Occupational hazard? The relationship between working conditions and fertility

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Occupational Hazard?

The Relationship between Working Conditions and Fertility

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Introduction and Overview of Studies

Labor force participation among women throughout their adult life increasingly presents a social norm and economic necessity, not only before the birth of the first child, but also for mothers of young children. A large body of literature has accumulated which examines the degree of compatibility of different types of jobs with family life (Allen, Herst, Bruck, & Sutton, 2000; Grzywacz & Butler, 2005; Mauno, Kinnunen, & Ruokolainen, 2006; Perry-Jenkins, Repetti, & Crouter, 2000; Van der Lippe, 2006; Van Rijswijk, Bekker, Rutte, & Croon, 2004). The results of these studies overwhelmingly point to the importance of the *type of job* in hampering or facilitating work-family compatibility. Fertility research, largely within demography, on the other hand, has not yet paid the same attention to job characteristics and working conditions. In the last decade, however, a body of literature emerged with a focus on differences in fertility behavior by educational and occupational fields (Hoem, Neyer, & Andersson, 2006a; Lappegård & Rønsen, 2005; Martín-García & Baizán, 2006; Van Bavel, 2010). The four studies presented in this book connect to and extend this stream of research by studying the influence of different types of jobs and various work conditions on fertility outcomes.

In their now widely cited review on fertility and women's employment, Brewster and Rindfuss (2000) stated that research into the fertility-employment relationship should aim at developing a unifying framework with the following requirements: *"it must be dynamic; it must recognize the multidimensionality of both labor force participation and fertility; and it must be multilevel, incorporating the institutional and normative arrangements that influence individual fertility and labor force behavior"* (p. 290). While this book neither claims nor aspires to develop a unifying framework, the four studies presented here seek to illuminate the thus far understudied aspects of work in their relationship to fertility outcomes while adhering to the requirements of being dynamic and multidimensional, with regard for the institutional and normative context. Moving beyond the dichotomy of work versus inactivity and measures of hours of work, the aim of this project was to examine various characteristics of work and how they relate to different fertility outcomes such as the intention to have a child within three years, the probability of having a child and the timing of births.

In short, this dissertation shows that the impact of increased female educational levels and labor market participation on fertility is not only related to a growth in the number of hours that women work, but also in the type of occupation, at what time of the day they work, their perceived control or job autonomy, and the level of work-life reconciliation. This is done by adopting a multidimensional approach that takes into account women's life course dynamics, interdependencies of partners within couples, and the institutional and cultural context in which men and women are embedded.

1.1 Background: Fertility and Women's Employment

Since the 1960s, women's levels of educational attainment have reached parity or even surpassed men's, coupled with women's widespread entry into the labor market and participation throughout their adult lives. Along with structural changes in the educational system and labor market, a cultural and ideational shift towards individualization and self-actualization has also occurred over the last 50 years (Lesthaeghe & Van de Kaa, 1986). This has led women to define themselves by not only their role as caregiver and homemaker, but also by a role of worker and professional. Furthermore, together with the introduction of reliable contraceptives which enabled the separation of sexuality and parenthood, there has been an emergence of a plurality of family forms and living arrangements. These developments have dramatically altered the opportunity structure young women face and changed the life courses of women (and men) profoundly. Both women and men now perceive finishing education and establishing oneself in the labor market as life stages that should ideally be completed before starting a family (Billari, 2004; Liefbroer & Corijn, 1999). As a result, marriage and first childbirth are increasingly postponed to higher ages.

This postponement of family formation does not per se imply the spread of childlessness as a preferred lifestyle, as the proportion of people that intends to be childless is lower than the proportion of people who remain childless (Coleman & Garssen, 2002). Also parenthood remains a major life goal in Western societies, with an average ideal and intended family size of two children (Bongaarts, 2001; Morgan & Taylor, 2006). Rather, a series of postponement decisions might lead to involuntary childlessness or smaller than intended family size (Mills, Rindfuss, McDonald, & Te Velde, 2011). The higher the human capital and professional ambitions of women, the more difficult it is to reconcile paid work and fertility, as a prolonged absence from the labor market is costly both in terms of foregone wages, skill depreciation and slow career progress in the long run (Amuedo-Dorantes & Kimmel, 2005; Budig & England, 2001; Sigle-Rushton & Waldfogel, 2007). For women nowadays, her fertility as well as her professional career require careful coordination and strategic choices.

At the macro level, the relationship between female labor force participation and fertility has since the 1980s changed from being negative, i.e., lower fertility rates were observed in countries with higher female labor force participation, to positive. Currently, the average number of children per woman is higher in countries where more women work for pay and fertility has reached lowest levels in the countries where female labor force participation and support for women's multiple roles is lowest (Castles, 2003; Engelhardt & Prskawetz, 2004; Kögel, 2004; Rindfuss, Guzzo, & Morgan, 2003). Paradoxically, the countries that attach the highest values to family

and children as central life goals and where women also conform most to the role of primary homemaker and follow traditional gender roles now experience the lowest fertility on the aggregate level (Rijken & Knijn, 2008). The fundamental role of institutional support in ameliorating tensions between work and childbearing and in explaining this micro-macro inconsistency (Coleman, 1990) is undisputed and has been examined widely by scholars in family sociology and social demography (Bernhardt, 1993; Diprete & Morgan, 2003; Morgan & Taylor, 2006).

This has also sparked policy concerns because the consistent gap between desired family size (of around two children in most Western countries[1]) with realized fertility has been said to reveal a "latent demand for family polices" (Chesnais, 1998, p.85). This gap has been acknowledged in recent public debates and policy mandates of the European Commission (2004, 2005, 2007), which attempt to simultaneously raise both fertility levels and female employment. To strengthen the labor force and increase European productivity, the Lisbon Strategy called for a rise in women's employment (European Commission, 2004). This was combined with the strategic goal to increase European fertility (European Commission, 2005, 2007).

1.2 Research Approach

1.2.1 Fertility outcomes

Within this study different measures of fertility are examined, namely the intention to have a child within three years (Chapter 5), the occurrence of a birth or pregnancy within three years (Chapter 3), and the time until the birth of a child (taking into account also women respectively couples who do not have children, Chapter 2 and 4). Additionally, these fertility decisions are examined separately at different parities (Chapter 3 – 5). The different outcome-measures of fertility each have their own inherent advantages and difficulties. Intentions are not always realized and are inconsequential in the sense that they might be adjusted at any point in life. Births however do not always occur at the moment they were planned or wanted. Estimates about the amount of mistimed and unwanted pregnancies range from one third or more in the United States to between 8% and 20% in European countries (net of abortions, Schmitt, 2009, p.102f). Intentions on the other hand, have been found to be imperfect predictors of behavior, especially when long-term estimates and lifetime fertility are concerned. The measure employed in this book, which is the time-dependent intention to have a first or second child within the next three years, has been shown to be a good predictor of fertility behavior, even after controlling for

[1] With the notable exception of German speaking countries where desired fertility is also below replacement level (Goldstein, Lutz, & Testa, 2003)

background and life course variables (Balbo & Mills, 2011; Billari, Philipov, & Testa, 2009; Schoen, Astone, Kim, Nathanson, & Fields, 1999; Spéder & Kapitány, 2009).

We analyze fertility intentions and births at first and higher order parities in separate models because the transition to becoming a parent is commonly viewed as a process guided by different considerations than the decision to have an additional child (Barber, 2001; Hobcraft & Kiernan, 1995). Furthermore, Chapter 2 and 4 specifically focus on the second child since in European countries (and also the Netherlands), the total fertility rate is around or below the replacement level of 2.1 and there exists a widespread two-child norm. We therefore regard women who intend to make the transition to a third or higher order birth as a rather distinct group with potentially different motivations and fertility ideals (Alich, 2006; Berinde, 1999).

1.2.2 Education and employment

In the four studies presented here, we have systematically extended our knowledge about how education and employment influence fertility outcomes. Information about the level of education attained is combined with more nuanced information about periods of enrolment (Chapter 2 and 4) and the field of study (Chapter 4). Pertaining to employment, diverse measures of work characteristics are included, ranging from earning potential and recent career dynamics (Chapter 2), non-standard work hours (Chapter 3) and occupational gender segregation (Chapter 4) to perceived control about pace and organization of work (Chapter 5). Detailed accounts of the theoretical background and operationalization of the different aspects of work studied in this book are presented in section 1.3.

1.2.3 Methodological approach

The multidimensional approach also manifests itself in the selection of data and methods across the four empirical chapters. The dynamic nature of the work-fertility relationship was taken into account by the use of longitudinal data and methods of analysis that consider the entire life course trajectory with regard to education and occupation, and fertility and relationship histories (Chapter 2 and 4). The use of event history methods allows to fully capture the dynamic changes in educational and occupational states and helped us to disentangle the temporal ordering of events. In order to understand how family life is organized around and influenced by the work schedules of both parents, the quantitative assessment of the impact of non-standard work schedules on the birth of a first or second child was supplemented with qualitative interviews with couples (Chapter 3). This mixed-method approach helped

to gain a deeper understanding into the dynamic manner in which work-schedules and family responsibilities interact.

The focus on interaction within couples and hence the inclusion of the male partner in the analysis of fertility decisions was a recurring theme in this book. The need to include information about the partner in fertility studies is widely recognized among scholars in the field (Beckman, 1984; Coombs & Chang, 1981; Corijn, Liefbroer, & de Jong Gierveld, 1996; Jansen & Liefbroer, 2006; Rijken & Liefbroer, 2008; Thomson, 1997; Vignoli, Drefahl, & De Santis, 2012). Evidence from a recent meta-analysis confirms that in order to avoid overestimating the negative effect of women's employment on fertility, the inclusion of partner information is vital (Matysiak & Vignoli, 2008). However, this is often hampered by data limitations and concern about unreliable accounts of male fertility in survey research (Schoen, Landale, & Daniels, 2007). In Chapters 2 and 3, we are able to exploit two datasets that contain longitudinal couple data, thus enabling us to include full information about both partners and examine in how far partners' work choices are interdependent in their impact on subsequent fertility behavior.

A final point that relates to the requirements posited by Brewster and Rindfuss (2000) is the inclusion of interactions between the institutional and normative context and fertility behavior. We take up this challenge in Chapter 5, which presents an analysis of 22 European countries and includes cross-level interactions between supportive policies and individual work characteristics (see section 1.3). The remaining Chapters focus on the context of the Netherlands and explicitly consider the institutional and normative background.

1.2.4 The Netherlands

To understand the theoretical development and hypotheses and enhance the interpretation of results, it is useful to briefly elaborate on some of the relevant contextual aspects of the Netherlands. Before the onset of fertility postponement in the 1970s, fertility rates in the Netherlands were among the highest in Europe, just above 3 children per woman (Coleman & Garssen, 2002). Between 1965–1975, the period total fertility rate fell to 1.66 and has shown a slight recovery to around 1.7 children per woman in the last two decades, which is relatively high in the European context (Fokkema, De Valk, De Beer, & Van Duin, 2008). The Netherlands is furthermore characterized by high ages at first childbirth in combination with low abortion and teenage pregnancy rates and high use of contraceptives (Coleman & Garssen, 2002). This makes the Netherlands a context of planned and thus generally intended childbearing. Fertility outside marriage remains relatively low, with only a quarter of all births recorded as extramarital in 2000, a share that is well below the

European average (Coleman & Garssen, 2002). Even though unmarried cohabitation is now widely accepted and increasingly viewed as a suitable alternative to marriage, most of the young couples ultimately get married once they want to become parents (Fokkema et al., 2008). In term of fertility ideals, the Netherlands are characterized by a strong two child norm and even though levels of childlessness are relatively high, this is not frequently a stated lifestyle preference but rather likely the result of fertility postponement (Coleman & Garssen, 2002).

The studies presented here cover the time period between roughly 1960 and 2005, a period characterized by educational expansion and increasing female labor force participation. In the Netherlands, women began to enter the labor force comparatively late, with the male breadwinner being the predominant family model until the 1970s when only about one third of Dutch women worked for pay (Van Gils & Kraaykamp, 2008). Since then, women have gradually increased their labor market participation to reach about 70% in 2000, placing the Netherlands at the European average (Eurostat Dissemination Database, 1983-2012). The large majority of women in the Netherlands, however, works part-time especially after the birth of the first child, making the so-called 'combination' or 'one-and-a-half earner model' the standard couple arrangement in the Netherlands (Plantenga, 2002; Van Gils & Kraaykamp, 2008; Verbakel & De Graaf, 2009). Reasons for this persistent pattern are of institutional as well as cultural nature: The Dutch tax system for a long time heavily favored single earner couples and male wages were comparatively high (Kremer, 2005; Van Gils & Kraaykamp, 2008). Also male unemployment in the Netherlands has been low in the last decades (with the exception of the economic crisis in the 1980s) and workers are well protected by labor laws and social insurance benefits (Fouarge & Baaijens, 2009). In addition, childcare availability was low in the period up to the end of the 1990s and there are cultural barriers to full-time childcare use (Clerkx & Van Ijzendoorn, 1992; Portegijs, Cloïn, Eggink, & Ooms, 2006). The cultural norm of superiority of maternal care (Clerkx & Van Ijzendoorn, 1992) as well as the shortage of formal child care facilities and lack of parental leave policies mean that the Netherlands can be referred to as a 'familialistic' welfare state when it comes to childcare policy (Haas, 2005; Leitner, 2003), a system in which "households carry the principal responsibility for their members' welfare" (Esping-Andersen, 1999:51).

Currently a cultural shift can be observed from a dominant model of *full-time motherhood*, where women are expected to stay and home and care for children of pre-school age, to a model of *parental sharing* with the mother engaged in part-time work and both parents involved in childcare (Haas, 2005; Kremer, 2005; Leitner, 2003). Still, the normatively acceptable and actual levels of institutionalized care for children remain limited at a maximum of two to three days per week with often

insufficient availability and affordability of formal childcare (Allewijn-Tzipris & Kroneman, 2006; Mills & Täht, 2010; Portegijs et al., 2006). This leads to women adjusting their paid work to increase work-family compatibility by decreasing their working hours after the transition to parenthood.

As recent research has demonstrated, in the Netherlands desynchronization of parent's schedules can be intentional and desired, compared to those without children (Täht & Mills, 2012; Van Klaveren, Maassen van den Brink, & Van Praag, 2011). In fact, less than 15 percent of couples with children are categorized as full-time dual earners (Van Gils & Kraaykamp, 2008). What is important to note is that part-time work is not synonymous with dead-end or low quality jobs (Kalleberg, 2000). The Netherlands have a highly regulated labor market with strong protection for those working part-time, in a temporary contract and in non-standard schedules (Fouarge & Baaijens, 2009) and a strong tradition of centralized collective bargaining and corporatism, ensuring that working conditions and wages do not differ widely between firms for the same occupation or sector (Hartog, 1999). Also throughout the 1980s and 1990s, the public sector was substantially reduced and has been subject to strong wage restraints, decreasing the differences between public and private sector employees (Hartog, 1999). It has to be noted that also in terms of male part-time work the Netherlands are the front runner in the world with the proportion of men who work part-time growing from about 6% in the 1980s to 24% in 2011 while the European average in the same period grew from 3% to 8% (Eurostat Dissemination Database, 1983-2012).

The combination of relatively high male wages and low unemployment with a high share of part-time (female) employment and low childcare availability implies that mothers face relatively high barriers to full-time employment and to pursuing a professional career and men are generally the main provider of household income (Rijken & Knijn, 2008).

1.3 Theoretical Assumptions

1.3.1 Fertility as purposive behavior

Throughout the four studies in this book, fertility is conceptualized as a *purposive behavior* in the sense that the involved actors can plan and control it to a large extent. Furthermore, fertility is regarded as a choice under alternatives, which implies that actors face competing life goals and apply some form of *cost-benefit consideration* to arrive at the decision to have a child or postpone a birth. In contrast with prominent neo-classical approaches to fertility, this does not imply the assumption of instrumental rationality of perfectly informed forward looking actors arriving at one

optimal solution (Becker, 1991; Easterlin, 1975; Leibenstein, 1981). Rather, individuals are assumed to be influenced by and learn from previous experiences. Moreover, fertility is guided by social norms that differ by institutional and historical context and individuals are assumed to include the costs of violating these context-dependent social norms regarding the right age and order of life course transitions into the assessment of costs and benefits associated with having a child (Ajzen, 1991; Brückner & Mayer, 2005; Elder, 1975; Liefbroer & Billari, 2010).

It is important to note that this approach also implicitly assumes that people 'want it all' in the sense that attaining an educational degree, finding a job, and forming a family are universal life goals that people will strive to achieve (Mills, Blossfeld, & Klijzing, 2005). This means that no differing and innate preferences in favor of either childbearing or working are assumed (as is the case for instance in the notion of preferences for a home or work centered life style, Hakim, 2003), even though preferences for children might vary between individuals based on for instance their own childhood experiences or religious beliefs or other experiences. The *formation* of these preferences however is not subject to empirical or theoretical consideration in these studies (Stigler & Becker, 1977). Hence children and reproduction are seen as major life goals in itself that cannot be easily substituted by other goods or activities (as assumed by the neo-classical New Home Economics, e.g. Becker 1991). Children are assumed to have an *inherent value* and provide a unique contribution to the fulfillment of needs of affection, bonding, and self-actualization (Friedman, Hechter, & Kanazawa, 1994; Hoffman & Hoffman, 1973; Morgan, 2003). This is not to say that the costs of children are irrelevant to (prospective) parents. As outlined above, actors are expected to weigh the costs of having a child now compared to postponing a birth in their fertility decisions.

1.3.2 Costs of children

The costs of children can be defined as *material* versus *immaterial* and *short-term* versus *long-term costs*. Material short-term costs are the direct costs arising from pregnancy and childrearing and entail costs for caring for and raising children including appropriate food, housing, and clothing. Material or monetary long-term costs of childbearing, often referred to as *opportunity costs*, result from forgone wages and career gains, compared to a situation without children. These costs are difficult to measure as they refer to a hypothetical situation, even though most people have an approximate idea of factors such as career steps they might have taken in the absence of family responsibilities.

Immaterial or non-monetary costs of fertility in the short term are changes in the quality of the partner relationship that might arise after having a child due to the

strain and time pressure associated with parenting responsibilities for a small infant. The long-term commitment towards the current partner can also be regarded as a cost of parenthood.

1.3.3 Sequential life course decisions and linked lives

The decision to have a child is irreversible and parents are bound to their own children (Hobcraft & Kiernan, 1995). In this sense, the consequences of parenthood cannot be exactly known to parents beforehand. Childbearing is a process of consecutive steps of one birth at a time, with the opportunity to re-evaluate intentions about future children. This is especially relevant with regard to the transition to parenthood and the subsequent evaluation of future further births, as the real consequences of the first childbirth for the division of labor within and outside the household only become apparent once the transition is made (Grunow & Schulz, 2007).

The division of labor within the couple, and more generally the interdependencies and negotiations between partners that each fertility decision is based on are captured in the notion of 'linked lives' and form an important part of the theoretical basis of the studies presented here (Elder, 1985). Starting from the moment two people form a relationship, the plans and trajectories of both partners form the opportunities and constraints that structure the shared biography and future family formation, also with regard to other life domains. Education and paid employment are arguably the most important life domains in this regard, since finishing education and starting work are two transitions that are expected to be undertaken by *both partners* before the transition to parenthood is considered.

1.4 Data and Methods

1.4.1 Data

This dissertation aims at giving a dynamic and multidimensional account of the relationship between work characteristics and fertility, but also pay attention to the institutional and normative context. This research driven aim demands high quality data that are longitudinal, contain detailed information about education, work and fertility histories of both partners and preferably are available for multiple countries. Since there is not a single dataset that fulfills these requirements, the four empirical chapters use three distinct data sources. All are large scale, publicly available datasets that are collected employing strict quality controls. Two of these datasets consist of representative samples of the population of the Netherlands and one is a cross-national project which contains representative samples from 23 European countries. Specifically, the second and fourth chapter make use of three waves of the Family

Survey of the Dutch Population (Familie-Enquête Nederlandse Bevolking 1998, 2000, 2003, (De Graaf, De Graaf, Kraaykamp, & Ultee, 1998, 2000, 2003). The third chapter analyzes the first (2002-2004) and second wave (2007) of the Netherlands Kinship Panel Study (NKPS, Dykstra, Kalmijn, Knijn, Komter, Mulder, Liefbroer, 2004, 2007), supplemented with qualitative interviews conducted within a subsample of respondents of the NKPS (NKPS qualitative mini-panel, Mills & Hutter, 2007). In the fifth chapter, the second wave (2004-2005) of the European Social Survey (ESS, 2004) was used, specifically drawing on the special module on family, paid work, and well-being. A detailed description of each dataset can be found in the separate chapters.

1.4.2 Analytical strategy

This section discusses the analytical approach chosen to test the theoretical propositions. As described in the previous section, three different datasets were used, each of which enabled us to address different aspects of work and the relationship with fertility.

The *second chapter* examines couples' educational and occupational resources in relation to the transition to parenthood. To make optimal use of the retrospective life-course information supplied by both partners in the Family Survey of the Dutch Population, we created a person-period file which contains information for all individual respondents from age 15 until the birth of the first child or censoring by the interview or age 45 occurs. A *discrete time event-history probit model with random effects at the couple level* (Mills, 2011; Steele, 2005) was estimated to model the transition to parenthood for couples. In this model, the period under observation for each couple starts at the time they started the relationship. This strategy could lead to biased estimates because only stable couples that 'survived' up to the moment of data collection are included and the age at which these couples start the relationship varies. In order to address this potential bias we also estimated a *discrete time probit model with sample selection* (a binary Heckman selection model, Billari & Borgoni, 2005; Van de Ven & Van Praag, 1981), which refers to the simultaneous estimation of two processes with binary outcomes with correlated error terms. The selection process was the transition into the relationship observed from age 15 onwards for all individual respondents. Once couples were selected into the relationship, the transition to first birth was modeled as the outcome process of interest, given that selection had occurred. We compared the estimates of the two equations using average marginal effects.

The *third chapter* addressed the effect of non-standard work hours on the probability of having a first or second child. We used data from two waves of a panel

study (NKPS) and made use of the prospective character of the data by measuring all covariates at the first wave and the outcome, the birth of a child, at the second wave collected three years later. Because we used multiple indicators for two of the main explanatory variables (non-standard work schedules and relationship quality) and we wanted to assess the presence of an indirect effect of non-standard work schedules and desynchronization via relationship quality, we used *structural equation models*. More specifically, we estimated a multiple group model for categorical outcome variables (Muthén & Asparouhov, 2002) in order to model the probability of first and second birth separately. The quantitative model was supplemented with a narrative analysis of the in-depth qualitative interview data which were coded by first defining general categories that related to the research questions and were then examined to isolate narratives that exemplified certain points or associations (Boyatzis, 1998).

The *fourth chapter* also made use of the Family Survey of the Dutch Population and analyzed the transition to first and higher order births. In this study, we focused only on women and constructed a person-period file for all female respondents, covering the time from age 16 until the fourth birth or censoring by the interview or age 45 occurred. We used detailed information about women's education and occupation and supplemented this with external macro-level information about occupational sex segregation in each occupation, female labor force participation and unemployment over the historical period covered (1956 to 2003). We estimated two *discrete-time event history models* of first and higher order (second to fourth) births with random effects at the person level using a complementary log-log link function (Allison, 1982; Jenkins, 2005). The transition to higher order births was analyzed as a *recurrent event model* where birth episodes were nested within women (Mills, 2011). By including individual-specific unobserved factors that were constant over episodes, we accounted for selection effects due to unobserved heterogeneity and the fact that (the durations of) episodes from the same individual were not independent.

In the *fifth chapter*, the dependent variable was a dichotomized measure of the intention to have a first or second child and explanatory variables were measured at the individual and country level. To account for the fact that respondents are clustered within countries, a *multilevel (random intercept) binary logistic model* stratified by parity was estimated. We estimated cross-level interactions between institutional indicators and employment characteristics and graphed the predicted probabilities of intending a birth to facilitate interpretation of these interaction effects (Steele, 2009).

1.5 Overview of the Four Studies

This section introduces the four empirical studies in this dissertation in more detail. An overview of this information can be found in Table 1.1. The main findings and contributions of each empirical chapter are discussed and, where possible, compared and combined. The four studies were designed to provide a broad and multi-dimensional examination of work characteristics that until now have not been related to fertility outcomes and each study was written as an independent contribution to the scientific debate. Due to the cumulative nature of the four chapters and their distinct contributions, no overarching framework is developed. Instead, the main contributions of each study are briefly discussed in a consecutive manner. Since the four studies were written in the form of journal articles, they are meant to be read in isolation from each other. As a result, some degree of overlap and repetition was inevitable.

1.5.1 Chapter 2: How do educational and occupational resources relate to the timing of family formation? A couple analysis

This chapter serves as a point of departure for the remaining empirical chapters and aims at giving an extensive account of how earning potential, career dynamics and labor market uncertainties of both partners impact family formation. This is achieved by analyzing the timing of first childbirth in a sample of couples from the Netherlands in the period between 1960 and 2000. Earning potential is defined by educational attainment, occupational status, supervisory responsibility and weekly working hours. Career dynamics refer to the experience of upward and downward job moves and the transition into employment (from non-employment) in the previous year. Labor market uncertainty arises in periods of unemployment, inactivity or self-employment. The main interest in this study was to see how the educational and occupational resources of each partner influence the transition to first childbirth and in how far these effects are interdependent. In addition, we attempted to gain more insight into the potential selection bias that could arise from looking at a sample that consisted only of stable couples and restricting the period of observation to the time spent in the relationship (see section 1.5 Methods and Chapter 2 for details).

The theoretical approach of this chapter drew on economic approaches to family formation which state that gains from marriage are reduced when women's earning potential grows, because their comparative advantage in the production of household labor diminishes. According to this, (first) childbirth is also delayed as opportunity costs of having children increase for women with higher human capital (Becker, 1991). In line with this hypothesis, the results of the empirical analysis confirmed a delaying effect of all indicators higher earning potential of the female

partner. Self-employment and homemaker status of the female partner were associated with a higher first birth probability.

Conversely for men, we expected that higher earnings should be associated with earlier family formation since the comparative advantage of men lies in securing the material standard of living through paid work. A higher earning potential of the male partner should therefore be associated with a faster transition to first birth. However, the positive 'income effect' of the higher earning potential of the male partner is expected to be stronger when the female partner does not face high career costs of parenthood herself. A central hypothesis of this chapter is therefore that a higher earning potential of the male partner is associated with a faster transition to parenthood in one-and-a-half (female partner works part-time) and male breadwinner (female partner not working) couples.

The results show that for the male partner, only a higher number of working hours and lower educational attainment predicted the first birth transition, with no effect found for employment status or occupational prestige. Also the evidence for interdependence between partners is weak. An accelerating effect of higher earning potential of the male partner on the probability to have a first child was found only for non-employed women (women who are inactive due to unemployment or disability, but not housewives) when their partner worked more hours per week. Assuming that working more hours is associated with higher earnings, we interpreted the higher number of working hours of the male partner as an income effect.

In neo-classical theory, it is assumed that more flexible working conditions, such as the opportunity to work part-time or flexibility of work times, are chosen by women with *actual or prospective* family responsibilities, even at the expense of earnings or career perspectives (Filer, 1985; Polachek, 1981). In line with what can be referred to as the 'anticipation' thesis, we expected that for the female partner, a recent transition to a job with lower occupational status and working less than full-time would result in a faster transition to parenthood. This was attributed to the fact that these conditions are a sign of reduced commitment to the labor market. Conversely, and in line with the economic approach to family formation, we expected that the transition into employment and an upward job move of the female partner would delay the birth of the first child since these transitions imply investments in the professional career that increase the opportunity costs of childbirth for the couple. The empirical results only supported this expectation with regard to part-time work. Couples in which the female partner worked less than full-time before the birth of their first child were more likely to experience a first birth. The effect of

career transitions of the female partner was opposite to our theoretical predication as an upward job move also reduced the likelihood of a first birth.

We also expected recent job moves and employment transitions of the male partner to impact the transition to parenthood over and above the current job status. Specifically, consistent with the effect of a higher earning potential, we expected a recent downward job move of the male partner to delay the transition to parenthood, whereas entering the labor market or experiencing a recent upward job move was expected to result in a faster transition to first childbirth. This hypothesis was not corroborated, career transitions of the male partner did not have an influence on the likelihood of a first birth.

Finally, in line with previous research, we expected couples where the male partner is in an uncertain labor market position to postpone the first birth (Kreyenfeld, 2009; Schmitt, 2012; Vignoli et al., 2012). Again, the empirical results lend no support to this expectation. Results from the selection equation of the binary Heckman selection model, however, provided interesting insights into the absence of effects of career transitions and employment status of the male partner. These results showed that having a paid job was one of the strongest determinants of entering a stable co-residential relationship.

We found no indication that the results of the first birth analysis were biased by the differential selection into relationships. We concluded that the occupational characteristics of the female partner are more important than the male partners' work in predicting the first birth and that the degree of interdependency between partners is rather small. The study also confirmed the importance of taking into account detailed occupational characteristics of women when studying the interrelation of fertility and paid employment for women.

The contribution of this chapter consisted of using full retrospective life-course information containing detailed educational and occupational trajectories of both partners and utilizing this information in a couple framework. This provided an extensive and dynamic operationalization of the earning potential and career transitions of both partners. Additionally, we modeled the transition to first birth while accounting for selection into relationships, thereby we accounted for selection processes that occurred before the couple was formed.

1.5.2 Chapter 3: Non-standard work schedules and childbearing in the Netherlands: A mixed-method couple analysis

The third chapter also undertook the analysis at the couple level. This chapter focused on how employment in non-standard schedules is related to the likelihood of

couples to have a first or second child. Non-standard schedules refer to paid employment outside of standard hours, which we defined as paid work carried out before 6 am and after 7 pm or any time during non-standard days, i.e. in the weekend.

It has been noted that the growth in female labor market participation is related to not only a growth in the sheer number of hours that women work, but also in the location of *when* they work these hours (Brewster & Rindfuss, 2000). Some researchers have argued that the rise in flexible working hours and in particular non-standard working schedules is due to the fact that this flexibility is used as a mode of child care to ensure that one parent is always present in the form of 'tag team' parenting (Han, 2004; Presser, 2003; Täht & Mills, 2012). We proposed that employment in non-standard schedules may have an divergent impact on couples. On the one hand, non-standard working times could operate positively as a means to flexibly combine caring for children and enhance continued labor force participation of women. On the other hand, it may result in the desynchronization of couples' joint time together, resulting in increased strain and conflict and lower partnership quality.

With regard to the first birth, we assumed that couples where the female partner works in non-standard schedules would have a lower probability of making the transition to parenthood. This was attributed to the fact that non-standard work schedules lead to being 'off sync' with institutions such as childcare and schools and this is perceived as incompatible with motherhood. Also for women, the negative physical consequences of non-standard schedules likely serve as a strong inhibitor to avoid the additional physical strain of pregnancy and early child care. Additionally, there is extensive evidence of a negative impact of non-standard schedules on relationship quality and stability (Barnett & Gareis, 2007; Presser, 2000; Schulz, Cowan, Cowan, & Brennan, 2004; White & Keith, 1990). We therefore took into account the effect non-standard work might have on relationship quality and tested whether couples without children where the female partner works at more non-standard times or days reported lower relationship quality which in turn results in a lower likelihood to have a first child.

The results of the analysis show that in line with our hypothesis, for couples where the female partner works in non-standard schedules the probability of becoming parents in the next three years was reduced. Additional analysis based on insights from the qualitative data demonstrated that this effect could be fully explained by the intention to have a child, indicating that women who do not have childbearing plans selected themselves into these non-standard work schedules. The proposed mediation of the effect of non-standard schedules by relationship quality was not confirmed in the analysis.

Relating to the probability of a second birth, non-standard work schedules could operate as a means to combine parenthood with labor market participation since it enables couples to maximize the amount of time that they care for their own children rather than using formal care (La Valle, Arthur, Millward, Scott, & Clayden, 2002; Riley & Glass, 2012). Particularly for women, this could lower the opportunity costs of having an additional child. Also compared to father who work a standard schedule, fathers employed in non-standard schedules have been shown to have higher childcare involvement (Brayfield, 1995; Presser, 2003; Wight, Raley, & Bianchi, 2008; Wood & Repetti, 2004) and household tasks (Presser, 1994). Based on this argumentation, we expected that couples where either partner was employed at non-standard times or days would have a higher probability of having a second child. This expectation received partial support, our analysis showed that couples where the male partner worked in non-standard schedules had a higher probability of having a second child within the next three years. No effect of the work schedule of the female partner was found.

Besides the impact of non-standard work schedules per se we also examined the combination of schedules at the couple level by looking at the overlap in work times. Time use studies have shown that non-standard work hours leads to less overlap between the work hours of partners (Lesnard, 2008), an effect that has been termed 'desynchronization'. With regard to first childbirth, we argued that when both partners work a substantial number of hours in non-overlapping schedules, this desynchronization can lead to couples spending less time together and lower relationship quality (Hertz & Charlton, 1989; Schulz et al., 2004). This in turn would result in a lower likelihood to have a first child.

Conversely we assumed that parents of one child seek this opportunity to engage in 'tag-team parenting' by desynchronizing their work schedules if they want to have an additional child and hence we hypothesized that working in non-standard schedules increases desynchronization, which would in turn be associated with a higher probability to have a second child. The results of the analysis however showed that the couple level measure of the extent of desynchronization did not affect the probability of having a first or second child and also did not affect relationship quality. The qualitative interviews supplemented this finding by illustrating that individuals accepted their non-standard work schedules as part of their occupation or job. Especially among women, the possibility to adapt work schedules to family responsibilities by working part-time once a child is born was salient. Respondents confirmed the advantages of fathers being able to spend more time with their children and avoid formal care when either partner worked in a non-standard schedule. This chapter extended existing research in several ways. Although there is a

Table 1.1 *Overview of the four empirical Chapters (Chapter 2-5) of the book*

Main Hypotheses	Outcome(s) and Predictor(s)	Data and Method	Main Findings
Chapter 2: *Female partner:* Higher earning potential or recent upward job move leads to lower transition to 1st birth. - A recent downward job move and part-time work lead to faster transition to 1st birth. *Male partner:* Higher earning potential or a recent upward job move lead to faster transition to 1st birth. - An uncertain labor market position or a recent downward job move delay the transition to parenthood. *Couple interactions:* Positive effect of higher earning potential of male partner stronger in one-and-a-half and male breadwinner couples.	*Outcomes*: Probability of couples to have 1st birth (observed from start of relationship) *Predictors:* Earning potential (occupational status, education, working hours, supervisory position) - Labor market uncertainty (non-employment, self-employment) - Career dynamics in previous 12 months (upward/downward job move, move into employment)	*Data*: Family Survey of Dutch Population 1998/2000/2003 *Sample:* Co-residing couples born after 1940, no previous marriage or children (N=1,849) *Control group:* all respondents born after 1940 who are not part of the couple sample *Method*: Discrete time random effect probit model and probit model with sample selection	*Female partner*: Higher earning potential and upward and downward job move delay transition to parenthood. *Male partner:* Only higher education and lower number of weekly working hours delay transition to parenthood. *Couple interactions:* Higher number of weekly working hours of male partner accelerates transition to 1st birth if female partner not employed *Selection bias:* No selection bias in couple analysis, selection into relationship strongly dependent on being employed for both sexes
Chapter 3: *Couples without children:* Couples where the female partner is engaged in non-standard (NS) work schedules have lower likelihood to have 1st child. Couples where the female partner works at NS times or days or who have strongly desynchronized work schedules report lower relationship quality which in turn results in a lower likelihood to have a 1st child. *Couples with one child:* Couples have a higher probability of having a 2nd child when either partner works NS schedules or when they have stronger desynchronized work schedules	*Outcomes*: Probability of having a 1st child between wave 1 and wave 2 of data collection - Probability of having a 2nd child between wave 1 and wave 2 of data collection *Predictors:* Non-standard work schedules (general frequency of NS work and proportion of hours worked at NS times in week prior to interview), both measured at wave 1 - Relationship quality of both partners (4 indicators, wave 1)	*Data*: Netherland Kinship Panel Study wave 1 (2003) and wave 2 (2007) *Sample:* Co-residential couples, female partner aged 18-46, no or one child in household, male partner in paid work (N=742) - Semi-structured qualitative interviews with 11 couples from NKPS (2007) *Method*: Multiple group structural equation model for categorical outcomes	*Probability 1st birth:* Female partner working NS schedules lowers probability of 1st birth. No effect of NS work or desynchronization on relationship quality, no effect of relationship quality on 1st birth. *Probability 2nd birth:* Male partner in NS schedule higher probability of 2nd birth, higher relationship quality of female partner associated with higher probability of 2nd birth, no effect of NS work on relationship quality *Qualitative interviews:* Women change job to accommodate family responsibilities, both sexes prefer having one partner home to using formal care

Table 1.1 continued

Main Hypotheses	Outcome(s) and Predictor(s)	Data and Method	Main Findings
Chapter 4: Effect of educational fields is stable over the life-course and independent of occupational effects *Faster transition to 1st and higher order births:* -Women in teaching, healthcare and personal/social care (gender typical fields) compared to women in gender-atypical (technical) fields -Women in part-time and public sector work -Women in occupations with stereotypical feminine qualities/communicative skills -Women in occupation with a higher share of women	*Outcomes*: Time to first birth of women (observed from age 15) - Time to higher order births (up to 4th) of women (observed after first birth) *Predictors*: Educational level and field - Occupation and occupational characteristics (proportion of women in occupation, weekly working hours, sector) - Institutional indicators (female labor force participation, unemployment among women)	*Data*: Family Survey of Dutch Population 1998/2000/2003 *Sample:* women born after 1940 (N=2,511) *Method*: Discrete time (recurrent event) random effect complementary log-log model	*Transition to first Birth:* Women educated in gender typical fields have faster transition to 1st birth than women in economics, social-cultural and technical field - Women working in healthcare, communicative occupation, occupation with higher share of women, or part-time work have faster transition to 1st birth *Higher order births:* No effect of educational fields and being out of employment on higher order births - Professionals and higher educated women have higher transition to first birth (compared to clerks)
Chapter 5: *Effects of Working conditions:* More work control leads to higher intention to have 1st and 2nd child. More job strain and work-family conflict lead to lower intentions to have a 2nd child. *Institutional context:* More childcare availability higher intention to have a 1st and 2nd child. More female part-time work higher intention to have 2nd child *Cross-level interactions:* Work control more important in countries with less childcare availability. More job strain and work-family conflict lead to lower intentions to have a 2nd child in countries with less part-time work.	*Outcomes*: Intention to have a 1st child within next three years - Intention to have a 2nd child within next three years *Predictors:* Work conditions (micro level): Perceived work control; Job strain; Work-family conflict - Institutional Context (macro level): Childcare availability; part-time work prevalence	*Data*: European Social Survey wave 2 (2004) *Sample:* Women from 23 European countries, up to age 45, living with partner, working at least 1h/week with no or one child (N=1,533) *Method*: Multilevel (random intercept) logistic regression	*Intention to have 1st child:* Higher intention to have 1st child when work-family compatibility more important, higher fertility intention in women who work part-time in countries with high prevalence of part-time work. *Intention to have second child:* Higher intention to have 2nd child in women with more work-control and higher work-family conflict. Job strain lowers fertility intentions in countries with low childcare availability.

substantial body of literature on the impact of women's employment on fertility, the effect of non-standard working times on childbearing had not been addressed.

