The Influence of Parental Education on Timing and Type of Union Formation: Changes over the Life Course and Historical Time in the Netherlands[1]

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Abstract

Family background shapes young adults' decisions in their transition to adulthood and the outcomes of these decisions lay the foundation for their subsequent life-course. This study examines the influence of parental education on their children's union formation process up to first marriage. We examine the timing of entry into a first union (irrespective of whether this is a married or a cohabiting union), the choice between marriage and cohabitation, and the timing of first marriage. Data from multiple nationally representative surveys conducted in the Netherlands are pooled (N=32,032) with cohorts being born between 1931 and 1990, to not only examine the effect of parental education on union formation, but also whether the effect changes over historical time and over the life-course. Results from discrete-time hazard analyses demonstrate little change in the effect of parental education across cohorts and periods, while life-course changes in the effect of parental education are strong.

Key words: Marriage, Cohabitation, Parental education, Life-course, Cohort, Period

INTRODUCTION

A persistent finding in demographic research is that parental socio-economic status (SES) influences the union formation process (Liefbroer and De Jong Gierveld 1992; Axinn and Thornton 1992; South 2001; Mulder et al. 2006; Uecker and Stokes 2008; Wiik 2009; Cavanagh 2011). Research indicates that persons from a higher socio-economic background delay the timing of their first union (Mulder et al. 2006; Thornton et al. 2007; Wiik 2009; Cavanagh 2011) and first marriage (Axinn and Thornton 1992; South 2001; Uecker and Stokes 2008). The timing of the first union can have important implications for the subsequent life-course. For instance, unions formed at an early age have a higher chance of disruption (Berrington and Diamond 1999; Lyngstad 2006), and individuals who experience union dissolution, have higher risks of unemployment (Covizzi 2008). Examining the influence of social origin on union formation may therefore improve our knowledge on persisting intergenerational social inequality.

An important phenomenon in many Western countries is the rise in unmarried cohabitation, replacing marriage as the most popular first union type in many countries (Kiernan 2001; Bumpass and Lu 2000). In the Netherlands, the focus of the present study, 83% choose for unmarried cohabitation for their first union, which is somewhat lower than in the Scandinavian countries (86% in Norway to 94% in Denmark), but relatively high compared to other Western European countries, such as Germany (74%) and the UK (72%) (Billari and Liefbroer 2010). Clearly, when examining the first union formation process in countries like the Netherlands, analyzing only the entry into first marriage would be insufficient.

The increasing popularity of unmarried cohabitation has complicated the analysis of the influence of socio-economic background on union formation. Unmarried cohabitation can

serve as a precursor of marriage, but also as an alternative to it (Landale and Forste 1991; Berrington and Diamond 2000; Wiik 2009; Hiekel et al. 2014). Parents may not only influence the timing of relationship formation, but also the choice for the type of relationships, i.e. married or unmarried cohabitation, that their children enter for their first union. Liefbroer (1991) finds that in the Netherlands children from high educated parents are more likely to opt for unmarried cohabitation. Research from other countries have produced mixed results. Schroeder (2006) finds that in Italy especially high education of the mother is associated with a higher propensity for unmarried cohabitation. However, Hoem and Kostova (2008) find an opposite effect in Bulgaria, while Thornton et al (2007) find no differences in preference for married or unmarried cohabitation on the basis of parental SES in the US.

The central question in this study is to what extent the effect of parental SES on timing and choice for type of union (i.e. married or unmarried cohabitation) changes over the life-course, across cohorts and periods. Previous research has found that the effect of parental SES on timing of relationship formation decreases during the life-course and across cohorts (South, 2001, Sassler and Goldscheider 2004; Wiik 2009). This study contributes to this literature in four ways. First, previous research has only focused on timing of union formation, while this research also includes the choice for married or unmarried cohabitation for the first union. Second, this study incorporates both the timing of the first union and the first marriage. Third, this study considers unmarried cohabitation to be a factor in decreasing the role of parents in their influence on the timing of the first marriage. Finally, this study does not only examine cohort change, but also takes into account periodic changes in economic conditions.

