner < 38 hours (ref ≥ 38 hours)	-0.004	0.009 *	0.001
Female partner in supervisory position (ref no)	-0.014 [†]	-0.012 ***	-0.010 ***
Occupational status of first job female partner			
Not started working	-0.036 ***	-0.021 ***	-0.017 **
Low (ISEI ≤ 30)	0.005	0.001	-0.004
Medium low (ISEI 31-45)	ref	ref	Ref
Medium high (ISEI 46-60)	-0.011	-0.009 *	-0.005
High (ISEI > 60)	-0.014	-0.012 [†]	-0.008
Educational attainment male partner (ref lower sec.)			
Short vocational / short upper secondary	-0.017 [†]	-0.008	-0.002
Full vocational / upper secondary	-0.021 *	-0.012 *	0.004
Higher professional / tertiary	-0.013	-0.008	0.005
Work hours male partner (ref 38-40 hours)			
< 38 hours	0.001	0.007	-0.005
> 40 hours	0.012	0.012 *	0.003
Male partner in supervisory position (ref no)	0.002	0.008 *	-0.001
Occupational status of first job male partner			
Not started working	-0.010	-0.005	0.014
Low (ISEI < 30)	0.037 **	0.003	-0.008 *
Medium low (ISEI 31-45)	ref	ref	ref
Medium high (ISEI 46-60)	0.022 **	0.001	-0.002
High (ISEI > 60)	0.031 *	-0.001	-0.004
Likelihood ratio test (df) of contribution to model fit:			
Female characteristics LR chi^2 (11)	32.72 ***	20.79 *	35.11 ***
Male characteristics LR chi^2 (10)	24.74 **	55.34 ***	12.51
N couples	439	1,017	1,078
N events	402	928	645
Observations	8,255	24,163	18,686

Source: FNB 1998/2000/2003/2009, calculations by author.

Note: [†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed).

Average Marginal Effects (dy/dx) were calculated as the discrete change from the base level from predicted probabilities assuming $u_i = 0$.

Coefficients of dependence duration (age at household formation and relationship duration, see Figure 1) and the year of data collection are omitted from the table.

5. Conclusion

The aim of this study was to advance our understanding of the influences of the educational and occupational resources of men and women on the timing of the first childbirth, using extensive and dynamic indicators of earning potential and career transitions, and employing a couple framework. The question of the degree of the interdependence of the partners in a couple is of particular relevance to fertility research, as in many studies on fertility trends only information about women is used to predict fertility outcomes. However, if the impact of the occupational characteristics of the female partners on fertility is conditional on the male partners' occupation and education, the conclusions drawn from studies that rely only on data from women could be incomplete or even misleading.

Relating the empirical results of the analyses back to the research questions, a central conclusion is that the educational and occupational characteristics of the female partner are stronger predictors of the timing of the first birth than those of the male partner. Additionally, the findings indicated that the degree of interdependence of the partners was small, a conclusion that is in line with that of a recent study using Finnish register data on socioeconomic resources and first birth timing among couples (Jalovaara and Miettinen 2013). With regard to the effects of individual characteristics, the results for the female partners were fully consistent with the theoretical expectations: if a woman had a higher earning potential and had recently moved up in her career, the transition to parenthood was delayed. For the male partner, on the other hand, only educational attainment and weekly working hours were significant predictors of the couple's probability of having a first birth. The estimation of the model for three different historical periods also revealed interesting changes over time; the effect of the educational attainment of the female partner was fully captured by controlling for educational enrollment in the 1960s and 1970s, and it became a strong predictor over and above educational enrollment only after 1990. During this final time period, couples with a non-working female partner no longer made the transition to parenthood faster. The comparison of the effects over the three time periods also suggested that the earning potential of the male partner was a stronger predictor of fertility decisions when women's human capital and labor market participation levels were lower.

The male partner working more than a full-time schedule (i.e., more than 40 hours per week) was the only significant predictor associated with a higher first birth probability; this might be explained by the fact that in our model, this indicator captured actual earnings rather than potential earnings, especially for less educated men (Andersson 2000; Dribe and Stanfors 2010). Moreover, the fact that the male partners' work patterns mattered less during the transition to parenthood may be related not only

to the higher opportunity costs of childbirth that women face, but also to the fact that there was less variability among men than women in terms of occupational trajectory and work status (see descriptive statistics in Appendix A). This difference might be related to the selection of men with relatively favorable characteristics in the analytical sample, a point that is addressed in more detail below.