Furthermore, we included the individual work schedules of both partners as well as the outcome of these schedules at the couple level (i.e., the extent to which schedules overlap). Finally, the majority of research, theorization and findings related to non-standard work schedules and family related outcomes have been conducted in the United States (e.g., Perry-Jenkins, Goldberg, Pierce, & Sayer, 2007; Presser, 2003; Strazdins, Clements, Korda, Broom, & D'Souza, 2006). Given the institutional differences (e.g., employment protection, legislation of working hours) between the United States with other Western countries, it is important to explicitly consider the national context when formulating expectations and interpreting findings. In addition the mixed method approach provided us with the opportunity to explore the relationship between non-standard work hours and fertility decisions from different perspectives.

1.5.3 Chapter 4: The influence of educational field, occupation and occupational sex segregation on fertility in the Netherlands

The fourth chapter connected to an emerging body of research that examines the influence of educational and occupational fields on fertility. The results of these studies generally report a positive association between fertility and 'classical' female fields such as teaching and healthcare (Bagavos, 2010; Lappegård & Rønsen, 2005; Martín-García & Baizán, 2006; Neyer & Hoem, 2008). Because previous research had either used information about educational level and field as a proxy for occupation or employed broad occupational classifications consisting of a small number of occupational classes, the factors driving the association between typically female occupations and fertility outcomes remained unclear.

This chapter aimed at gaining more insight into the mechanisms behind this association by including information about the educational field, occupation and occupational sex segregation. Specifically, we looked separately at women's transition to first and higher order births and their entire educational and occupational trajectories. With this approach we tried to uncover whether the educational field predicted the timing of a birth over and above the educational level and occupation women worked in. Furthermore, we included information about the working conditions associated with higher work-family compatibility and the degree to which occupations were female dominated (sex-segregated) to assess the validity of theoretical explanations that explained the effect of classical 'female' occupations by the working conditions and the presence of other women.

Mechanisms that have been posited to explain higher fertility in typically female occupations include better working conditions, a more supportive work-family culture in predominantly female occupations, or a preference of women with higher family orientation for occupations that focus on stereotypical feminine qualities such as interpersonal contact and caring. The first explanation emphasizes the role of job characteristics and employment conditions such as access to stable employment, maternity leave, and flexible working hours (Cooney & Uhlenberg, 1989; Martín-García, 2009; Stanfors, 2010). We examined the two most frequently cited factors, which are whether jobs allow reduced working hours (part-time work) or are located in the public sector and expected both to be associated with a faster transition to having a first and higher order births. The results of the analysis showed that women working in small part-time jobs (less than 19 hours per week) indeed had an increased first birth transition compared to full-time working women, but no effect of working in the public sector was found. Neither of these working conditions influenced the transition to higher order births.

The second explanation is based on the vast amount of research that has examined the determinants of the provision of family-friendly policies, which are ultimately assumed to be conducive to childbearing. Research showed that a higher share of women in the workplace (Davis & Kalleberg, 2006; Goodstein, 2010) as well as at the industry level (Cook & Minnotte, 2008) is related to a higher level of work-family support. This implies that there should be a direct effect of occupational sex segregation on fertility. The results of the analysis showed that working in an occupation with a higher proportion of women was indeed associated with a faster transition to first birth. This effect was not explained by part-time work and public sector status. The proportion of women in the occupation however did not predict higher order births.

Finally another mechanism referred to processes of self-selection into gender-typical educational fields and occupations based on attitudes about work and family roles and socialization within female dominated fields (Hakim, 2003; Hoem et al., 2006a; Van Bavel, 2010). Assuming this self-selection was true, we expected women in healthcare, teaching and personal and social care to have a faster transition to first and higher order births as these are fields that emphasize *stereotypical feminine qualities* such as caring and interpersonal contact and that this effect could still be observed when controlling for the proportion of women in the occupation (sex segregation) and working conditions. The results confirmed this expectation, we found that the transition to first birth was faster among women in educational fields of teaching, social care and healthcare compared to women in the field of technology and science, economics and administrative and the social-cultural fields. When

current occupation was included in the model, women working in healthcare and personal and social care had a higher transition to first birth (compared to clerks). The operationalization of current occupation in four groups according to cultural, communicative, economic and technical resources confirmed the theoretical expectations that first birth rates are higher among women in communicative jobs (i.e., jobs characterized by stereotypical female qualities) compared to women in economic and technical jobs. This result remained significant also when controlling for occupational sex segregation and part-time work and public sector status. When the transition to higher order births was concerned, the educational field was no longer a predictor of fertility behavior. Among women working in professional occupations, and more specifically those working as teachers and lower healthcare professions, a higher transition to higher order births compared to clerks was found. This result was confirmed with the alternative measurement of occupational resources, which showed a higher transition to higher order births among women in communicative occupations compared to those in economic jobs.

In general, the main effect of paid employment, which was associated with a lower transition to first birth compared to homemakers, was fully explained by differences between occupations when the transition to higher order births was concerned. This provides evidence that mothers either arrange their paid work in a way that is compatible with family life or withdraw from the labor market. This result is in line with findings from *Chapter 3,* where work conditions were found to matter less for the transition to higher order births and the qualitative interviews highlighted the ability and desire of women in the Netherlands to adapt their work schedules to family needs.

This study contributed to the literature by taking into account the effect of both educational fields and occupation. Because we used data with full retrospective life-histories of education, employment, relationship and fertility trajectories of individuals, we were able to account for the fact that occupations and other characteristics may change and vary across the life course. Moreover, we also controlled for some of the work conditions that are often associated with high work-family compatibility, namely working reduced hours or in the public sector. This meant that we went beyond the assumption of a direct impact of occupations on fertility to also focus on the underlying factors of work conditions related to certain occupations which in turn influence the ability to combine employment with parenthood. Finally, we applied not only theoretical reasoning, but also empirically tested the impact of occupational sex segregation on fertility. By including this measure, we were able to test whether the effect of educational and occupational

fields on the transition to first or additional children persists over and above share of women within an occupation.

1.5.4 Chapter 5: The impact of subjective work control, job strain and work-family conflict on fertility intentions: A European comparison

The fifth chapter in this dissertation is distinct from the previous three studies in the sense that a different type of fertility outcome is studied, namely the *intention* to have a first or second child among women in paid work. Moreover this study is the only one to present a cross-national comparative approach where we focused on the moderation of the effects of work characteristics by institutional indicators of work-family compatibility.

The aim of this study was to introduce new employment-related factors that are associated with the plan to have a(nother) child and test how the effect of these characteristics varied across different institutional contexts. The employment related factors were perceived work control, job strain, and work-family conflict. We subsumed several aspects under the broader theoretical construct of *work control*, which were autonomy (control over the pace and organization of work, low degree of supervision), variety (variety and challenge at work, work requires one to learn new things) and time flexibility (employee can decide when to start and finish work). Both job autonomy and variety have been linked to higher worker well-being and more recently to the reduction of work-family conflict (Grzywacz & Butler, 2005). In general, there appears to be an attenuating effect of *autonomy and variety* on work-family conflict, and a positive effect on parenting style and other personality features, such as self-esteem (Friedman & Greenhaus, 2000; Grimm-Thomas & Perry-Jenkins, 1994). We assumed that women who have jobs that are characterized by a high degree of work control were more able to combine the demands of childrearing and paid work and would also evaluate the possibility of having a second child more positively than women with lower levels of work control. We therefore hypothesized that higher levels of perceived work control would result in more positive fertility intentions to have both a first and a second child.

Based on the influential job demand-control framework of Karasek (1979), we also investigated whether perceived job strain had an impact on the intention to have a child. We anticipated that women who did not have children would be less influenced by job strain since they had not as of yet experienced the tension between paid work and family responsibilities that children bring (Brewster & Rindfuss, 2000) and expected that only for mothers of one child, a high degree of job strain would lead to lower intentions to have a second child. We drew on the same argument with regard to the effect of higher levels of work-family conflict, where our central

hypothesis was that high levels of conflict between work and private life would lead to lower fertility intentions in women who already have one child. Women without children were expected to experience less conflict between their paid work and private life since children put a large claim on parents' time, especially when they are young.

In addition to employment characteristics, national level policies operate to enhance or constrain the compatibility of work and care. We focused on policies designed to maintain or promote the labor force participation of women, namely the availability of childcare facilities and the opportunity to work part-time, because both reduce the opportunity costs of having children (Gauthier, 2007a; Walsh, 2007). We expected that more childcare availability would positively influence the fertility intentions of working women. Furthermore, as an extension of our previous argumentation regarding the importance of work control for fertility decision-making, it was expected that a heightened level of work control was more important in countries with less institutional support in the form of childcare availability. This was attributed to the fact that women in these countries are more dependent on their individual resources if they want to combine childrearing and work. We likewise expected that higher levels of job strain and work-family conflict were associated with lower intentions to have a child, particularly in countries with lower childcare availability.

With respect to part-time work, we hypothesized that a higher prevalence of part-time work among women within a country would be associated with positive fertility intentions in the case of women who already had one child. These women were more likely to have already experienced time scarcity related to working full-time with family responsibilities. Women who did not have children were expected to be more concerned about establishing themselves in the labor market and building a career. Within this group, the country-level prevalence of part-time work was therefore not anticipated to influence the intention to have the first child.

Moreover, we also expected an additive effect of work characteristics when the institutional context offered less opportunities to work reduced hours and expected that heightened levels of work control were more important for intending to have a second child in countries with a lower availability of part-time work. Due to the fact that women in these countries were expected to experience a stronger time-squeeze when combining paid work and family responsibilities, we also anticipated that higher levels of job strain and work-family conflict would be associated with lower intentions to have a second child in countries with a lower availability of part-time work.

The results showed that women working in jobs where they had higher control about their pace, organization and timing of work were more likely to intent to have first and second child and this effect did not differ across institutional contexts. Conversely, job strain, operationalized as the perception of time pressure at work, was associated with lower intentions to have a second child, but only in contexts with low availability of formal childcare. An interesting result was the effect of part-time work on first birth intentions at the individual and contextual level. We found that compared to full-time working women, women who worked part-time (less than 30 hours per week) in countries where the proportion of women who work part-time was relatively low had a lower probability of intending to have a first child. This effect was reversed in settings where the country level proportion of female part-time work was high. Here women who worked part-time themselves had higher first birth intentions compared to full-time working women.

This study provided a contribution to fertility research by introducing the examination of working conditions and subjective perceptions of work in addition to empirical measures of institutional circumstances that impact fertility intentions across Europe. It demonstrated the usefulness of women's subjective experiences such as their perceived control or autonomy over work, the impact of job strain and work-family conflict to explain fertility desires. It also acknowledged that women's employment and subjective perceptions do not exist in a vacuum, but are shaped by a wider national context where certain policies enhance or constrain the compatibility of paid work and care.

1.6 Conclusion

In conclusion, the studies presented here demonstrated the pivotal importance of the *type and characteristics of work* for understanding the work-fertility relationship. When looking at the first birth outcome, there was clearly a delaying effect of higher human capital and earning potential of women (Chapter 2 and 4). This opportunity cost effect was not compensated by the earning potential of the male partner (Chapter 2). In this sense, the work characteristics of the male partner were less important in determining the timing of the first birth (Chapter 2 and 3). It is important to note that information about the educational attainment of *both partners* appeared to be crucial in predicting the transition to first birth as the delaying effect of higher educational attainment of women is attenuated by also including information about the educational level of their partner (Chapter 2, 3 and 5). We also find that the number of working hours of the male partner positively influenced the first birth outcome in Chapter 2 and 3, leading us to conclude that when conducting

an analysis of the effect of women's work on first birth, information about human capital and some indication of income of the male partner should be included as well.

The results on second and higher order births showed that having or intending to have another child was less determined by women's work status and work characteristics than the first birth. The results of Chapters 3, 4 and 5 showed no difference in likelihood of having or intending another child by participation in paid employment of mothers (Chapters 3 and 4) or by the number of working hours that mothers worked (Chapters 3, 4 and 5). One interpretation could be that if the combination of work and family does not work out well, women in the Netherlands withdraw from work rather than compromise fertility plans. At least for the second child this seems to be a plausible explanation as there is a strong two child norm in most Western countries.

1.7 Limitations, Suggestions for Further Research and Relevance

This dissertation presents four studies that used a diverse set of methods and three different datasets containing detailed longitudinal information about women, their partners and their work. This approach was adopted in order to avoid the pitfalls that are commonly associated with cross-sectional examinations of women's work and fertility decisions such as reverse causality. Moreover, three out of four studies included information about both partners, a demand that is frequently made in fertility research.

Nevertheless, some limitations remain. A key limitation was often the sample size in our analyses, which inhibited a deeper examination of specific sub-groups with certain occupational or work characteristics. It also severely limited the opportunities to investigate different employment constellations within couples. One way to overcome this problem could be the use of register data, which of course comes at the cost of containing no psychometric measures. Still, many countries, with the Scandinavian states as the forerunners, make register data available to researchers and the opportunities to combine and link information from different sources for each individual are steadily increasing with the digitalization of governmental archives and registries.

Another limitation lay in the fact that three out of four studies used data from the Netherlands only. Although this is a highly interesting context with regard to female employment and fertility and we explicitly take the institutional and normative setting into account, the focus on one country could be not only a strength, but also a weakness. The focus on one country limits the generalizability of the results and therefore it remains unclear in how far the findings on work characteristics such as non-standard work schedules, that have not previously been addressed, reflected a

Dutch peculiarity or a general mechanism. A replication of the study of effects of these work characteristics in more countries would therefore be highly desirable.

The development of suitable methods to address the dynamic nature of work and fertility decisions and the availability of computational power that allows researchers to use these methods on a very large number of observations nowadays are unprecedented. With these emerging possibilities comes the need for data of high quality that contains experiences and subjective evaluations as well as a large amount of objective information about the work and fertility careers of individuals collected in a prospective design. While some countries have long prospective panels that mostly satisfy these requirements, we are still a long way from being able to analyze many different countries with such high quality data. This kind of data would be however ideally suited to adopt a truly dynamic and multidimensional point of view and study the impact of fertility on work decisions simultaneously with the effect of decision about work on fertility outcomes.

As a final point, the societal relevance of the insights generated by the studies in this dissertation should be addressed. We believe that more insight into the ability to combine work and fertility in a fruitful way and for both partners is of utmost importance. There is no going back to a situation where women (or men) are required to choose between paid work or parenthood. Women appear to want it 'all' and couples increasingly want to share responsibilities inside and outside of the home. This is a legitimate wish with positive externalities for the well-being of all actors involved, including children. Generally, nowadays two incomes are needed to maintain a family and periods of absence from the labor market because of work-family incompatibility imply a unjustifiable loss of human capital for women, who are now at least as well educated as their male partners. Moreover at the societal level, population ageing and the associated shortages of qualified workers make it costly for governments to ignore compatibility issues between work and family responsibilities. The studies presented here provide evidence that institutional support might buffer the fertility-dampening effects of adverse work conditions (Chapter 5). They also show however, that work conditions and characteristics are an important factor in ameliorating the tension between work and fertility in the context of the Netherlands, which stands out by combining relatively high fertility with an underdeveloped package of parental leave and childcare options but provide extensive part-time options (Rijken & Knijn, 2008).

2

How do Educational and Occupational Resources relate to the Timing of Family Formation?

A Couple Analysis

This study aimed at giving an extensive account of how earning potential, career dynamics, and labor market uncertainties of both partners impacted the timing of *first* childbirth for Dutch couples who were observed in the period between 1960 and 2000. Using full retrospective life-course information containing detailed educational and occupational trajectories of both partners from three waves of the Family Survey of the Dutch Population (*N*=1,849) the transition to parenthood was analyzed in a couple framework. Additionally, the process of entering into the current relationship was modeled for male and female respondents separately to account for selection processes that occur before the couple was formed. Results showed stronger effects of educational and occupational resources for the female than the male partner. Higher earning potential and recent career dynamics in the form of upward and downward job moves of the female partner delayed the transition to first childbirth. The probability of first birth was higher in couples where the male partner worked more hours per week and this effect was stronger if the female partner was not in paid employment. The selection model did not indicate selection bias but showed that paid employment was one of the strongest predictors of entering a stable co-residential relationship.

This chapter is currently under review, earlier versions were presented at the at the Dag van de Sociologie 2012 in Utrecht (The Netherlands), at the 4th Dutch Demography Day 2011 in Utrecht (The Netherlands), and at the European Population Conference 2012 in Stockholm (Sweden).

2.1 Introduction

The decision to have a first child is generally taken by both members of a couple. While this is seemingly self-evident, many studies on the interrelationship between paid work, education and childbearing focused only on women, even though it is widely acknowledged that both partners in a couple influence the decisions if and when to have a child (Beckman, 1984; Coombs & Chang, 1981; Corijn et al., 1996; Jansen & Liefbroer, 2006; Rijken & Liefbroer, 2008; Thomson, 1997; Vignoli et al., 2012).

One reason why fertility research frequently used only information about women is the lack of suitable data. Male accounts of fertility have been found to be unreliable or incomplete in retrospective research and couple data are scarce (Schoen et al., 2007). A more substantive reason why much fertility research takes a female perspective is the theoretical notion that women were the driving force behind the postponement of parenthood because of the stronger consequences of childbirth in terms of time and energy investments in childrearing that women face (Morgan & Taylor, 2006). While women undeniably are faced with higher direct costs of having children than men, caused for instance by career interruptions when children are very young, it has been shown that the omission of information about the male partner can lead to biased estimates of the effect of female employment on fertility (Matysiak & Vignoli, 2008).

The present study aimed at giving an extensive account of how earning potential, career dynamics and labor market uncertainties of both partners impact the timing of *first* childbirth in couples from the Netherlands who were observed in the period between 1960 and 2000. Using full retrospective life-course information containing detailed educational and occupational trajectories of both partners, the transition to parenthood was analyzed using a couple framework. Additionally the process of entering into the current relationship was modeled for male and female respondents separately to account for selection processes that occur before the couple was formed. By following this approach, the current study contributed to the literature on the relationship between work characteristics and family formation by providing an extensive and dynamic operationalization of the earning potential and career transitions of both partners and by modeling the transition to first birth while accounting for selection into relationships. The research questions addressed in this study are:

1. How do earning potential, labor market uncertainties and career transitions of the male and female partners influence the (timing of) first childbirth?

2. Are earning potential, labor market uncertainty and career transitions of the two partners interdependent in their influence on the (timing of the) birth of the first child?
3. Is it necessary to take into account the selection into stable relationships when analyzing the timing of the first birth in a couple framework?

2.2 Main Concepts and Institutional Background

The last decades have brought significant changes to the lives of men and women, consisting of an unprecedented expansion of life opportunities in terms of educational and professional participation as well as the spread of new and diverse relationship and family forms, effectively making marriage and parenthood one among many possible life choices (Mills et al., 2005). Although the large majority of people still aspire and opt to have a stable partnership with children, the trajectory leading up to these major life course transitions has become more diverse and is influenced by educational and occupational resources, choices and aspirations (Billari, 2004). This study examines specific aspects of these educational and occupational resources, which are grouped into earning potential, career dynamics and employment uncertainty.

Earning potential was defined by educational attainment, occupational status, supervisory responsibility and weekly working hours[2]. Career transitions refer to recent upward and downward job moves and the transition into employment (from non-employment). The third aspect of couples' paid work that was examined in relation to the first birth in this study are labor market uncertainties which were defined as periods of unemployment, inactivity or self-employment and have frequently been linked to the postponement of parenthood (Adsera, 2011; Kohler & Kohler, 2002; Kreyenfeld, 2009; Schmitt, 2012; Sobotka, Skirbekk, & Philipov, 2011; Vignoli et al., 2012). Because the compatibility of paid employment and fertility depends, especially for women, on the institutional context (Matysiak & Vignoli, 2008; Nieuwenhuis, Need, & Van der Kolk, 2012), the next section introduces the Netherlands as the institutional and cultural background of this study. Subsequently the theoretical expectations with regard to the effect of earning potential, career dynamics and employment uncertainty on the timing of the first birth are discussed.

[2] Because retrospective information was used, the life course of each respondent is reconstructed from age 15 onwards. This implies that all concepts were measured dynamically at each point in time and thus referred to *current status*.

2.2.1 Couple employment: the context of the Netherlands

This study covered the time period between roughly 1960 and 2000, a period characterized by educational expansion and increasing female labor force participation. The proportion of women with higher education increased from about 40% in the oldest generation examined (born in the 1940s) to about 75% in the youngest cohort (born after 1970), with women surpassing the proportion of men with higher education in the cohorts born after 1960 ("Eurostat Statistical Database," 2009). In the Netherlands, women began to enter the labor force comparatively late with the male breadwinner being the predominant family model until the 1970s with at that time only about one third of Dutch women working for pay (Van Gils & Kraaykamp, 2008). Since then, women have gradually increased their labor market participation to reach about 70% in 2000, which situates the Netherlands at the European average (Eurostat Dissemination Database, 1983-2012). However, the large majority of women in the Netherlands has always worked 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 couple arrangement in the Netherlands (Plantenga, 2002; Van Gils & Kraaykamp, 2008; Verbakel & De Graaf, 2009). Reasons for this persistent pattern are of institutional as well as of a economical nature: The Dutch tax system heavily favored single earner couples[3] and (male) wages were comparatively high (Kremer, 2005; Van Gils & Kraaykamp, 2008). Also unemployment in the Netherlands was low in the last decades (with the exception of the economic crisis in the 1980s) and workers are well protected by labor laws and social insurance benefits (Fouarge & Baaijens, 2009). In addition, childcare availability was low in the period up to the end of the 1990s and there are strong cultural barriers to full-time childcare use (Clerkx & Van Ijzendoorn, 1992; Portegijs et al., 2006).

The combination of relatively high male wages and low male unemployment with a high share of part-time female employment and low childcare availability implies, that mothers face relatively high barriers to full-time employment and to pursuing a professional career and men are generally the main provider of household income.

2.2.2 Earning potential

According to economic approaches to family formation, gains from marriage are reduced when women's earning potential grows because their comparative advantage in the production of household labor diminishes and (first) childbirth is

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

delayed as opportunity costs of children increase for women with higher human capital (Becker, 1991). Conversely for men, higher earnings are associated with earlier family formation as the comparative advantage of men lies in securing the material standard of living through paid work. Based on these notions of economic theories, a higher earning potential of the female partner is expected to delay the transition to first birth, whereas a higher earning potential of the male partner is associated with a faster transition to first birth. These contrasting predictions with regard to the influence of the earning potential of the male and the female partner imply a high degree of role specialization between the sexes, with women focusing on household and family responsibilities and men specializing in paid work (Oppenheimer, 1994) and a certain degree of incompatibility between paid work and childrearing. However, the negative relationship between higher human capital and family formation depends on the institutional context. For example, it has been found that this association is weak or even absent in supportive settings, i.e., countries where the state alleviates care responsibilities for parents with young children (Matysiak & Vignoli, 2008). Because the Netherlands are expected to provide an institutional context which favors a sex specific division of labor, which leads to an expectation that is in line with the economic theory namely that *a higher earning potential of the female partner is associated with a lower transition to first birth (H1a)*. Conversely, *for the male partner, a higher earning potential is expected to be associated with a faster transition to first birth (H1b)*.

Yet as couples tend to be homogenous with regard to their educational attainment and occupational status (Kalmijn, 1998; Verbakel & De Graaf, 2009), the delaying effect of a higher earning potential of the female partner likely dominates the positive effect of a higher earning potential that is hypothesized for the male partner. Because the sex-specific division of labor assumed in the economic theory is expected to result in different spheres of interest for each sex, the female partner is expected to be the principal voice in decisions regarding the household and family issues (Jansen & Liefbroer, 2006; Thomson, McDonald, & Bumpass, 1990). The positive income effect of the higher earning potential of the male partner is therefore expected to be dependent on the employment status of the female partner. This is because a higher income of the male partner will influence fertility decisions positively only in situations where the female partner does not face high career costs of parenthood herself. Therefore, in the second hypothesis it is expected that *a higher earning potential of the male partner is associated with a faster transition to parenthood in one-and-a-half (female partner works part-time) and male breadwinner (female partner not working) couples (H2).*

2.2.3 Labor market uncertainty

The prevalence of a male main-earner model in the Netherlands points toward a strong reliance on the male partner as the main provider of family income and in this context, a failure to fulfill this role brought about by an uncertain labor market position delays the process of family formation for men (Blossfeld, Mills, & Bernardi, 2006; Kalmijn, 2011; Kreyenfeld, 2009; Liefbroer & Corijn, 1999; Mills et al., 2005; Oppenheimer, 1988; Sobotka et al., 2011). Couples where the male partner is in an uncertain labor market position are expected to postpone the first birth until the he is able to financially provide for the family, because an unstable or low income is unlikely to be compensated by the earnings of the female partner as she additionally suffers income losses in the period directly after childbirth. We therefore anticipate *a negative effect of an uncertain labor market position of the male partner on the transition to first childbirth (H3).*

For the female partner the effect of employment uncertainty is more ambiguous. The transition to parenthood might be postponed until the female partner has also achieved stable employment. On the other hand, women with low labor market attachment might view motherhood as an alternative way to structure expectations about the future and thereby reduce uncertainty (Friedman et al., 1994; Mills et al., 2005). It has been argued that for women, prolonged periods of unemployment can act as an encouragement to have a first child because in this period opportunity costs of motherhood are low (Kreyenfeld, 2009). Also women who, based on their social and economic background, do not expect to stay in the labor market or increase their earnings throughout their adult lives could opt for early motherhood (McDonald, 2000). For these women, a stable employment career might not be an important prerequisite for the transition to parenthood because they are focused on their role as a homemaker (Hakim, 2003). This implies that for women, the expected effect of an uncertain labor market position depends more strongly on their individual resources, labor market attachment and professional ambitions and the institutional context. For this reason, no prediction with regard to an unstable labor market position of the female partner is formulated.

2.2.4 Career dynamics

As women are the main caregiver of small infants, their working conditions are of critical importance in determining the compatibility of paid work with family life (Begall & Mills, 2011; Matysiak & Vignoli, 2008). Because the focus in this study is on the transition to *first* childbirth, the combination pressure that working mothers experience should play a role only in the form of an *anticipation effect*. In neoclassical theory it has been argued that women who anticipate that they will reduce their

commitment to the labor market after childbirth select themselves predominantly in jobs characterized by higher starting wages and lower wage growth, as well as a lower depreciation of wages in the case of discontinuous employment (Polachek, 1981). Conversely men self-select into high paying jobs requiring continuous high commitment (Polachek, 1981; Trappe & Rosenfeld, 2004). Furthermore working conditions such as the opportunity to work part-time or flexibility of work times are assumed to be chosen by women with actual or prospective family responsibilities even at the expense of earnings or career perspectives (Filer, 1985). In line with this 'anticipation' thesis, *for the female partner, a recent transition to a job with lower occupational status and working part-time is expected to be associated with a faster transition to parenthood (H4a)* as these conditions are a sign of reduced commitment to the labor market[4]. Conversely and in line with the economic approach to family formation, *the transition into employment, and an upward job move are expected to delay the transition to parenthood (H4b)* as these transitions imply investments in the professional career that increase the opportunity costs of childbirth for the couple. In line with the hypothesis about the influence of career dynamics of the female partner, we also expect recent job moves and employment transitions of the male partner to impact the transition to parenthood over and above the current job status. Specifically, consistent with the effect of higher earning potential and labor market uncertainty, *a recent downward job move of the male partner is expected to delay the transition to parenthood (H5a),* whereas *entering the labor market, and having experienced a recent upward job move respectively are expected to be associated with a faster transition to first childbirth (H5b).*

2.3 Data

The data used combined three waves (1998, 2000, 2003) of the Family Survey of the Dutch Population (Familie-enquête Nederlandse Bevolking, FNB), a large-scale repeated cross-sectional survey administered in the Netherlands (De Graaf et al., 1998, 2000, 2003). The surveys cover the Dutch population between the ages 18 and 70 with an overrepresentation of couples and are based on structured face-to-face interviews and self-completion questionnaires. The FNB registers the complete life-courses of primary respondents and their partners with respect to education, occupation, religion, mobility, and partnership formation through retrospective questioning. Using this information, a person-period file is constructed with complete information about couples' transition to first childbirth as well as the complete

[4] It is important to note that these conditions could also be interpreted as a sign of labor market uncertainty since we do not know whether downward job moves, changes in employment status, or the number of hours worked were voluntary decisions or employer driven.

individual respondents' educational and occupational trajectory *before* they entered into the current relationship.

The three waves of the FNB contain information about 3,177 primary respondents born between 1914 and 1985. The final couple sample consisted of 1,849 primary respondents and their partners (representing 87% of interviewed couples and 68% of primary respondents) of which 1,468 (79%) reported the birth of at least one common child (see information on sample selection below). Information about the 596 female and 540 male primary respondents that were not part of the couple sample was used in the analysis that modeled the selection process from age 15 until the start of the relationship (see Figure 2.1 for an overview of the types of events and censoring for the two processes under observation).

Sample selection: The analysis was restricted to respondents born after 1940 in order to be able to capture enough variability in female partners' occupational status. This reduced the number of primary respondents in the three waves from 3,177 to 2,709. In 2,125 (78%) of these households, a partner was present and interviewed. The sample was restricted to couples who did not report a marriage or childbirth with a different partner than their current one. This means that 91 couples (4.3% of couples, 3.4% of primary respondents) where both partners were interviewed but one of them reported a marriage or childbirth with a previous partner were regarded as left censored. Moreover the sample contained information about 584 (22%) primary respondents who were not living with a partner at the time of the interview. Out of these respondents, 370 reported to have never been in a co-residential relationship and were considered as right censored in the couple analysis. The remaining 214 respondents were divorced, separated or widowed and were considered as left censored in the couple analysis. See Figure 2.1 for an illustration of the sample selection.

2.4 Analytical Strategy

In order to analyze couples' transition to first childbirth, a discrete time event history model with random effects was estimated. In order to assess the robustness of the results and to account for selection into a stable relationship, a binary Heckman sample selection model was also estimated, where the transition to first birth was estimated simultaneously with the process of entering into the relationship.

2.4.1 Discrete time event history model with random effects

To analyze the transition to first birth, a discrete-time event history model (Allison, 1982; Jenkins, 2005; Mills, 2011; Steele, 2008) was estimated where the couple was the unit of analysis. The data were organized in a couple-period format where each

row of the dataset corresponded to a time period of three months in the relationship and contain information about both partners[5].

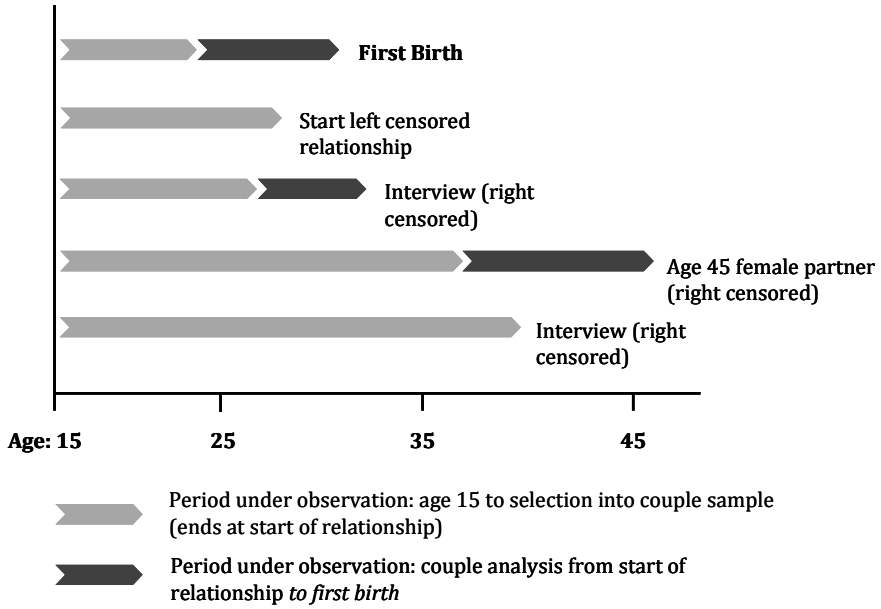


Figure 2.1 *Illustration of censoring and events in data: selection into analytical couple sample and transition to first birth*

The period under observation started at the start of the relationship[6] and ended either at the date of conception of the first child or was right-censored at the date of the interview or when the female partner reached age 45 (whichever happened first). To define the event of interest, the conception of the first child, the date of birth of each child was lagged by 9 months to avoid misspecification of the order of events. For this reason the terms birth and conception are used interchangeably. The event of interest was thus the probability of first conception of couple *i* occurring during the specified interval *t*, conditional on the fact that it did not occur before time interval *t* (Steele, 2005)

$$p_{ti} = Pr(y_{ti}=1|y_{t-1,i}=0).$$

This probability of first childbirth was modeled as a function of relationship duration, observed individual characteristics (time-constant and time-varying), and

[5] Aggregating time periods into blocks of three months was chosen to reduce the number of observations, results did not differ from a monthly specification.

[6] Respondents were asked about the age at which they started a relationship with their partner. This was asked separately from the age at which they got to know each other, date of marriage and cohabitation and thus referred to the age at which they started dating. See Table 2.1 for mean ages at start of relationship, first marriage and first childbirth.

unobserved time-invariant characteristics. The discrete-time probability function was defined by a probit link function[7]. We modeled the probability of having a child for couple *i* at time *t* as:

$$\Phi(p_{ti}) = D_{ti}\alpha + X_{ti}\beta + \upsilon_i \quad (1)$$

Where $\Phi(.)$ is the cumulative density function of the standard normal distribution. D_{ti} is a quadratic function of relationship duration interacted with dummies representing young (≤ 17 years), average (18 to 22) and late (≥ 23 years) age of the female partner at the start of the relationship to allow for different fertility trajectories among these groups. A quadratic function was chosen to model temporal dependence in the data because family formation trajectories typically take a hump-shaped form over time (see Figure 2.2 for a graphical representation of the baseline risk of first birth by early, mean and late starting age and relationship duration). X_{ti} denotes a vector of covariates (time-varying or constant) with coefficients β. Furthermore, we included a normally distributed random effect υ_i on the couple level, with a mean of zero and a standard deviation to be estimated: $\upsilon_i \sim N(0, \sigma_u^2)$. By including this couple-specific unobserved factors that were constant over episodes, we accounted for selection effects due to unobserved heterogeneity and the fact that the episodes from the same couple could not be regarded as independent observations (Steele, 2005; Mills, 2011).

2.4.2 Binary Heckman sample selection model

The observations in the couple sample could be regarded as the result of a selection process into a stable relationship that was not taken into account when only time spent in the relationship was analyzed. We accounted for this by estimating a Heckman sample selection model for binary outcomes, which was implemented as a discrete time probit model with sample selection (Van de Ven & Van Praag, 1981). The two processes of interest were the binary outcomes of entering into a stable relationship at some point in time after age 15 (y_{ti}^{select}) and conceiving a first child (y_{ti}^{probit}). The latter process, y_{ti}^{probit}, was only observed if the couple entered the relationship (y_{ti}^{select}=1). In order to account for the fact that the time periods from the same individual could not be regarded as independent observations, robust standard errors that account for within-cluster correlation were obtained.

[7] The probit link function was chosen in order to ensure comparability with the results of the Heckman sample selection model (see section 3.2.2) which is estimated as a probit regression. To ensure that the choice of link function did not influence the results, the model was also estimated with a logit and complimentary log-log link and no substantial differences were found).

This approach implied that the observation period of selection into the relationship covered all 2,389 male respondents and all 2,445 female respondents. They were observed from age 15 until they entered the couple relationship or were censored either by the interview date (respectively reaching age 49 for men and 45 for women) or by entering a relationship with a partner with whom they were no longer together at the interview (a left censored relationship). See Figure 2.1 for censoring and selection processes. This selection process was then modeled in a two equation system together with the transition to first childbirth[8].

The data structure was identical to the discrete time model with random effects described above (section 3.2.1), with the difference that respondents entered the observation period at age 15. The duration dependence of selection into the relationship was defined in a piecewise constant specification by categorical indicators of age and birth cohort (see Supplemental Table 3 in Appendix A for estimates of the selection model). The couple model of the transition to first childbirth was identical to the model described in section 2.4.1.

2.5 Measures

The dependent variable was a binary indicator taking the value 1 in the time period when conception occurred and 0 otherwise. In the sample section model, the conception of a child was only observed for respondents who are part of the couple sample and have reached the age at which they started the relationship. The dependent selection variable was a binary indicator that was 0 after respondents turned 15 and took the value 1 in the time period respondents entered the relationship and in all time periods after the initial selection, until the couple conceived the first child, was censored by the interview or the female partner reaching age 45. Refer to Supplemental Table 1 and Supplemental Table 2 in Appendix A for a distribution of exposure time and events over all variables used.

Educational attainment of both partners was measured as a time-varying indicator and was coded in four categories: 1) lower secondary or under, 2) short upper

[8] The probit model with sample selection is implemented in Stata (under the name heckprob) using maximum likelihood estimation. It is assumed that there exists an underlying relationship $y_2^* = D_{ti}\alpha + x_{ti}\beta + u_{1i}$ such that we observe only the binary outcome $y_{ti}^{probit} = (y_{ti}^* > 0)$. The dependent variable, the transition to parenthood, however, is not always observed. Rather, the dependent variable for couple *i* is observed if $y_{ti}^{select} = (z_{ti}\gamma + u_{2i} > 0)$, where $u_{1i} \sim N(0,1)$ and $u_{2i} \sim N(0,1)$ and the correlation $corr(u_{1i}, u_{2i}) = \rho$. When $\rho \neq 0$ standard probit techniques applied to the first equation yield biased results (Billari & Borgoni, 2005; StataCorp, 2011; Van de Ven & Van Praag, 1981).

secondary/short vocational education, 3) upper secondary (vocational and theoretical); and, 4) tertiary education (professional and scientific).