In this study data on cohorts born between 1931 and 1991 from eight Dutch datasets are pooled. Socio-economic background is often measured by occupational status, educational attainment or income of the parents. In this study the educational attainment of

the parents[2] is used as an indicator for socio-economic background, which captures the more cultural aspects of socio-economic background and to a lesser extent the economic aspects, which are likely to be more strongly associated with the occupational status and income of the parents (Lyngstad 2006).

THEORY

With the rise in unmarried cohabitation, theory on relationship formation has become more complex. Before the 1960s, unmarried cohabitation only occurred in very rare circumstances, whereas today it is a common form of first union in the Netherlands (Manting 1996), but also in many other Western countries (Billari and Liefbroer 2010; Bumpass and Lu 2000). First, we examine how parental education influences the timing of entry into first union (either married or unmarried cohabitation) and first marriage. Next, the influence of parental education on the choice for married or unmarried cohabitation is discussed.

TIMING OF UNION FORMATION

There are several arguments as to why higher parental education leads to postponement of the first union and first marriage. First, the attitudes and values of children with high educated parents may differ from those with low educated parents. Children with high educated parents are more likely to be socialized to value autonomy rather than conformity (Hitlin 2006; Magee 2006) than their peers with low educated parents. If children adopt values such as autonomy and self-realization, career aspirations are likely to be higher (Hitlin 2006),

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[2] Many datasets with union formation information on cohorts born from 1930 onwards have no information on all aspects of parental SES. Therefore, we concentrate on parental level of education, as that indicator is the most widely available.

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implying a stronger focus on education and work, leading to postponement of relationship formation. When one considers that higher education often leads to higher income, it can be argued that children with high educated parents, compared to children with low educated parents, are likely to have been raised in a more wealthy home environment. Individuals who were raised in a household with high consumption levels may develop the same consumption aspirations for their own household (Easterlin 1980) and may not want to start a household before they are able to afford this luxurious life-style themselves, which will delay their timing of marriage (Axinn and Thornton 1992). Parental socialization may also cause children to adopt certain preferences for their desired partner. Because of their advantaged background, children with high status parents may have higher demands, in terms of economic and cultural resources, for their future spouse (Wiik 2009). However, from a search-theoretical framework finding such a high status spouse is time-consuming and is likely to end in a longer search time and therefore in a delay of the entry into a first union (Oppenheimer 1988). Furthermore, children may only wish to partner when they have more complete information on the social status of their partner and therefore postpone cohabitation and marriage until after education is completed or steady employment is obtained (Wiik 2009).

Second, apart from preferences obtained through socialization in the parental household, children from high educated parents are also more likely to experience life events which may increase their preference for individualistic values. Literature on intergenerational transmission of education demonstrates that children of high educated parents are more likely than children of low educated parents to attain higher education (Shavit and Blossfeld 1993). This means that children with high educated parents will be longer enrolled in education, leading to a postponement of relationship formation, because the educational system serves as a moratorium in which demographic transitions are delayed (Blossfeld and Huinink 1991;

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Thornton et al. 1995; Raymore et al. 2001). Another important life event is leaving the parental home. Children of high educated parents are more likely to have lived independently before entering a cohabiting union. Independent living has been associated with an adherence of individualistic values (Waite et al. 1986). Thus, individuals who live independently may postpone the entry of a union as they are reluctant to relinquish some of their personal autonomy, whereas those who live with their parents are less individualistic and possibly more family-oriented, making them less likely to postpone entry into a union (Mulder 2006).

Third, children from high educated parents are likely to face different opportunities than their peers with low educated parents. Remaining in the parental home for a longer period of time may be more attractive to children of high educated parents as their parental home is likely to provide more non-material (such as a warm psychological climate) and material (such as a larger house and more luxury in the home) resources, making them less inclined to leave the parental home (Axinn and Thornton 1992). Moreover, children from low educated parents may be more inclined to view entry into a union as a potential route to leave an unsatisfying parental home situation (Clarkberg 1999). Parental resources may also influence the relationship formation process outside the parental home. Parents can use their financial resources to influence the timing of the first union by providing better alternatives to early marriage in late adolescence and early adulthood, but accelerate marriage later in young adulthood by providing the necessary means for marriage (Waite and Spitze 1981; Manting 1996; Sassler and Goldscheider 2004). However, providing the means for marriage will most likely occur at a later stage in young-adulthood, generally meaning that children with educated parents postpone union formation more than their peers with low educated parents.