The overall conclusion drawn from the results presented in this study with regard to the interrelationship of employment and the timing of the first birth is that, while women's employment has become an accepted phenomenon over the course of the past few decades, and is no longer necessarily viewed as being in conflict with motherhood, having a high level of human capital and having a job which requires continuous commitment are still associated with the postponement of the first childbirth. The impact of the career of the male partner on the first birth was not as strong as that of the female partner, and it decreased over time, a development which is most likely due to the increasing educational and occupational homogamy between the partners. This implies that a man with a high earning potential is likely to have a partner who is also highly committed to her career (Verbakel et al. 2008). The data used did not permit us to test the effect of career dynamics over the different time periods, which is unfortunate, as doing so might have provided us with some insight into whether the more equal sharing of childrearing tasks among more recent cohorts of men has led to a postponement of the transition to parenthood in response to an upward career move.

A limitation of the data was the fact that all of the information was collected retrospectively. Because this study focused on couples who lived together at the time of the interviews, there might have been selection bias present in the sense that men who had uncertain labor market positions or few resources might not have entered the types of stable relationships that we observed. Men with less desirable occupational positions might have been in non-cohabiting relationships or in relationships that had a higher chance of separation. Thus, the positive effect of male earnings might be underestimated. A similar argument about selection bias could be made about women; that is, that women who have high career aspirations have lower chances of cohabitating or marrying, and that the negative effects of female earnings might therefore be underestimated. Additional analyses showed that there is no evidence that selection into stable relationships affected the main effects estimated for men and women, as the direction and significance of all of the covariates remained unchanged when the sex-specific models were estimated including all of the respondents in the survey, and the duration from age 15 to the first birth was analyzed (N=7,038, see Appendix B). This additional analysis showed that men and women who were part of the analytical couple sample were less likely to have transitioned to a first birth than the excluded respondents. This finding is likely attributable to the fact that these respondents were somewhat younger and better educated than the left-censored

respondents, and is in line with previous research reporting an association between relationship stability and socioeconomic status (Jalovaara, 2001).

In conclusion, this study has confirmed the importance of taking into account detailed occupational and work characteristics when studying the relationship between fertility and the paid employment of women (Brewster and Rindfuss 2000; Matysiak and Vignoli 2008). In relation to the inclusion of partner characteristics, the results presented here suggest that by obtaining information about the educational levels and working hours of the male partners, researchers should be able to accurately model the transition to a first birth. An extensive couple data collection or a restriction of the sample to stable couples might not always be necessary. Future research on the relative importance of the partners' characteristics is desirable, and should address not only the transition to the first birth, but also to higher order births and union formation processes in different national contexts.

6. Acknowledgments

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Appendix A: Distribution of exposure time and events for all variables used

Variable	Categories	Exp.	%	Events
Age female partner at	< 21	14,844	29.1	533
household formation	21-23	21,274	41.6	798
	> 23	14,986	29.3	644
Year of data collection	1998	10,544	20.6	414
	2000	7,665	15.0	328
	2003	12,525	24.5	468
	2009	20,370	39.9	765
Relationship status	Cohabiting	21,677	42.4	351
	Married	29,427	57.6	1,624
Period of household	1960-75	8,255	16.2	402
formation	1976-89	24,163	47.3	928
	1990-09	18,686	36.6	645
Total		**51,104**		**1,975**

		Female partner			Male partner		
		Exp.	%	Events	Exp.	%	Events
Main activity	Paid work	43,211	84.6	1,650	46,943	91.9	1,884
	Household	2,606	5.1	216	n.a.	n.a.	n.a.
	Unemployed/disabled/inactive[a]	1,985	3.9	66	1,504	2.9	42
	Enrolled in education	3,302	6.5	43	2,657	5.2	49
Educational	Lower secondary	8,449	16.5	423	9,324	18.3	441
attainment	Short vocational/upper sec.	10,596	20.7	427	8,749	17.1	310
	Full vocational/upper sec.	16,816	32.9	606	15,185	29.7	560
	Higher professional/tertiary	15,243	29.8	519	17,846	34.9	664
Supervisory	Not working	7,893	15.4	325	4,161	8.1	91
position	No	34,952	68.4	1,405	32,241	63.1	1,264
	Yes	8,259	16.2	245	14,702	28.8	620
Work hours	Not working	7,893	15.4	325	4,161	8.1	91
	< 38 hours / week	17,728	34.7	710	5,872	11.5	214
	38-40 hours / week[b]	25,483	49.9	940	34,852	68.2	1,343
	> 40 hours / week	n.a.	n.a.	n.a.	6,219	12.2	327
Occupational status	Not started working	3,743	7.32	77	3,007	5.9	62
first job	Low (ISEI < 30)	7,582	14.84	350	8,247	16.1	330
	Medium low (ISEI 30-45)	14,300	27.98	635	20,794	40.7	821
	Medium high (ISEI 46-60)	19,553	38.26	700	11,763	23.0	481
	High (ISEI > 60)	5,926	11.60	213	7,293	14.3	281
Career dynamics	No change	48,337	94.59	1,899	47,670	93.3	1,853
	Downward move	1,088	2.13	33	1,241	2.4	46
	Upward move	1,679	3.29	43	2,193	4.3	76
Total		**51,104**		**1,975**	**51,104**		**1,975**