Weekly working hours. For the male partner, a linear specification of the weekly working hours was included. For the female partner, the weekly working hours were coded into three categories: up to 19 hours, between 20-34 hours, or more than 35 hours per week. This categorization was based on the difference between marginal and substantial part-time work (Bielenski, Bosch, Wagner, & Travail, 2002). This definition was chosen because small part-time jobs are common among women in the Netherlands, and working reduced hours is not unusual even before the first child is born (Plantenga, 2002; Visser, 2002).

Occupational status. The occupational status of each job was measured by the International Socio-Economic Index of Occupational Status (ISEI) ranging from 16 to 90, with higher values indicating higher occupational status (Ganzeboom, De Graaf, & Treiman, 1992; Ganzeboom, 1996).

Supervisory responsibility of both partners is measured for each job by a dummy indicating whether the respondent was supervising at least one other employee (not counting pupils, clients, patients, or residents).

Career dynamics and employment transitions in previous year. For both partners a measure of employment transitions and career dynamics was constructed that indicated a change in the previous 12 months from: 1) non-employment, inactivity or educational enrollment to employment; 2) a downward move into a job with an occupational status at least 5 points lower than the previous one; or, 3) an upward move into a job with an occupational status at least 5 points higher than the previous one.[9]

Employment relationship: For both partners, the employment relationship was included as a time-varying covariate coded as: 1) dependent worker with employment contract and 2) self-employed (see Supplemental Table 1 and 2 in Appendix A for distribution).

Control variables. The model included controls for the historical period (coded in decades, the reference was 1960-69), the time-varying status of main activity of both partners (coded as: 1) employed (reference category), 2) full-time homemaker (female partner only), 3) unemployed/inactive /disabled and, 4) in education). Also a

[9] Alternative definitions of the time period in which changes occurred (i.e, a lag of 9 months rather than 12) and different definitions of downward and upward job moves (any difference in status, 8 points on the ISEI scale, 10% on the ISEI scale) did not lead to different results.

time-varying measure of relationship status (coded as 1) dating, 2) cohabiting and, 3) married was included.

In the sample selection model, the status of the first job was included as a time varying covariate. This was coded as a categorical measure to account for non-linear effects of this variable: 1) if respondent had not started work yet, 2) low status (ISEI between 16 and 30), 3) medium low (ISEI between 31 and 45), 4) medium high (ISEI between 46 and 60); and, 5) high (ISEI 61 and higher).

Interaction effects. In order to test the couple interaction hypotheses (H2), the following interaction terms were included one by one and removed if not significant: indicators of earning potential of the male partner (occupational status (ISEI), weekly working hours, educational attainment and supervisory responsibility) each interacted with work status and work hours of the female partner.

2.6 Results

The results of the analyses of the transition to first birth are presented in Table 2.2 and Figures 2.2, 2.3, and 2.4, the distribution of analysis time over all variables can be found in Supplemental Table 1 and 2 in Appendix A. Table 2.1 presents the mean age of male and female partners in the sample at different stages of family formation. The mean age of the female partner at the start of the relationship was 19.9, male partners were on average 2.3 years older. Female partners were on average 24 years old when they got married and on average 2.5 years later the first child was born. This indicates that the difference in exposure time between using the start of the relationship as compared to a model where respondents enter the observation period at a fixed age (i.e., 15) is not large. The couples in the analysis of the transition to first birth were observed starting from the age they indicated as the start of their relationship, but all

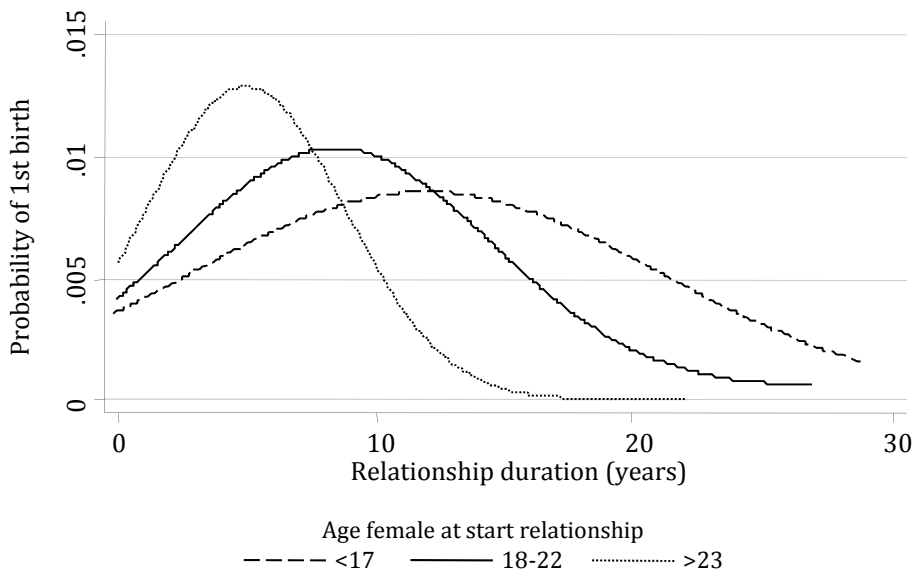
Table 2.1 *Mean age at start of relationship, first marriage and first childbirth in couple sample*

	N	Mean	S.D.	Min	Max
Female partner					
Age at start of relationship	1,859	19.9	3.9	12	41
Age at first marriage	1,635	24.1	3.9	16	47
Age at first birth	1,492	26.7	4.0	16	41
Male partner					
Age at start of relationship	1,856	22.2	4.5	11	47
Age at first marriage	1,635	26.5	4.1	17	47
Age at first birth	1,492	29.0	4.4	17	53

Source: FNB 1998, 2000, 2003

time spells occurring before age 15 of the female partner were regarded as left censored and all time spells after the female partner turned 45 were regarded as right censored (only 2 respondents reported a birth before age 15 and there were no births after age 45). Before turning to the effects of the covariates in relation to the hypotheses, the baseline risk is presented in Figure 2.2 (estimates are shown in Supplemental Table 4 in Appendix A).

The duration dependence was defined by a quadratic function of relationship duration interacted with the age of the female partner at the start of the relationship, categorized as early (<17), average (18-22) or late (>23) start. Figure 2.2 shows that, logically, couples who started their relationship at an comparatively early age had a longer duration until first birth compared to late starters. Also the more compressed risk distribution of the couples who started their relationship late in relation to the sample mean is clearly visible. These couples had a child sooner after starting their relationship, which is combined with a steeper decline at longer durations, also due to the decrease in the biological ability to have a child compared to the couples who started at an average or early age The results of the discrete time random effect model are presented in the first three models in Table 2.2 and are discussed in relation to the hypotheses.



Note: Estimates from full model (Model 3, see Supplemental Table 4 in Appendix A for estimates)

Figure 2.2 *Transition to first childbirth by relationship duration and age of the female partner at the start of the relationship*

To determine how far the characteristics of each partner influenced the transition to parenthood, the first two models included indicators of earning potential, labor market uncertainty and career dynamics only for the female (Model 1) and the male (Model 2) partner respectively. The third model shows estimates with characteristics of both partners simultaneously included in the model. Finally, the fourth model in Table 2.2 presents coefficients of characteristics of both partners from the outcome equation of the binary Heckman sample selection model, in which also the period before couples entered the relationship was modeled (full estimates from both equations for male and female respondents are presented in Supplemental Table 3 in Appendix A).

The first hypothesis predicted that a higher earning potential of the female partner would delay the transition to parenthood. Indicators of earning potential were educational attainment, occupational status of the current job, weekly working hours and supervisory responsibility. This first hypothesis 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 attained higher education (compared to being low educated), held a job with higher occupational status, was in a supervisory position, or worked more than 20 hours had a lower transition to first childbirth (see Table 2.2 for estimates). For the male partner, the opposite effect was expected. Higher earning potential should be related to a faster transition to parenthood. This expectation was not fully confirmed as out of all indicators of earning potential only a higher number of working hours was associated with a significantly higher first birth probability. Higher educational attainment was, contrary to the hypothesis, related to a lower transition to parenthood.

The second hypothesis focused on role specialization within couples and proposed that a higher earning potential of the male partner would be associated with a faster transition to parenthood in male breadwinner and one-and-a-half earner couples. This hypothesis was tested by introducing interaction terms of the indicators of earning potential of the male partner and the work status and work hours of the female partner on a one for one basis into the model and then removing them again if the model did not significantly improve. The empirical results show only partial support for the hypothesis. One of the interaction terms was found to significantly predict the transition to parenthood and to (marginally) improve the model (Likelihood ratio test for nested models $Chi^2(3) = 6.31$, $p = 0.09$). This interaction effect shows that for couples with a female partner who was not employed (unemployed, disabled or inactive), a higher number of working hours of the male partner accelerated the transition to first birth.

Table 2.2 *Results of analysis of transition to first birth of discrete time random effect model and sample selection model*

	Random effects model									Sample selection model		
	(1) Female only			(2) Male only			(3) Both partners			(4) Both partners		
	B	S.E.		B	S.E.		B	S.E.		B	S.E. [a]	
Main activity female (ref employed)												
Homemaker	0.232	0.077	**				0.305	0.173	†	0.210	0.213	
Unemployed / disabled	-0.148	0.092					-0.610	0.235	**	-0.629	0.267	*
In education	-0.379	0.090	***				-0.281	0.133	*	-0.313	0.122	*
Main activity male (ref employed)												
Unemployed / disabled / inactive				0.106	0.119		0.136	0.127		0.158	0.158	
In education				-0.121	0.116		-0.061	0.126		-0.040	0.165	
Educational attainment female (ref lower secondary)												
Short upper secondary / short vocational	-0.092	0.044	*				-0.084	0.044	†	-0.072	0.045	
Upper secondary / vocational education	-0.123	0.044	**				-0.099	0.045	*	-0.069	0.040	†
Higher professional / tertiary education	-0.125	0.049	*				-0.098	0.052	†	-0.074	0.050	
Educational attainment male (ref lower secondary)												
Short upper secondary / short vocational				-0.089	0.043	*	-0.072	0.046		-0.069	0.046	
Upper secondary / vocational education				-0.116	0.040	**	-0.104	0.043	*	-0.090	0.040	*
Higher professional / tertiary education				-0.084	0.045	†	-0.042	0.049		-0.030	0.046	
Weekly working hours female (ref ≥ 35) [1]												
1 – 19 hours	0.198	0.066	**				0.190	0.066	**	0.164	0.062	**
20 – 34 hours	0.020	0.037					0.018	0.037		0.005	0.034	
Weekly working hours male partner				0.004	0.002	*	0.004	0.002	†	0.004	0.003	
Occupational status female (ISEI) / 10	-0.030	0.012	*				-0.029	0.012	*	-0.026	0.012	*
Occupational status male (ISEI) / 10				-0.015	0.011		-0.006	0.012		-0.006	0.013	
Supervisory position female partner (ref no) [1]	-0.153	0.043	***				-0.158	0.043	***	-0.151	0.038	***
Supervisory position male partner (ref no) [1]				0.021	0.031		0.030	0.033		0.028	0.031	
Career dynamics and employment transitions female (ref no change)												
Started working	-0.112	0.072					-0.103	0.072		-0.105	0.069	
Downward job move	-0.280	0.106	**				-0.278	0.106	**	-0.257	0.098	**
Upward job move	-0.158	0.086	†				-0.157	0.086	†	-0.145	0.082	†

Table 2.2 continued

	Random effects model (1) Female only			(2) Male only			(3) Both partners			Sample selection model (4) Both partners		
	B	**S.E.**		**B**	**S.E.**		**B**	**S.E.**		**B**	**S.E.** [a]	
Career dynamics and employment transitions male (ref no change)												
Started working				-0.096	0.072		-0.065	0.073		-0.052	0.070	
Downward job move				0.066	0.078		0.053	0.081		0.055	0.076	
Upward job move				-0.002	0.067		-0.011	0.069		-0.003	0.065	
Female self-employed *(ref employee)*[1]	0.204	0.088	*				0.199	0.089	*	0.183	0.075	*
Male self-employed *(ref employee)* [1]				-0.024	0.073		-0.038	0.078		-0.032	0.075	
*Main activity female * working hours male*												
Homemaker * working hours							-0.002	0.004		-0.001	0.005	
Not employed * working hours							0.012	0.006	*	0.012	0.006	*
Enrolled by working hours							-0.002	0.003		-0.002	0.003	
Constant	-2.304	0.097	***	-2.507	0.120	***	-2.388	0.141	***	-2.416	0.306	***
σ_{ui} (s.e.)	0.221	0.044	***	0.143	0.054	***	0.219	0.045	***			
ρ										0.071	0.107	
Observations	54,791			55,502			54,791			54,791		
Log likelihood (df)	-5,491.8	(29)		-5562.1	(27)		-5,478.1	(44)		-81,251.5	(66)	
BIC	11,299			11,418			11,436			16,322		
N couples / N events	1,794	1,364		1,798	1,364		1,794	1,364		1,794	1,364	

Source: FNB 1998, 2000, 2003. Calculations by author

Note : † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[a] Robust standard errors estimated in sample selection probit model, results of selection equation are presented in Supplemental Table 3 in Appendix A.

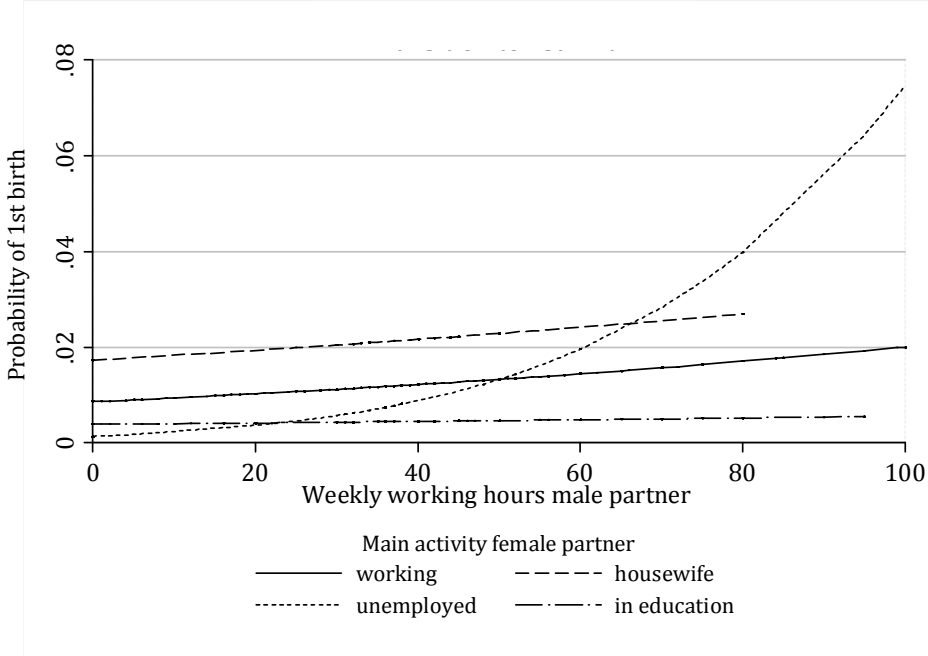
[1] Information about occupation and working conditions refers only to work episodes, all non-work episodes are therefore assigned the same value as the reference category respectively 0 (non-work episodes can be episodes of housework, unemployment or education).

Coefficients of the specification of duration dependence and control variables (historical period, relationship status) are omitted from the Table and are presented in Supplemental Table 4 in Appendix A.

A graphical representation of the effect is presented in Figure 2.3 and shows that the probability of having a first birth strongly increased for couples where the female partner was not employed, but only when the male partner worked more than 40 hours per week. Another interdependency between partners that is visible in the results was a positive effect of educational homogamy on the probability of first childbirth. For both partners, the delaying effect of higher education was substantially attenuated once information for both partners was included in the full model (see Table 2.2, Model 3).

In the third hypothesis the expectation was that couples with a male partner in an uncertain employment situation, defined as being self-employed or non-employed, would have a lower first birth probability compared to couples with a male partner who was a dependent worker. This hypothesis was not corroborated by the data as there was no difference among couples in the probability of a first birth by the employment status of the male partner (see Table 2.2, Model 2 to 4).

The fourth and fifth hypothesis referred to the effects of recent career and employment transitions that were expected to affect fertility decisions of couples over and above the current employment and career status. With regard to an upward job move, defined as moving to a job which is at least 5 points higher in occupational



Note: Estimates from full model (see Table 2.2, Model 3 for estimates)

Figure 2.3 *Interaction effect of main activity of female partner and working hours of male partner on first birth probability*

status (measured by ISEI) in the preceding 12 months, an increased probability of first childbirth was expected in couples where the male partner had experienced this kind of mobility (H5b) and a decreased probability of childbirth if this was the case for the female partner (H4b). The results of the empirical analyses showed only partial support for this expectation. An upward job move by the female partner delayed the transition to parenthood (at $p < .1$), but no significant effect of upward career mobility is found for the male partner. The same direction of effects, i.e., negative for the female, positive for the male partner, was expected when considering the transition into employment (from either educational enrollment, non-employment or homemaker status). However, taking up a job did not influence the probability of having a first child. Finally, a downward job move, defined by a move from one job to another with at least 5 points lower occupational status (measured by ISEI) in the preceding year, was expected to increase the probability of first childbirth when the female partner was concerned (H4a), but delay the birth in the case of the male partner. Contrary to this expectation, the results of the analyses showed a decrease in the probability of first childbirth for couples where the female partner experienced downward mobility in the previous year. The expectation with regard to the male partner was not supported. There was no significant difference in the transition to parenthood between couples with a downwardly mobile male partner and those where no change occurred in the previous year.

Besides testing the specific theoretical expectations formulated in the five hypotheses, the research questions in this study concerned the relative importance of the educational and occupational characteristics of the male and the female partner and the potential bias that could arise when only stable couples are analyzed and only from the moment the relationship started.

With regard to the relative importance of the male and the female partner, the results showed in unambiguous terms that the occupational resources and characteristics of the female partner were stronger predictors of the transition to parenthood than those of the male partner. When comparing the effects of educational and occupational resources of the female partner without taking into account information about the male partner (Model 1, Table 2.2) to the effects of the same model for the male partner (Model 2, Table 2.2), it is evident that practically all female occupational characteristics significantly predicted the first birth probability for the couple. However, only two of the male indicators, educational attainment and weekly working hours, influence the transition to parenthood. Regardless, the model was improved by adding the male characteristics to the model containing only

information about the female partner (Model 1) as indicated by the significant Likelihood ratio test for nested models ($Chi^2(12) = 20.95$, $p = 0.051$)[10].

Note: Average marginal effects of univariate (marginal) predicted probability of $y_{ti}^{select} = 1$ and univariate (marginal) predicted probability of $y_{ti}^{probit} = 1$ from sample selection model (see Table 2.2, Model 2 for estimates)

Figure 2.4 *Average marginal effects of main activity status of male partner (reference employed) from sample selection model*

The type of couple analyses as conducted here might be biased due to the fact that not all respondents had an equal chance to be selected into stable couple relationships, and those that formed a stable relationship did so at different ages. To assess this potential bias, a discrete time probit model with sample selection was estimated. The results showed that there was no bias in the statistical sense, which was indicated by the fact that the error terms of the selection and the outcome equation were not correlated (ρ=0, see Supplemental Table 3 in Appendix A for results of full model). What became apparent from the results of the selection equation was that for both sexes, the start of a stable relationship was strongly dependent on having finished education and holding a paid job. This was particularly pronounced for men for whom employment status did not lead to different

[10] For comparison: LR test when female information was added to model containing only male partners' information (Model 2): LR chi^2 (14) = 133.46, p = 0.000

probabilities of the transition to parenthood in the couple analysis. The probability of being in a relationship, however, strongly decreased for men who were not employed. This is graphically represented in Figure 2.4, which shows the average marginal effects of being not employed or enrolled in education (compared to working for pay) on the probability of selection into a relationship and on the probability of becoming a father for the first time. In addition to the activity status, also the educational level and occupational status of the first job were included in the selection model. The educational level did not predict the probability of being in a stable relationship. Also no difference among women by the status of the first job was found in the likelihood of being in a relationship. For men in a first job with high status, the likelihood of entering a stable relationship was lower than for men in lower status first jobs (see Supplemental Table 3 in Appendix A for estimates).

2.7 Conclusion

This study aimed at advancing the understanding of the influence of educational and occupational resources on the timing of the first birth by using extensive and dynamic indicators of earning potential, career transitions, and labor market uncertainties and conducting a couple analysis. In order to assess the robustness of the results, the empirical strategy explicitly addressed the bias that might arise when focusing only on 'surviving' couples. Specifically, the study intended to answer the questions about how the earning potential, career dynamics and labor market uncertainties of the male and female partner in couples influenced the (timing of) first childbirth and in how far the effects of these characteristics of both partners were interdependent. The question of couple interdependency is of particular relevance to fertility research as frequently only information about women is used to predict fertility outcomes. If the effects of occupational characteristics of the female partner are conditional on the male partners', the conclusions drawn from studies relying only on data only from women could be incomplete or even misleading.

Relating the empirical results of the analyses back to these research questions, a central conclusion was that the occupational characteristics of the female partner were more important than the male partners' work in predicting the first birth, and that the degree of interdependency between partners was small. In line with the theoretical expectations, it was found that higher earning potential, non-employment and upward and downward job moves of the female partner delay the transition to parenthood. Conversely, for the male partner, only educational attainment and weekly working hours were significant predictors of couples' first birth probability, and the effects were weakened when introducing information about the female partner into the model. In terms of interdependency, it was found that for non-employed women (but not full-time homemakers), having a higher income male

partner (using the proxy of a higher number of working hours), accelerated the transition to first birth. This finding was in line with previous research which showed that for women, un- or non-employment can increase fertility (Kreyenfeld, 2009; Mills et al., 2005; Schmitt, 2012). The fact that working hours were the only important predictor of first birth of the male partners work characteristics might be explained by the fact that actual earnings were perhaps best captured by this indicator in our model and the importance of income for fertility decisions is well documented (Andersson, 2000; Dribe & Stanfors, 2010).

The fact that the male partners' work mattered to a lesser extent in the transition to parenthood is related to the higher opportunity costs of childbirth that women face, but also to the fact that there was relatively little variability in men's occupational trajectories. The results of the selection model confirmed this interpretation since non-employment was one of the most important predictors (after age) of entering a relationship for men. Employment status, however, had no significant effect on the transition to first birth once the relationship was formed. This suggests that the men who had the most uncertain labor market position or low resources did not enter these stable relationship we observed (i.e., couples who moved in together, as they were interviewed in the same household). Men with less desirable occupational positions might then end up in non-cohabiting relationships and in relationships that have a higher chance of breaking up. While this seems to be a plausible explanation for the absence of differences by male status in first birth timing among couples, the sample selection model indicated no selection bias into the relationships we observed. Because this study concerned a specific institutional context and time period, i.e., the Netherlands between 1960 and 2003, it would be desirable to conduct similar studies in other settings to see in how far these conclusions are robust. Unfortunately, this study's sample size did not allow the testing of effects for specific periods or cohorts. Similarly, considerations about statistical power also limited the possibilities of examining specific combinations of occupational characteristics within couples.

Finally, two unexpected empirical findings warrant closer attention, namely was the faster transition to parenthood among self-employed women and the lower probability of first childbirth in the year after the female partner experienced a downward job move. Concerning self-employment, the theoretical argument was related to income uncertainty and predicted a delayed transition to parenthood for couples with a self-employed male partner. The empirical results did not support this expectation showing no effect of self-employment of the male partner whereas a self-employed *female* partner increased the first birth probability. Closer inspection of the data shows that among the female partners who identified themselves as self-

employed, women with agricultural educational degrees are overrepresented. This suggests that this group might consist of many farmers' wives. A higher first birth probability among this group might be related to normative differences in rural areas (more traditional norms about family formation, higher religiosity) as well as the fact that these women might be more comparable to the group of homemakers in terms of the organization of their daily lives than to women working outside the home (self-employed or as employee).

With regard to downward occupational mobility, the hypothesis derived from neo-classical theory predicted a positive effect on family formation for women who took on lower level jobs, based on the assumption that these jobs are more compatible with the anticipated career interruptions after childbirth. Contrary to this expectation, a negative effect of downward mobility of the female partner was found. The fact that no delaying effect was found for the male partner seemed to suggest that the negative effect of the female was not only an effect of lower household income after a downward job move. If this was the case, one would expect to see a similar effect for the male partner. It might be that women who took on a lower level job did so involuntarily in the sense that their preference would be to stay at home. If the male partners' income was insufficient to provide for the couple, women who lost their work and could not find a job at the same level of their previous employment might be forced to take on a lower level occupation because they could not afford to stay at home. This effect might thus indicate that the couple was not yet ready for a child due to the fact that the income of the female partner was still essential.

In conclusion, this study has confirmed the importance of taking into account detailed occupational characteristics when studying the interrelation of fertility and paid employment in women (Brewster & Rindfuss, 2000; Matysiak & Vignoli, 2008). In relation to the inclusion of partner characteristics, the results presented here suggested that by obtaining information about the educational level, labor force participation, and working hours of the male partner, researchers should be able to accurately model the transition to first birth. Collecting extensive couple data and restricting the sample to stable couples only might therefore not be necessary in all research endeavors. Future research into the relative importance of partners' characteristics is desirable and should also address not only the transition to first birth, but also include higher order births and union formation processes across various national contexts and historical periods.

3

Non-Standard Work Schedules and Childbearing in the Netherlands: A Mixed-Method Couple Analysis

This study examined the effect of working at non-standard times and days on the probability of first and second childbirth. Using quantitative couple data from two waves of The Netherlands Kinship Panel Study (N=742) and semi-structured qualitative interviews (N = 22), we found that there was a lower probability of having a first child when the female partner was engaged in non-standard schedules, whereas a higher likelihood of second childbirth was found for couples where the male partner worked a non-standard schedule. In line with expectations about the institutional and normative context of the Netherlands, we concluded that women adjust their work schedules to their fertility plans and that couples had a preference for taking care of their children themselves rather than relying on formal care arrangements. Non-standard schedules serve as a means to achieve this.

This chapter is co-authored by Melinda Mills and Harry Ganzeboom and currently under review. Earlier versions were presented at the Dag van de Sociologie 2011 in Ghent (Belgium), at the ECSR 20th Anniversary Conference in Dublin (Ireland), and at the Annual Meeting of the Population Association of America 2012 in San Francisco (USA).

3.1 Introduction

The increased labor market participation of women is a driving force behind the postponement of births and smaller families in many industrialized countries (Brewster & Rindfuss, 2000). When linking employment with childbearing, previous research has generally focused on the high opportunity costs of childbearing for women (Becker 1991), the 'wage penalty' of motherhood (Amuedo-Dorantes & Kimmel, 2005; Budig & England, 2001), impact of working hours (Begall & Mills, 2012; Budig, 2003; Mills, Mencarini, Tanturri, & Begall, 2008), type of contract (Kreyenfeld, 2009), expected earnings (Van Bavel, 2010) or perceived work control (Begall & Mills, 2011). The growth in female labor market participation is, however, related to not only a growth in the sheer number of hours that women work, but also to *when* they work these hours (Brewster & Rindfuss, 2000). Two-fifths of Americans work in non-standard schedules (Presser, 2003), compared to 27.4% of workers in the Netherlands and 29.4% in the United Kingdom (Presser, Gornick, & Parashar, 2008). Some researchers have argued that the rise in flexible working hours and in particular non-standard working schedules is due to the fact that this flexibility is used as a mode of child care to ensure that one parent is always present in the form of 'tag team' parenting (Han, 2004; Presser, 2003; Täht & Mills, 2012).

The aim of this paper was to extend existing literature on the relation between paid employment and fertility by examining how employment in non-standard schedules was related to the likelihood of couples to have a first or second child. We studied the transition to parenthood separately from having a second child since we assumed that there was a different mechanism of how non-standard schedules impacted fertility at these different family cycle stages. Non-standard schedules referred to paid employment outside of standard hours, which in the current study was defined as paid work carried out before 7 am and after 6 pm or in the weekend. This definition is in line with both international research (Han, 2007) and the definition used by national statistical offices (e.g., CBS, 2011).

This study extended existing research in several ways. First, although there is a substantial body of literature on the impact of women's employment on fertility, there is a surprising lack of research studying the effect of non-standard working times on childbearing. To our knowledge, this was the first study to empirically assess the relationship between employment in non-standard schedules and fertility outcomes. Second, we included the individual work schedules of both partners as well as the outcome of these schedules at the couple level (i.e., the extent to which schedules overlap). A couple approach was essential in order to go beyond the examination of individuals and to embrace the household and family as unit of

analysis (Bauer & Kneip, 2012; Carriero, Ghysels, & Van Klaveren, 2009; Corijn et al., 1996; Lesnard, 2008).

Third, the majority of research, theorization and findings related to non-standard work schedules and family related outcomes have been conducted in the United States (e.g., Perry-Jenkins, Goldberg, Pierce, & Sayer, 2007; Presser, 2003; Strazdins, Clements, Korda, Broom, & D'Souza, 2006). Given the institutional differences (e.g., employment protection, legislation of working hours) between the United States with other Western countries, it is important to explicitly consider the national context when formulating expectations and interpreting findings. Furthermore, jobs in non-standard schedules in the U.S. are often worked within low-level service jobs, overrepresented by disadvantaged groups (Presser, 2003). This study used data from the Netherlands, where compared to other European countries a relatively high proportion of employees are employed in non-standard schedules (Carriero et al., 2009). Compared to the United States, the Netherlands also have a highly regulated labor market with strong protection for those working part-time, on a temporary contract and in non-standard schedules (Fouarge & Baaijens, 2009). Moreover, the Netherlands have a strong tradition of female part-time work and limited use of formal childcare facilities, with a preference for care of young children by one of the parents (Täht & Mills, 2012; Wielers & Raven, 2011).

Finally, the lack of direct research examining the link between non-standard schedules and childbearing obliged us to enter relatively uncharted theoretical and empirical ground. In order to gain more insight into the underlying mechanisms driving this relationship, we opted to apply a mixed-method approach, drawing on both quantitative and qualitative data. We made use of two waves from a quantitative panel dataset – The Netherlands Kinship Panel Study (NKPS) (Dykstra et al., 2004, 2007) and complemented our findings using data from qualitative interviews taken from a subsample of respondents of the same panel (Mills & Hutter, 2007). This provided us with the opportunity to explore the relationship between non-standard work hours and fertility decisions from different perspectives and in a longitudinal research design where we assessed our outcome variable, the birth of a child, roughly three years after the initial data collection.

3.2 Theoretical Background and Hypotheses

We propose that employment in non-standard schedules may have divergent impacts on couples. On the one hand, non-standard working times could operate positively as a means to flexibly combine caring for children with continued labor force participation. On the other hand, it might result in the desynchronization of couples' joint time together, resulting in increased strain and conflict and lower partnership

quality. Adopting a family-cycle perspective, we assumed that once a life-course transition was made, couples adjusted and reevaluated their current situation and future options (Hobcraft & Kiernan, 1995). We therefore acknowledge the fundamentally different nature of the transition to having a first versus a second child and developed our theory and related hypotheses accordingly (Billari et al., 2009). Figure 3.1 provides an overview of a conceptual model to describe how these factors impact and interact to influence fertility, which will be elaborated upon in this section.

3.2.1 Non-standard schedules and the birth of the first child

Before the birth of the first child, most women are engaged in either a full-time job or one with substantial work hours (Van Gils & Kraaykamp, 2008). The economic costs of having a child are therefore particularly poignant for dual earner couples, as it often means considerably reduced household resources due to a reduction in working times or even exit from the labor market of the female partner after the birth. Employees working in non-standard schedules face the extra challenge of considering how the irregular and physically demanding aspects of their jobs could be combined with parenthood. Due to the irregularity of schedules such as shift work or night shifts, we assumed that prospective parents were acutely aware that they are 'off sync' with standard institutions, such as childcare and schools (Fenwick & Tausig, 2001; Täht & Mills, 2012). Especially when there are normative expectations about the importance of maternal care for very young infants (Portegijs et al., 2006), women who work at non-standard times or days might view their work schedules as incompatible with entering motherhood. Additionally, night shifts and shift work have been shown to disrupt the biorhythms of individuals, leading to negative health consequences and higher levels of irritability and fatigue (Davis, Goodman, Pirretti, & Almeida 2008; Fenwick & Tausig 2001). Previous studies have shown that particularly women who engage in non-standard schedules suffer from higher levels of stress, guilt and depression (Davis et al. 2008; Joshi & Bogen 2007; Perry-Jenkins et al. 2007; Strazdins et al. 2006). For these women, the negative physical consequences of non-standard schedules likely serve as a stronger inhibitor to avoid the additional physical strain of pregnancy and early child care. We therefore expected that c*ouples where the female partner was engaged in non-standard work schedules would have a lower likelihood to make the transition to having a first child* (Hypothesis 1). There is an extensive body of literature examining the effects of non-standard work schedules on outcome variables related to partnership functioning such as satisfaction with family and partnership roles, partnership quality and conflict, time spent with partner or family members, dissolution risk (see Presser, 2003 for a review). These studies generally showed a negative impact of non-standard schedules on

relationship quality and stability (Barnett & Gareis, 2007; Presser, 2000; Schulz et al., 2004; White & Keith, 1990). Considering these previous findings we also considered relationship quality within our conceptual and empirical model (see Figure 3.1). Several mechanisms might be at play. First, desynchronization of schedules might lead to time restrictions, which cause not only stress but also an inability to keep up with domestic household duties and less positive interactions between couples (Presser, 2000; Schulz et al., 2004). Second, as described previously, the negative physical effects of non-standard work times could increase levels of stress, tiredness and sleeping disorders which has a negative impact on partnership quality (Fenwick & Tausig, 2001).

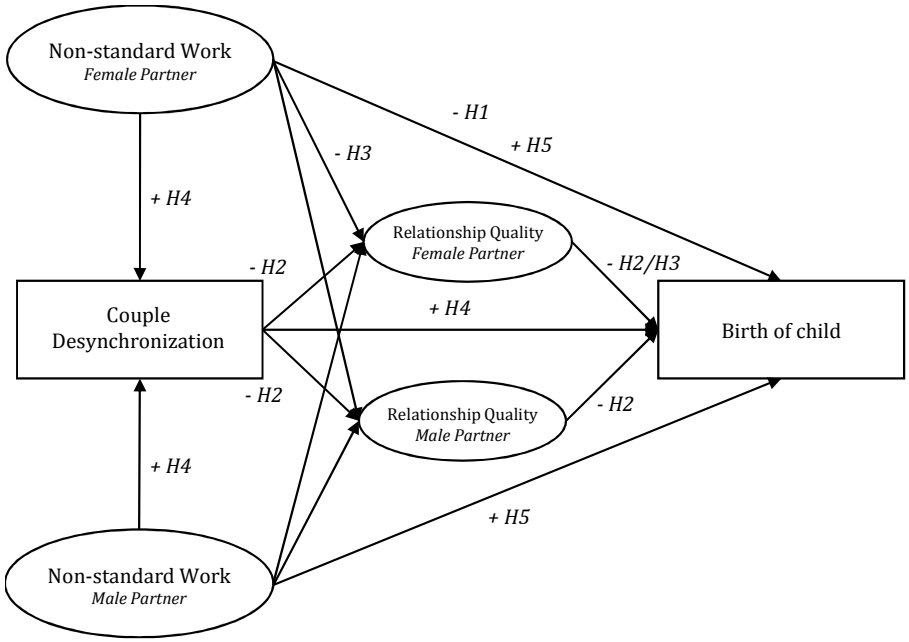


Figure 3.1 *Conceptual model with direct and indirect relationships of non-standard work, relationship quality, desynchronization, and birth of child*

This led us to expect that the desynchronization of schedules resulted in lower relationship quality, which in turn negatively impacted the decision to have a child (Rijken & Liefbroer, 2008). We anticipated that *for couples without children desynchronization of schedules would lead to lower levels of relationship quality which in turn resulted in a lower likelihood to have a first child (Hypothesis 2).* We were also interested in the possibility that the negative effect of the individual non-standard schedule of the female partner on fertility proposed in Hypothesis 1 was actually mediated by the negative effect that non-standard work might have on relationship quality so that c*ouples without children where the female partner worked in non-*

standard schedules would report lower relationship quality which in turn resulted in a lower likelihood to have a first child (Hypothesis 3).

3.2.2 Non-standard schedules and the birth of the second child

Previous research has demonstrated that couples attempt to maximize the amount of time that they care for their own children (Mennino & Brayfield, 2002), with a preference for sharing the care between them (La Valle et al., 2002; Riley & Glass, 2012). This means that for those who already have one child, non-standard schedules might operate as a means to combine parenthood with labor market participation, particularly for women, thereby lowering the opportunity costs of having an additional child (Han, 2004; Presser, 2003). We assumed that strength of the preference for desynchronized work schedules among parents to be influenced by perceptions of what constitutes good family life and parenting. These perceptions vary between social groups and are influenced by welfare state arrangements, which are decisive in constraining or enabling the ability to combine employment with parenthood (Kremer, 2005; Lewis, Knijn, Martin, & Ostner, 2008). The Netherlands is currently shifting from a dominant model of full-time motherhood, with women expected to stay and home and care for children of pre-school age, to a model of parental sharing with the mother engaged in part-time work and both parents involved in childcare (Haas, 2005; Kremer, 2005; Leitner, 2003). Although there is a shift for mothers to enter the labor market, the normatively acceptable and actual levels of institutionalized care for children remain limited at a maximum of two to three days per week and in addition, availability of formal childcare is not always sufficient (Allewijn-Tzipris & Kroneman, 2006; Mills & Täht, 2010; Portegijs et al., 2006). Women, and particularly mothers, in the Netherlands generally reduce their working hours after having the first child, with less than 15 percent of couples with children categorized as full-time dual earners (Van Gils & Kraaykamp, 2008) and laws and regulations supporting part-time work (Portegijs et al., 2006). Once the transition to parenthood is made and the hours of paid work have been adjusted to this, employment in non-standard schedules, particularly for women in the Dutch context, may therefore serve as a means to remain in the labor market part-time while still confirming to cultural norms about the care of children. Recent research demonstrated that in the Netherlands, desynchronization of *parent's* schedules was intentional and desired, compared to couples without children (Van Klaveren et al., 2011). Extending these theoretical arguments to fertility and assuming that being able to arrange childcare efficiently within the couple dyad would lower the perceived costs of having an additional child, we posed the following hypothesis (see also Figure 3.1): *Working in non-standard schedules increased desynchronization, which in turn was associated with a higher probability to have a second child for*

parents who already have one child (Hypothesis 4). Additionally, previous studies have shown that when the mother is employed in a non-standard schedule, fathers appear to engage in more childcare and interaction with their children (Brayfield, 1995; La Valle et al., 2002). Also fathers who are themselves employed in non-standard schedules have been shown to have a higher involvement in childcare (Brayfield, 1995; Presser, 2003; Wight et al., 2008; Wood & Repetti, 2004) and household tasks compared to fathers who work standard hours (Presser, 1994). Based on this, we expect that not only the degree of desynchronization, but also the individual non-standard schedule enabled parents to engage in a more satisfying division of tasks in childrearing and expected that *couples where the male or the female partner worked non-standard schedules would have a higher likelihood to have a second child (Hypothesis 5).*

The hypotheses of a *positive* effect of non-standard schedules on the likelihood of having a *second* child are based on the assumption that parents might actively opt for non-standard schedules and the desynchronization of schedules as a flexible means to combine work and family. Previous research has demonstrated that an important determinant of the effect of non-standard hours on family life is related to the autonomy to choose these schedules and their predictability (Fenwick & Tausig, 2001; Golden, 2001; Le Bihan & Martin, 2004; Liu, Wang, Keesler, & Schneider, 2011; Perry-Jenkins et al., 2007; Presser, 2003). We therefore explore whether the autonomy that both partners have about their hours of work is associated with working in non-standard schedules.