Although there is literature on the influence of parental education on timing of the first union (Wiik 2009; Mulder et al. 2006) and first marriage (Axinn and Thornton 1992; South 2001), there is no theory on whether the influence of parental education differs for

entry into first union and first marriage. Probably, the reason is that there is little theoretical ground to make such a distinction. Parental education is likely to postpone both transitions in a similar fashion. However, it may delay first marriage somewhat more, because unmarried cohabitation, if anything, is a precursor to marriage and not the other way around (at least not prior to separation). On the other hand educated parents are more likely to provide the resources to enable marriage. Therefore, we do not differentiate between influences of parental resources on first union and first marriage as we expect the direction of the effect to be the same. Therefore we hypothesize:

Hypothesis 1 (H1):

The higher the parental education, the higher the age of entry into first union and first marriage.

The influence of parents on their children is likely to change during their children's life-course. As mentioned before, highly educated parents use their resources to deter early marriage, but may use them to foster marriage later in the life-course. In addition, there are many indications that the influence of parents on their children decreases with age. On their path to adulthood, the importance of young adults' own life experiences and preferences will increase relative to features of family background (Hogan and Astone 1986; South 2001). Life events that may alter the relationship between parents and their children are leaving the parental home and obtaining a full-time job. When children leave home, geographical distance decreases the influence that parents have on their children. Bucx et al. (2012), for instance, show that children who live independently receive less counsel or personal advice from their parents. Furthermore, individuals who live independently may rely more on their own social network than that of their parents compared to those still living with their parents.

Individuals will reach more financial independence when they enter fulltime employment, which becomes increasingly likely with age. They can then rely on their own resources and are less likely to require financial help from their parents in order to make union formation transitions.

Young adulthood is also characterized by biological and psychological changes. Brain development continues through young adulthood (Lebel and Beaulieu 2011). Also psychological processes of maturation remain important during this period. During young adulthood personality changes occur, for instance by becoming socially more dominant (Roberts and Mroczek 2008). Young adults also reexamine their worldviews and consider themselves adult when they have adopted their own beliefs based on independent reflection (Arnett, 2000). Irrespective of whether reaching adulthood is mainly based on demographic transitions or psychological and biological maturation, we can deduce that with age individuals gain more independence. Therefore, the influence of parental characteristics such as parental education is likely to decrease. This leads to the following expectation:

Hypothesis 2 (H2):
The effect of parental education on the timing of first union and first marriage decreases with age

So far, we have not differentiated between those who marry with or without prior cohabitation. If we focus on the timing of first marriage rather than first union, one has to consider both these trajectories, because parents are likely to fulfill different roles in each of them. If the choice for unmarried cohabitation is based on individualistic needs, such as self-fulfillment, cohabiters are likely to be less influenced by their socio-economic background in their timing of the first marriage than those marrying directly (Wiik 2009). Furthermore,

parents may be less able to influence the timing of marriage when their children are living with a partner, as they are no longer the most important significant other for their child. Moreover, the individual can (possibly) rely on the resources of the partner instead of those of his/her parents. Thus, parents may have less means to exert social pressure on children who are cohabiting than on those who live independently or still live at the parental home, which will likely result in the decrease of the influence of parental education. This leads to the following expectation:

Hypothesis 3 (H3):
Unmarried cohabitation decreases the effect of parental education on the timing of first marriage.

There are several reasons as to why the strength of the influence of parental educational attainment may have changed across cohorts. First, the process of individualization may have led to a decreasing influence of parental education. Second Demographic Transition (SDT) theory claims that around the 1960s, a value shift occurred, in which values of solidarity and social group adherence lost their prominent position to values of autonomy and self-realization (Lesthaeghe and Van de Kaa 1986; Lesthaeghe 2010). Parents would evaluate their role in the socialization of their children differently, putting more emphasis on stimulation and autonomy rather than discipline (Sieben and De Graaf 2003; Van Poppel et al. 2008). Moreover, parents became less able to exert social pressure on their children (Kalmijn 1998). These cultural shifts made it more difficult for parents to influence their children's decisions regarding living arrangements and parenthood. Second, social boundaries between social classes may have decreased. The increasing educational expansion has created the opportunity for children of all social classes to be able to attend higher

education. Kalmijn (1991) finds that mating is increasingly based on achieved rather than ascribed characteristics. When there is more social origin heterogamy, i.e. partnering between people with high and low educated parents, social boundaries based on social origin will erode and therefore timing of union formation will become more similar for children of high and low educated parents.