Source: FNB 1998/2000/2003/2009, calculations by author.
Note: [a] Female partner: Unemployed/disabled/inactive/household; b Female partner ≥ 38 hours;
Exp. = Exposure time. One time period comprises three months of observation.

Appendix B: Estimates from the discrete time random effect logit model of the transition to a first birth (from age 15) for respondents born ≥ 1945 (including left- and right-censored respondents)

	Female Respondents			Male Respondents		
	B	SE	OR	B	SE	OR
Part of analytical sample (ref no)	-0.42	0.07	0.66 ***	-0.21	0.08	0.81 **
Age	0.65	0.04	1.91	0.51	0.04	1.67 ***
Age squared	-0.01	0.00	0.99 ***	-0.01	0.00	0.99 ***
Relationship status (ref married)						
Single / dating	-2.93	0.08	0.05 ***	-3.18	0.09	0.04 ***
Cohabiting	-1.39	0.07	0.25 ***	-1.45	0.07	0.24 ***
Historical period[2] (ref 1960-69)						
1970-79	-0.96	0.13	0.38 ***	-0.96	0.14	0.38 ***
1980-89	-1.21	0.14	0.30 ***	-1.28	0.14	0.28 ***
1990-99	-1.04	0.14	0.35 ***	-1.13	0.15	0.32 ***
2000-10	-0.85	0.16	0.43 ***	-0.93	0.17	0.39 ***
Main activity (ref paid work)						
Household (female only)	0.79	0.09	2.21 ***			
Unemployed / disabled / inactive	-0.01	0.13	0.99	-0.24	0.15	0.79
Enrolled in education	-0.52	0.20	0.60 **	-0.37	0.25	0.69
Educational attainment (ref lower sec.)						
Short vocational / short upper secondary	-0.35	0.08	0.70 ***	-0.25	0.08	0.78 ***
Full vocational / upper secondary	-0.48	0.08	0.62 ***	-0.34	0.07	0.71 ***
Higher professional / tertiary	-0.48	0.09	0.62 ***	-0.24	0.08	0.79 ***
Work hours (ref 38-40 hours / week)[1]						
<38 hours / week	0.13	0.06	1.14 *	0.03	0.08	1.03
> 40 hours / week (male only)				0.16	0.07	1.17 *
Supervisory position (ref no)[1]	-0.32	0.07	0.72 ***	0.05	0.05	1.05
Career dynamics (ref no job move)						
Downward move	-0.20	0.16	0.82	-0.12	0.10	0.89
Upward move	-0.27	0.14	0.76 *	-0.14	0.09	0.87
Occupational status of first job						
Not started working	-0.02	0.18	0.98	-0.04	0.24	0.96
Low (ISEI < 30)	-0.01	0.07	0.99	0.06	0.07	1.06
Medium low (ISEI 30-45)	ref		1.00	ref		1.00
Medium high (ISEI 46-60)	-0.19	0.06	0.82 ***	-0.01	0.07	0.99
High (ISEI > 60)	-0.26	0.10	0.77 **	-0.04	0.09	0.96
Year of data collection (ref 1998)						
2000	0.23	0.08	1.26 **	0.23	0.08	1.26 *
2003	0.02	0.08	1.02	0.01	0.08	1.01
2009	-0.02	0.07	0.98	-0.02	0.07	0.98
Constant	-10.34	0.62	0.00 ***	-9.26	0.65	0.00 ***
σ_{ui}(s.e.)	0.65		***	0.60		***
Observations	180,393			182,551		
Log likelihood (df)	-11,235.8		(26)	-10,908.4		(26)
N Respondents N events	3,549		2,624	3,489		2,516

Source: FNB 1998/2000/2003/2009, calculations by author

Note: [†] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed)

B: unstandardized logistic regression coefficient. SE: standard error of coefficient B. OR: Odds Ratio = Exp(B)

[1] Information about work characteristics refers only to work episodes; all non-work episodes are assigned zero, and information about non-work episodes is included in the model (household, unemployment/disabled/inactive, enrolled).

[2] The specification of the historical period differs from the models presented in Table 2 and 3 because the additional respondents included here did not all share a household with a partner.