3.2.3 The Definition of non-standard work Schedules

Following the influential work of Harriet Presser in this area (Presser, 1988; Presser, 1994, 1999, 2000, 2003; Presser, Gornick, & Parashar, 2008), non-standard work schedules are often measured as schedules where more than half of the hours worked on most days falls outside 8 am and 4 pm. Other definitions include asking respondents whether they perform their work on a regular day schedule, night, weekend or split / varying shift (Joshi & Bogen, 2007) or counting all hours worked outside certain weekdays and times of the day (Breedveld, 1998). It is important to note that the choice of the definition has important implications for the composition of the group of workers with non-standard hours. Adopting a majority rule (i.e., the majority of work hours are worked during non-standard times or days) implicitly limits the definition of non-standard workers to contain mainly shift workers and part-time workers, while excluding overwork and high work hours which are non-standard work forms typically found in white collar jobs.

In this study, non-standard work schedules were measured on a continuous scale, which implied that there was no clear cut-off point that differentiates workers in a standard schedule from those in a non-standard or shift schedule. We opted for this approach, as opposed to the stricter categorization of the majority rule, due to the fact that we wanted to take into account the consequences for family life and child care arrangements that arise from working at non-standard times or days. This definition implied that we could do this without applying such a strict cut-off point which in our opinion would fail to pick up the consequences for families where, for example, one partner is unable to be home for dinner or pick up the children three out of four days a week but does not work the majority of his hours outside the standard office day. Because we only took into account work occurring before 7 am and after 6 pm (rather than the much broader band of work outside the 8 to 4 limit suggested by Presser), we captured work as 'non-standard' only at hours that are normally reserved for private life.

3.3 Method

We first describe the quantitative and qualitative data used in the study, followed by a description of the measurement of variables and the structural equation modeling (SEM) approach and qualitative analysis techniques used to analyze our data.

3.3.1 Quantitative data

The quantitative data used in this study were taken from two waves of the Netherlands Kinship Panel Study (NKPS) collected in 2002-2004 (wave 1) and 2005-2007 (wave 2) respectively. The NKPS is a large-scale survey of the Dutch population aged 18–79 (Dykstra et al., 2004, 2007). Respondents were selected from a random sample of addresses of private households in the Netherlands. The data were collected using a combination of computer-assisted personal interviews (CAPI) and self-completed questionnaires. In the first wave, 8,161 primary respondents participated, resulting in a response rate of 45%, comparable to that of other large-scale surveys in the Netherlands (Dykstra et al., 2005), which are generally lower than in other countries (De Leeuw & De Heer, 2002). In the second wave, 6,091 original respondents participated, a response rate of 74%. We used the information from wave 1 for all explanatory variables and derived information about the birth of a child in the three years between the waves from wave 2.

Because we required information about whether a child was born between the two waves of data collection, our sample only contained main respondents that were interviewed at both time points (n=6,091). Since we focused on the probability of having a first or second child and conducted a couple analysis, we only included in

our analytical sample primary respondents and their partners who lived together and had either no or one child at the time of the first wave (*n*=1,243). We also restricted the age of the female partner in each couple to be between 18 and 46 years of age at wave 2. This age restriction was necessary because questions about children born between the two waves of data collection were only asked if the female partner of the couple was below age 46 at wave 2. After additionally excluding 40 cases with suspect quality, 859 couples satisfy these conditions. We subsequently also omit couples who split up between the two waves (*n*=73) [11] and homosexual couples (*n*=34). Moreover, we omitted couples where the male partner was not in paid employment at the time of the first interview (*n*=61). These restrictions resulted in a final sample of 742 couples, of which 432 were childless and 310 had one child at wave 1 (see Table 3.1 for descriptive statistics).

3.3.2 Qualitative data

The qualitative data come from a NKPS Minipanel (Mills & Hutter 2007). Interviews took place from February to June 2006 in respondents' homes, and each individual was interviewed separately. In the first phase, 34 semi-structured individual-level interviews were conducted with couples where least one of the respondents was engaged in non-standard schedules at the time of the first NKPS data collection. Each interview lasted around 1.5 hours and was digitally recorded and transcribed verbatim with observations of the household. Respondents were asked detailed questions about employment, disadvantages and advantages of nonstandard schedules, strategies, their vision of a good relationship, their own relationship, relationship history and process, and conflicts or tensions and family and child interactions. In the second phase of interviews, seven couples were re-interviewed in a series of couple-interaction interviews (in total 14 people / 7 couples were willing to participate). These interviews were conducted after an analysis of the individual interviews to bring out inconsistencies, tensions, and additional questions that arose from the analysis of the individual interviews. From the individual sample of 34 individuals, we excluded nine respondents from the current analysis: four respondents who already had grown-up children (and who themselves were older than 50 years at the interview and might have problems recalling the situation at home when they were in their childbearing years), four respondents where no partner interview was conducted and one homosexual couple (due to the gender-specific hypotheses, see Supplemental Table 5 in Appendix B for characteristics of all

[11] An additional analysis of relationship dissolution between waves of data collection, taking into account non-standard employment and relationship quality was attempted, but not feasible due to the low number of cases

couples in the final sample). The final qualitative sample therefore includes 22 individual-level interviews (11 couples) and 7 couple-level interviews among the same couples. This results in a total analysis of 29 interviews.

3.3.3 Measures

With the exception of the dependent fertility variable (birth or pregnancy at wave 2, see below) all information used in the analysis was taken from wave 1 data.

Fertility. The dependent variable was a binary indicator that represented whether a couple had a child between the two waves of data collection or was pregnant at wave 2. This information was taken from the second wave of data collection, which was administered three years after the first wave (see Table 3.1 for descriptive statistics of all variables used).

Non-Standard work schedules (wave 1). Non-standard work schedules were measured by a latent construct with three indicators and separately for the male and female partner. The three indicators were derived from two independent measurements of non-standard work schedules, one based on the general occurrence of non-standard work in the current job from the CAPI interview and the other based on the actual working hours of respondents in the week prior to the interview was assessed by means of a self-completion questionnaire. The construction of the indicators of non-standard work schedules is presented in Figure 3.2.

The first measurement consists of questions about the frequency of work at non-standard times and days. Respondents were asked about employment in three different types of non-standard schedules in their current job: evening (between 6:00 and 12:00 pm), night hours (after 0:00h) and weekends. Answers were coded on a scale ranging from 1 = never to 4 = almost every week. Female partners who were not in paid work were coded as 1 = never on all three questions. A sum score of these three questions was formed[12], where higher values indicate more frequent non-standard work. In an additional question respondents were asked whether non-standard work times were required in their job ('Does your job require that you work outside regular office hours (7 am–6pm)?'), coded as no = 0 or yes = 1.

The second measurement of non-standard work schedules consisted of information about respondents' work schedule in the week prior to the interview and was collected in the self-completion questionnaire. For each day of the week, respondents indicated the start and end times of work. We then used this information

[12] Because the three questions about the frequency of non-standard work could not be regarded as reflective indicators

to calculate the *proportion* of non-standard working hours (Monday to Friday between 7 pm and 6 am and any hours in the weekend) of the total weekly working hours. This proportion ranged from 0 to 1 with a value of 1 indicating that all hours were worked at non-standard times or days. Female partners who were not employed were coded as 0 and a dummy variable controlling for the work status of the female partner was included in the analysis.

The sum score of the three questions about the general frequency of non-standard hours, the question whether non-standard work is necessary in the respondents' job, and the proportion of non-standard work-hours out of all hours worked were used as indicators of the latent variable measuring the extent of non-standard work. The factor loadings and residual variances from the measurement model are presented in Supplemental Table 6 in Appendix B).

Desynchronization (wave 1). Desynchronization of work schedules was measured at the couple level using information derived from the work schedule of respondents in the week prior to the interview (see also Figure 3.2). The total number of hours where both partners were at work simultaneously was divided by the total number of working hours of the partner with the lower number of working hours. For ease of interpretation, the resulting proportion of hours that couples worked synchronized was then reversed to form the proportion of working hours that were not worked simultaneously, which we term desynchronization.[13]

Relationship quality (wave 1). Relationship quality was measured separately for the male and female partner by agreement with the four items "We have a good relationship", "The relationship with my partner makes me happy", "Our relationship is strong", and "The relationship with my partner is very stable". Answers were coded on a five-point scale ranging from strongly agrees to strongly disagree(Cronbach's α = 0.94). These items were used as indicators for the latent construct of relationship quality. We reversed the coding of this item so that a positive effect of the latent construct indicated an effect of higher relationship quality. Supplemental Table 6 in Appendix B shows the factor loadings and residual variances from the measurement model.

Control variables (wave 1). Working time autonomy was measured by the question "How free are you to choose the hours and days that you work?" with answers coded on a scale ranging from 1 = 'no freedom' to 4 = 'respondent chooses the hours and days of work her/himself'. For female partners who were not employed, this value

[13] Couples where the female partner was not in paid work were coded as 0, i.e., no desynchronization of schedules and the work status of the female partner was included as a control variable.

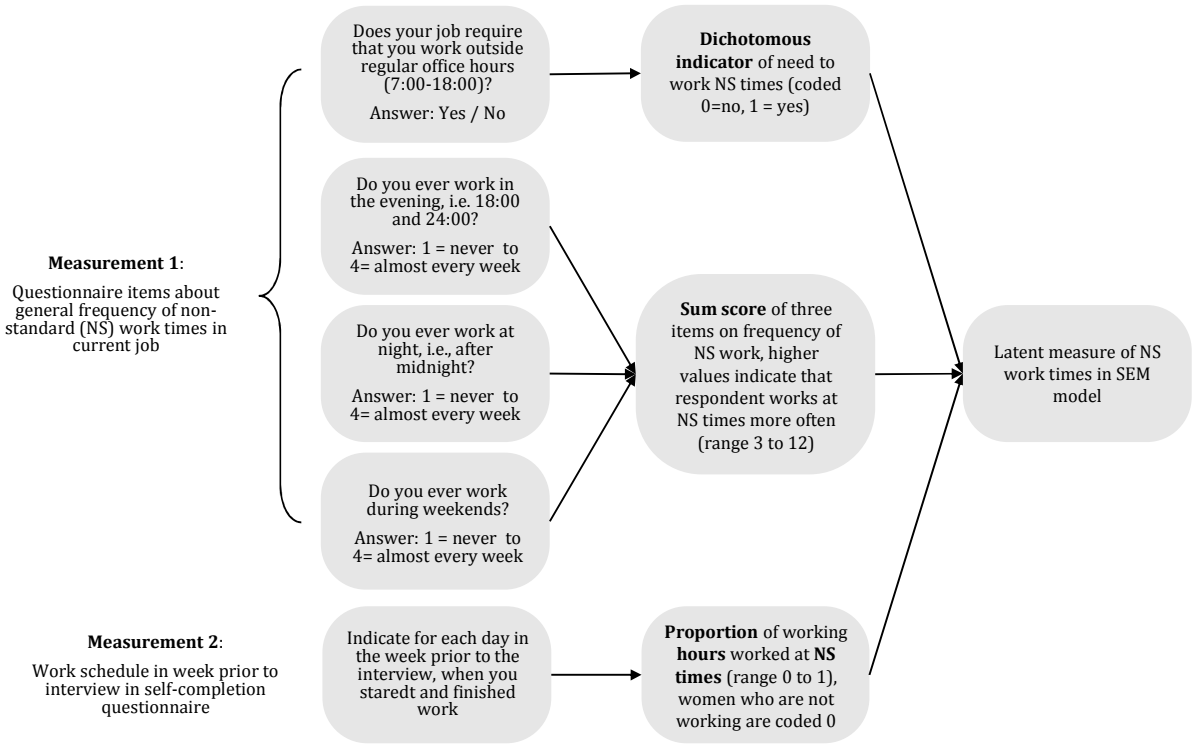


Figure 3.2 *Measurement and construction of indicators of latent variable of non-standard (NS) work schedules in structural equation models*

was set to 1 and a dummy variable controlling for work status of the female partner is included. Age of the female partner in years at wave 1 was included as a continuous variable. Educational attainment of both partners (bivariate correlation 0.44) was measured on a ten point scale ranging from 1 = incomplete primary education to 10 = Postgraduate education. Furthermore, we controlled for relationship duration (measured at wave 1 in years since first started living together) and marital status (0= cohabiting, 1 = married). We also took into account the number of weekly working hours of the male partner and the employment status of the female partner (not working, 1 to 29 hours per week, 30 or more hours per week). See Table 3.1 for descriptive statistics of all variables.

3.3.4 Data analysis and model specification

We used structural equation modeling (SEM) to test our theoretical propositions because two of our main constructs – relationship quality and non-standard work – were measured by multiple indicators. Structural equation models allowed us to model these concepts as latent constructs while explicitly taking into account measurement error. Moreover, we were especially interested in the indirect influence of non-standard work via relationship quality and desynchronization on the birth of a child and these indirect relationships could be adequately modeled with the SEM approach (see Figure 3.1).

Table 3.1 *Descriptive statistics of all variables used*

	Couples without children				Couples with one child			
	N	**Mean**	**S.D.**	**Range**	**N**	**Mean**	**S.D.**	**Range**
Birth of child between T1 and T2	432	0.51	0.50	0 - 1	310	0.54	0.50	0 - 1
Age female	432	29.95	5.03	19 - 42	310	32.61	4.77	20 - 42
Education female	420	7.02	1.77	1 /10	306	6.51	1.99	1 - 10
Education male	432	6.82	1.95	1 - 10	310	6.25	2.27	1 - 10
Female not in paid work	430	0.11	0.32	0 - 1	310	0.31	0.46	0 - 1
Female works ≤ 30 hours	430	0.17	0.38	0 - 1	310	0.55	0.50	0 - 1
Female works > 30 hours	430	0.71	0.45	0 - 1	310	0.15	0.35	0 - 1
Weekly working hours female [1]	381	35.58	10.30	3 - 140	214	24.90	8.43	5 - 54
Weekly working hours male	432	43.63	10.16	15 - 130	308	42.53	9.56	5 - 80
Relationship duration (years living together)	430	5.19	4.43	0 - 23	309	8.99	5.25	0 - 35
Married	432	0.39	0.49	0 - 1	310	0.78	0.41	0 - 1
Schedule autonomy female [1]	357	1.99	0.94	1 - 4	208	2.16	0.98	1 - 4
Schedule autonomy male	387	2.25	1.01	1 - 4	257	2.25	0.99	1 - 4
Proportion of non-standard hours female [1]	332	0.08	0.17	0 - 1	187	0.13	0.23	0 - 1
Proportion of non-standard hours male	367	0.09	0.16	0 - 1	241	0.09	0.15	0 - 1
Sum score of three non-standard work questions female [1]	345	5.17	2.33	3 - 12	205	5.26	2.44	3 - 12
Sum score of three non-standard work questions male	374	6.20	2.58	3 - 12	248	6.07	2.48	3 - 12
Non-standard work required female [1]	357	0.49	0.50	0 - 1	208	0.50	0.50	0 - 1
Non-standard work required male	386	0.63	0.48	0 - 1	257	0.62	0.49	0 - 1
Couple desynchronization (1 = no overlap) [1]	268	0.19	0.22	0 - 1	143	0.31	0.30	0 - 1

Source: NKPS wave 1 and 2. Calculations by authors
Note: [1] refers to women in paid work only.
All variables measured at T1 unless otherwise indicated.

All analyses were conducted using the Mplus software (version 5.2) because Mplus handles categorical variables and provides maximum likelihood estimation of missing values (Muthén & Muthén, 1998 - 2007). As a first step, a factor analysis was conducted to confirm that the indicators of the latent constructs loaded on the expected factors. This model showed that, in line with our theoretical expectations, the solution with four latent factors (relationship quality of male and female partner

and non-standard work of male and female partner) had the best fit with the data (CFI: 0.98, TLI: 0.96, RMSEA 0.05). Subsequently, the measurement model containing the four latent factors and their correlations was estimated separately for the entire sample and for couples with and without children to confirm that there was a good fit in the subgroups we were interested in. Model fit, standardized factor loadings and residual variances from the measurement model are presented in Supplemental Table 6 in Appendix B. We then estimated our proposed model as a structural equation multiple group model for categorical outcome variables using the Weighted Least Square Means and Variance Adjusted (WLSMV) estimator with the DELTA parameterization (Muthén & Asparouhov, 2002).

The quantitative model was supplemented with a narrative analysis of the in-depth qualitative interview data from 29 interviews. The interviews were analyzed and coded using the Atlas.ti computer software. Interviews were first read and re-read by multiple coders to gain a general understanding of the data. Subsequently, the interviews were digitally coded by first defining general categories that related to the research questions, which allowed us to identify effects of non-standard work related to our causal model and hypotheses. This type of detailed reading allowed us to isolate narratives that exemplified certain points or associations. We then reduced the data to general themes and examined the association between these coded categories with other categories, type of non-standard work and personal characteristics of the respondent or couple (Boyatzis, 1998; Braun & Clarke, 2006).

3.4 Results

3.4.1 Descriptive results

The descriptive statistics of the quantitative sample (see Table 3.1) showed that about half of the couples had a child in the period between the two waves of data collection and that the difference between couples becoming a parent (51%) and those having a second child (54%) is small. The disparity between couples with and without children was however pronounced when comparing the employment status at wave 1 of the female partner. While only 11% of women without children were not employed, the corresponding number among mothers of one child is 31%. Also, the group of mothers employed part-time was larger, with 15% of mothers with one child working full-time (more than 30 hours per week), compared to 71% among women without children. The difference in employment hours of the male partner at wave 1 between the two groups was much smaller, with fathers of one child working approximately 1.5 hours less per week (42 hours on average) than their childless counterparts. In terms of working time autonomy, there was hardly any difference between fathers and male respondents without children. Mothers of one child,

conversely, had significantly more autonomy in choosing their work hours than women without children ($t = -1.98$, $p < 0.04$).

This difference between mothers and women without children was even more evident when comparing these groups by non-standard work schedules. Mothers worked on average 13% of their hours during non-standard times or days, compared to 8% of women without children ($t = -2.6$, $p < 0.001$). This suggested that women either quit their paid job when they became mothers or adapted their work and hours to non-standard schedules to accommodate family responsibilities. Fathers and childless men did not differ in the proportion of hours they worked at non-standard times or days. The amount of work hours where both partners were at work simultaneously decreased with the transition to parenthood. In couples without children where both partners had a paid job, the proportion of worked hours that was not worked simultaneously (i.e., the amount of desynchronization) is 19%. Conversely, it increased to 31% in working couples with one child ($t = 4.7$, $p < 0.000$). These differences were not visible in the frequency of non-standard work (combined score of three questions) and the indicator of whether non-standard work times or days were required by the respondents job, which both hardly differed between respondents with and without children (no significant differences) but showed a higher value (and thus more frequent work at non-standard times or days) for male partners compared to female partners ($t = 5.34$, $p< 0.000$ / $t = -5.76$, $p< 0.000$).

Comparing the quantitative sample with the qualitative sample, respondents from the qualitative sample were slightly older, had more children and worked more often in non-standard schedules (see Supplemental Table 5 in Appendix B for characteristics of all couples in the qualitative sample).

3.4.2 Results from structural equation model

The description of the results is organized according to the hypotheses formulated in the theory section, with the results of the quantitative analysis summarized in Figure 3.3 (standardized coefficients and significance levels are shown next to paths). The results of the full structural model (including all control variables) are presented in Table 3.2. We used the quantitative results as a basis for our findings, relying upon the qualitative analyses for supplementary information.

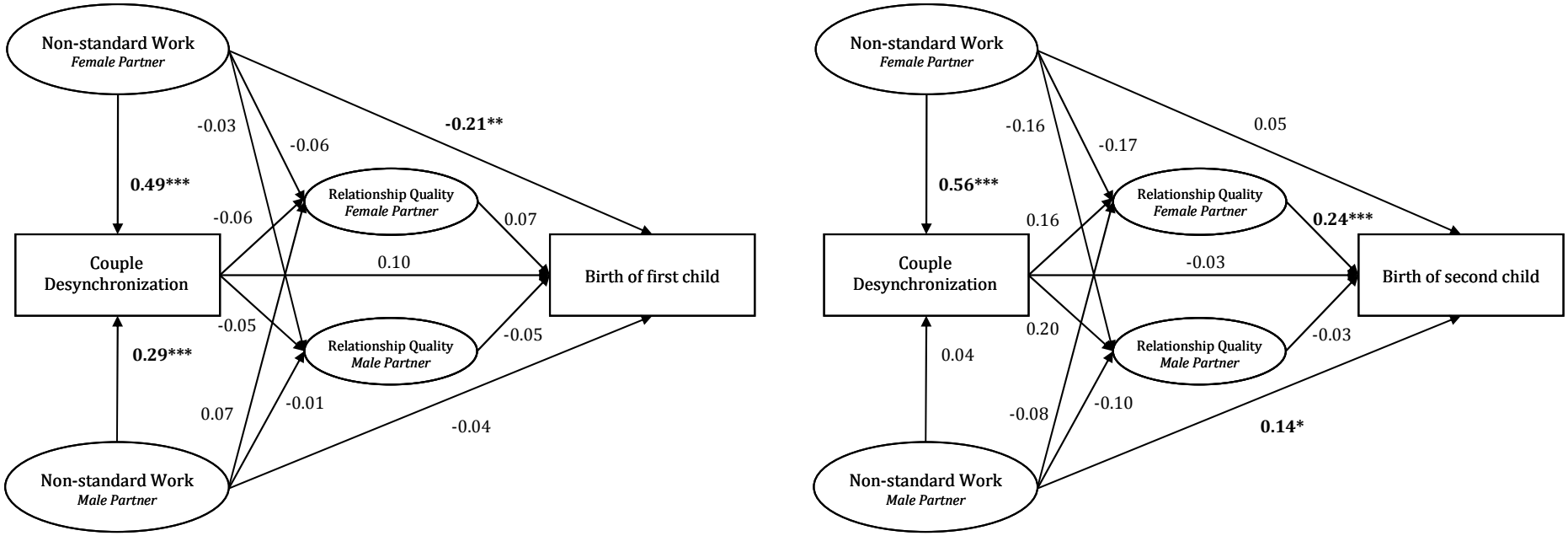
Non-standard schedules and the first and second child. The quantitative results provided support for our first expectation (Hypothesis 1) which stated that couples with a female partner in non-standard schedules had a lower probability of having a first child ($t = -2.9$, $p < 0.01$). With regard to the probability of having a second child, we hypothesized that working in non-standard schedules for both the female and male partner (Hypothesis 5) would result in a higher likelihood to have a second

child. Hypothesis 5 gains partial support. There was no significant effect of the schedules for the female partner's transition to having a second child (t = 0.5, n.s.), but for the male partner, we found the expected higher probability of having a second child when the father worked a non-standard schedule (t = 1.9, p < 0.05).

Relationship quality. In our second and third hypothesis, we anticipated that the effect of non-standard schedules on fertility might be explained by a negative effect of non-standard work and schedule desynchronization on relationship quality. Or in other words, couples that had a lower relationship quality due to their non-standard work schedules would be less likely to have a first child. The empirical results did not provide any support for this mediation hypothesis. Neither partners' non-standard schedules nor desynchronization affected relationship quality and there was no effect of either partners' relationship quality on the probability to have a first child (female partner: t = 1.1, n.s.; male partner: t = -0.8, n.s.). We also found no evidence for the proposed mediation of the expected negative effect of the individual schedule of the female partner on the likelihood of having a first birth (Hypothesis 3). When examining the likelihood of having a second child, we found a higher probability of second birth when the female partner reported higher relationship quality (t = 3.5, p < 0.00), but relationship quality was not influenced by either partners' non-standard work schedule or the extent of couple desynchronization.

Desynchronization of schedules. We also argued that working non-standard schedules would increase desynchronization in couples with one child, which would in turn be associated with a higher probability to have a second child (Hypothesis 4). The first part of this hypothesis received only partial support, because it was only when the female partner worked in a non-standard schedule that desynchronization increased (female partner: t = 9, p , 0.00; male partner: t = 0.8, n.s.). With regard to the proposed effect on fertility, we did not find support as desynchronization did not appear to affect the likelihood of having a second child (t = -0.2, n.s.). We found that for couples without children, the degree of desynchronization was higher when either partner worked non-standard schedules (female partner: t = 10.7, p < 0.00; male partner: t = 6.4, p < 0.00), but the desynchronization of schedules did not affect the probability of having a first child (t = 1.2, n.s.). We did not find evidence, therefore, that the outcome of non-standard schedules at the couple level, measured by the proportion of hours that partners do not work at the same time (given that they could have work simultaneously), had an effect on the likelihood of having a first or second child.

Control variables. Finally, we also included in our analyses the weekly working hours and the degree of autonomy over working times as predictors of non-standard work and desynchronization (see Table 3.2 for results of full model). In this way we could



Note: $\chi^2(128)=238.41$, p < . 001 / CFI: 0.93 / TLI: 0.94 / RMSEA: 0.04
† p < .1, *p < .05, **p < .01, ***p < .001
Control variables included in equation predicting birth between waves: age female partner, educational attainment of both partners, marital status, relationship duration, work status of female partner (not working, 1 to 29 hours per week, more than 30 hours per week), weekly working hours male partner. Control variables in equation of non-standard work: work status of female partner, weekly working hours male partner, autonomy in work times male and female partner. Control variables included in equation of desynchronization: work status of female partner, autonomy in work times male and female partner (results of the full model are presented in Table 3.2). Correlations of latent variables are omitted in Figure, see Supplemental Table 6 in Appendix B for estimates.

Figure 3.3 *Standardized parameter estimates from Multiple Group Structural Equation Model predicting the birth of a first (left Figure) and second child (right Figure)*

Table 3.2 *Parameter estimates from multiple group structural equation model including all control variables*

	Couples without children				Couples with one child			
	Estimate	(SE)	Std. Est.		Estimate	(SE)	Std. Est.	
Dependent: Birth of Child (between T1and T2)								
Non-Standard work schedule female	-1.64	(0.57)	-0.21	***	0.46	(0.97)	0.05	
Non-Standard work schedule male	0.34	(0.70)	0.04		1.64	(0.86)	0.14	*
Desynchronization of schedules	0.55	(0.48)	0.10		-0.13	(0.63)	-0.03	
Relationship quality female	0.18	(0.15)	0.07		0.56	(0.16)	0.24	***
Relationship quality male	-0.11	(0.14)	-0.05		-0.07	(0.20)	-0.03	
Weekly working hours male	0.01	(0.01)	0.12	*	0.01	(0.01)	0.07	
Female partner no paid job	-0.60	(0.38)	-0.17		-0.06	(0.33)	-0.02	
Female partner works ≤ 30 hours	0.02	(0.19)	0.01		0.13	(0.25)	0.05	
Female partner works > 30 hours	ref		ref		ref		ref	
Educational attainment female	0.09	(0.04)	0.14	*	0.09	(0.05)	0.13	†
Educational attainment male	0.00	(0.04)	0.01		0.15	(0.04)	0.26	***
Duration of relationship (years)	-0.07	(0.02)	-0.28	***	-0.06	(0.02)	-0.22	***
Married (ref = cohabiting)	0.63	(0.15)	0.27	***	0.22	(0.20)	0.07	
Age female	-0.06	(0.02)	-0.24	***	-0.12	(0.02)	-0.41	***
Dependent: Relationship Quality Male								
Non-Standard work schedule female	-0.12	(0.22)	-0.03		-0.58	(0.42)	-0.16	
Non-Standard work schedule male	-0.04	(0.23)	-0.01		-0.47	(0.29)	-0.10	
Desynchronization of schedules	-0.11	(0.17)	-0.05		0.41	(0.27)	0.20	
Dependent: Relationship Quality Female								
Non-Standard work schedule female	-0.18	(0.24)	-0.06		-0.65	(0.40)	-0.17	
Non-Standard work schedule male	0.27	(0.26)	0.07		-0.40	(0.34)	-0.08	
Desynchronization of schedules	0.13	(0.19)	0.06		0.34	(0.28)	0.16	
Dependent: Non-Standard Work Schedule Female								
Schedule autonomy female	0.01	(0.01)	0.04		0.01	(0.01)	0.06	
Female partner no paid job	-0.14	(0.22)	-0.30		-0.12	(0.20)	-0.37	
Female partner works ≤ 30 hours	0.06	(0.02)	0.15	***	-0.06	(0.02)	-0.20	**
Female partner works > 30 hours	ref		ref		ref		ref	
Dependent: Non-Standard Work Schedule Male								
Schedule autonomy male	0.02	(0.01)	0.15	***	0.00	(0.01)	-0.01	
Weekly working hours male	0.00	(0.00)	0.33	***	0.00	(0.00)	0.25	***
Dependent: Desynchronization of Schedules								
Non-Standard work schedule female	0.71	(0.07)	0.49	***	1.00	(0.11)	0.56	***
Non-Standard work schedule male	0.51	(0.08)	0.29	***	0.09	(0.11)	0.04	
Schedule autonomy female	-0.01	(0.01)	-0.05		0.01	(0.02)	0.02	
Schedule autonomy male	0.01	(0.01)	0.03		-0.05	(0.02)	-0.15	**
Female partner no paid job	-0.11	(0.14)	-0.17		-0.26	(0.16)	-0.45	†
Covariance of latent variables								
NS work female ↔ NS work male	0.00	(0.00)	0.21	***	0.00	(0.00)	0.20	***
Relationship quality female ↔	0.10	(0.01)	0.43	***	0.16	(0.02)	0.51	***
N	416				303			

Source: NKPS wave 1 and 2. Calculations by authors. Standard errors in parentheses
Note: $\chi 2(128)=238.41$, $p < .001$; CFI = .93; TLI = .94; RMSEA = .05
† p < .1, *p < .05, **p < .01, ***p < .001

see whether parents with children who had a high degree of autonomy over their working hours were more likely to work at non-standard times or days and increase the desynchronization of schedules. The results of structural equation models showed no effect of autonomy over working times of the female partner. For the male partner, we found that for men without children, more control about the times at which they work was associated with working more at non-standard times or days while for fathers of one child, schedule autonomy decreased couple desynchronization.

With regard to the relationship between the number of working hours and non-standard work schedules, we found that for men with and without children a higher number of working hours per week also increased work in non-standard work schedules. For women, there were opposite effects for mothers and women without children. While women without children who worked part-time (compared to full-time) also worked more at non-standard times or days, for mothers the association between part-time work and non-standard work schedules is negative. This indicated that these schedules might indeed enable women to combine paid work and childrearing.

3.4.3 Results from semi-structured interviews

Predictability and desynchronization of schedules. The qualitative interviews helped us to further understand and interpret the results of the structural equation models as they pointed to aspects of non-standard work schedules that were difficult to capture in the quantitative data. One of these aspects was the fact that for the respondents we interviewed, their non-standard work schedules were strongly viewed as something that was an inherent part of their job or occupation, something that came with the choice for working for instance in healthcare, and also as a source of extra income. At the same time, work schedules, jobs and working hours appeared to be constantly in flux within couples. The semi-structured interviews were held between the two waves of the quantitative data collection and in a number of cases, the work situation of one of the partners had already changed since the first wave of data collection. Especially the female respondents adapted their work situation to the family responsibilities and age of the children. Practically all women had worked full-time (or nearly full-time) before they had children and these women and their partners recalled high degrees of desynchronization (e.g., one partner working a night shift while the other has a regular full-time day job). However these situations were viewed as transient and subject to change if desired, or in case of the birth of a child. One full-time working couple without children where the female partner was engaged in very irregular non-standard hours described that they would rarely physically see

each other at home and since their 'off time' work did not overlap, they often resorted to writing notes or leaving messages on the answering machine for communication. The female partner repeatedly stressed that her job would not be suitable with having children. Nevertheless, since both partners did not desire children and valued a high degree of autonomy in their relationship, they both independently evaluated their working hours and relationship positively.

Other couples gave comparable accounts of desynchronization in the past, before they had children, indicating that they changed the situation once it did not fit their lives. Children or childbearing plans then provided a valid reason to reduce the number of working hours (especially for women) or to look for a different job. When we related this to the negative effect of non-standard work found for women without children, this could be interpreted as a result of self-selection. In other words, women who did not want to have children (at this point in their lives) were more likely to work non-standard schedules, while those who saw an incongruity with their childbearing plans actively changed their job situation.

We tested this notion by including an assessment of the intention to have a child within the next three years (measured at wave 1) in the equation predicting work in non-standard schedules (results not shown, but available on request). The results showed a significant negative effect of intending to have a child on working non-standard times or days *only for women without children*. The effect of non-standard work on the probability to have a first child after three years was reduced to marginal significance in this model ($t = -1.7$, $p < 0.09$). This additional quantitative analysis supported our interpretation of the qualitative data that women attempted to select themselves into employment that matched their family needs and if necessary, reduced their hours or even withdrew from paid employment. Some form of schedule change as a response to the family and life course situation was present in virtually all couples, indicating that there was considerably more interaction between family and work life than we were able to model with our quantitative approach.

Another important determinant of the compatibility of non-standard work schedules with family life was the predictability of the work schedule. Friction between home and work existed when time together could not be planned and especially when young children were involved, unpredictable schedules posed a greater problem than non-standard work schedules. Especially when formal childcare was used, it was usually necessary to chose fixed days at which children go to the childcare facility. This could lead to the situation that both parents were home but still had to get up in the morning and bring the children to the crèche. Predictable non-standard work schedules on the other hand were often evaluated positively.

> Interviewer: […] You refer to positive things [of non-standard work schedules], but do you think that it also has a negative effect on the family?
> Male partner: No, I couldn't think of something
> Female partner: On the family? No, I am thinking, is there something negative…. Maybe if it were very irregular. But you actually work *regular irregular* schedules.
>
> *(Couple 1: Male partner works alternating shifts, female partner does not work, 2 small children)*
>
> [Interviewer: Oke… u beschrijft allemaal positieve dingen, maar denkt u dat het ook een negatieve invloed heeft op het gezin, of?
> Man: Nou, dat zou ik niet weten
> Vrouw: Op het gezin? Nee, ik zit sowieso te denken, is er iets wat negatief is… misschien als het heel onregelmatig was. Maar jij hebt eigenlijk regelmatig onregelmatige diensten.]

Especially for the arrangement of childcare by the parents, the predictability of the schedule of both parents was crucial as it allowed parents to desynchronize their schedules without having to reorganize on short-notice. We anticipated that an important determinant of this desynchronization would be the cultural norm in the Netherlands that prescribes care by the parents as preferable to formal care. In our quantitative analysis we did not find the expected positive effect of being able to adhere to this norm of 'good parenthood' by desynchronizing work schedules for couples with children. However, the motive to increase desynchronization in order to always have a parent at home was ubiquitous in the qualitative data:

> *Female partner:* [If you both work at the same time] You need formal care, you name it, the whole organization. Well, this is not how we want it. We wanted to raise the children together, with as little outside care as possible.
>
> *(Couple 11: Male partner used to work irregular hours but works now regular full-time (32 h / week), female partner work irregular hours (20 h / week), 3 children)*
>
> [Vrouw: Nee, maar, als je allebei onregelmatig werkt […] Ja, dat kan wel, maar dan moet je betaalde oppas, of dan moet je de kinderen naschoolse opvang, noem het hele rijtje. Nou, daar hebben wij niet voor gekozen, wij wilden samen de kinderen opvoeden, zo weinig mogelijk oppas]

> *Female partner:* I thought to myself, yes okay, we really wanted kids, then you are responsible for taking care for them yourself.
>
> *(Couple 7: Male partner works full-time regular hours, female partners switched recently from irregular to regular, 2 children)*
>
> [Vrouw: Ik had zoiets van, ja goed, wij wouden graag kinderen, dan ben je er zelf ook verantwoordelijk voor.]

> *Male partner:* Yes, I find it a bit strange to want to have children and then not take care of them yourself. And these are our children and we, we take care of them, as much as possible ourselves.
>
> *(Couple 1: Male partner works alternating shifts, female partner does not work, 2 small children)*
>
> [Man: ja ik vind het wat vreemd om kinderen te willen krijgen en er niet voor te zorgen. En dat zijn onze kinderen en wij, wij zorgen daarvoor, zoveel mogelijk zelf.]

In fact one of the main reasons for women to work evening and night shifts was to be home for the children during the day, and these women planned to change to regular work schedules once the children would be older. Interestingly, mothers had the feeling that even when they were sleeping after a night shift and the children were watched by somebody else, they were present in the home and that this was preferable to working outside the house at daytime.

Fathers' role. In line with our theoretical expectation, the quantitative results showed a higher probability of having a second child in couples where the male partner worked a non-standard schedule. This positive effect was attributed to the norms regarding care of children by their parents and the higher involvement of fathers in childcare when they work non-standard schedules, which in turn we assumed positively impacted the decision to have another child. In the qualitative interviews, fathers who worked non-standard times or days (and their partners) stated that they were around more often during day time, which enabled them to not only spend more time with their children, but also do things 'normal (Dutch) fathers' do not often do, such as picking the children up from school. In this sense, non-standard schedules afforded not only more time, but actually enabled fathers to adopt a different role within the family. A shared perception among fathers who worked non-standard hours in the qualitative sample was that they knew more about the daily life (school, friends) of their children. This was echoed in the words of a father who worked alternating shifts and was therefore often at home during the day. when asked about differences between the relationship he had with his two small children compared to a 'normal' father:

> In fact you only spend the weekend with the children [if you have a '9 to 5' job]. Maybe you see them briefly in the evening, but that's actually not enough time to know what has really happened that day.
>
> *(Couple 1: Male partner works alternating shifts, female partner does not work, 2 small children)*
>
> [Man: Maar dan heb je in principe alleen het weekend met de kinderen [als je elke dag van negen tot vijf zou werken]. Dan zie je de kinderen misschien heel even 's avonds, en dat is eigenlijk te min tijd om dan echt te weten wat nou allemaal gebeurt is op zo'n dag.]