Hypothesis 4 (H4):

The effect of parental education on the timing of first union and first marriage decreases across cohorts.

Hitherto, cultural change over birth cohorts has been discussed. However, economic changes may account for period-related changes in the influence of parental education. Although in general there has been an increase in prosperity over the last half-century, the Netherlands has been hit by several economic crises. The crisis in the 1970s and early 1980s was caused by the global oil crisis and the most recent one starting in 2008 was caused by the global credit crisis. The economic consequences of the crises included an increase in (youth) unemployment, stagnation, a decrease in wages and increased difficulty in obtaining a mortgage (Bagheloe-Datadin 2013). During the latest crisis, the timing of marriage and parenthood have been postponed (De Beer 2012). In times of financial hardship, young adults may have to rely more on their parents. Thus, the influence of parental education is likely to increase in times of economic crisis and decrease in time of economic prosperity.

Hypothesis 5 (H5):

In periods of economic crisis, the effect of parental education on the timing of the first union and first marriage is larger than in periods of economic prosperity.

CHOICE FOR THE TYPE OF UNION

Educational level of the parents may influence the timing of entry into a first union of their children, but also whether their children opt for marriage or unmarried cohabitation. Earlier, we suggested that parents' educational attainment influences both the attitudes of the their children (socialization argument) and the resources available to their children (resource argument). These arguments lead to competing hypotheses regarding the influence of parents' educational attainment on the choice for married and unmarried cohabitation. The socialization argument is related to the SDT. According to the SDT, people who are more individualistic and less traditional are more likely to choose for less conventional relationship forms such as unmarried cohabitation (Lesthaeghe 2010). Higher education has been associated with having less orthodox family and marital values, including less disapproval of unmarried cohabitation (Arends-Tóth and Van de Vijver 2009; Liefbroer and Billari 2010). Thus, highly educated parents are likely to socialize their children with these less traditional values, implying that their children are less likely to oppose unmarried cohabitation. On the other hand, lower educated parents may be more conservative and do not want their children to break societal norms in fear of social exclusion, leading their children to opt for marriage instead of unmarried cohabitation. Research indicates that mothers' attitudes towards unmarried cohabitation are related to the attitudes of their children (Axinn and Thornton 1993) and that a higher education of the mother is associated with a more positive attitude on unmarried cohabitation of the child (Axinn and Thornton 1996). During young adulthood, experiences of enrollment in higher education and independent living may not only influence the timing of union formation, but also the choice between married and unmarried cohabitation. As argued before, these experiences are likely to lead to a higher adherence to individualistic values. Unmarried cohabitation may then be viewed as an alternative to being

single (Rindfuss and Van de Heuvel 1991), that guarantees more personal freedom than marriage.

An alternative branch of research on cohabitation considers it to be related to a pattern of disadvantage (Perelli-Harris et al. 2010; Perelli-Harris and Gerber 2011; Mikolai 2012). Here, the key argument is that people opt for cohabitation because of a lack of available resources. Rather than expecting children from higher educated parents to choose unmarried cohabitation, this theory expects children from lower educated parents to opt for unmarried cohabitation. The pattern of disadvantage (PoD) theory focusses on constraints rather than preferences. The lower educated parents are, the less likely they are to have financial capital to support the marriage of their children. Moreover, children of lower educated parents compared to their peers with higher educated parents are likely to have less human capital themselves and may be unable to raise the necessary funds for marriage. They then opt for unmarried cohabitation rather than marriage, because this is less costly. Unmarried cohabitation in this case serves as a *poor man's marriage* (Hiekel et al. 2014). Furthermore, couples with few financial means may be more inclined to cut costs by living together and pooling their resources (Wiik 2009). Thus, although marriage may be the preferred option of a couple, economic constraints may prevent them from doing so.