The partners of fathers who worked at non-standard times or days also reported that these men '*are more a part of the family*' (female partner couple 1) because they were around more. That this extended role of the father was also perceived as positive by the outside world was illustrated by the words of a male police officer who worked in non-standard schedules his entire career and recalled from the time his children were smaller:

> Other mothers used to be jealous that I would bring the children to school all the time, going: 'How is that possible?' Well, this is one of the advantages of the irregularity.
>
> *(Couple 4: Male partner works full-time irregular hours, female partner does not work, 3 children)*
>
> [Man: Nou, vroeger waren de moeders waren jaloers, dat ik iedere keer de kinderen op school kwam brengen et cetera. Van uh, wat is daar aan de hand. Nouja, dat is gewoon een voordeel van die onregelmatigheid.]

Relationship quality. The qualitative interviews concur that there was no perceived negative effect of non-standard schedules on relationship quality. While couples were strongly aware of the consequences of these work schedules on their social life, stating for example that working non-standard schedules often meant to miss out on family events, birthday parties or clubs and other forms of organized leisure activities, they did not perceive those schedules as affecting their relationship quality. One reason for this could of course be a 'survivor bias', in the sense that couples who experienced a negative impact of non-standard work schedules on their relationship might choose to opt out of these schedules rather than seeing their relationship suffer. There was evidence for self-selection out of non-standard work especially among women, where several stated that they would consider to stop working altogether if it affected their children or relationship negatively. Couples also stated that they would work desynchronized hours "as long as they could stand it" and would consider changing jobs when necessary. On the other hand, some female respondents described non-standard work as an active strategy to remain active in paid work which they considered important for their personal well-being, but also be present at home.

> *Female partner:* ... I could not do it without work. No, you couldn't put me here for 7 days a week, here in the house with only the kids. I'd go insane. People sometimes say to me that, 'Gee, you have children and still you work 27 hours!' [Both laugh] Then I think: yes, but I am a nice mom when I am there. I'd just be really grumpy if I didn't work.
>
> *(Couple 8: Male partner studies and works for police, female partners switched recently from irregular to regular, 2 children)*
>
> [Vrouw: …ik zou niet zonder werk kunnen. Nee je zou mij hier niet 7 dagen, hier in huis moeten zitten met alleen de kinderen. Dan zou ik oorlogsdol worden. Dan

> zeggen mensen wel eens jee je hebt kinderen en dan werk je nog 27 uur dan denk ik van ja maar ik ben wel een leuke moeder. [Beiden lachen]. Ja als ik, ik weet gewoon als ik niet, dat niet zou doen dan zou ik, ja dan zou ik gewoon super chagrijnig worden.]
>
> *Female partner:* "Four walls and one or two kids [laughs] that's not always enough to make you happy."
>
> *(Couple 9: Male partner works full-time regular hours, female partner works irregular hours, 24 h / week, 4 children)*
>
> [Vrouw: Vier muren en een of twee kinderen [lacht] word je ook niet altijd blij van.]

It is important to note that for all families we interviewed, the compatibility of work and family life hinged on one of the partners (usually the female) working part-time or not working at all. This meant that the desynchronization of schedules, which is in most cases was actively sought in order to arrange childcare, did not impact family life or the couple relationship negatively because of the limited number of non-overlapping work hours. Respondents showed to be aware of this, and a situation where both partners work full-time, whether at non-standard or regular times, was not seen as desirable by any couple. This is obviously also grounded in the strong institutional acceptance of part-time work in the Netherlands.

3.5 Discussion

The aim of the present study was to explore whether and how employment in non-standard schedules had an effect on the probability to have a child within three years. For couples without children we expected and also found a lower likelihood of having a first child when the female partner worked non-standard schedules. Relying also on the qualitative evidence, we interpreted this result as a selection effect of women who did not plan to have children at this time of their life. We were able to confirm this interpretation by conducting an additional analysis where we found that the negative effect of these schedules on having a fist child could be almost fully explained by controlling for the intention to have a child.

For parents of one child we expected a higher probability of having a second child when either partner was engaged in work in non-standard schedules, but our empirical results only supported this for the male partner. We found a positive effect of non-standard work on the probability of the birth of a second child for fathers in our empirical analysis. Moreover, this finding was illustrated by the clear accounts of a more extensive role of the father who worked non-standard working times in the qualitative interviews and the strong desire of Dutch parents to take care of their own children rather than making use of formal childcare (Portegijs et al., 2006). This

preference is the result of a tradition of low female labor force participation and an emphasis on the superiority of maternal care (Clerkx & Van Ijzendoorn, 1992), as well as of the shortage of formal child care facilities and lack of paid parental leave. This means that the Netherlands can be referred to a 'familialistic' welfare state when it childcare policies are concerned (Haas, 2005; Leitner, 2003), which refers to a system in which 'households must carry the principal responsibility for their members' welfare' (Esping-Andersen, 1999:51).

The reason that we did not find any effect of the work schedule or work hours of the mother on the probability to have a second child might be attributed to the strong part-time working culture of women in the Netherlands, where 75% of working women work part-time. Mothers are generally able to adjust their paid work to increase work-family compatibility by decreasing their working hours. This was also apparent in the qualitative accounts where we identified two responses of women in this respect: some women either withdrew from paid work completely after the birth of their child or at least see this as a possibility if "things do not work out anymore" while another group envisioned work as a non-negotiable part of their lives but, by decreasing their working hours, had managed to arrive at a situation where work and family did not conflict.

We also tested the expectation of a higher likelihood of a second birth via more work in non-standard schedules with regard to schedule desynchronization at the couple level. This was because we were interested to see whether the individual work schedules of both partners would produce an additional effect when combined, as argued in previous research. We found no support for this 'indirect' or 'combination effect' of non-standard employment on the probability of having a first or second child. This was particularly intriguing since the expectation of an effect of the combination of schedules was based on previous research (Lesnard, 2008; Van Klaveren et al., 2011) and was also prevalent in our qualitative data where respondents gave many examples of desynchronization of schedules to optimize childcare coordination. The reason that we were not able to find this relation in our empirical model might also be related to the operationalization chosen. By using the lower number of working hours in each couple dyad as the denominator when calculating the share of work hours that does not overlap within each couple, this measure was heavily influenced by the part-time work of mothers. A more direct measure of couple coordination, that relies less on the number of hours worked would therefore be desirable. Unfortunately, our data did not provide such information. Another limitation of our quantitative data source in this regard was that it did not provide information about the predictability of schedules. In the qualitative

data, this was one of the most important aspects for families to reconcile the work schedules of both partners.

In our remaining two hypotheses, we explicitly connected our theoretical model to the large body of literature that has examined non-standard work schedules with respect to relationship functioning and relationship quality (Barnett, Gareis, & Brennan, 2007; Presser, 2000; Schulz et al., 2004; White & Keith, 1990). We tested whether more work at non-standard times or days would lead to worse perceived relationship quality of either partner in couples without children and in how far this would also result in a lower probability of having a first child. In other words, we tested whether the effect of non-standard work on the likelihood of having a first child is mediated by relationship quality. Our empirical results showed no evidence for a relation between non-standard work schedules and relationship quality, which was surprising given the evidence from previous research that these schedules often have a negative effect on relationship. We attribute the absence of an effect to the Dutch institutional context where workers are generally better protected and often have the opportunity to opt out of non-standard work schedules if these do not fit in with for instance the organization of family life (Mills & Täht, 2010). The qualitative interviews also illustrated that couples did not perceive their schedules to affect their relationship quality. Those couples that perceived a negative impact of these schedules on their home life had actively looked for different jobs or found a way to avoid the most straining circumstances, such as not working the night shift anymore. In this way, the qualitative interviews complemented our empirical findings.

More generally, the in-depth approach we have taken, in which we combined quantitative longitudinal analysis with qualitative information collected among a sub-sample of the representative sample, enabled us to gain insight into the subtle and dynamic ways non-standard work influenced family life and further deepened and extended our conclusions from the quantitative analysis. The qualitative data enabled us to make sense of some of our quantitative findings, particularly with regard to the fluidity of schedules and the ways couples and families adapted their family life to their work. Because all the qualitative interviews involved at least one partner with non-standard work hours, we did not have any qualitative accounts of couples with regular work hours. This is a limitation of the qualitative part of this study and examining this further with a more extensive sample of respondents would be desirable.

By using structural equation models, we were able to test the direct and indirect effects of non-standard work and to choose an innovative operationalization of non-standard work schedules as a latent construct. This latent construct was formed by two independent measurements of non-standard work hours, one factual,

relating to the times of work in the week prior to the interview, and a more stylized set of four questions that asked respondents to rate the general occurrence and the necessity of non-standard work in their job. While both measures came with inherent problems in terms of their reliability and scope, we believe that by combining them in a model that allowed us to also include measurement error associated with both concepts, we could adequately measure the intensity of non-standard work. This of course came at the cost of not being able to define a clear cut-off point of when a work schedule is defined as non-standard. It also made our study less comparable to previous research which mostly used a categorized definition of schedules with a majority rule (i.e., most hours of most days worked outside 8 am and 4 pm, see Presser, 2003), which is a limitation that we acknowledge. Regardless, this study provided several new insights and indications for additional fruitful lines of research.

4

The Influence of Educational Field, Occupation and Occupational Sex Segregation on Fertility in the Netherlands

Women have made considerable gains in educational attainment and increased their labor market participation, which has in turn impacted childbearing behavior. The current study contributed to the growing literature on the impact of educational fields and occupation on fertility. We examined how women's field of study, occupation and occupational sex segregation shaped the transition to first, second and third births. Using data from a repeated cross-sectional survey of the Dutch population (born 1940-1985), we estimated a series of discrete-time complementary log-log models with frailty. We found differences in the transition to first birth by educational field. Compared to women with a degree from educational studies (teaching), women who studied technological, economical or cultural subjects had a significantly lower transition to first birth. Compared to those in economic and technical jobs, women in communicative jobs (healthcare, teaching) had faster transitions for all births. We also found evidence that occupational sex segregation impacted fertility, because women employed in occupations with a higher proportion of women had a significantly faster transition to first birth. Although women in higher professional and managerial occupations were more likely to postpone first births, they compressed the time to motherhood, having additional children significantly faster.

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4.1 Introduction

Women have made considerable gains in educational attainment and increased labor market participation across most industrialized societies. Although the impact of these changes on childbearing behavior has been extensively examined, the majority of research on this topic has studied the more general picture of how women's educational and employment gains resulted in the delay of motherhood and a smaller completed family size (Blossfeld & Huinink, 1991; Brewster & Rindfuss, 2000; Chesnais, 1996; Kohler, Billari, & Ortega, 2006). By focusing on the overall level of education or labor force participation, previous studies have paid less attention to the more nuanced underlying mechanisms that can describe why and how education and employment actually shape the childbearing behavior of women.

The aim of the current study was to go beyond these broader approaches to examine how women's educational field of study, occupation and occupational sex segregation shaped fertility behavior. Fertility behavior was examined by parity by looking at the transition to first births and then second, third and fourth births. We regarded obtaining an educational degree in a certain discipline as a decision guided by preferences and expectations about the nature of the work associated with it (Lippa, 2010). These initial educational decisions about the field of study not only determine the time spent in education, but also strongly shape an individual's entire labor market career (Allmendinger, 1989; Gesthuizen, Solga, & Künster, 2011; Gundert & Mayer, 2012). Different occupations also diverge widely with respect to the time until a secure position is reached, depreciation of skills after periods of absence, opportunities to work part-time and the general climate surrounding the combination of parenthood and paid work (Brewster & Rindfuss, 2000; England, 1984).

Recently, a handful of studies have started to examine the influence of educational and occupational fields on fertility (e.g., Hoem, Neyer, & Andersson, 2006a, 2006b; Martín-García, 2009; Van Bavel, 2010). The results have been surprisingly unequivocal, generally reporting a positive association between fertility and 'classical' female fields such as teaching and healthcare (Bagavos, 2010; Lappegård & Rønsen, 2005; Martín-García & Baizán, 2006; Neyer & Hoem, 2008). Possible explanations for this association include: better working conditions, since most of these occupations are located in the public sector (Hoem et al., 2006a), a more supportive work-family culture in predominantly female occupations (Charles, 2005; Cook & Minnotte, 2008), and coinciding preferences of women with higher family orientation for occupations that focus on stereotypical feminine qualities such as interpersonal contact and caring (Van Bavel, 2010).

The factors driving the association between occupation and fertility outcomes, however, remained unclear in previous research, largely due to the fact that these studies have used information about educational level and field as a proxy for occupation and did not measure occupation directly (Hoem et al., 2006a, 2006b; Lappegård & Rønsen, 2005; Martín-García & Baizán, 2006; Neyer & Hoem, 2008). We believe it is problematic to adopt educational field as a direct proxy for occupation for several reasons. First, it requires the assumption that educational degrees are an accurate proxy for occupation and subsequent working conditions which are typically matched with a particular field of study. Research that linked educational field with occupational outcomes demonstrates that this assumption might be flawed. Robst (2007), for example, showed that 45% of workers report that their job is only partially or not related to their original field of study. The degree of mismatch differed by the field of study, with graduates from fields that emphasized more general skills (e.g., liberal arts) and have a low degree of occupational specificity experiencing a significantly higher likelihood of mismatch. Second, by assuming that the field of education leads only to one occupation, researchers implicitly assumed that an individual's occupation remains stable throughout the life course and that there are no additional job and occupational changes. Previous research has demonstrated, however, that particularly after returning to the labor market after childbirth, women's employment and job conditions changed (McRae, 1993), and they were more prone to enter lower-wage occupations, even more so when opting to work part-time (Tomlinson, Olsen, & Purdam, 2009). Although a handful of studies have used information about the occupation women actually worked in, the number of different occupations included in the analysis remains limited (Cooney & Uhlenberg, 1989; Dribe & Stanfors, 2010; Kalmijn, 1996; Martín-García & Baizán, 2006; Stanfors, 2010; Strand, Wergeland, & Bjerkedal, 1996; Zabel, 2006).

This study extended the field in several ways. First, we took into account the effect of both educational fields and occupation in our analysis. This enabled us to empirically examine whether there are differences between the effects of educational field and occupation on fertility. Second, since we used data that contained full retrospective life-histories of education, employment, relationship and fertility trajectories of individuals, we were able to account for the fact that occupations and other characteristics may change and vary across the life course. Third, we also controlled for some of the work conditions that are associated with high work-family compatibility, namely working reduced hours or in the public sector. This meant that we went beyond the assumption of a direct impact of occupations on fertility to also focus on the underlying factors of work conditions related to certain occupations, which in turn influence the ability to combine employment with parenthood. Finally,

we applied not only theoretical reasoning, but also empirically tested the impact of occupational sex segregation on fertility. By including this measure, we were able to test whether the share of women within an occupation influenced the transition to first or additional children.

We examined this topic within the context of the Netherlands, which is an interesting case due to the fact that high (generally part-time) female labor market participation is combined with relatively high fertility and late ages of first birth (Mills, 2011; Plantenga, 2002) (see Table 4.1). This means that most women spend a relatively long time in the labor market after finishing education and before the birth of their first child. The labor force participation of Dutch women has also risen steadily from around 20% at the beginning of the 1970s to over 80% in 2009 (see also Supplemental Table 7 in Appendix C for yearly (un)employment rates).

Table 4.1 *Main indicators of educational attainment, labor market participation and fertility in the Netherlands*

	1970	1980	1990	2000
Educational attainment of women 25-34[1]				
Lower secondary (%)	57.8	45.5	32.0	23.3
Upper secondary (%)	28.7	35.8	45.3	49.5
Tertiary (%)	13.5	18.7	22.7	27.2
Female labor force participation 25-54 (%)[2]	22.8	36.7	58.5	72.7
Share of part-time work among women aged 25-49[1]	[4]	60.5[5]	63.2	69.4
Total Fertility Rate	2.57	1.60	1.62	1.72
Mean age at first birth[3]	24.2	25.6	27.6	29.1

Source: [1]Eurostat, [2] OECDstats, [3] Beets, Dourleijn, Liefbroer, & Henkens, 2001
Note: [4] Data not available; [5] Data refer to 1983

4.2 Theory and Hypotheses

We first turn to a theoretical discussion and build hypotheses in relation to the impact of educational field, occupation, and occupational sex segregation on the transition to first and higher order births. We then test these hypotheses by making use of data from a repeated cross-sectional survey of the Dutch population that covers women born between the 1940 and the 1985 with complete retrospective histories of multiple life domains (De Graaf et al., 1998, 2000, 2003). We engaged in separate analyses of the time until first birth and transitions to higher order (second, third and fourth) births. A series of discrete-time complementary log-log models with frailty were estimated, followed by the presentation of results and a final discussion.

4.2.1 Educational field and fertility

A number of studies have recently examined the relationship between the educational field of study with family formation and fertility. Two companion papers by Hoem and colleagues (2006a, 2006b) examined permanent childlessness and completed fertility for a full cohort of Swedish women born between 1955 and 1959, comparing roughly 60 educational categories according to field and level. The results show low levels of childlessness and high fertility among women educated in the female-dominated fields of healthcare and teaching, but do not fully support the hypothesis of a linear relationship between the numbers of women in a particular discipline with higher fertility. Women who studied in educational fields that led to female dominated private sector occupations with schedules and working conditions that are difficult to combine with parenthood (e.g., hotel and restaurant workers) or fields with general skills (e.g., fine and applied arts), had remarkably higher levels of childlessness. Conversely, women who studied within male dominated disciplines that led to stable and predictable career paths had low levels of childlessness and high fertility (Hoem et al., 2006a, 2006b).

A comparative study between Sweden and Austria using a similar research-design also produced analogous results for the Austrian case (Neyer & Hoem, 2008). Other studies using a smaller number of educational categories confirmed the finding that educational fields related to caring and teaching are associated with higher fertility for Norway (Lappegård & Rønsen, 2005), Spain (Martín-García & Baizán, 2006) and Greece (Bagavos, 2010). Examining 21 European countries, van Bavel (2010) found that the postponement of first birth was the most pronounced for women who had studied in male-dominated disciplines and least delayed for those in the more female-dominated fields.

Building on these previous findings and considering the institutional context of the Netherlands, we expected an effect of educational field on fertility related to the degree to which the educational field is associated with stereotypical feminine qualities and the 'match' between educational field and the labor market. Educational fields that are related to stereotypical feminine qualities such as healthcare and teaching, provide an environment that fosters gender-typical attitudes and roles (Goffman, 1977; West & Zimmerman, 1987). The faster transition to motherhood of graduates from these gender-typical fields found in previous studies (Hoem et al., 2006a, 2006b; Martín-García & Baizán, 2006; Van Bavel, 2010) has been attributed to two processes: socialization and self-selection. Socialization emphasizes the formative influence educational institutions have on family related attitudes and values of young people. The assumption is that educational fields that highlight stereotypical female qualities also lead to developing a preference for early family

formation and high fertility (Hoem et al., 2006a; Van Bavel, 2010). The self-selection argument maintains that individuals with a stronger family orientation sort themselves into educational fields that emphasize the care of individuals or interpersonal skills (Hakim, 2003). The association we observe between highly feminized educational fields and fertility is in this view caused by the same underlying trait or preference.

These two processes are difficult to distinguish empirically and are not regarded as mutually exclusive (Van Bavel, 2010). One way of disentangling these mechanisms would involve repeating the measurement of relevant attitudes and values from an early age, which would allow more insight in whether gender-typical fields are causing, reinforcing or accommodating pro-family values. Since we do not have any information about the attitudes of respondents before they entered a particular educational field, we could only infer from the effect educational fields and occupational conditions the role socialization or self-selection might play. We assumed that the effects of socialization are more stable over the life-course than self-selection, because the latter is also based on work-family compatibility and therefore also refers to occupation and working conditions. Our first hypothesis therefore predicted that if socialization would be the driving force behind the association between highly-feminized educational fields and fertility*, the effect of educational fields was expected to be stable over the life-course and independent of occupational effects (H1).* Based on the arguments of both socialization and self-selection, we anticipate a faster transition to having a child among women in educational fields that emphasize stereotypical female qualities. Since earlier research has consistently shown a faster transition to motherhood among women with degrees that led to teaching positions (e.g., (Van Bavel, 2010), we used this as our reference category. Our hypothesis predicted that: *Women in (para)medical, and personal and social care educational fields would not differ in their fertility behavior from women who studied education and teaching.* Furthermore we contend that: *Women who studied educational and teaching fields would have a higher transition to first and higher order births than women in the gender-atypical fields of technical studies (e.g., technology, science, transport) (H2).*

The Dutch educational system is stratified, sorting pupils into an academic track and a (school-based) vocational track (Dronkers, 1993). Secondary education is provided on three levels (pre-vocational secondary education, senior general secondary education and pre-university education). After finishing secondary education, pupils can choose a vocational or higher (professional) education depending on the level of their secondary education exam. Completing vocational education or higher professional education qualifies students to enter the next higher

level of education within the same educational field. This implies that the initial choice for a certain field of education determines the field in which a further qualification might be attained (Allmendinger, 1989; EURYDICE, 2008; Kerckhoff, 1995). In a stratified educational system with a strong focus on vocational skills as the Dutch one, educational profiles conveying skills that are not tailored towards a narrow job profile could lead to a more precarious school-to-work transition (Kerckhoff, 1995; Wolbers, De Graaf, & Ultee, 2001). Examining cross-national data of school-leavers across Europe, Wolbers (2003) found that in countries where the educational system was vocationally oriented, the incidence of mismatch between educational fields with the first job was generally lower. Those who experienced a high education-job mismatch had a lower occupational status, were more likely to seek further employment, and continued with further vocational training. This type of school to work transition increases the time period between leaving school and reaching a secure position and thus delays family formation (Shavit & Blossfeld, 1993).

Based on this previous research, we anticipated difficulties in matching educational profiles with a job for two kinds of educational categories. First, we expected that women with a general secondary education only (classified as 'general skills') would face more difficulties in the job market due to their lower and basic education coupled with an inability to signal any specific skills. The second group consisted of women educated in the social-cultural and humanities field, where there is a low demand for people with such a specific degree in the labor market (Dronkers, 1993; Hoem et al., 2006a; Robst, 2007; Wolbers, 2003). Our third expectation regarding educational fields was therefore that *compared to women who studied education and teaching*, *women without a qualification in a specific field and graduates in the social-cultural and humanities domain would have a lower transition to first birth*. After the initial transition from school to work however, the influence of the educational degree on occupational specificity of vocational education on unemployment risk has been shown to diminish (Korpi, De Graaf, Hendrickx, & Layte, 2003). We therefore *did not expect this effect to persist in the transition to higher order births (H3).*

4.2.2 Occupations and fertility

Studies directly linking occupations to fertility are rare and the few that exist used broad occupational classifications consisting of a small number of occupational classes (Martín-García, 2009; Strand et al., 1996; Zabel, 2006). Results have been relatively consistent across countries, with occupations related to caring and interpersonal skills such as professions in healthcare and teaching generally

associated with lower childlessness and higher fertility (Cooney & Uhlenberg, 1989; Martín-García, 2009; Stanfors, 2010; Strand et al., 1996; Zabel, 2006).

Two main mechanisms have been posited, namely working conditions and self-selection. The first explanation emphasized the role of job characteristics and employment conditions such as access to stable employment, maternity leave, and flexible working hours (Cooney & Uhlenberg, 1989; Martín-García & Baizán, 2006; Stanfors, 2010). Certain healthcare occupations located in the public sector have particularly favorable work-family compatibility. In the case of teachers, women have the opportunity to work part-time and have working times and holidays that are in sync with their own children. In order to test whether the effect of working in healthcare and teaching occupations could be attributed to working conditions, we examined the two most frequently cited factors, which are whether jobs allow reduced working hours or are located in the public sector. This led to the hypothesis that *working reduced hours and working in the public sector would be associated with a faster transition to having a first and higher order births* (H4).

The second explanation referred to processes of self-selection into gender-typical occupations based on attitudes about work and family roles (Hakim, 2003; Hoem et al., 2006a, 2006b; Van Bavel, 2010). Previous research has demonstrated that stereotypical images of feminine traits are associated with occupational choice and thereby contribute to the existence of gender typical occupations and occupational sex segregation (Anker, 1997; Charles & Bradley, 2002; Charles, 2005; Deaux, 1985; Lippa, 2010; Ridgeway, 1997; Smyth & Steinmetz, 2008; Yoder & Schleicher, 1996). The connection between gender-typical occupational choice and fertility was supported by earlier research, as women in traditional female occupations have been found to have higher childbearing intentions compared to those in non-traditional occupations (O'Connell, Betz, & Kurth, 1989). In an Australian study, individuals with more traditional attitudes about women's roles were more likely to desire more children (Holton, Fisher, & Rowe, 2009). Gender-typical occupations have also been associated with a higher orientation towards family life and traditional gender roles in the perception of others. In several experimental studies where college students rated the future family status and family size of different occupational groups, women in non-traditional occupations were projected to have fewer children or being more likely to forego marriage (Baber & Monaghan, 1988; Yoder & Schleicher, 1996). This supports the idea that students with a strong orientation towards caring and a preference for family life would self-select themselves into the educational and occupational fields that are perceived to be the most congruent with an orientation towards caring and the preference for family life (Van Bavel, 2010; Yaremko & Lawson, 2007).

Since it is not possible to include gender attitudes in this study, we test this hypothesis by including information about working in healthcare and teaching occupations, as well as applying a categorization of occupational resources relating to cultural, economic, technical and communicative skills (Van de Werfhorst & Kraaykamp, 2001; Van de Werfhorst, 2002). Jobs that are primarily feminine are characterized by those with communicative skills, defined as: "jobs where social interaction with other individuals is central" (van de Werfhorst, 2002: 289). Conversely, jobs that fall into the economic (commercial, juridical) and technical (agriculture, mathematical, natural sciences) would be classified as more masculine. A full explanation of the categorization with examples of occupations is provided in the measurement section and shown in Supplemental Table 8 in Appendix C. We expected that *feminine occupations characterized by communicative skills would be associated with a faster transition to first and higher order births compared to those that are more masculine such as economic and technical types* (H5).

4.2.3 Occupational sex segregation and fertility

The association of healthcare and teaching occupations with higher fertility has also been attributed to the explanation that these are jobs performed predominantly by women. In other words, there should be a direct effect of occupational sex segregation on fertility (Hoem et al., 2006a; Martín-García, 2009; Van Bavel, 2010). Empirical tests of this hypothesis that explicitly include fertility behavior are rare. One example is a recent Swedish study which found a positive effect of female co-workers having children on the probability of childbirth (Hensvik & Nilsson, 2010). However, a vast amount of research has examined the determinants of the provision of family-friendly policies, which are ultimately assumed to be conducive to childbearing. Research shows, for instance, that a higher share of women in the workplace (Davis & Kalleberg 2006; Goodstein 2010) as well as at the industry level (Cook & Minnotte, 2008) is related to a higher level of work-family support. It is important to note that even though a better provision of family friendly policies is often related to white-collar jobs, the general argument of why a higher share of women in an occupation should be associated with higher fertility also holds for lower level jobs. Women with children or the desire to have children are expected to choose jobs not only on the basis of wages, but also take working conditions into account. We used neo-classical economic theory to argue that jobs that offer relatively low wages but so-called compensating differentials (i.e., non-monetary benefits), which are attractive for women with (young) children, would be female dominated (Filer, 1985). Prime examples of compensating differentials are flexible working hours and part-time work. Occupational sex segregation could also be explained via the related mechanism of women anticipating withdrawing from the labor market for

prolonged periods of time for parenthood and therefore choosing occupations with low wage penalties upon returning (Polachek, 1981). Because jobs which are associated with low wage penalties after periods of withdrawal are usually those jobs which also require relatively low human capital, women should be disproportionably represented in the lower occupational segments (Desai & Waite, 1991). This led to our final hypothesis where *we expected to find a positive effect of the share of women in an occupation on the transition to having a first or higher order birth* (H6).

4.3 Data, Analytical Method and Measures

4.3.1 Data

The data used for this analysis combined three waves (1998, 2000, 2003) of the Family Survey of the Dutch Population (Familie-enquête Nederlandse Bevolking, FNB), a large-scale repeated cross-sectional survey administered in the Netherlands (De Graaf et al., 1998, 2000, 2003). The surveys covered the Dutch population between ages 18 and 70 with an overrepresentation of couples and was based on structured face-to-face interviews and self-completion questionnaires. The FNB is unique in that it registered the complete life-courses of primary respondents and their partners with respect to education, occupation, religion, mobility, and partnership formation through retrospective questioning. The response rate in the three waves of data collection ranged between 40% and 53%, which is comparable to that of other large-scale surveys in the Netherlands as response rates in the Netherlands are generally lower than those in other countries (De Leeuw & De Heer, 2002). In total, 2,922 female respondents were interviewed in the three waves. Since the information needed to construct the time-varying covariates was only available from about 1970 onwards, we restrict our sample to women born after 1940. This yields a total number of 2,567 female respondents of whom 91 (3.5%) are excluded because of missing information, leaving a subsample of 2,511 women (see Table 4.2 for descriptive statistics). We restricted our analyses to women because the theoretical mechanisms connecting educational and occupational choices and fertility focus on women.

4.3.2 Analytical strategy

We estimated two discrete-time event history models of first and higher order (second to fourth) births (Allison, 1982; Jenkins, 2005; Mills, 2011; Steele, 2005). For the transition to first birth, the period of observation started at age 16 and ended either at the date of conception of the first child or was right-censored at the date of

the interview or when the respondent reached age 45 (whichever happened first).[14] The date of birth of each child was lagged by 9 months to avoid misspecification of the order of events, and for this reason the terms birth and conception are used interchangeably. The transition to first birth was analyzed separately from the transition to higher order births because we assume the decision to have a first child to be guided by different considerations than the decision to have an additional child (Schoen et al., 1999; Thomson, 1997).

Table 4.2 *Sample descriptive statistics*

		N	***Per cent***
Number of children	No children	641	25.5
	One child	368	14.7
	Two children	1,015	40.4
	Three children	379	15.1
	Four children	108	4.3
Wave of data collection	1998	878	34.9
	2000	644	25.7
	2003	989	39.4
Birth cohort	1941-1950	533	21.2
	1951-1960	677	27.1
	1961-1970	821	32.7
	>1970	480	19.1
Total		2,511	100

Source: Family Survey of the Dutch Population 1998. 2000, 2003.

The transition to higher order births was analyzed as a recurrent event model (Aalen, Borjan, & Gjessing, 2008; Box-Steffensmeier & Zorn, 2002; Mills, 2011; Steele, 2005). After women gave birth to a first child they became at risk to have a second child only after the date birth of the first child (the months of pregnancy were removed from the analyses) and were observed until they either conceived their second child or were censored by reaching age 45 or the interview date. The same was true for the transition to the third and fourth birth. Births beyond the fourth were not examined because of data restrictions (in one wave date of birth of children was only collected up to the fourth child), which meant that we slightly underestimated the total fertility of the 23 respondents with more than 4 children (0.09% of the sample) in our data.

The data were organized in a person-month format, which meant that each row of the dataset corresponds to a time period of one month. The dependent

[14] We tested the robustness of our results by estimating the model with different entry ages (15 and 18) and by only including time spent in a relationship (cohabiting or married) and found no substantial differences. We also estimated the two models jointly, allowing for a correlation of the woman level random terms, but no significant correlation was found.

variable is a binary indicator taking the value 1 in the month when conception occurred and represents the risk of conception of individual *i* occurring during the specified monthly interval *t* of birth episode *j*, conditional on the fact that it did not occur before time interval *t*: $p_{tij} = Pr(y_{tij}=1|y_{t-1,ij}=0)$ (Steele, 2005).

We modeled the hazard of having a child as a function of age, observed individual characteristics (time-constant and time-varying), and unobserved time-invariant characteristics[15]. The discrete-time hazard function was defined by a complementary log-log (cloglog) hazard function, which can be interpreted as the discrete time model corresponding to an underlying continuous time proportional hazards model. We modeled the probability of having a child for individual *i* with parity *j* at time *t* as:

$$(1)\ \log(-\log(1-h_{tij})) = D_{tij}\,\alpha + X_{tij}\,\beta + u_i$$

Where D_{tij} is a vector of functions of the cumulative duration of time *t* with coefficients α and was specified as a piecewise linear spline transformation of biological age[16]. X_{ti} denotes a vector of covariates of observed individual characteristics (time-varying or constant) with coefficients β. Furthermore we included a normally distributed random effect on the individual level with a mean of zero and a standard deviation to be estimated: $u_i \sim N(0, \sigma_u^2)$. By including individual-specific unobserved factors that are constant over episodes, we accounted for selection effects due to unobserved heterogeneity and the fact that the duration of episodes from the same individual were not independent (Mills, 2011; Steele, 2005).

4.3.3 Measures

Education. The *educational field* of highest educational attainment was recoded into eight different groups based on the original 14 categories and case numbers (see Supplemental Table 9 in Appendix C). These recoded categories were: 1) Education, Teaching 2) Languages, History, Art 3) Technology, Science, Transport, Communication, Agriculture 4) (Para)Medical 5) Administrative 6) Social-cultural 7)

[15] Models were estimated using the *xtcloglog* function in Stata 11 and coefficients refer to cluster specific effects. The *quadchk* command was used to check the sensitivity of the quadrature approximation and showed that 12 integration points achieved a good accuracy of the quadrature approximation (all relative differences were smaller than 0.01 when using 8 or 16 integration points).

[16] For the transition to first birth starting at age 16, with nodes at the end of the years when the person turned 20, 23, 27, 32, and 37. For the analysis of higher order births, the starting age was the age at first birth and nodes were placed at age 25, 30 and 35. Additionally this model contained a duration spline with four nodes at 2, 4, 6 and 8 years after the previous birth. Alternative specification of the duration dependence (second order polynomial, piecewise constant) did not lead to different results.

Personal/Social care and 8) General education, no specific field. The reference category was the field of education and teaching.

The *highest level of educational attainment* was measured in four categories based on the International Standard Classification of Education (ISCED) which were: 1) primary education 2) lower secondary / short vocational education 3) upper secondary / vocational education and 4) higher professional / tertiary education (see Supplemental Table 9 in Appendix C for distribution).

Occupation. The occupation of respondents was measured using a recoded version of the major groups of the International Standard Classification of Occupations (ISCO-88; ILO 1990). Information from the more detailed level of sub and minor groups of the ISCO-88 was used to differentiate between the occupational groups that we were specifically interested in, such as teaching and health care professionals (see Supplemental Table 9 in Appendix C). Occupation was then included in our models as a time-varying covariate. The 11 occupational groups we differentiated are: 1) senior official and managers 2) professionals 3) health professionals 4) teaching professionals 5) technicians and associate professionals 6) associated health professionals 7) office workers 8) personal service workers 9) shop workers 10) skilled agricultural, craft and trade workers and 11) plant and machine operators and assemblers. We chose the group of office workers (clerks) as the reference category in our analysis for technical (it was the largest group) as well as substantial reasons (it is an occupational group on the intermediate level with normal working conditions).

Occupational characteristics. Information about the proportion of women within occupations was obtained from the SEGREGAT database of the International Labor Organization (ILO, 1993) which contains data about the number of men and women in detailed occupational groups from over 80 countries and different points in time (Anker, 1998). Data for the Netherlands refers to the years 1970, 1979 and 1990 and is based on labor force surveys conducted by Statistics Netherlands (CBS). The proportion of women was matched to the occupational groups (defined by the minor (three digit) groups of ISCO88) and the time period in the analysis. The information about the proportion of women within occupations therefore varies between occupations and over decades.

Weekly working hours and employment relationship. For each employment episode, the related weekly working hours were coded into three categories to indicate whether the respondent worked 1) up to 19 hours 2)between 20-34 hours or 3) more than 35 hours per week. This categorization was based upon the difference between marginal and substantial part-time work (Bielenski et al., 2002). We chose this

definition because small part-time jobs are common in the Netherlands, especially among mothers.

The *employment relationship* was included as a time-varying covariate using the categories of whether individuals worked in the: 1) private sector 2)(semi)public sector or 3) were self-employed.

Categorization of occupational resources. We used an adapted version of the categorization of educational and occupational resources by van de Werfhorst & Kraaykamp (2001, see also Kalmijn & van der Lippe, 1997) where jobs were coded according to the four resources that they predominantly required, which are: 1) cultural 2) economical 3) communicative and 4) technical. An additional category of 5) elementary occupations is added that comprised all non-specialized jobs and jobs in production (see Supplemental Table 8 in Appendix C for a detailed specification).

Institutional indicators. Besides individual and occupational characteristics, we included information about female labor force participation and the unemployment rate among women on a yearly basis (OECD 2010, see Supplemental Table 7 in Appendix C). This was done in order to take into account the increase in female labor force participation over the years of study. The level of female unemployment was included as an approximation of economic conditions that might influence major life decisions (Mills et al., 2005).

Control variables. Birth cohort, the time-varying status of main activity (coded as 1) full-time homemaker 2) in education 3) employed and 4) unemployed/disabled) and the time-varying relationship status (coded as 1) single 2) cohabiting 3) married) were also included in the model. In the analysis of the transition to higher order births, age at first birth and age at first birth squared, parity (1 to 3) and the time since the birth of the previous child (in years) were also incorporated in the model.

4.4 Results

The results are presented in Table 4.3 (transition to first birth) and Table 4.4 (transition to higher order births). We first discuss the results directly in relation to each of our hypotheses. We then provide a general overview of the results of control variables, focusing on the relationship with birth cohort, educational attainment, relationship status, main activity status and our two macro-level variables (see Supplemental Table 10 and 11 in Appendix C for results of control variables).

In our first hypothesis we predicted that an effect of socialization in educational fields would be visible by a persistent effect of educational fields, both in combination with the effect of occupations and working conditions and over the life course. We found, however, that the impact of educational field only seems to be

relevant for the transition to first birth as no significant differences were found for the transition to higher order births and the effects were also not independent of occupational effects. For women educated in the (para)medical field, the effect of educational field on first birth was not significantly different from the reference category of those educated for education and teaching when information on occupations was not included. After including the occupation, this effect was captured by the occupational category of health professionals which was related to a faster transition to first birth and the effect of the (para)medical educational field became negative in comparison to the field of teaching .

Our second hypothesis anticipated firstly that women in (para)medical, personal and social care educational fields would not differ in their fertility behavior from those who engaged in studies for education and teaching. There was support for this expectation for the transition to first birth only, where we did not find significant differences between women educated in the (para)medical or personal and social care field compared to the reference category of women who studied education and teaching. The second part of this hypothesis then predicted that women engaging in educational and teaching fields would have a higher transition to all births compared to women in the gender-atypical fields of more technical studies (technology, science, transport). Once again we saw significant differences only for first births in the expected direction, with lower transitions to first births for those educated in technical studies and for those who studied economics, administrative and commercial fields.

Finally, in support of our third hypothesis, we saw that for first births only (as predicted), women with social-cultural degrees have a significantly lower transition to first birth. In this hypothesis we also anticipated that those women with only general skills (secondary education only) would to have a lower transition to first birth related to the potentially higher education-job mismatch in these fields. Although the effect was negative, it was not significantly different from women with degrees in education and teaching and this hypothesis was not supported.

Turning to hypothesis four and job characteristics, we expected that working part-time and in the public sector would have a positive effect on all birth transitions. In contrast to our expectations, working in the (semi)public sector in the Netherlands did not predict a faster transition to having a first or higher order birth. Rather, being self-employed or working in a family business positively affected the transition to having a first birth. We return to a discussion and further interpretation of this finding in the conclusion. Concerning working hours, our results partly supported this hypothesis, since working in a marginal part-time job of up to 20 hours a week was

Table 4.3 *Results of discrete time random effect complementary log-log model of transition to first birth*

	Educational fields			***Occupational groups***			***Educational fields & occupational groups***			***Occupational categories***			***Educational fields & occupational categories***		
	HR	***t***		***HR***	***t***		***HR***	***t***		***HR***	***t***		***HR***	***t***	
Educational Fields															
Education / teaching	1.00	ref					1.00	ref					1.00	ref	
Languages/History/Art	0.79	-1.15					0.79	-1.13					0.79	-1.14	
Technology / Science / Transport	0.64	-2.20	*				0.60	-2.49	*				0.67	-1.95	†
(Para-)Medical	0.80	-1.59					0.73	-1.93	†				0.82	-1.43	
Economics, Administrative, Commercial	0.70	-2.50	*				0.70	-2.31	*				0.74	-2.01	*
Social-cultural	0.66	-2.30	*				0.62	-2.47	*				0.65	-2.35	*
Personal / social care	0.89	-0.77					0.82	-1.30					0.88	-0.84	
General / no specific field	0.82	-1.34					0.81	-1.33					0.86	-1.01	
Occupational groups[1]															
Legislators, senior officials & managers				0.85	-0.78		0.84	-0.81							
Professionals				1.30	1.63		1.35	1.80	†						
Health professionals				1.44	2.33	*	1.42	2.08	*						
Teaching professionals				1.25	1.36		1.06	0.30							
Technicians & associate professionals				1.09	0.68		1.09	0.67							
Life science & health associate professionals				1.12	0.82		1.13	0.80							
Clerks				1.00	ref		1.00	ref							
Personal & protective services worker				1.30	2.02	*	1.28	1.83	†						
Models, salespersons & demonstrators				1.27	1.78	†	1.28	1.79	†						
Skilled agricultural & fishery worker				1.56	2.41	*	1.57	2.36	*						
Plant & machine operators & assemblers				1.47	2.64	**	1.47	2.59	**						
Occupational categories[1]															
Cultural										1.14	0.80		1.22	1.20	
Economic										0.83	-2.13	*	0.87	-1.43	
Communicative										1.00	ref		1.00	ref	
Technical										0.67	-1.96	*	0.68	-1.85	†
Lower										1.22	1.56		1.28	1.87	†
Working conditions[1]															
Proportion women in occupation	1.38	2.63	**	1.37	2.13	*	1.35	2.00	*	1.32	2.13	*	1.33	2.19	*

Table 4.3 continued

	Educational fields			***Occupational groups***			***Educational fields & occupational groups***			***Occupational categories***			***Educational fields & occupational categories***		
	HR	***t***		***HR***	***t***		***HR***	***t***		***HR***	***t***		***HR***	***t***	
Weekly working hours															
1 – 19 h	1.48	2.82	**	1.41	2.49	*	1.45	2.63	**	1.39	2.38	*	1.42	2.49	*
20 – 34 h	1.09	1.10		1.08	0.92		1.07	0.89		1.08	0.99		1.08	0.95	
≥ 35 h	1.00	ref		1.00	ref		1.00	ref		1.00	ref		1.00	ref	
Sector															
Private sector dependent	1.00	ref		1.00	ref		1.00	ref		1.00	ref		1.00	ref	
(semi) public dependent	0.92	-1.10		0.91	-1.14		0.92	-1.00		0.89	-1.41		0.89	-1.38	
Self employed	1.49	2.22	*	1.57	2.50	*	1.56	2.46	*	1.46	2.14	*	1.46	2.12	*
Unemployment rate women	0.97	-3.02	**	0.97	-2.96	**	0.97	-3.03	**	0.97	-3.01	**	0.97	-3.06	**
Female labor force participation	1.00	0.57		1.00	0.37		1.00	0.41		1.00	0.46		1.00	0.50	
$\sigma(u_i)$	0.85	0.07		0.84	0.07		0.84	0.07		0.84	0.07		0.85	0.07	
n_t (person months) n_i (women)	307,693		2,511	307,693		2,511	307,693		2,511	307,693		2,511	307,693		2,511
Events			1,716			1,716			1,716			1,716			1,716
Df	31			34			41			28			35		
AIC	14611.6			14737.6			14726.8			14613.0			14602.8		
BIC	14926.6			15081.5			15013.4			15023.4			14956.0		

Source: Family Survey of the Dutch Population 1998. 2000, 2003. Calculations by authors

Note:*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.1$, coefficients are exp(b).

[1] Information about occupation and working conditions refers only to work episodes, all non-work episodes are therefore assigned the same value as the reference category (non-work episodes can be episodes of housework, unemployment or education). This strategy is common in event-history modeling (Hoem, 2000; Zabel, 2006).

All Models control for duration dependence (piecewise linear spline of biological age), birth cohort, relationship status, main activity and educational attainment (see Supplemental Table 10 in Appendix C).

Table 4.4 *Results of discrete time random effect complementary log-log model of transition to higher order births (hazard ratios)*

	Educational fields			***Occupational groups***			***Educational fields & occupational groups***			***Occupational categories***			***Educational fields & occupational categories***		
	HR	***t***		**HR**	***t***		**HR**	***t***		**HR**	***t***		**HR**	***t***	
Educational Fields															
Education / teaching	1.00	ref					1.00	ref					1.00	ref	
Languages/History/Art	0.92	-0.50					0.91	-0.57					0.90	-0.64	
Technology / Science / Transport	0.98	-0.15					1.03	0.18					0.97	-0.18	
(Para-)Medical	1.03	0.29					1.04	0.33					0.99	-0.09	
Economics, Administrative, Commercial	0.86	-1.44					0.91	-0.91					0.89	-1.15	
Social-cultural	0.90	-0.77					0.90	-0.71					0.89	-0.85	
Personal / social care	0.88	-1.21					0.92	-0.79					0.88	-1.20	
General / no specific field	0.93	-0.70					0.96	-0.37					0.94	-0.55	
Occupational groups[1]															
Legislators, senior officials & managers				0.93	-0.29		0.90	-0.40							
Professionals				1.62	2.81	**	1.63	2.80	**						
Health professionals				1.36	1.94	†	1.29	1.50							
Teaching professionals				1.63	2.86	**	1.60	2.65	**						
Technicians & associate professionals				1.21	1.29		1.21	1.25							
Life science & health associate professionals				1.43	2.44	*	1.37	2.09	*						
Clerks				1.00	ref		1.00	ref							
Personal & protective services worker				1.05	0.29		1.05	0.33							
Models, salespersons & demonstrators				1.00	0.01		1.00	0.02							
Skilled agricultural & fishery worker				1.21	0.88		1.19	0.78							
Plant & machine operators & assemblers				0.84	-1.04		0.83	-1.10							
Occupational categories[1]															
Cultural										1.17	0.99		1.20	1.13	
Economic										0.78	-2.64	**	0.79	-2.38	*
Communicative										1.00	ref		1.00	ref	
Technical										1.33	1.31		1.30	1.21	
Lower										0.67	-2.94	**	0.67	-2.85	**
Working conditions[1]															
Proportion women in occupation	1.07	0.50		1.18	0.95		1.16	0.85		1.07	-0.42		1.06	-0.38	

Table 4.4 continued

	Educational fields			***Occupational groups***			***Educational fields & occupational groups***			***Occupational categories***			***Educational fields & occupational categories***		
	HR	***t***		**HR**	***t***		**HR**	***t***		**HR**	***t***		**HR**	***t***	
Weekly working hours															
1 – 19 h	0.93	-0.79		0.93	-0.77		0.93	-0.71		0.92	-0.84		0.93	-0.77	
20 – 34 h	0.88	-1.45		0.87	-1.58		0.88	-1.48		0.85	-1.81	†	0.86	-1.69	†
≥ 35 h	1.00	ref		1.00	ref		1.00	ref		1.00	ref		1.00	ref	
Sector															
Private sector dependent	1.00	ref		1.00	ref		1.00	ref		1.00	ref		1.00	ref	
(semi) public dependent	1.08	0.91		0.95	-0.54		0.95	-0.53		0.98	-0.19		0.98	-0.25	
Self employed	1.06	0.39		1.12	0.70		1.11	0.65		1.04	0.26		1.03	0.20	
Unemployment rate women	1.01	0.98		1.01	1.08		1.01	1.14		1.01	0.93		1.01	1.01	
Female labor force participation	1.01	1.72	†	1.01	2.14	*	1.01	1.89	†	1.01	2.02	*	1.01	1.80	†
σu_i	0.21	0.16		0.16	0.20		0.13	0.24		0.19	0.16		0.17	0.19	
n_t (person months) n_i (women)	244,517		1,716	244,517		1,716	244,517		1,716	244,517		1,716	244,517		1,716
Events			1,817			1,817			1,817			1,817			1,817
Df	34			37			44			31			38		
AIC	14391.5			14506.4			14389.3			14499.3			14381.8		
BIC	14727.3			14870.7			14818.5			14807.5			14754.9		

Source: Family Survey of the Dutch Population 1998, 2000, 2003. Calculations by authors

Note:*** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.1, coefficients are exp(b).

[1] Information about occupation and working conditions refers only to work episodes, all non-work episodes are therefore assigned the same value as the reference category (non-work episodes can be episodes of housework, unemployment or education). This strategy is common in event-history modeling (Hoem, 2000; Zabel, 2006)

All Models control for duration dependence (piecewise linear spline of biological age, piecewise linear spline of duration since last birth, age at first birth, age at first birth^2, parity), birth cohort, relationship status, main activity and educational attainment (see Supplemental Table 11 in Appendix C).

indeed associated with a positive effect on first births compared to working full-time (more than 35 hours per week). We found no effect of the number of working hours on higher order births and no difference between substantial part-time work and full-time employment.

Previous research has found that working in a highly feminized occupation (teaching, healthcare), had a positive effect on all fertility transitions. In order to empirically test the underlying assumptions behind this hypothesis in a more systematic manner, we also categorized all jobs into being cultural, economic, communicative, or technical in nature and tested this categorization as well as a recoded version of the International Standard Classification of Occupations. Recall that our expectation in hypothesis five was that the more feminized communicative jobs would have a positive effect on all fertility transitions compared to the more masculine-typed economic and technical jobs. Our model shows that indeed economic and technical jobs were associated with a significantly lower transition to having a first birth compared to the communicative category when educational fields were not included in the model. The results for higher order births partly supported our expectation, with jobs related to communicative skills having a significantly higher risk of transition to a higher order births than economic jobs. Also a negative effect was observed for women in the lower occupational category. There was no difference, however, with regard to technical jobs.

Our models also included a recoded version of the International Standard Classification of Occupations. We find that in comparison with office workers, only working as a healthcare professional positively predicted the transition to motherhood (see Table 4.3). However, the results of the transition to higher order births showed an increased birth hazard for the occupational groups of professionals, teachers and lower level healthcare professionals (compared to office workers, see Table 4.4), which again lent some support to our expectation that highly feminized occupations would be associated with higher fertility.

Finally, we hypothesized that occupational sex-segregation would have a positive effect on having a first or higher order birth (Hypothesis 6). Here we obtained support for the transition to first birth. No effect of occupational sex segregation was found for the transition to higher order births, a result that we discuss in more detail shortly. The results of variables we did not specify hypotheses for, birth cohort, educational attainment, relationship status, main activity status and our two macro-level variables showed no unexpected results (see Supplemental Table 10 and 11 in Appendix C). Turning first to the results of the transition to first

birth[17], we saw that compared to their older counterparts born in 1941-50, women from younger birth cohorts have a lower transition to first birth (HR 1951-60: 0.74, t=-2.5); HR 1961-70: 0.65 (t=-2.1); HR 1970-85: 0.57 (t=-1.9)). Higher educational attainment also had a negative effect on the transition to a first child (HR lower secondary: 0.46 (t=-6.4); HR upper secondary: 0.38 (t=-7.1); HR high education: 0.31 (t=-7.9)). Logically, compared to being married, being single or in a cohabiting union was associated with a strong decrease in the probability of first birth (HR single: 0.1 (t=-26.2); HR cohabiting: 0.29 (t=-13.7)). Compared to women who were in paid work, full-time homemakers showed a faster transition to first birth (HR household: 2.9 (t=6.8)), while those enrolled in education had a significantly lower transition to first birth (HR in education: 0.34 (t=-4.8)). When we examined the two macro-level indicators, unemployment among women decreased the transition to having a first child (Table 4.3), while there was a marginal significant positive effect of female labor force participation on higher-order births (Table 4.4). Turning to the results of the transition to higher order births[18], we saw that compared to women who were married, women who were not married have a lower hazard of higher order births (HR not married: 0.69 (t=-4.9), with the same holding for transitions to third or fourth births compared to the second (HR parity 2: 0.29 (t=-10.8); HR parity 3: 0.19 (t=-7.1).

As was the case for the transition to first birth, having a paid job was associated with a negative effect on the transition to higher order births (HR not working: 1.26 (t=2.1)), but only until information about educational fields, occupation and work conditions is added to the model (HR not working full model: 1.06 (t=0.38)). Compared to those with low educational attainment, women in the highest educational category had a significantly higher hazard of higher order births (HR high education: 1.35 (t=3.12)).

4.5 Conclusion

The goal of this study was to go beyond general explanations of the impact of education and employment on fertility behavior to explore the underlying mechanisms of how educational field, occupations and occupational-sex segregation impact fertility. We examined the impact of both educational field and occupation,

[17] Unless otherwise indicated, all hazard ratios in this paragraph refer to the final model that included all control variables, educational field, occupational groups and working conditions. See Supplemental Table 10 in Appendix C for estimates of control variables omitted from Table 4.3.

[18] Unless otherwise indicated, all hazard ratios in this paragraph refer to the final model that included all control control variables, educational field, occupational groups and working conditions. See Supplemental Table 11 in Appendix C for additional estimates omitted from Table 4.4.

thus going beyond previous studies that used educational field as a proxy for occupation or studied only limited occupational categories. Our analyses also added an extra dimension by including information on work conditions and structural characteristics. By including occupation as a time-varying covariate, we were also able to take into account the transitional nature of women's occupations in relation to parenthood transitions. Finally, this study was among the first to empirically examine whether occupational sex segregation impacted women's fertility transitions. Although we extended the literature in several ways, some limitations remain, one being that the consequence of using retrospective information to model employment and fertility behavior came at the cost of being unable to integrate information about attitudes and subjective perceptions.

In our initial hypothesis, we predicted that socialization rather than self-selection within educational fields would be the driver behind the association between highly-feminized educational fields of study and fertility. If this was the case, the effects of these fields should be stable across fertility transitions and inclusion of occupational characteristics. Our findings show that the field in which the highest educational attainment was attained predicted the transition to first birth, but had no effect on the transition to higher order births. We also found that the effect of having obtained an educational degree in the (para)medical field on the transition to first birth was dependent on the kind or level of medical training. When occupational groups were included in the model, the transition to having a first child was faster for medical professionals but the effect of the medical educational field was now negative. We can conclude that there was no evidence of a pure socialization effect, but rather of a combined effect of self-selection and socialization. We were also able to replicate the finding of previous research with regard to higher fertility in the highly feminized of areas of study related to (health)care, and education and teaching for the transition to first birth.

With regard to educational fields, we also expected women from fields with a difficult match to the labor market (more general skills with no additional education and social-cultural degrees) to have a lower transition to first birth because of a prolonged period of uncertainty after finishing education. We found that a protracted period of employment uncertainty after finishing education had a larger impact of first birth postponement on the latter group. Compared to lower educated women who did not attain vocational training but only held a general secondary education with general skills, higher educated women were older when leaving the educational system and therefore had to combine establishing themselves in the labor market and forming a family.

We also aimed at extending the field by formulating and testing empirical hypotheses about the effect of holding classical feminine occupations (i.e., communicative occupations where social interaction with other individuals is central). Classical feminine occupations located in healthcare and teaching have been associated in virtually all previous studies with higher fertility. We argued that this effect might be attributed to more favorable working conditions in these occupations (part-time work, better work-family policies in the public sector), which we have tested. Although working reduced hours positively impacted fertility, it did not substantially reduce the positive effect of the occupational categories. We found that women in communicative occupations had faster transitions to all births compared to those in economic jobs and we also found a higher first birth hazard compared to women in technical jobs. These results supported the notion that it was indeed the particular features of jobs related to caring that are associated with higher fertility rather than only working conditions. This was further corroborated by the effects of occupation on higher order births, where we found positive effects of (health) professionals, teachers and associated health professional (nurses and midwives). It is important to note that these effects could stem from the selection of fertility prone individuals into these jobs based on the preference for caring or the higher compatibility with family responsibilities as well as a negative selection out of employment of mothers in other occupations. We come back to this point below.

We also empirically tested an occupational-sex segregation hypothesis, namely that fertility would be higher in female-dominated occupations. Interestingly, the effect was significant and positive for the transition to first birth while there was no effect on the transition to higher order births. In both models, the effect of being a teacher or healthcare worker, respectively being in a communicative type job, significantly predicted the transition to having a child also when occupational sex segregation was included in the model.

This points to the fact that the impact of these female dominated occupations on fertility is multifaceted and it might be necessary to make the distinction between what we termed a *quantitative* and a *qualitative* effect of occupational sex segregation. The quantitative dimension of occupational sex segregation, which is indicated by the proportion of women within an occupation, is assumed to affect fertility via network effects (Hensvik & Nilsson, 2010) and by the better provision of family friendly policies in female dominated occupations and industries (Cook & Minnotte 2008; Davis & Kalleberg 2006; Goodstein 2010). The qualitative aspect was more difficult to capture and relates to the coinciding preference of women with higher family orientation for occupations that focus on stereotypical feminine qualities such as interpersonal contact and caring. It is important to note that it is

unclear whether women who already have a stronger family orientation select themselves into occupations that match this preference or whether this effect is related to socialization effects within traditionally female fields (Hoem et al., 2006a; Holton et al., 2009; O'Connell et al., 1989; Van Bavel, 2010). Both mechanisms have been argued for in the literature and future research will have to shed more light on the direction of causality.

The absence of an effect of occupational sex segregation on the transition to having a second or third child might be explained by the way women select themselves into occupations with conditions that are conducive to childbearing. We assumed that jobs with a higher share of women are more conducive to childbearing, because they offer more family friendly policies or lower wage penalties after periods of absence. If we also expect that women without children but who plan to have a child, choose these jobs with a higher share of women because they deem them to be more suitable for combining work and family responsibilities, while women who do not plan to have a child choose according to other criteria (pay, more enjoyable work), we would indeed expect to see a positive effect of occupational sex segregation. Mothers of one or more children on the other hand, should already be employed or 'self-selected' into these jobs that offer good conditions for combining work and childrearing. Looking at descriptive figures we could indeed see some evidence for this process. Examining all of the months that women without children worked for pay, we saw that 57% were spent in jobs with at least 50% of women, while among mothers with one or more children, the same figure amounts to 66%. Also the time spent in paid employment was much lower when we focus on the period after the birth of the first child. Of all person-months in our data before the birth of the first child, 67% were spent in employment and around 27% in education, while after the first child was born, about half of the time under observation was taken up by paid work and about 50% by time as a homemaker.

Another interesting, but unexpected result of this study was that jobs located in the (semi)public sector did not predict the transition to having either a first or higher order birth. This result was surprising in the light of previous research but might be explained by the fact that the Netherlands has a strong tradition of centralized collective bargaining and corporatism, ensuring that working conditions and wages do not differ widely between firms for the same occupation or sector (Hartog, 1999). Moreover, throughout the 1980s and 1990s, the public sector was substantially reduced and has been subject to strong wage restraint (Hartog, 1999). In the analysis of the transition to second and third births, the results showed a positive effect of being self-employed, which we did not explicitly hypothesize. However this result might be related to the fact that self-employment in the

Netherlands is much more common among mothers of young children than among women without children since it is seen as a more flexible option with opportunities to choose hours of work freely and work from home (Plantenga, 2002; Riele & Souren, 2010).

A further notable result was that the contribution of educational and occupational information for the explanation of fertility behavior was smaller than expected based on previous research. Previous studies have reported educational fields to be at least as important as educational levels (Bagavos, 2010; Hoem et al., 2006a, 2006b). In this study, except for the results discussed in the previous section, educational fields produced hardly any effects in our model when also controlling for demographic indicators and level of education. Furthermore, the differences between occupational categories were relatively small. To our knowledge, this was the first study that was able to explore these relationships in such detail while using monthly information and full retrospective histories in a multivariate framework. Since our data covered only one country and thus represent a highly specific institutional context, future research is needed to uncover just how important the contribution of educational and occupational fields is when explaining fertility behavior.

5

The Impact of Subjective Work Control, Job Strain and Work-Family Conflict on Fertility Intentions: A European Comparison

The link between employment and fertility is often only examined by focusing on women's labor market status or the impact of part- versus full-time employment. This study introduced a new explanation by examining how women's subjective perceptions of control or autonomy over work, job strain and work-family conflict influenced fertility intentions. National-level measures of childcare enrolment under the age of three and the occurrence of part-time work were also included to examine their relation to fertility intentions and their interplay with perceptions of work. Using data from 23 countries from the 2004/5 European Social Survey (ESS), multilevel logistic regression models of fertility intentions were estimated separately for women without children and women with one child. The results showed that women with higher levels of work control were more likely to intend to have a child. Higher levels of job strain (time pressure) significantly lowered fertility intentions for mothers in contexts where childcare availability was low. The prevalence of part-time work among the female work force predicted the intention to become a mother but had different effects for women who worked part-time themselves compared to full-time employees.

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5.1 Introduction

The difficulty of combining paid work with family responsibilities has been a prominent focus in fertility research and public policy debates. The massive entry of women into the labor market in the 1960s, together with women's gains in educational attainment, are seen as central factors driving fertility postponement (Brewster & Rindfuss, 2000). In fact, around 80 per cent of women between the ages of 25-44 in the European Union are now in paid employment compared to around 50 per cent 30 years ago (OECD, 2007a, 2007b). This is coupled with recent public debates and policy mandates of the European Commission (2004, 2005, 2007) to attempt to simultaneously raise both fertility levels and female employment. To strengthen the labor force and increase European productivity, the Lisbon Strategy called for a rise in women's employment (European Commission, 2004). This was coupled with the strategic goal to increase European fertility (European Commission, 2005, 2007). These mandates raise the potential dilemma of how to combine an increase in female employment with an increase in fertility and thus make paid employment more compatible with family responsibilities (European Commission, 2005; Kohler et al., 2006; Kok, 2004). It also corresponds to a shift in policy from the male breadwinner/female carer model towards an adult worker model of the family (Lewis et al., 2008).

Although the link between participation in paid employment and fertility has been widely studied, employment is often examined by focusing on women's labor market status or number of hours in terms of part- versus full-time employment (e.g., Brewster & Rindfuss, 2000; Budig, 2003; Engelhardt & Prskawetz, 2004; Rindfuss, Guzzo, & Morgan, 2003; Vere, 2007). While we have an increasingly adequate picture of the association between labor market participation and number of hours with fertility intentions and outcomes, we lack an understanding of how subjective perceptions of autonomy and control over work, time pressure and levels of work-family conflict impact fertility decisions.

The central argument of this study is that it is not merely employment versus non-employment that is pivotal, but rather certain job characteristics that enable employment to become more conducive to parenthood. Previous research on work-family conflict has identified various characteristics of 'good' jobs, that allow paid employment to become more compatible with family responsibilities, such as flexibility in timing and organization of work and a higher degree of autonomy (Allen et al., 2000; Eby, Casper, Lockwood, Bordeaux, & Brinley, 2004; Mills & Täht, 2010; Perry-Jenkins et al., 2000).

The study provided several contributions to fertility research by introducing the examination of working conditions and subjective perceptions of work in addition to empirical measures of institutional circumstances that might impact fertility intentions across Europe. The first contribution of this study is that it demonstrated the usefulness of women's subjective experiences, such as their perceived control or autonomy over work, the impact of job strain and work-family conflict to explain fertility desires. A second extension of the literature was the acknowledgement and empirical measurement of national contextual factors that might impact fertility intentions (Mills & Begall, 2010). Women's employment and subjective perceptions do not exist in a vacuum, but are shaped by a wider national context where certain policies enhance or constrain the compatibility of paid work and care (Balbo & Mills, 2011). In this study, we considered the opportunity to work part-time and the availability of childcare for young children (Castles, 2003; Kravdal & Rindfuss, 2008; Rindfuss, Guilkey, Morgan, Kravdal, & Guzzo, 2007). The ability to combine paid work with parenthood differs considerably across Europe. In the Nordic countries, labor force participation rates are generally high throughout the entire family cycle, whereas in Southern, Eastern and to some extent Western Europe (i.e., the German speaking countries), female and maternal paid employment remain highly dependent on the number of children and the educational attainment of women (OECD, 2007a, 2007b). The aim and scope of national family policies such as parental leave and cash benefits for families have been positioned as the underlying reason for the differences found between countries in female labor force participation and fertility. But in how far these policies are effective in increasing fertility or labor force participation has been subject to many studies, most of which yielded ambiguous results (Castles, 2003; Gauthier, 2007b; Hantrais, 1997; Neyer, 2003; Van der Lippe, 2006). This study included national-level measures of childcare enrolment under the age of three and the proportion of part-time female employment to understand how these macro characteristics were related to fertility intentions and examine their interplay with perceptions of work control and strain on fertility intentions.

Our focus is on fertility intentions, and more specifically, the time-dependent intention to have a first or second child within the next three years. Some researchers have argued that fertility intentions are more reliable concerning the total desired number of children for aggregate rather than for individual predictions (Quesnel-Valée & Morgan, 2003) or that the link between intentions and behavior is weak (Toulemon & Testa, 2005). A growing number of studies, however, have demonstrated the high predictive power of fertility intentions. In studies that compare fertility intentions and their subsequent realization, it appears that time-dependent fertility intentions, which refer to the intention to have a child within a

specified time interval, are good predictors of fertility, even after controlling for background and life course variables (Balbo & Mills, 2011; Billari et al., 2009; Schoen et al., 1999; Spéder & Kapitány, 2009). We acknowledge that fertility intentions may be revised due to changing constraints (Spéder & Kapitány, 2009), but also maintain that a measure of time-dependent fertility intentions is appropriate to understand fertility decision-making.

We analyzed the intention to have a first and second child in separate models because the intention to become a parent is commonly viewed as a process guided by different considerations than the decision to have an additional child (Barber, 2001; Hobcraft & Kiernan, 1995). We focused on the intention to have a second child because considering that the total fertility rate is below the replacement level of 2.1 children in most European countries and the widespread two-child norm, we assumed that women who intend to make the transition to a third or higher order birth were a special and distinct group with different motivations and fertility ideals (Alich, 2006; Berinde, 1999). Also time dependent fertility intentions have been found to be most reliable for individuals with no child or one child (Berrington, 2004).

5.2 Theoretical Background

As stated previously, the aim of this study was to introduce new employment-related factors that are associated with the plan to have a(nother) child and test how the effect of these characteristics varies across different institutional contexts. Previous studies relating female employment to fertility have shown that women who work continuously throughout their adult lives have fewer children than women who are not in paid work. In other words, there is a negative relationship between employment and fertility at the individual level. One explanation for this effect is that paid work delays the transition to parenthood mainly by raising the age at first birth (Bernhardt, 1993). A competing argument is that the negative impact of paid work on employment only manifests itself after the first child is born. This is said to be due to the fact that women only become aware of the incompatibility of the mother and worker role when they are confronted with the conflicting demands of childrearing and work and thus delay or forego the birth of a second or third child (Brewster & Rindfuss, 2000). In order to theoretically and empirically evaluate the two modes in which employment presumably affects fertility, we formulate separate hypotheses for women with and without children and also analyzed these groups separately. We first discuss work characteristics, followed by an examination of institutional factors.

Jobs with certain characteristics might be more compatible with family life than others since it is not only the quantity or number of hours, but also the quality of work that matters (Grönlund, 2007; Shreffler, Pirretti, & Drago, 2010). Characteristics

that have been identified as potentially reducing the conflict between work and family life are control over work, such as flexible working times or arrangements (Byron, 2005; Kelly & Moen, 2007; Mills & Täht, 2010; Shockley & Allen, 2007; Van Rijswijk et al., 2004), while stressful and irregular jobs tend to increase the conflict experienced between paid work and family (Byron, 2005; Grönlund, 2007). To understand how these aspects might impact fertility intentions, we drew upon a broader body of literature outside of demographic fertility research on perceived work control, job strain and work-family conflict.

5.2.1 Subjective work control

The underlying requirements for 'good jobs' that facilitate lower friction between work and family are those with higher autonomy (level of independence given to a worker) and variety (extent to which jobs vary in content, location, and routine) (Grzywacz & Butler, 2005). Both job autonomy and variety have been frequently linked to higher worker well-being (Hackman & Oldham, 1976; Karasek, 1979; Kohn & Schooler, 1978) and more recently to the reduction of work-family conflict (Friedman & Greenhaus, 2000; Grimm-Thomas & Perry-Jenkins, 1994; Grzywacz & Butler, 2005). In general, there appears to be an attenuating effect of *autonomy and variety* on work-family conflict, and a positive effect on parenting style and other personality features (i.e., self-esteem) (Friedman & Greenhaus, 2000; Grimm-Thomas & Perry-Jenkins, 1994). Autonomy and variety afford employees the opportunity to learn new things and maintain a feeling of control over their work, thereby enhancing the feeling of responsibility and meaning (Karasek, 1979). The ensuing motivation, energy, and attitudes derived from work can likewise be mobilized to facilitate functioning in other life domains such as the family (Friedman & Greenhaus, 2000) and result in a better 'synergy' between multiple roles (Voydanoff, 2004).

Another important employment feature is the level of *time flexibility* provided by the employer. Flexible work schedules have been shown to have a positive impact on work-family conflict by increasing the time available for family responsibilities and the perception of control (Christensen & Staines, 1990; Han, Miller, & Waldfogel, 2010; Thomas & Ganster, 1995). In a meta-analysis which reviewed 60 studies, Byron (2005) reported that schedule flexibility leads to lower levels of work-family conflict. In a study of the impact of job characteristics on work-family facilitation in the United States, Grzywacz and Butler (2005) found that autonomy and variety were associated with lower reported work-family conflict and higher work-family facilitation. In the Netherlands, Mills and Täht (2010) demonstrated that non-standard and flexible hours resulted in lower relationship conflict and more time spent with children, particularly for men. In a study conducted in three Finnish organizations, Mauno and

colleagues (2006) found that job control (measured as the degree of autonomy in the timing and method of work) protected employees from experiencing high levels of time and strain based work-family conflict.

Since no previous studies linked work control to fertility intentions, we entered into relatively new theoretical terrain. It is possible, however, to draw upon the previous findings related to work-family conflict to formulate a hypothesis related to fertility intentions. In this study, we subsume several aspects under the broader theoretical construct of *work control*, which includes: autonomy (control over the pace and organization of work, low degree of supervision), variety (variety and challenge at work, work requires one to learn new things) and time flexibility (employee can decide when to start and finish work). Based on previous research, our first hypothesis was that: *higher levels of perceived work control would result in more positive fertility intentions to have both a first and a second child.* We assumed that women who have jobs that are characterized by a high degree of work control are more able to combine the demands of childrearing and paid work and would also evaluate the possibility of having a second child more positively than women with lower levels of work control.

5.2.2 Job strain

Not only work control, but also the related concept of *job strain* has been shown to serve as an important factor for work and family compatibility. Job strain may operate via two different mechanisms. The first mechanism emphasizes stress at the workplace. According to this view, job-related strains are reactions or outcomes that result from the experience of stress (Westman, 2005). Building on this approach, we would expect to find a direct negative effect of job strain on various outcomes in private as well as working life, including lower fertility intentions.

A second more nuanced mechanism of job strain has been proposed by Karasek, (1979), who argues that mental strain is dependent on the job demands placed on the worker in combination with the discretion permitted to the worker in deciding how to meet these demands. This definition maintains that the decisive factor in subjective experiences of high job demands is the amount of control granted to the worker. Four types of jobs are distinguished in a 'Job Demand-Control' model, which operates according to the combination of demands and control they offer: passive jobs (low demands, low control), low strain jobs (low demands, high control), active jobs (high demands, high control) and high strain jobs (high demands, low control). This means that aside from the direct effect of job strain and perceived work control, the combination of high job demands and low perceived work control might result in higher strain. The Job Demand-Control model has been tested on various

outcome variables such as well-being, depression, and different aspects of physical health (Van der Doef & Maes, 1999). Several studies also examined whether the model also holds when work-family conflict is considered (Duxbury, Higgins, & Lee, 1994; Grönlund, 2007; Thomas & Ganster, 1995; Voydanoff, 1988; Wallace, 2005), showing that increased job demands are associated with higher work-family conflict, while control has an alleviating effect. In Sweden, for example, Grönlund (2007) found that high job demands increased work-family conflict whereas high job control had the opposite influence. There was, however, no significant interaction between job demands and control, leading the author to conclude that high job demands are associated with higher levels of work-family conflict with the effect of control being rather marginal. Very similar results were obtained in a study of the effect of job control, job demands and social support on work-family conflict and depression in Canadian lawyers (Wallace, 2005). Job strain and work control independently influenced work-family conflict, but no multiplicative effects in the form of significant interactions were found. Since the focus of this study is on fertility intentions and not job strain, we do not empirically test the multiplicative model here, but rather assume that the effect of job strain and work control indeed operate independently on fertility intentions. Based on these previous explanations and findings, we hypothesized that a *high degree of job strain would lead to lower fertility intentions in women who already have one child*. We anticipated that women who do not have children would be less influenced by job strain since they have not as of yet experienced the tension between paid work and family responsibilities that children bring (Brewster & Rindfuss, 2000).

5.2.3 Work-family conflict

A final interrelated concept with work control and job-strain is work-family conflict. Work-family conflict has been defined as "a form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect. That is, participation in the work (family) role is made more difficult by virtue of participation in the family (work) role" (Greenhaus & Beutell, 1985, p.77). Three forms of work-family conflict are generally distinguished: time-based, strain-based and behavior-based conflict.

Time-based conflict is regarded as the most common and occurs when work and family life compete for the individuals' time in such a way that the individual is unable to perform at the desired level in both domains. Strain-based conflict arises when stress or tension experienced in one life domain spill over into the other domain. This includes worries about work, which often leads to impatient or irritable behavior at home (Schulz et al., 2004). Behavior-based conflict refers to the situation

where behavior required in one role makes it difficult to fulfill requirements of another role. One example is the potential role conflict between the stereotypical behavior of managers like aggressiveness and objectivity. This may clash when the same individual is expected to express emotions in the family such as being warm, emotional, and vulnerable (Greenhaus & Beutell, 1985; Hammer & Thompson, 2003). The different types of work-family conflict often overlap and can be difficult to distinguish empirically. As described in more detail shortly, we use a measure of work-family conflict that refers to both time and strain-based conflict since these are the most relevant for the majority of employees (Greenhaus & Beutell, 1985). Our central hypothesis in relation to work-family conflict was that *high levels of conflict between work and private life would lead to lower fertility intentions in women who already have one child*. Women without children were expected to experience less conflict between their paid work and private life since children put a large claim on parents time, especially when they are young. We also expected that women without children that plan to become mothers would be sensitive to these issues and anticipate that *women without children who already place a higher importance on the compatibility of a job with their private life would be more likely to intend to have a child*.

In addition to employment characteristics and individual subjective perceptions, national level policies operate to enhance or constrain the compatibility of work and care. In this study, we focused on policies designed to maintain or promote the labor force participation of women rather than policies aimed at stay-at-home mothers or the provision of long unpaid leave that might elicit a negative effect on mothers' participation in paid work. Policies that enhance the compatibility between work and care included affordable childcare facilities and the opportunity to work part-time since both reduce the opportunity costs of having children (Gauthier, 2007b; Walsh, 2007).

5.2.4 Childcare availability

Adopting the assumption that a reduction in the opportunity costs of childbearing results in higher fertility, childcare availability has frequently been hypothesized as having a positive influence on fertility (Becker, 1991). The empirical evidence generally shows that a higher availability of childcare has a positive impact on fertility, but there are also some mixed findings (Gauthier, 2007; Kravdal, 1996). Brewster and Rindfuss (2000) found a positive effect of childcare availability on the combination of childrearing and paid employment, showing a higher return to the labor market after childbirth. Others have likewise demonstrated that fertility is positively influenced by reducing childcare costs and increasing childcare availability

(e.g., Del Boca, 2002; Diprete & Morgan, 2004). Hank and Kreyenfeld (2003) found that access to informal childcare arrangements significantly increased the transition to first birth in Germany, concluding that availability and not affordability of childcare was central. Rindfuss et al. (2007; 2010) also found that increased childcare availability in Norway clearly and consistently had a positive effect on fertility. In this study, we focus on childcare for the youngest group of children under three years old, which has been demonstrated as a crucial period for the labor market re-entry of women (Castles, 2003). We considered it as a close empirical proxy to capture childcare as a policy designed to maintain a mother's continuous labor force participation throughout her childbearing years. Here our hypothesis was that a *higher availability of childcare for young children would have a positive influence on the intention to have a first and second child for women in paid employment*. Furthermore, as an extension of our previous argumentation regarding the importance of work control for fertility decision-making, it was expected that a *heightened level of work control would be more important in countries with less institutional support in the form of childcare availability*. This was attributed to the fact that women in these countries are more dependent on their individual resources if they want to combine childrearing and work. We likewise expected that *higher levels of job strain and work-family conflict would be associated with lower intentions to have a child particularly in countries where the institutional support of childcare availability is lower.*

5.2.5 Part-time work

Part-time work, usually defined as working less than 30 hours per week, is one of the most widely used work arrangements among women of childbearing age to manage work and family responsibilities. In fact, roughly one third of women aged 25-49 employed in Europe work part-time (Margherita, O'Dorchai, & Bosch, 2009; Van Bastelaer, Lemaitre, & Marianna, 1997). The prevalence of part-time work varies considerably across countries, ranging from over 70 per cent in the Netherlands, compared to less than 5 per cent of women in Bulgaria and Slovakia (Eurostat Statistical Database, 2009, see Supplemental Table 13 in Appendix D). When part-time work is considered as a way to reduce the incompatibility between work and family life, the assumption is that women work these hours deliberately and voluntarily. This assumption, however, is potentially problematic as one aspect of part-time work is that it is often associated with 'bad' jobs, which are jobs with unfavorable working conditions that offer limited perspectives for advancement (Blossfeld & Hakim, 1997; Kalleberg, 2000) or have a stigmatizing effect, signaling to the employer that commitment to work is low (Walsh, 2007).