The SDT and PoD arguments provide competing hypotheses, therefore we need to examine whether the strength of each mechanism may depend on the country context. Research in the Netherlands indicates that unmarried cohabitation is associated with the higher educational classes (Liefbroer 1991; De Feijter 1991). In the Netherlands, the choice for unmarried cohabitation therefore appears to be based on values rather than economic circumstances. Cohabitation among the lower social classes is more common in countries with relatively high poverty, for instance Bulgaria (Hoem and Kostova 2008), Russia (Perelli-Harris and Gerber 2011; Gerber and Berman 2010), but also among subgroups in

populations, such as the Afro-Americans in the US (Smock et al., 2005). However, the Netherlands can be considered as a country with relatively little poverty (Peichl et al. 2010). Thus, the Netherlands appears to be a societal context in which opting for unmarried cohabitation is more likely to result from preferences than from economic constraints, and therefore we expect that:

Hypothesis 6 (H6):

The higher the parental education, the more likely their children will choose for unmarried cohabitation instead of direct marriage.

However, this relationship is unlikely to be stable over either age or across cohorts. Earlier, we argued for a diminishing effect of parental education on the timing of entry into a union as young adults age. The same reasoning would lead us to argue that this also applies to their effect on the choice of the type of union, leading us to formulate the following expectation:

Hypothesis 7 (H7):

The effect of parental education on the choice between married or unmarried cohabitation decreases with age.

The influence of parental education may have weakened across cohorts with the increasing popularity of cohabitation. One explanation for this rise in unmarried cohabitation is that over time the reason for unmarried cohabitation changed. In the words of Manting (1996, p. 63): *Cohabitation started as a protest against bourgeois marriage, but changed into a means of gradual movement into a union, whereas direct marriage changed from being normal to being deviant behavior.* Thus, unmarried cohabitation has increasingly become more of a

prelude rather than an alternative to marriage. As a result, unmarried cohabitation has become more "mainstream", making it less likely that social background matters in the choice for married or unmarried cohabitation (Liefbroer and Dourleijn 2006), which leads to the following expectation:

Hypothesis 8 (H8):
The effect of parental education on the choice between married or unmarried cohabitation decreases across cohorts.

Apart from cultural changes, periodic change in economic conditions may influence the relationship formation process and the influence of parental education. The mechanism of change due to economic conditions can be related to the pattern of disadvantage argument. In times of financial crisis, individuals with low human capital may have more difficulty to afford marriage and therefore opt for unmarried cohabitation. Furthermore, unmarried cohabitation may serve as a means for pooling resources, which may be more necessary when parents have fewer resources to invest. Because children from educated parents are, even in economic crises, expected to base their decision to marry or cohabit on cultural preferences (because they can afford to), the differences between children with high educated parents and those with low educated parents in their propensity to choose for unmarried cohabitation will decrease. This leads to the following expectation:

Hypothesis 9 (H9):
In periods of economic crisis, the effect of parental education on the choice between married or unmarried cohabitation is smaller than in periods of economic prosperity.

DATA AND METHODS

DATA

To test our hypotheses, data from a number of Dutch surveys containing retrospective partner histories were pooled. We pooled data from four waves of the Dutch Fertility and Family survey (Onderzoek Gezinsvorming (OG) (1993, 1998, 2003, 2008), two waves of the Dutch family survey (Familie-enquête (FE) (2003, 2008), the Living Arrangements and Social Networks of Older Adults survey (NESTOR) (1992) and the ESR telepanel (1993). All datasets are based on probability sampling techniques to assure that they are nationally representative. The total number of respondents is 43,197. Because of missing values on the parental education variables and because only birth cohorts born from 1931 onwards were selected, the total number of observations used in the analysis is 32,032. The non-response rates vary quite substantially between the surveys (see table 1). The lowest non-response rate (27%) is in OG 1998, whereas OG 1993 has the highest of somewhat over 50%. The age of the respondents at the time of the interview varies between the datasets. In NESTOR, respondents from the age of 54 were interviewed, while in the other datasets individuals from 18 onwards were included. OG 1993 only included individuals aged between 18 and 42, whereas in the other waves of the Dutch Fertility and Family survey the upper age range was 52 in OG 1998 and 62 in OG 2003 and OG 2008. In the other surveys the maximum age lies at least at age 70. In general, females are slightly overrepresented, with a maximum of 55% females in FE 2003.