Besides being concentrated in certain sectors (i.e., hotel and restaurants, health

and education) and lower paying occupations, there is little empirical evidence that part-time workers in Europe experience their jobs as being worse in quality than a comparable full-time position. A recent examination of working conditions and work-family reconciliation in Europe showed that more than 60 per cent of women in part-time work named family responsibilities as a reason to not work full-time, whereas only one fifth indicated that she could not find a full-time job (Margherita et al., 2009). In addition, in terms of work life balance, mothers in particular report positive effects of working reduced hours (Fagan & Burchell, 2002; Van Rijswijk et al., 2004). In addition to controlling for whether women work part- or full-time at the individual level, we also included the opportunity to work part-time in this study as a characteristic of the institutional context. The prevalence of part-time work among women in a country is associated with institutional aspects and overall working-time regimes, such as the rigidity of the labor market and thus affects the ability of individuals to opt for reduced hours. In this respect we hypothesized that *a higher prevalence of part-time work among women within a country would be associated with positive fertility intentions in the case of women who already have one child*. This was due to the fact that these women are more likely to have already experienced time scarcity in full-time employment due to their family responsibilities. Since women who do not have children are expected to be more concerned about establishing themselves in the labor market and building a career, the prevalence of part-time work is not anticipated to influence the intention to have the first child. Furthermore, we also expected an additive effect of work characteristics when the institutional context offered less opportunities to work reduced hours and expected that *heightened levels of work control would be more important for intending a second child in countries with a lower availability of part-time work.* Due to the fact that women in these countries were expected to experience a stronger time-squeeze when combining paid work and family responsibilities, we also anticipated that *higher levels of job strain and work-family conflict would be associated with lower intentions to have a second child in countries with a lower availability of part-time work.*

5.3 Method

5.3.1 Data and sample

Data used came from the second wave of the European Social Survey (ESS), a large-scale quantitative survey administered in 2004/5 across Europe (ESS, 2004). In each country, a representative random probability sample was drawn with strict quality controls employed to ensure that all national samples met the requirements. Each wave of the ESS consists of a core questionnaire on attitudes and values and rotating modules. The 2004/5 wave contained a module on family, paid work, and well-being

which included information on family life and fertility intentions. The total sample consisted of 49,066 respondents, which was subsequently reduced further to examine fertility intentions as realistically as possible. We excluded Turkey and Ukraine from the analyses, leaving 23 countries (see Supplemental Table 13 in Appendix D) for a complete list of all countries).[19] We also opted to examine women only due to the very different mechanisms involved in paid employment and fertility men. This meant that the sub-sample used in these analyses included women who were not older than 45 years at the time of the interview and lived together with their partner or husband. The sample also only included respondents who were engaged in paid labor as a dependent worker[20] for at least one hour in the week prior to the interview. The final restricted sample used here consisted of 1,533 female respondents. For details of the descriptive statistics, refer to Supplemental Table 12 in Appendix D.

5.3.2 Measures

The *dependent variable* were fertility intentions, which were measured by the question of whether the respondent intended to have a(nother) child within the next three years, answered on a four point scale (definitely not, probably not, probably yes, definitely yes). This variable was subsequently recoded to a dichotomous measure of fertility intentions in which the answers probably not and definitely not were coded as 0) 'no' and the answers probably yes and definitely yes was coded as 1) 'yes'.

Explanatory micro-level variables. Perceived work control was measured by an index of six items that asked whether the respondent was allowed to influence the: (a) pace of work (b) daily organization of work (c) policy decisions (d) whether the work done required learning new skills (e) offered variety and challenge and (f) was not closely supervised. These six items were averaged into a scale that ranged from 0.5 to 7.5 with higher values indicating more perceived work control. Internal reliability of the scale is sufficient (Cronbach's $\alpha = .74$). In order to facilitate interpretation, the scale was centered around the mean.

Job strain was measured by the extent to which the respondent felt that there was never enough time to get everything done at work (coded from 1 disagree strongly to 5 agree strongly).

[19] Turkey is not included due to the fact that results resemble those from non-Western countries and the related cultural and socio-economic differences. Ukraine had to be excluded due to the lack of reliable macro-level institutional data.

[20] Unfortunately questions concerning job characteristics were not recorded for self-employed respondents.

Work-family conflict was measured by a scale that was constructed using four items asking how often the respondent: (a) kept worrying about work problems when not working (b) felt too tired after work to enjoy the things they would like to do at home (c) found that their job prevented them from giving the time they want to their partner or family and (d) found that their partner or family got fed up with the pressures of their job. The four items were averaged into a scale running from 1 to 5, with higher values indicating more conflict (Cronbach's α = .72). Once again, to facilitate interpretation, the scale was centered around its mean. A measure of the importance placed on being able to combine family and work when choosing a job (coded from 1 not important at all to 5 very important) was also included as a continuous measure.

Control variables. The *educational attainment* of respondents was measured by the total number of years the respondent was enrolled in full-time education. Also the number of years the respondent was employed was included to account for individual differences in labor market attachment. To facilitate interpretation, both variables were centered around the mean. Furthermore, respondents' *age (centered)* and, if applicable, the age of the first child was included in the analysis. The number of weekly working hours was also included. As described shortly, models are estimated for women with and without children. In the model for women without children, a cross-level interaction term of the proportion of women working part-time on the country level by a dummy indicating whether the respondent herself works in a part-time job (30 hours or less per week) was included. The cut-off point of 30 hours is in line with the definition applied by the OECD in comparative studies (Van Bastelaer et al., 1997). Furthermore, the educational attainment of the partner was included (measured using 6 categories ranging from 0 = not completed primary to 6 = second level tertiary education). Due to high levels of non-response, it was not possible to include additional information about the partner, such as weekly working hours or access to flexible working times.

Explanatory macro level variables. The availability of *child care* facilities was measured at the country level, with a variable that indicated the percentage of children aged 0 to 3 enrolled in formal childcare (OECD, 2005). Opportunities for *part-time work* were measured by the share of women working part-time (percentage of part-time work among the female working population, Eurostat 2009). In order to facilitate interpretation of the coefficients, both variables are divided by 10 and centered around their mean (see Supplemental Table 13 in Appendix D for macro-indicators per country).

5.3.3 Analysis

A multilevel binary logistic model was run in Stata 10.1 (StataCorp, 2007) with separate models estimated for women without children and those with one child. The multilevel binary logistic model was a two-level random coefficient model with respondents (*i*) nested in the country cluster *j*, which included a random intercept u_j for clusters in the latent response model (Rabe-Hesketh & Skrondal, 2008; Rabe-Hesketh, Skrondal, & Pickles, 2004). The amount of variance attributable to the country level (variance partition coefficient (VPC)) can be calculated as $\sigma^2_{u0}/(\sigma^2_{u0}$ +3.29) in logistic multilevel models. Although we acknowledge that the estimates should be interpreted with some caution since this approach of calculating the VPC is influenced by the explanatory variables in the model. In other words, the inclusion of certain level one variables might increase the estimated VPC compared to the empty model (Snijders & Bosker, 1999; Steele, 2009). In our analysis in the empty models the between-country variance in fertility intentions was estimated to be 7.3% (women without children) and 10.2% (women with one child) respectively. After estimating the full model, the between-country variance in the sample of women without children was fully explained by introducing the contextual variables and the cross-level interactions. In the sample consisting of mothers with one child, the between-country variance in the full model was reduced to 5%.

In order to test whether the effect of the main explanatory variables varied between countries, random slopes for these variables were introduced in the model but there was no evidence that the relationship between fertility intentions and work characteristics varied across countries. Therefore the final model only contained a random intercept to account for differences in fertility intentions in the various countries.

5.4 Results

The results of the regression analysis are presented in Table 5.1. The first and expected finding was that the results were markedly different for women with and without children. This supports previous research, which has also found that issues such as work-family conflict, job strain and control only become salient after the birth of a first child (e.g., Brewster & Rindfuss, 2000). Recall that our first expectation was that a heightened level of perceived work control would positively influence the intention to have a first child (for women without children) and a second child (for those who already had one child). The results supported this expectation for women who already had one child. In other words, women who experienced higher levels of work control were more likely to intend to have their second child.

We found no support for our second hypothesis, where we anticipated that a high level of job strain would lead to lower fertility intentions for women that already have children. Recall that job strain tapped the subjective perception that one is unable to get everything done at work, which is a job characteristic that is intrinsically difficult to combine with having another child. One explanation is that these are challenging jobs that offer career perspectives perceived as being incompatible with having additional children. However, as indicated by the significant interaction coefficient between job strain and childcare availability, the direction of the effect of job strain on fertility intentions differed according to the level of childcare availability. To facilitate interpretation of these interaction effects, we graphed the predicted probabilities in Figure 5.1, which were calculated holding the group-level residual at its mean of zero (i.e., substituting $u_j = 0$, Steele 2009). Turning to the right panel of Figure 5.1, we see that women who experienced higher levels of job strain (i.e., time pressure at work), were more likely to intend to have a second child when childcare availability is high while the relationship goes in the opposite direction when childcare availability is low. This was in line with our cross-level interaction hypothesis where we expected that work characteristics would have stronger negative effects in settings where the institutional context was less supportive. Our results suggested that higher childcare availability was related to higher second birth intentions for women who experienced high levels of time pressure at work Our third hypothesis predicted that higher levels of work-family conflict would translate into lower fertility intentions for women who already have children. The results showed a strong and positive effect of work-family conflict for mothers with one child, contradicting our expectations. A plausible explanation is that it was precisely these women who experienced the highest levels of work-family conflict that were also those who placed the highest value on their job and family. Therefore these women were most likely to stay in paid work while at the same time not compromising their fertility plans. Turning to the institutional effects, recall that our initial expectation was that the higher availability of childcare would have a positive impact on the intention to have both a first or second child. We did not, however, find any linear positive effect of childcare, neither for women without children nor for mothers of one child. There was however, as described previously, evidence of a diverging effect of higher enrolment in formal childcare on fertility intentions for mothers with one child who experienced high levels of job strain (see Figure 5.1, right panel). The quadratic term of childcare enrolment was significant and positive in the analysis of women without children, suggesting that the relationship between childcare enrolment and fertility intentions was u-shaped with positive effects at the lower and higher ends of the scale.

The reason for the absence of a linear effect might be that the enrolment of children under the age of three in formal care might not sufficiently tap into the availability of care of individual parents, which has been shown to have a positive effect on fertility (Rindfuss et al. 2007; 2010). Nationwide availability, we believe, indicates the general policy climate concerning the compatibility of paid work and childrearing for women. Previous research has shown that particularly in countries in Central and Eastern Europe, characterized by a low availability of formal childcare and high female labor force participation, informal care provided by grandparents and other relatives plays a key role in attenuating conflicts between work and family responsibilities (Bühler & Fratczak, 2007; Bühler & Philipov, 2005; Sobotka, 2002), which could be one explanation for the u-shaped effect found for women without children.

Our final expectation was that a higher prevalence of part-time work among women within a country would be associated with positive fertility intentions in the case of women who already have one child. The results did not, however, support this hypothesis. We found, however, a consistent and negative effect of part-time work on fertility intentions for women without children. To explore this unexpected finding further, we added a quadratic term of this variable into the analysis to see whether the negative effect was linear or u-shaped. The quadratic term proved to be significant which led us to conclude that women without children in countries with either a very low or very high proportion of women working part-time have higher first birth intentions than women from countries with moderate part-time employment possibilities. To explore this effect further, we then added a dummy variable measuring whether the respondent works part-time herself and interacted this variable with the institutional indicator of the proportion of part-time work among the female workforce. This interaction was significant and positive, indicating that the relationship between fertility intentions and part-time work on the country level was u-shaped for women who worked more than 30 hours per week, but J-shaped for women working part-time themselves (see Figure 5.1, left panel). As Figure 5.1 illustrates, the two lines intersected slightly below the mean of female part-time work, indicating that women who worked full-time (i.e., more than 30 hours per week) have higher fertility intentions compared to those who work part-time in countries where the proportion of female part-time employment was lower than the overall sample average. One explanation for this finding might be the type of jobs where part-time work is located in different institutional settings. In countries where part-time work is less prevalent, part-time jobs tend to be of a lower quality in aspects such as wages. In these contexts, it would be particularly women without children that might view part-time employment as more of a constraint than an

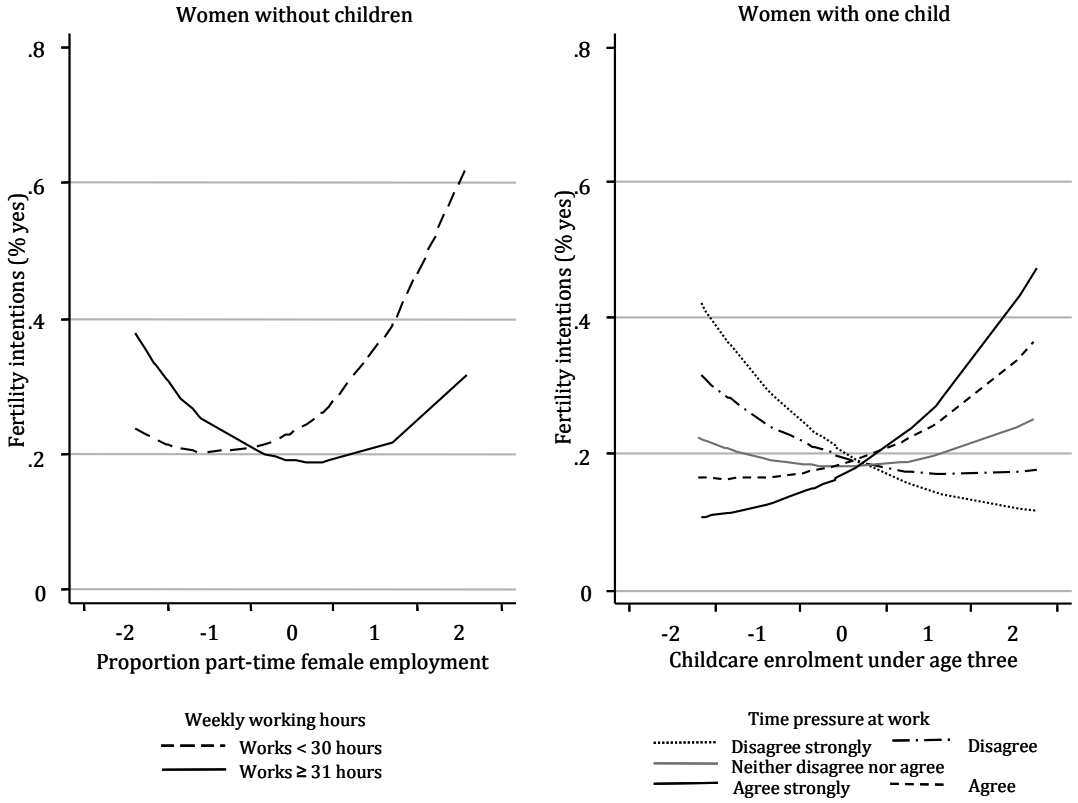
Table 5.1 *Results of multilevel logistic regression of intention to have a(nother) child in next three years*

	Women without children								Women with one child							
	Model 1				Model 2				Model 1				Model 2			
	B	SE		OR	B	SE		OR	B	SE		OR	B	SE		OR
Age at birth 1st child	n.a.				n.a.				-0.15	0.0	**	0.86	-0.15	0.0	**	0.86
Work experience (years)	-0.07	0.0	**	0.93	-0.08	0.0	**	0.93	-0.04	0.0		0.96	-0.04	0.0		0.96
Age	-0.09	0.0	**	0.91	-0.09	0.0	**	0.91	-0.12	0.0	**	0.89	-0.12	0.0	**	0.89
Years of fulltime education	0.07	0.0	*	1.07	0.07	0.0	*	1.07	0.06	0.0		1.06	0.05	0.0		1.05
Educational attainment partner	0.14	0.0	*	1.15	0.14	0.0	*	1.16	0.07	0.0		1.07	0.08	0.0		1.08
Weekly working hours	0.03	0.0	*	1.03	0.03	0.0	*	1.03	0.00	0.0		1.00	0.00	0.0		1.00
Part-time: works less than 30 hours per week	0.33	0.3		1.39	0.11	0.3		1.12	0.53	0.3		1.70	0.40	0.4		1.49
Work-family comp. important when choosing	0.31	0.1	**	1.36	0.28	0.1	*	1.32	0.06	0.1		1.07	0.09	0.1		1.10
Work characteristics																
Work control	0.11	0.0	†	1.12	0.11	0.0	†	1.12	0.14	0.0	†	1.15	0.15	0.0	*	1.17
Time pressure at work	0.08	0.0		1.08	0.11	0.0		1.11	-0.10	0.0		0.90	-0.11	0.1		0.89
Work-family conflict	-0.11	0.1		0.90	-0.10	0.1		0.90	0.32	0.1	*	1.37	0.28	0.1	*	1.32
Country level variables																
Childcare enrolment age < 3	-0.05	0.0		0.95	-0.11	0.1		0.90	-0.05	0.1		0.95	-0.57	0.2	**	0.57
Childcare enrolment age < 3 squared	0.06	0.0	*	1.07	0.08	0.0	*	1.08	0.03	0.0		1.03	0.04	0.0		1.04
Proportion women working part-time	-0.20	0.0	**	0.82	-0.11	0.1		0.89	-0.04	0.1		0.96	0.03	0.2		1.03
Proportion women working part-time squared	0.07	0.0	**	1.07	0.06	0.0	*	1.06	0.01	0.0		1.01	0.00	0.0		1.00
Cross-level interactions[1]																
Time pressure * childcare enrolment age < 3					0.01	0.0		1.01				0.17	0.06		**	1.18
Part-time work * prop. women working part-					0.25	0.1	*	1.03				0.11	0.16			1.01
Constant	1.50	0.9			1.54	0.9			4.43	1.3	**	4.43	1.41		**	
Level 2 variance $\sigma(u_i)$	0.00				0.00				0.18		*		0.22		*	
Log likelihood	-412.3				-409.6				-320.3				-315.7			
N_j countries	23				23				23				23			
N_i women	800				800				722				722			

Source: European Social Survey 2004/5, calculations by authors, OR = Exponentiated coefficients, two-tailed p values

Note: [1] † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Cross-level interactions of all work characteristics with both country level variables were included in the final model, non-significant results were omitted from the Table to preserve space. Results available from the authors upon request.



Source: ESS 2004/2005, calculations by authors
Note: Predicted probabilities for $u_j = 0$

Figure 5.1 *Graphical representation of cross-level interaction effects*

opportunity to combine family and work responsibilities. Conversely, in countries where a large proportion of women are employed in reduced working hours, part-time work would be less likely related to the quality or level of the job.

Finally, it is interesting to note the varied effects of the control variables we included in the models for women with and without children. For women without children, higher labor force attachment, indicated by more years in paid employment, was associated with lower fertility intentions, while women's own education, their partners' education and a higher number of weekly working hours predicted the intention to become a mother.

For women with one child, the results showed a different pattern of the control variables, with only age and the age of the first child serving as significant predictors of fertility intentions. In order to explore the idea that women without children are less influenced by the characteristics of their present job because they are not yet aware of difficulties that might arise once they have to combine employment with parenting, we introduced a variable in the model to measure the extent to which the

respondent thought that when choosing a job it was important that the job allowed them to combine work and family. Placing a higher importance on this hypothetical job characteristic significantly predicted the intention to become a mother but was not associated with the intention to have a second child.

5.5 Conclusions

This study contributed to the existing fertility literature by introducing working conditions, subjective perceptions of work and empirical measures of institutional circumstances to understand fertility intentions across Europe. To theoretically and empirically evaluate the different ways in which employment affected fertility intentions, separate hypotheses for women with and without children were formulated and tested.

Previous research on perceived work control, job strain and work-family conflict outside of demographic fertility research was used to develop theory and hypotheses about how these factors might influence fertility intentions. Our results showed that while the 'objective' indicators of labor market position and conditions (labor force experience, working hours, educational attainment of a woman and her partner, prevalence of part-time work) are strong predictors of the intention to become a mother, the intention to have a second child was more strongly associated with work characteristics. Perceived work control in the form of autonomy and variety in work and time flexibility has previously been shown to have a positive effect on reducing work-family conflict. Extending these previous assumptions to fertility intentions, we found support for our expectation that those with higher levels of work control would be significantly more likely to intend to have a second child.

Previous research in the domain of work-family conflict has also shown that job strain is an important factor, yet to date there is a lack of research linking this type of conflict to fertility intentions. The current study found that for women who already have a child, higher levels of negative job strain (time pressure) had an effect on the intention to have a second child only in combination with the availability of formal childcare for young children. We believe that this was because if one already experiences an inability to get everything done at work, that it would be difficult to combine this job with having an additional child when the level of institutional support is low (see also Rindfuss et al. 2010).

While the effect of work control operated in the expected direction, we found an unexpected positive effect of a higher amount work-family conflict on the intention to have a second child. We believe that this effect can be attributed to the fact that mothers of one child who remained in paid work but place high importance on family life and on having another child might be more likely to experience higher levels of

conflict between paid work and family responsibilities. These women might not want to compromise on family size but still place high importance on participating in the labor force. Unfortunately, we had no measure of labor market attachment in our data that would permit us to test whether this is the case. That the effect of work-family conflict on fertility intentions was not as straightforward as expected is highlighted by the fact that the only other study, to our knowledge, that used work-family conflict to predict fertility intentions by Shreffler and colleagues (2010) failed to find a significant direct effect of the perceived conflict between work and family (measured by a single item) of men and women on the intention to have a child within the next three years in a sample of dual-earner couples in the United States.

The results of this study demonstrated clear differences for women with and without children, once again underlining the finding that issues such as work-family conflict, job strain and control only become salient after the birth of a first child, (Brewster and Rindfuss 2000). This does of course not mean that women without children are oblivious to these issues, which was demonstrated by the effect of the measure of the importance of work-family compatibility when choosing a job. Placing a higher importance on being able to combine a job with family life was associated with the intention to become a parent, indicating that women without children were aware of potential friction between these domains of life but related these potential frictions less to their present job and work characteristics than mothers of one child for whom no effect of this prospective measure was found.

A strength of this study was to go beyond previous theoretical discussions that underline the importance of institutional factors in shaping fertility, to empirically examine how national level policies in combination with subjective perceptions of paid work can enhance or constrain the compatibility of work and care. We empirically examined how childcare availability for children under three years of age and the prevalence of part-time work among women within a country impacted the intention to have a second child. We obtained some mixed and interesting findings in this respect. Contrary to our expectation, only the quadratic terms of both institutional indicators predicted the intention to have a first child, while no significant main effects were found for mothers of one child. We additionally found two interesting cross-level interactions showing that childcare availability was positively associated with fertility intentions for mothers in stressful jobs and that part-time work was only associated with a lower intention to become a mother in contexts where only few other women work part-time.

In conclusion, it appears that in order to enable women across Europe to fulfill their desires and ambitions in the work as well as the family domain, the institutional as well as the workplace characteristics and the subjective experiences of

employment can play a crucial role. The option of staying at home for extended periods of time during the most productive years of life is no longer a viable option for the large majority of European women, neither economically nor in terms of self-actualization and societal participation. Foregoing the birth of children or having a smaller family than desired on the other hand seems to be a very high price to pay in exchange for employment. Creating and implementing policies that are effective in promoting work-life balance certainly remains a challenge for many policy-makers. It is the hope that this study provides some insights into the more nuanced mechanisms and impact of workplace characteristics and subjective experiences of employment and work-family balance that afford individuals with the ability to fulfill multiple roles in both the workplace and family.

Appendix

Supplemental Tables

Appendix A: Supplemental Tables Chapter 2

Supplemental Table 1. Distribution and number of events for categorical variables of transition to first birth and sample selection model

	Start relationship to 1st birth		Age 15 to start relationship	
	# Birth events	Exposure Couple	Exposure Women	Exposure Men
Age of female partner at start relationship: ≤ 17	579	44.3		
18 - 22	650	42.5		
≥ 23	236	13.2		
Historical period: 1956-69	137	8.4	15.7	18.0
1970-79	331	20.9	24.3	24.9
1980-89	417	33.4	34.4	31.8
1990-2003	580	37.4	25.6	25.3
Birth cohort female: 1940-49	324	16.5	24.8	
1950-59	475	30.2	30.1	
1960-69	540	38.8	30.7	
1970-85	126	14.5	14.5	
Birth cohort male: 1940-49	422	22.1		25.7
1950-59	517	33.7		32.1
1960-69	454	34.9		30.0
1970-85	72	9.4		12.2
Relationship status: Dating	127	46.9		
Cohabiting	198	20.1		
Married	1,140	33.1		
Main activity female: Employed	1,163	73.4	47.8	
Housewife	191	4.1	6.6	
Unemployed / inactive / disabled	53	3.5	4.2	
Enrolled in education	46	19.1	41.5	
Main activity male: Employed	1,366	80.5		50.4
Unemployed / inactive / disabled	39	4.0		6.7
Enrolled in education	47	15.5		42.9
Educational attainment female: lower secondary or less	408	22.1	24.2	
Short upper secondary / short vocational	307	19.9	21.7	
Upper secondary / vocational	411	31.7	30.9	
Higher professional / tertiary	339	26.3	23.3	
Educational attainment male: lower secondary or less	405	23.1		26.8
Short upper secondary / short vocational	235	15.9		16.4
Upper secondary / vocational	382	29.3		33.0
Higher professional / tertiary	443	31.8		24.0
Weekly working hours female partner: Not working	302	27.5	54.7	
1 – 19 h	80	3.3	3.1	
20 – 34 h	300	16.2	7.0	
≥ 35	746	53.0	35.2	
Supervisory position female partner: Not working	302	27.5	54.7	
Not supervising	964	60.8	38.1	
Supervising at least one person	163	11.7	7.2	
Supervisory position male partner: Not working	99	20.7		51.4
Not supervising	925	57.2		36.8
Supervising at least one person	429	22.2		11.8
Career dynamics and employment transitions female: No change	1,274	88.4	90.5	
Started working	39	6.9	6.9	
Downward job move	22	1.9	1.2	
Upward job move	27	2.7	1.7	
Career dynamics and employment transitions male: No change	1,233	88.3		90.2
Started working	41	5.8		6.6
Downward job move	39	2.2		1.4
Upward job move	49	3.7		1.9
Employment relationship female: Not working	302	27.5	54.7	
Employee	1,089	70.7	43.1	
Self-employed	44	1.8	2.2	
Employment relationship male: Not working	99	20.6		51.3
Employee	1,293	76.2		46.0
Self employed	59	3.2		2.7
# Time periods (exposure)	58105		70,416	87,382
N couples / individual respondents (# birth events)	1,849	(1,465)	2,264 (n.a.)	2,354 (n.a.)

Supplemental Table 2. Distribution and number of events for continous variables of transition to first birth and sample selection model

	Start relationship to 1st birth		Age 15 to start relationship	
	Couples		Women	Men
	Mean (sd)	Range	Mean (sd)	Mean (sd)
Relationship duration	5.15 (4.56)	0 / 29		
Age of female partner	24.08 (5.34)	15 / 45	22.7 (7.0)	
Age of male partner	26.27 (5.73)	15 / 57		22.9 (7.1)
Weekly working hours male partner	32.58 (18.05)	0/100		20.2(21.8)
Occupational status female (ISEI) / 10	3.51 (2.48)	0/9	2.1 (2.5)	
Occupational status male (ISEI) / 10	3.70 (2.34)	0/8.8		2.1(2.5)
Exposure	58,105		70,416	87,382
N Couples / respondents /(# events)	1,849	(1,465)	2,264 (n.a.)	2,354 (n.a.)

Supplemental Table 3. Results of binary Heckman sample selection model of transition to first birth (outcome equation) and selection into relationship (selection equation) for male and female respondents

	(1) Female respondents			(2) Male respondents		
	B	S.E.		B	S.E.	
Transition to first birth						
Age female partner at start of relationship (ref < 17)						
18 - 22	0.069	0.117		0.069	0.097	
≥ 23	0.282	0.132	*	0.315	0.119	***
Relationship duration (years)	0.072	0.021	***	0.074	0.018	***
Relationship duration ^{2}	-0.004	0.001	***	-0.004	0.001	***
Age at start <17 * relationship duration						
Age at start 18 – 22 * relationship duration	0.024	0.024		0.025	0.021	
Age at start ≥ 23 * relationship duration	0.064	0.038	†	0.058	0.035	†
Age at start < 17 * relationship duration ^{2}						
Age at start 18 – 22 * relationship duration ^{2}	-0.003	0.001	*	-0.003	0.001	**
Age at start ≥ 23 * relationship duration ^{2}	-0.012	0.003	***	-0.011	0.003	***
Historical period (ref 1960-69)						
1970-79	-0.401	0.067	***	-0.416	0.063	***
1980-89	-0.498	0.073	***	-0.520	0.066	***
1990-2003	-0.364	0.078	***	-0.393	0.070	***
Relationship status (ref dating)						
Cohabiting	0.446	0.052	***	0.448	0.052	***
Married	0.984	0.048	***	0.985	0.049	***
Main activity female (ref employed)						
Homemaker	0.210	0.213		0.189	0.211	
Unemployed / disabled	-0.629	0.267	*	-0.620	0.258	*
In education	-0.313	0.122	*	-0.295	0.115	**
Main activity male (ref employed)						
Unemployed / disabled / inactive	0.158	0.158		0.144	0.130	
In education	-0.040	0.165		-0.068	0.126	
Educational attainment female (ref lower secondary)						
Short upper secondary / short vocational	-0.072	0.045		-0.075	0.046	
Upper secondary / vocational education	-0.069	0.040	†	-0.070	0.040	†
Higher professional / tertiary education	-0.074	0.050		-0.069	0.048	
Educational attainment male (ref lower secondary)						
Short upper secondary / short vocational	-0.069	0.046		-0.067	0.047	
Upper secondary / vocational education	-0.090	0.040	*	-0.091	0.041	*
Higher professional / tertiary education	-0.030	0.046		-0.028	0.046	
Weekly working hours female (ref ≥ 35) [1]						
20 – 34 hours	0.164	0.062	**	0.163	0.062	**
1 – 19 hours	0.005	0.034		0.005	0.033	

Supplemental Table 3 continued

	(1) Female respondents			(2) Male respondents		
Transition to first birth	**B**	**S.E.**		**B**	**S.E.**	
Weekly working hours male partner	0.004	0.003		0.003	0.002	
Occupational status female (ISEI) / 10	-0.026	0.012	*	-0.027	0.011	*
Occupational status male (ISEI) / 10	-0.006	0.013		-0.006	0.012	
Supervisory position female partner (ref no) [1]	-0.151	0.038	***	-0.149	0.038	***
Supervisory position male partner (ref no) [1]	0.028	0.031		0.027	0.031	
Career dynamics and employment transitions						
Started working	-0.105	0.069		-0.075	0.067	
Downward job move	-0.257	0.098	**	-0.331	0.106	**
Upward job move	-0.145	0.082	†	-0.136	0.082	†
Career dynamics and employment transitions male						
Started working	-0.052	0.070		-0.071	0.071	
Downward job move	0.055	0.076		0.077	0.074	
Upward job move	-0.003	0.065		0.003	0.064	
Female self-employed (ref employee)[1]	0.183	0.075	*	0.189	0.074	*
Male self-employed (ref employee) [1]	-0.032	0.075		-0.030	0.071	
Couple interaction: work hours male partner by main activity female (ref female partner employed)						
Homemaker * work hours male	-0.001	0.005		0.000	0.005	
Not employed * work hours male	0.012	0.006	*	0.012	0.006	*
Enrolled * work hours male	-0.002	0.003		-0.002	0.003	
Constant	-2.416	0.306	***	-2.361	0.234	***
N time periods	54,771			55,49		
N couples	1,794			1,798		
Selection into relationship						
Age (ref 17 - 19)						
< 17	0.514	0.028	***	-0.631	0.035	***
19-22	0.896	0.043	***	0.592	0.025	***
22-25	1.142	0.054	***	0.982	0.037	***
> 25	0.919	0.068	***	1.011	0.051	***
Birth cohort (ref 1940-50)						
1951-1960	0.303	0.076	***	0.168	0.068	*
1961-1970	0.504	0.072	***	0.297	0.064	***
>1970	0.506	0.077	***	0.229	0.075	**
Main activity female (ref employed)						
Homemaker	-0.456	0.102	***	n.a.	n.a.	
Unemployed / disabled	-0.369	0.101	***	-0.654	0.067	***
In education	-0.250	0.088	**	-0.247	0.073	***
Educational attainment (ref lower secondary)						
Short upper secondary / short vocational	-0.042	0.075		0.120	0.073	†
Upper secondary / vocational education	-0.024	0.069		0.092	0.065	
Higher professional / tertiary education	-0.132	0.080		0.134	0.072	†
Status first job (ISEI) (ref medium low)						
No first job	-0.237	0.099	*	-0.208	0.080	**
Status low	-0.009	0.086		0.033	0.077	
Status medium high	0.039	0.072		-0.019	0.076	
Status high	0.061	0.111		-0.221	0.098	*
Constant	-1.032	0.092	***	-1.014	0.068	***
N time periods	123,231			141,036		
N individuals	2,357			2,306		
Rho	0.071	0.107		0.035	0.136	
Log likelihood	-81,251.49			-85,986.8		

Source: FNB 1998/2000/1003, calculations by author
Note: † p < 0.10, * p < 0.05, ** p < 0.01
Robust standard errors adjusted for clustering of time period in individuals

Supplemental Table 4. Specification of duration dependence and control variables of models presented in Table 2.2

	Model with random effects									Sample selection Model		
	Female only			Male only			Both partners			Both partners		
	B	S.E.		B	S.E.		B	S.E.		B	S.E.[a]	
Age female partner at start of relationship (ref < 17)												
18 - 22	0.049	0.096		0.095	0.090		0.059	0.097		0.069	0.117	
≥ 23	0.328	0.124	***	0.388	0.117	***	0.327	0.125	***	0.282	0.132	*
Relationship duration (years)	0.081	0.018	***	0.084	0.017	***	0.078	0.018	***	0.072	0.021	***
Relationship duration ^{2}	-0.003	0.001	***	-0.004	0.001	***	-0.003	0.001	***	-0.004	0.001	***
Age at start <17 * relationship duration												
Age at start 18 – 22 * relationship duration	0.033	0.023		0.019	0.022		0.033	0.023		0.024	0.024	
Age at start ≥ 23 * relationship duration	0.073	0.041	†	0.047	0.040		0.073	0.041	†	0.064	0.038	†
Age at start < 17 * relationship duration ^{2}												
Age at start 18 – 22 * relationship duration ^{2}	-0.003	0.001	**	-0.002	0.001	*	-0.003	0.001	*	-0.003	0.001	*
Age at start ≥ 23 * relationship duration ^{2}	-0.012	0.003	***	-0.010	0.003	**	-0.012	0.003	***	-0.012	0.003	***
Historical period (ref 1956-69)												
1970-79	-0.431	0.059	***	-0.461	0.056	***	-0.414	0.060	***	-0.401	0.067	***
1980-89	-0.566	0.062	***	-0.625	0.058	***	-0.544	0.063	***	-0.498	0.073	***
1990-2003	-0.431	0.064	***	-0.529	0.059	***	-0.414	0.064	***	-0.364	0.078	***
Relationship status (ref dating)												
Cohabiting	0.442	0.055	***	0.461	0.053	***	0.433	0.055	***	0.446	0.052	***
Married	1.031	0.051	***	1.051	0.050	***	1.016	0.052	***	0.984	0.048	***
Constant	-2.304	0.097	***	-2.507	0.120	***	-2.388	0.141	***	-2.416	0.306	***
σ_{ui} (s.e.)	0.221	0.044	***	0.143	0.054	***	0.219	0.045	***			
ρ										0.071	0.107	
Observations		54,791			54,791			54,791			54,791	
Log likelihood (df)		-5,491.8	(29)		-5,562.1	(27)		-5,478.1	(44)		-81,251.5	(66)
N couples / N events	1,794	1,364		1,794	1,364		1,794	1,364		1,794	1,364	

Source: FNB 1998/2000/1003, calculations by author

Note: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[a] Robust standard errors with adjustment for clustering of time period in respondents estimated in probit model with sample selection, results of selection equation are presented in Supplemental Table 3

Appendix B: Supplemental Tables Chapter 3

Supplemental Table 5. Characteristics of respondents of qualitative interviews recorded at first wave of data collection

Couple	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Sex main respondent	M	F	F	M	M	M	F	F	F	F	F
Children in household	2	2	0	3	2	2	2	1	4	3	2
Birth of child betweenT1 and T2 (1 = yes)	0	0	0	0	0	0	1	1	0	0	1
Married (1 = yes)	1	1	0	1	1	1	1	0	1	1	1
Age female partner	36	37	31	44	38	45	38	33	40	35	34
Educational attainment female partner (1-10)	8	8	8	3	4	8	7	7	5	8	8
Educational attainment male partner (1-10)	7	8	7	7	4	7	7	4	8	7	7
Weekly working hours female partner	[a]	20	32	[a]	[a]	20	16	38	24	22	[a]
Weekly working hours male partner	38	32	40	38	34	42	65	32	50	40	24
Proportion of NS hours female partner	[a]	0.63	0	[a]	[a]	0	0.83	0.62	0.47	0.42	[a]
Proportion of NS hours male partner	0	0.03	0.09	0.49	0.56	0.52	0.14	[b]	0.07	0	[b]
Desynchronization (1 = no overlap)	[a]	0.92	0.83	[a]	[a]	0.87	0.97	[a]	0.75	0.86	[b]
Sum score on questions NS work female partner (3 to 12)	[a]	10	11	[a]	[a]	4	9	9	9	10	[a]
Sum score on questions NS work male partner (3 to 12)	9	6	7	12	12	9	9	11	5	3	[b]
NS work required female partner (1=yes)	[a]	1	1	[a]	[a]	1	1	1	1	1	[a]
NS work required male partner (1=yes)	1	0	1	1	1	1	1	1	0	0	[b]

Source: NKPS wave 1 and 2 and NKPS Minipanel, calculations by authors
Note: [a] female partner not in paid work; [b] missing information. NS = non-standard

Supplemental Table 6. Unstandardized and standardized factor loadings, residual variances and significance levels of measurement model

	Whole sample			No children			One child		
	Est.	**Std.**		**Est.**	**Std.**		**Est.**	**Std.**	
Non-standard (NS) work female partner (F1)									
NS work sum score (Y1)	1.00	0.91	n.a.	1.00	0.88	n.a.	1.00	0.98	n.a.
Proportion NS hours (Y2)	0.07	0.80	***	0.07	0.82	***	0.07	0.73	***
NS work required (Y3)	0.40	0.83	***	0.38	0.76	***	0.38	0.86	***
Non-standard (NS) work male partner (F2)									
NS work sum score (Y4)	1.00	0.82	n.a.	1.00	0.83	n.a.	1.00	0.84	n.a.
Proportion NS hours (Y5)	0.05	0.72	***	0.05	0.73	***	0.05	0.73	***
NS work required (Y6)	0.41	0.85	***	0.39	0.84	***	0.39	0.82	***
Relationship Quality female partner (F3)									
Relationship good (Y7)	1.00	0.93	n.a	1.00	0.89	n.a.	1.00	0.94	n.a.
Relationship happy (Y8)	0.96	0.88	***	0.96	0.86	***	0.96	0.89	***
Relationship strong (Y9)	0.95	0.87	***	0.96	0.84	***	0.96	0.88	***
Relationship stable (Y10)	1.07	0.85	***	1.12	0.81	***	1.12	0.94	***
Relationship Quality male partner (F4)									
Relationship good (Y11)	1.00	0.90	n.a.	1.00	0.90	n.a.	1.00	0.91	n.a.
Relationship happy (Y12)	1.00	0.90	***	0.95	0.87	***	0.95	0.85	***
Relationship strong (Y13)	0.90	0.81	***	0.92	0.82	***	0.92	0.85	***
Relationship stable (Y14)	1.09	0.90	***	1.10	0.94	***	1.10	0.89	***
Covariance of latent variables									
F1 ↔ F2	0.87	0.20	***	0.91	0.21	***	0.90	0.19	**
F1 ↔ F3	-0.04	-0.04		-0.02	-0.02		-0.08	-0.06	
F2 ↔ F3	0.01	0.00		0.08	0.09		-0.12	-0.10	
F4 ↔ F1	-0.05	-0.04		-0.08	-0.08		-0.03	-0.02	
F4 ↔ F2	-0.06	-0.05		-0.05	-0.05		-0.09	-0.08	
F4 ↔ F3	0.14	0.50	***	0.10	0.42	***	0.18	0.54	***
Residual Variances									
Y1	0.90	0.17	***	1.16	0.22	***	0.17	0.03	
Y2	0.01	0.37	***	0.01	0.33	***	0.02	0.47	***
Y3[1]									
Y4	2.09	0.32	***	2.07	0.31	***	1.82	0.30	***
Y5	0.01	0.48	***	0.01	0.47	***	0.01	0.47	***
Y6[1]									
Y7	0.05	0.14	***	0.06	0.21	***	0.05	0.13	***
Y8	0.08	0.22	***	0.07	0.26	***	0.09	0.21	***
Y9	0.09	0.25	***	0.08	0.29	***	0.10	0.23	***
Y10	0.12	0.27	***	0.14	0.35	***	0.05	0.11	*
Y11	0.07	0.19	***	0.07	0.19	***	0.06	0.17	***
Y12	0.07	0.19	***	0.08	0.24	***	0.11	0.28	***
Y13	0.12	0.34	***	0.11	0.33	***	0.10	0.27	***
Y14	0.08	0.18	***	0.04	0.12	***	0.10	0.21	***
Model fit									
X^2 (df)	46.23	(19)	***			82.45 (41)	***		
CFI	0.98					0.97			
TLI	0.99					0.98			
RMSEA	0.04					0.05			
n	742			432			310		

Source: NKPS wave 1, calculations by authors

Note: † p < .1, *p < .05, **p < .01, ***p < .001

n.a.: Non-standardized loadings are set up to be 1 for model identification and no significance tests are conducted. NS = non-standard.

[1] No residual variances are provided for categorical items

Appendix C: Supplemental Tables Chapter 4

Supplemental Table 7. Institutional indicators

Year	Labor force participation women 25-54	Unemployment rate women 25-54
1971[1]	22.83	0.98
1972	24.30	1.30
1973	25.71	1.52
1974	27.15	1.70
1975	28.51	2.21
1976	29.79	2.38
1977	30.93	2.53
1978	32.02	2.82
1979	33.96	2.85
1980	36.69	3.03
1981	38.63	3.87
1982	40.57	4.93
1983	42.44	8.21
1984	43.44	8.97
1985	44.43	9.39
1986	45.26	9.68
1987	53.50	12.65
1988	55.72	12.21
1989	56.26	11.10
1990	58.47	10.35
1991	60.80	9.32
1992	61.41	7.26
1993	63.34	7.21
1994	64.47	7.85
1995	66.44	7.73
1996	66.82	7.28
1997	69.12	6.32
1998	70.16	4.81
1999	71.10	3.70
2000	72.72	3.30
2001	73.25	2.75
2002	74.61	3.17
2003	75.88	3.76

Source: OECDstat
Note: [1]1971 is the earliest available year of data. In the analysis the first respondent entered in 1956, therefore the information from 1971 is used for the period 1956 – 1971

Supplemental Table 8. Categorization of jobs according to resources

Job type	Corresponding Educational Field	Description
Lower	No specific field	All elementary occupations (elementary level), and non-specialized jobs of the lower level, except for clerical work
Cultural	Humanities/arts Behavior/society	Jobs in languages, history, theology and arts at intermediate, higher and academic level Jobs in welfare, social science and journalism at intermediate, higher and academic level
Economic	Economic/commercial Juridical	Jobs in commerce, sales, clerical work, business and automation at lower, intermediate, higher and academic level, plus clerical work in general field Jobs in juridical sector at intermediate, higher and academic level
Communicative	(Para)medical Personal/social care Teaching	Jobs in nursing, paramedics and medics Jobs where the treatment of other individuals in central, e.g. in physical and psychological sense, and hotel industry, at lower, intermediate and higher level All teachers in lower, intermediate, higher and academic level jobs
Technical	Agriculture, Technical	Jobs in agriculture at lower, intermediate, higher and academic level Mathematical and natural science jobs; technical jobs, e.g. civil engineering, electronics, graphics, building; transport, at lower, intermediate, higher and academic level

Source: Table adapted from van de Werfhorst and Kraaykamp (2001).
Note: The major difference between the coding scheme used here and the one in van de Werfhorst and Kraaykamp (2001) is the coding of teachers as cultural (van de Werfhorst) rather than communicative. Jobs are coded based on the minor group coding of ISCO88.

Supplemental Table 9. Table of exposure in person months and occurrences of events

		1st birth		Higher order births	
		# Events	Exposure	# Events	Exposure
Parity	0	1,716	307,693	n.a.	n.a.
	1	n.a.	n.a.	1,323	65,061
	2	n.a.	n.a.	412	137,580
	3			82	41,876
Birth cohort	1941-1950	439	58,686	517	97,550
	1951-1960	556	91,955	655	95,855
	1961-1970	590	112,199	569	47,160
	>1970	131	44,853	76	3,952
Relationship status	Single	305	210,970	193	27,827
	Cohabiting	224	36,991	68	8,140
	Married	1,187	59,732	1,556	208,550
Main activity	Household	246	8,917	956	112,419
	Work	1,382	204,549	768	120,606
	Other	59	10,115	80	9,335
	Education	29	84,095	13	2,157
Highest educational attainment	Prim. school / 1st stage of basic	191	19,946	237	39,604
	Lower secondary / short vocational	657	101,796	693	104,573
	Upper secondary / vocational education	468	101,962	464	54,785
	Higher professional / tertiary education	400	83,989	423	45,555
Field of highest educational attainment	General education / no specific field	507	86,699	571	89,055
	Education / teaching	151	29,446	189	22,767
	Languages/History/Art	57	13,600	55	6,589
	Technology / Science / Transport / Communication / agriculture	64	14,753	65	7,244
	(Para-)Medical	235	42,071	257	27,395
	Administrative	295	54,265	266	32,562
	Social-cultural	82	18,640	74	9,516
	Personal / social care	325	48,219	340	49,389
Occupation	Not in paid work	334	103,144	1,049	123,911
	Legislators, senior officials and managers	43	7,735	26	6,601
	Professionals	85	12,337	64	7,619
	health professionals	100	11,305	74	8,750
	Teaching professionals	104	15,515	81	11,967
	Technicians and associate professionals	200	29,878	95	13,030
	Life science and health associate professionals	118	20,360	95	11,836
	Clerks	297	44,846	115	18,675
	Personal and protective services worker	142	19,296	71	12,454
	Models, salespersons and demonstrators	127	19,085	58	9,581
	Skilled agricultural and fishery worker	59	8,084	30	4,391
	Plant and machine operators and assemblers	107	16,108	59	15,702
Occupational Categories	Not in paid work	334	103,144	1,049	123,911
	cultural	69	8,857	53	6,545
	economic	670	101,003	291	47,820
	communicative	449	64,452	317	44,411
	technical	40	8,469	27	3,283
	lower	154	21,768	80	18,547

Supplemental Table 9 continued

		1st birth		Higher order births	
		# Events	Exposure	# Events	Exposure
Weekly	Not in paid work	334	103,230	1,052	124,218
working	< 20 h	91	9,201	212	39,067
hours	20-35h	352	38,949	270	45,758
	>35h	939	156,313	283	35,474
Sector	Not in paid work	334	103,144	1,049	123,911
	Dependent private sector	843	126,530	414	65,630
	(semi) public dependent	485	72,093	301	44,599
	Self-employed / family business	54	5,926	53	10,377
Time	50s	0	1,874	-	-
period	60s	215	36,846	131	5,548
	70s	390	65,737	424	41,467
	80s	489	102,618	527	84,331
	90/00s	622	100,618	735	113,171
Total		**1,716**	**307,693**	**1,817**	**244,517**

Source: Family Survey of the Dutch Population 1998, 2000, 2003. calculations by authors.

Supplemental Table 10. Duration and control variables of cloglog model of transition to first birth (hazard ratios)

		Educational fields & occupational groups			Educational fields & occupational categories		
		HR	**t**		**HR**	**t**	
Duration	Linear spline of age: (16,20)	1.40	3.75	**	1.39	3.71	**
	Linear spline of age: (20,23)	1.10	1.93	†	1.10	1.89	+
	Linear spline of age: (23,27)	1.16	4.84	**	1.16	4.89	**
	Linear spline of age: (27,32)	1.14	4.87	**	1.14	4.95	**
	Linear spline of age: (32,37)	0.86	-3.48	**	0.86	-3.45	**
	Linear spline of age: (37,45)	0.47	-4.74	**	0.47	-4.75	**
Birth	1941-1950	1.00	ref		1.00	ref	
cohort	1951-1960	0.74	-2.50	*	0.74	-2.49	*
	1961-1970	0.64	-2.12	*	0.66	-2.01	*
	>1970	0.57	-1.88	†	0.59	-1.76	†
Relationship	Married	1.00	ref		1.00	ref	
status	Single	0.10	-26.20	**	0.10	-26.09	**
(TVC)	Cohabiting	0.29	-13.70	**	0.29	-13.61	**
Main	Employed	1.00	ref		1.00	ref	
activity	Housewife	2.99	6.80	**	3.07	6.85	**
(TVC)	Unemployed / disabled	1.04	0.20		1.07	0.32	
	In education	0.34	-4.77	**	0.35	-4.55	**
Highest educational	Prim. school / 1st stage of basic	1.00	ref		1.00	ref	
attainment (TVC)	Lower secondary / short vocational	0.46	-6.44	**	0.46	-5.65	**
	Upper secondary / vocational education	0.38	-7.08	**	0.40	-5.95	**
	Higher professional / tertiary education	0.31	-7.87	**	0.32	-6.43	**
σu_i		0.84	0.07		0.85	0.07	
	Person months		307,693			307,693	
	Df		28			35	
	AIC		14,726.85			14,602.83	
	BIC		15,013.44			14,955.98	

Source: Family Survey of the Dutch Population 1998, 2000, 2003. Calculations by authors
Note:*** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.1
Coefficients are exp(b), variables marked with (TVC) are time-varying covariates, estimates of educational fields, occupation and working conditions from this model are shown in Table 4.3.

Supplemental Table 11. Duration and control variables of cloglog model of transition to higher order births (hazard ratios)

		Educational fields & occupational groups			Educational fields & occupational categories		
		HR	**t**		**HR**	**t**	
Duration	Age at first birth	0.88	-1.52		0.87	-1.64	
	Age at first birth^2	1.01	3.26	**	1.01	3.39	**
	Linear spline of age: first birth,25	0.94	-1.53		0.94	-1.45	
	Linear spline of age: 25,30	0.86	-4.70	**	0.86	-4.65	**
	Linear spline of age: 30,35	0.80	-6.92	**	0.80	-6.86	**
	Linear spline of age: 35,45.	0.64	-9.90	**	0.64	-9.81	**
	Linear spline of duration since last birth: 0,2	1.76	6.04	**	1.74	5.88	**
	Linear spline of duration since last birth: 2,4	0.25	-7.94	**	0.25	-7.89	**
	Linear spline of duration since last birth: 4,6	3.27	2.85	**	3.26	2.84	**
	Linear spline of duration since last birth: 6,.	0.26	-0.49		0.26	-0.50	
Parity	Parity 1						
	Parity 2	0.29	-10.78	**	0.29	-10.60	**
	Parity 3	0.19	-7.10	**	0.20	-6.98	**
Birth	1941-1950						
cohort	1951-1960	0.92	-0.81		0.94	-0.64	
	1961-1970	0.78	-1.48		0.81	-1.27	
	>1970	0.66	-1.67	†	0.70	-1.40	
Relationship	Married						
Status (TVC)	Not married	0.69	-4.97	**	0.70	-4.93	**
Main	Employed						
activity(TVC)	Not employed	1.06	0.38		1.07	0.43	
Highest	Prim. school / 1st stage of basic						
educational attainment	Lower secondary / short vocational	0.99	-0.08		1.02	0.20	
(TVC)	Upper secondary / vocational education	1.12	1.24		1.14	1.26	
	Higher professional / tertiary education	1.35	3.12	**	1.34	2.37	*
$\sigma(u_i)$		0.19	0.16		0.17	0.19	
	Person months		244,517			244,517	
	Df		31			38	
	AIC		14499.33			14381.85	
	BIC		14807.51			14754.98	

Source: Family Survey of the Dutch Population 1998, 2000, 2003. Calculations by authors
Note: *** p < 0.001, ** p < 0.01, * p < 0.05, † p < 0.1
Coefficients are exp(b), variables marked with (TVC) are time-varying covariates, estimates of educational fields, occupation and working conditions from this model are shown in Table 4.4.

Appendix D: Supplemental Tables Chapter 5

Supplemental Table 12. Distributions and descriptive statistics of individual level variables used

	N	Mean	Std. Dev.	Min	Max
Women without children					
Intention to have a child within 3 years	981	0.60		0	1
Age 1st child	n.a.	n.a.	n.a.	n.a.	n.a.
Work experience (years)	955	10.31	7.11	0	31
Age	1026	31.44	6.80	19	45
Years of fulltime education	1023	14.03	3.30	2	25
Educational attainment partner	1011	3.50	1.39	0	6
Weekly working hours	1002	39.04	8.63	2	80
Part-time: works less than 30 hours per	1002	0.14		0	1
Work-family comp. important when	1012	4.14	0.78	1	5
Work control	905	4.22	1.39	0.5	7
Time pressure at work	911	3.05	1.16	1	5
Work-family conflict	989	2.55	0.73	1	4.8
Childcare enrolment age < 3	1026	22.51	15.47	2.0	61.7
Proportion women working part-time	1026	33.28	18.48	4.2	74.7
Valid N	804				
Women with one child					
Intention to have a child within 3 years	959	0.40		0	1
Age 1st child	947	8.29	6.43	0	27
Work experience (years)	958	13.78	6.89	0	34
Age	1020	35.17	6.19	20	45
Years of fulltime education	1016	13.56	3.68	2	30
Educational attainment partner	1013	3.33	1.36	0	6
Weekly working hours	988	36.77	10.17	1	84
Part-time: works less than 30 hours per	988	0.23		0	1
Work-family comp. important when	1003	4.36	0.74	1	5
Work control	874	4.05	1.59	0.5	7.4
Time pressure at work	882	3.13	1.15	1	5
Work-family conflict	989	2.59	0.78	1	5
Childcare enrolment age < 3	1020	23.64	15.92	2.0	61.7
Proportion women working part-time	1020	30.02	17.33	4.2	74.7
Valid N	729				

Source: European Social Survey 2004/2005

Supplemental Table 13. Description of country level indicators of childcare availability and part-time work

	Sample N	Per cent	Percentage of children aged 0 to 3 enrolled in formal childcare [1]	Percentage of female labor force working part-time (30 hours or less)[3]
Austria	62	4.04	4.1	38.0
Belgium	83	5.41	38.5	40.5
Switzerland	97	6.33	7.2	58.8
Czech Republic	69	4.50	3.0	8.3
Germany	109	7.11	9.0	41.6
Denmark	72	4.70	61.7	33.8
Estonia[2]	76	4.96	22.0	10.6
Spain	62	4.04	20.7	17.9
Finland	89	5.81	22.4	18.4
France	78	5.09	26.0	29.9
Great Britain	83	5.41	25.8	43.8
Greece	53	3.46	7.0	8.5
Hungary	44	2.87	6.9	6.3
Ireland	39	2.54	15.0	31.5
Iceland	19	1.24	58.7	36.8
Luxembourg	65	4.24	14.0	36.3
The Netherlands	81	5.28	29.5	74.7
Norway	78	5.09	43.7	45.4
Poland	44	2.87	2.0	14.0
Portugal	85	5.54	23.5	16.3
Sweden	85	5.54	39.5	36.3
Slovenia[2]	31	2.02	45.0	11.0
Slovakia	29	1.89	17.7	4.2
Total / Mean	1,533	100	23.1	31.2

Source: [1] *OECD Family and Education databases, data refers to the years 2000-2005*
[2] Eurydice database Eurobase
[3] Eurostat

Nederlandse Samenvatting

(Dutch Summary)

Beroepsrisico?
De Relatie tussen Arbeidsomstandigheden en Vruchtbaarheid

Dit proefschrift laat zien dat de invloed van het toegenomen opleidingsniveau en de gestegen arbeidsmarktparticipatie van vrouwen op vruchtbaarheid, dat wil zeggen het krijgen van kinderen, niet beperkt is tot de hoogte van het behaalde diploma en het al dan niet werken. Beslissingen over het krijgen van kinderen worden mede beïnvloed door de keuze voor een bepaald studievak of beroep, of het gaat om een typisch mannen- of vrouwenberoep, het werken op onregelmatige tijden en controle over indeling en taken. Het in dit boek gepresenteerde onderzoek draagt bij aan het verbreden en verdiepen van de kennis over de relatie tussen vruchtbaarheid en betaald werk. De vier afzonderlijke empirische studies waaruit dit boek is opgebouwd zullen hieronder worden samengevat, een algemene beschouwing sluit het hoofdstuk af.

5.6 Onderzoeksbenadering

In hun onder familiesociologen en demografen veelvuldig geciteerde overzichtsstudie naar de samenhang tussen betaald werk en vruchtbaarheid noemen de onderzoekers Brewster en Rindfuss (2000, p. 290) de volgende vereisten voor een succesvolle benadering van deze relatie in toekomstig onderzoek: "[Dit onderzoek] moet dynamisch zijn, moet recht doen aan de multidimensionaliteit van zowel arbeidsmarktparticipatie als vruchtbaarheid, daarbij rekening houdend met de verschillende niveaus waarop institutionele en normatieve regelingen werken en zowel de individuele vruchtbaarheid als de arbeidsmarktparticipatie beïnvloeden." Het in deze dissertatie gepresenteerde onderzoek heeft als doel de tot nu toe onderbelichte aspecten van de relatie tussen betaald werk en vruchtbaarheid te bestuderen. Daarbij werd, in navolging van de hierboven genoemde overzichtsstudie, gekozen voor een dynamische en multidimensionale benadering. Zo gebruiken wij *verschillende definities van vruchtbaarheid,* zoals de intentie om binnen drie jaar een eerste of tweede kind te krijgen, de waarschijnlijkheid dat stellen binnen drie jaar een eerste of tweede kind krijgen en de timing van het krijgen van kinderen in de levensloop. Daarnaast maken wij gebruik van longitudinale en multilevel onderzoeksmethodes en combineren wij kwantitatieve en kwalitatieve databronnen. Tevens nemen wij in de verschillende studies de institutionele, normatieve, en culturele context mede in beschouwing waarin individuele vrouwen en stellen beslissingen over het krijgen van kinderen nemen.

De aspecten van werk die in de vier empirische hoofdstukken worden bestudeerd in hun relatie tot vruchtbaarheid zijn aspecten die tot nu toe niet, of niet in deze vorm, waren toegepast in eerder onderzoek. Voorbeelden zijn het vrouwenaandeel per beroep, de subjectieve beleving van arbeidsomstandigheden en het werken buiten kantooruren.

Wegens een gebrek aan geschikte data beperkt veel onderzoek naar betaald werk en vruchtbaarheid zich tot de vrouw. In drie van de vier hier gepresenteerde studies is informatie over de mannelijke partner meegenomen. Dit is van belang omdat vruchtbaarheidsbeslissingen in verreweg de meeste gevallen een *beslissing van twee partners* zijn en niet door vrouwen alleen worden genomen.

5.7 Hoofdstuk 2: Hoe beïnvloeden opleidings- en beroepskenmerken van beide partners de timing van het krijgen van het eerste kind?

Dit hoofdstuk heeft als doel een uitgebreide uiteenzetting te geven over hoe het individueel verdienpotentieel, loopbaanveranderingen en een onzekere arbeidsmarktpositie van beide partners de timing van het krijgen van het eerste kind beïnvloeden. Wij analyseren Nederlandse stellen geobserveerd in de periode tussen 1960 en 2000. Verdienpotentieel is gemeten met indicatoren voor opleidingsniveau, beroepsstatus, het bekleden van een leidinggevende positie en het aantal werkuren per week. Onder loopbaanveranderingen in het voorgaande jaar verstaan wij veranderingen in de beroepsstatus of het instromen in de arbeidsmarkt vanuit inactiviteit. Van een onzekere arbeidsmarktpositie is sprake in periodes van werkloosheid, inactiviteit of zelfstandigheid. In het onderzoek besproken in dit hoofdstuk, waren wij ook in het bijzonder geïnteresseerd in hoe de genoemde kenmerken van beide partners samenhangen en of er eventueel sprake zou zijn van wederzijdse versterking. Daarnaast wilden wij meer inzicht verkrijgen in een mogelijke vertekening van de resultaten voortkomend uit het feit dat wij in onze steekproef alleen koppels hebben opgenomen die op het moment van dataverzameling samen leefden, waardoor wij alle individuele respondenten die niet meer samen zijn met de partner waarmee zij hun eerste kind kregen alsmede kinderloze alleenwonende respondenten uitsluiten uit de analyses.

In lijn met onze verwachtingen laten de resultaten van dit onderzoek zien dat een hoger verdienpotentieel van de vrouw het krijgen van een eerste kind vertraagt. Voor de mannelijke partner vinden wij daarentegen alleen een versnellend effect door een hoger aantal wekelijkse werkuren, terwijl wij hadden verwacht dat alle indicatoren van verdienpotentieel voor de mannelijke partner een versnellend effect op de transitie naar ouderschap zouden hebben. Een hoger opleidingsniveau heeft, in

tegenstelling tot onze verwachting, ook voor mannen en vertragend effect. Dit heeft waarschijnlijk te maken met het feit dat hoogopgeleide mannen ook een hoogopgeleide vrouwelijke partner kiezen en er pas aan kinderen wordt begonnen wanneer beide partners hun studie hebben afgerond en een passende baan hebben gevonden. Met betrekking tot loopbaanveranderingen vinden wij dat zowel een opwaartse als ook een neerwaartse baanverandering van de vrouwelijke partner het krijgen van het eerste kind vertragen, maar er is geen effect van een loopbaan verandering van de mannelijke partner. Daarnaast krijgen stellen waarvan de vrouw al voor het moederschap deeltijd werkt sneller een eerste kind dan stellen waar de vrouw een voltijdse aanstelling heeft.

De analyses laten dus meer invloed van de baankenmerken van de vrouwelijke partner op de timing van het eerste kind zien, dan van de mannelijke partner. Een mogelijke verklaring hiervoor vinden wij in de aanvullende analyses, waarbij gekeken wordt of er verschillen zijn tussen respondenten in een stabiele samenwoon relatie en respondenten die alleen zijn. Hier vinden wij dat voor mannen het hebben van een baan een belangrijke voorwaarde is voor het hebben van een stabiele relatie. Mannen met minder gunstige arbeidsmarktperspectieven krijgen dus mogelijk vooral later een partner, terwijl bij vrouwen het soort baan ook de beslissing over het krijgen van een eerste kind beïnvloedt.

5.8 Hoofdstuk 3: Onregelmatige werktijden en het krijgen van kinderen in Nederland: Een mixed-method analyse van stellen

In dit hoofdstuk wordt de samenhang tussen het werken op onregelmatige tijden en het krijgen van een eerste en tweede kind onderzocht. Onregelmatige werktijden zijn gedefinieerd als betaald werk buiten kantooruren, namelijk voor zes uur 's ochtends en na zeven uur 's avonds of in het weekend. Wij verwachtten dat voor kinderloze stellen de waarschijnlijkheid dat zij binnen drie jaar een kind krijgen kleiner is als de vrouw op onregelmatige tijden werkt en als de werkuren van beide partners minder overlappen. Omdat in stellen zonder kinderen beide partners meestal voltijd betaald werk verrichten leiden niet-overlappende werkuren namelijk tot minder contact en eerder onderzoek vond ook meer conflicten en spanningen in deze situatie. Deze verwachting wordt bevestigd door de statistische analyses. Uit de analyse van diepte-interviews die wij in aanvulling op de statistische analyses hebben uitgevoerd blijkt dat vrouwen voor deze werktijden kiezen als zij nog geen kind willen. Dit blijkt ook uit statistische analyse: het negatieve verband tussen de waarschijnlijkheid een eerste kind te krijgen en de onregelmatige werktijden van de vrouwelijke partner verdwijnt als wij ook het plan om binnen drie jaar een kind te krijgen in de analyse meenemen.

Met betrekking tot het tweede kind was onze verwachting juist tegenovergesteld. Omdat het makkelijker en voor veel ouders wenselijk is de kinderopvang binnen het gezin te regelen en de kinderen niet in een kinderdagverblijf onder te brengen, verwachtten wij dat ouders voor onregelmatige werktijden kiezen zodat altijd één van de ouders thuis aanwezig is en hun werkuren dus niet overlappen. Dit biedt voor vrouwen de mogelijkheid betaald (deeltijd) werk met het moederschap te verbinden zonder het gevoel te hebben er niet genoeg voor de kinderen te zijn. In deze situatie verwachtten wij dat de waarschijnlijkheid dat ouders binnen drie jaar nog een tweede kind krijgen groter is dan bij stellen waar geen van de partners onregelmatig werkt. Uit onze analyses blijkt dat dit effect alleen bestaat voor de mannelijke partner; stellen met één kind waarvan de vrouw onregelmatige werktijden heeft hebben geen vergrote kans op het krijgen van een tweede kind.

Omdat er in het verleden veel onderzoek is verricht naar de invloed van onregelmatige werktijden op de kwaliteit van en de tevredenheid met de partnerrelatie hebben wij in onze analyses ook gekeken of er een verband was tussen onregelmatige werktijden en de kwaliteit van de relatie. Vervolgens hebben wij ook getoetst of de verandering in relatiekwaliteit weer door zou werken op de waarschijnlijkheid een eerste of tweede kind te krijgen. Wij vinden echter geen aanwijzing voor een slechtere relatiekwaliteit door onregelmatige werktijden. Wel is het zo dat stellen waarvan de vrouwelijke partner tevredener is met de kwaliteit van de relatie een grotere kans hebben binnen drie jaar een tweede kind te krijgen. Het feit dat wij in ons onderzoek geen negatief effect van onregelmatige werktijden op de relatiekwaliteit hebben gevonden is ook te wijten aan de context. Wij hebben gebruik gemaakt van Nederlandse data terwijl veel voorgaand onderzoek is verricht in de Verenigde Staten. In Nederland zijn werknemers door collectieve arbeidsovereenkomsten en wettelijke regelingen als ontslagbescherming en onregelmatigheidstoeslagen veel beter beschermd dan in de Verenigde Staten, waardoor het werken op onregelmatige tijden een minder negatief effect heeft op werknemers in Nederland.

5.9 Hoofdstuk 4: De invloed van studierichting, beroep en seksesegregatie op vruchtbaarheid in Nederland

Het vierde hoofdstuk sluit aan op een aantal in de afgelopen jaren gepubliceerde studies waarin de samenhang tussen vruchtbaarheid en de studierichting en beroepskeuze centraal staan. In dit hoofdstuk kijken wij naar de timing van individuele vrouwen (zonder informatie over de partner) van het krijgen van hun eerste kind en de timing van hun tweede, derde en vierde kind. Verder kijken we in hoeverre deze vruchtbaarheidsbeslissingen kunnen worden voorspeld door, naast

informatie over het opleidingsniveau en arbeidsomstandigheden, ook meer gedetailleerde informatie over de studierichting, het beroep en de mate van seksesegregatie binnen hun beroepsgroep mee te nemen. Hierbij verwachtten wij dat vrouwen die studeren voor typische vrouwenberoepen, of werkzaam zijn in, dergelijke beroepen, sneller een eerste of volgend kind krijgen dan vrouwen in andere beroepen. Deze verwachting is gebaseerd op de aanname dat vrouwenberoepen vaak betere mogelijkheden bieden gezin en werk te combineren, bijvoorbeeld door middel van het aanbieden van deeltijdopties en langer verlof. Daarnaast zijn er ook aanwijzingen dat er een 'besmettingseffect' is. Dit betekent dat vrouwen met meer zwangere collega's een hogere waarschijnlijkheid hebben zelf zwanger te (willen) worden. Om te kunnen bepalen of het effect van vrouwenberoepen sterker wordt bepaald door de arbeidsomstandigheden of door het feit dat er meer vrouwen werken, nemen wij deze informatie apart in de analyses mee. Uit de resultaten blijkt dat vrouwen die voor een ‘vrouwelijke’ studierichting (onderwijs, zorg, verzorging) kiezen sneller een eerste kind krijgen dan vrouwen in technische beroepen. Het krijgen van volgende kinderen werd echter niet voorspeld door de gekozen studierichting. Ook vrouwen die werken in typische vrouwenberoepen (zorg, onderwijs, verzorging) en in beroepen met een hoger aandeel vrouwen krijgen sneller een eerste kind. Dit effect blijft bestaan als er wordt gecontroleerd voor het werken in deeltijd en in de publieke sector, twee vaak genoemde indicatoren voor een hoge werk-gezin-compatibiliteit. De timing van volgende kinderen na de eerste wordt echter alleen door de beroepsgroep voorspeld (vrouwen in de gezondheidssector en het onderwijs), het vrouwenaandeel speelt hier geen rol meer.

Concluderend kan worden gesteld dat vooral de transitie naar het moederschap wordt beïnvloedt door de keuze voor studierichtingen en beroepen die als vrouwenberoepen worden waargenomen en dat deze indicatoren een verklarende werking hebben naast informatie over opleidingsniveau en arbeidsomstandigheden zoals het aantal werkuren of het werken in de publieke sector. In tegenstelling tot onderzoek uit andere landen vinden wij in onze analyses overigens geen effect op vruchtbaarheid van het werken in de publieke sector. Dit verklaren wij door de in vergelijking met andere landen relatief kleine verschillen tussen de arbeidsomstandigheden in de private en publieke sector in Nederland, veroorzaakt door onder andere de hoge dekkingsgraad van collectieve arbeidsovereenkomsten.

5.10 Hoofdstuk 5: Het effect van subjectief waargenomen controle over werk, werkbelasting en de mate van werk-familie conflict

Het vijfde hoofdstuk van deze dissertatie verschilt op twee belangrijke manieren van de overige hoofdstukken. Ten eerste bestudeerden wij hier de *intentie* van vrouwen in de leeftijd tussen 18 en 45 om binnen drie jaar een eerste of tweede kind te krijgen, en niet het daadwerkelijk krijgen van een kind. Ten tweede gaat dit hoofdstuk niet over Nederland, maar maakten wij gebruik van een dataset met informatie over 22 Europese landen. Dit bood ons de mogelijkheid informatie op landenniveau op te nemen in onze analyses waardoor wij in staat waren te zien of de werking van het effect van individuele arbeidsomstandigheden hetzelfde is in verschillende institutionele contexten. Hierbij keken wij op landniveau naar de prevalentie van deeltijdwerk en het aandeel kinderen in de leeftijdsgroep nul tot drie met een plek in de kinderopvang omdat deze twee aspecten de combinatie van betaald werk en moederschap vergemakkelijken. Daarnaast hebben wij aspecten van werk in deze analyse opgenomen die niet eerder in hun relatie tot vruchtbaarheidsbeslissingen zijn onderzocht, namelijk de inschatting van respondenten over de controle die zij hebben over hun werkritme, de indeling van hun taken en het leren van nieuwe vaardigheden, in hoeverre zij het gevoel hebben onder tijdsdruk te staan op werk en de mate van conflict tussen werk en gezin.

Onze resultaten laten zien dat meer controle over werk de waarschijnlijkheid een tweede kind te willen vergroot en dat dit effect niet verschilt tussen landen. Met betrekking tot werkbelasting, gemeten als het gevoel van tijdsdruk op werk, vinden wij een lagere waarschijnlijkheid een tweede kind te willen krijgen als het gevoel van tijdsdruk hoog is, maar alleen in landen waar de beschikbaarheid van kinderopvang laag is. Een hogere mate van werk-familie-conflict hangt, in tegenstelling tot onze verwachting, samen met een grotere waarschijnlijkheid een tweede kind te willen krijgen en dit verschilt niet tussen landen met meer of minder deeltijdwerk of kinderopvangfaciliteiten. Wij denken dat deze samenhang voortkomt uit het feit dat moeders waarvan het eerste kind nog relatief jong is een grotere mate van werk-familie-conflict ervaren terwijl dit ook de groep is die de grootste waarschijnlijkheid heeft nog een tweede kind te willen. Een ander interessant resultaat was de wisselwerking tussen deeltijdwerk op individueel en contextueel niveau. Vrouwen zonder kinderen die voltijds werken, hebben een hogere waarschijnlijkheid een kind te willen dan vrouwen die in deeltijd werken in landen waar een *klein* deel van de vrouwen in deeltijd werkt, maar een lagere waarschijnlijkheid in landen waar het aandeel deeltijdwerkers onder vrouwen *hoog* is.

5.11 Conclusie

De in dit proefschrift gepresenteerde studies demonstreren het belang van informatie over het soort werk, het beroep en de arbeidsomstandigheden voor ons begrip van de relatie tussen betaald werk en vruchtbaarheid. Met betrekking tot het krijgen van het eerste kind vinden wij een vertragend effect van hoger menselijk kapitaal en verdienpotentieel van vrouwen. Deze alternatieve kosten worden ook niet gecompenseerd door meer resources van de mannelijke partner. Hoofdstuk 2 en 3 laten zien dat het werk en de arbeidsomstandigheden van de vrouwelijke partner bepalender zijn dan die van de mannelijke partner als het gaat om de timing van het eerste kind. Als het gaat om het krijgen van volgende kinderen nadat de transitie naar ouderschap is gemaakt zijn de werkkenmerken van de vrouw minder van belang (hoofdstukken 3, 4 en 5). Eén interpretatie van deze bevinding is dat in de Nederlandse context vrouwen hun vruchtbaarheidsbeslissingen niet onderschikt maken aan hun werk. Het werk en inkomen van de mannelijke partner zou dan bepalender kunnen zijn voor het krijgen van volgende kinderen na de eerste geboorte.

Zoals elk onderzoek kennen ook de in dit boek gepresenteerde studies beperkingen. Een belangrijke limitatie werd zoals in elk empirisch onderzoek gevormd door de beschikbare data. Wij zijn in staat geweest in drie van de vier hoofdstukken data over de partner op te nemen (hoofdstukken 2, 3 en 5). Daarnaast zijn er in drie van de vier hoofdstukken longitudinale gegevens gebruikt (hoofdstukken 2, 3 en 4) waardoor de valkuil van omgekeerde causaliteit grotendeels kon worden vermeden. Ondanks de goede kwaliteit van de beschikbare data werden onze mogelijkheden om specifieke subgroepen van beroepen en constellaties tussen partners te onderzoeken beperkt door de omvang van de verschillende steekproeven. Een mogelijke oplossing voor dit probleem in toekomstig onderzoek zou het gebruik van verschillende gekoppelde populatieregisters kunnen zijn, zoals in de Scandinavische landen al veelvuldig gebeurt.

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Curriculum Vitae

Katia Begall was born in Frankfurt am Main, Germany on March 30 1982. After studying Italian language and culture in Perugia, Italy from 2001 to 2002 and Sociology, Political Sciences and Dutch in Oldenburg, Germany from 2002 to 2003, she moved to the Netherlands in 2003. She obtained her Bachelor in Sociology from the University of Groningen in 2006. Subsequently she enrolled in the two-year Research Master program 'Human Behavior in Social Context' at the University of Groningen which she completed (cum laude) in 2008. From 2008 to 2012 she conducted her dissertation research within the PhD program of the Interuniversity Center for Social Science Theory and Methodology (ICS) at the department of Sociology of the University of Groningen. In October 2012, Katia started working as a postdoctoral researcher at the department of Sociology and Anthropology of the University of Amsterdam.

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