[table 1 about here]

DEPENDENT VARIABLES

In this study, the focus is on the timing of both first union and first marriage, and on the choice between married or unmarried cohabitation as type of first union. All the surveys contained information about the year, month and order of all cohabiting (married or unmarried) relationship that lasted at least three months. Table 2 shows descriptive information for these variables per 10 year birth cohort.

[table 2 about here]

Table 2 shows remarkable developments in union formation. First, it is noticeable that for both first union and first marriage the median age of entry is lower for women than for men, meaning that women tend to partner with older men. Second, the median ages of entry into first union and first marriage decline from birth cohort 1931-1940 to birth cohort 1941-1950, but thereafter the median ages of first union and first marriage start to diverge. Age at entry into a first union remains fairly stable around age 25 for all birth cohorts born since the 1940s, whereas the median age of marriage rose substantially up to over 30 among cohorts born after 1970. As a result, there is an increasing gap between the age at which young adults start cohabiting and the age at which they marry. In the youngest birth cohort, more than 50% of the respondents have not married (yet). Third, there is a very sharp increase in the percentage of respondents who opt for unmarried cohabitation as their first union. Whereas among the 1931-40 birth cohort only 5% of men and 2% of women chose unmarried cohabitation, this increased to 85% among the 1981-90 birth cohort.

INDEPENDENT VARIABLES

In the analysis, two education variables are included, the average level of education of the parents and the level of education of the respondent. The latter is included to examine whether the effect of parental education is mediated through the education of the respondent. The data contained information on the education of respondents and of both their parents. This information was used to recode them to International Standard Level of Education (ISLED) scores (Schröder and Ganzeboom 2013). ISLED is a continuous measure of education that allows comparison across surveys and across countries. Because level of education was coded slightly different in each of the surveys, a strategy had to be adopted to recode these variables into a uniform and continuous measure of education. The Fertility and Family surveys used broad categories with scores ranging from 1 (primary education or less) to 5 (university), while the Dutch Family surveys (FE) and the ESR telepanel had respectively 10 and 8 educational level categories. In NESTOR, the education variables indicated the number of years of education. For all these categories, ISLED scores were matched. When more than one ISLED score could be matched to a category, the average of all the different ISLED scores that were covered by a category was taken. In addition, the number of categories and their labels varied somewhat between parental and respondents' education, an important reason for this being the educational reforms that took place in the Netherlands in the second half of the 20th century. Finally, a score for *parental education* (mean=38.96, sd= 17.76), based on the average of father's and mother's level of educational attainment, was constructed. A mean score for parental education is chosen, because we do not hypothesize differences between the influence of the father and the mother and also because we do not assume the highest educated parent to have the most dominant influence. In addition, information on the final level of education attained by the respondents themselves was available (*education,* mean=50.33, sd=19.76). However, using final

education as a time-constant variable could lead to estimation bias (Hoem and Kreyenfeld 2006). Therefore, we constructed a synthetic time-varying education score based on the years that are minimally required to finish such an education. Thus, the ISLED score of respondents increased at ages at which next steps in their educational career would have been completed, assuming that they took the shortest educational route available.[3] Finally it has to be noted that individuals in OG 2003 and OG 2008 that reported themselves a "child" in the household were not asked about the educational level of their parents. This means that relatively few respondents born from 1980 onwards are included in the analysis.

The *age* variable is constructed as the number of years since age 15 until one experiences a transition. To examine whether there have been changes over time a *cohort* (mean=1962, sd=12) variable is constructed based on the birth year of the respondent. The periodic change, *economic growth* is measured by GDP volume change (percentage). Yearly information from 1949 until 2009 is obtained from Statistics Netherlands. Figure 1 shows the trend in economic growth. All continuous measures are centered around the mean with the exception of economic growth. In the analysis for first marriage, a time-varying dichotomous variable indicating whether someone is in a cohabiting relationship or not, is included. Finally, survey dummies are included to control for possible survey differences.

[figure 1 about here]

ANALYTICAL STRATEGY

To test the first four hypotheses, a discrete-time hazard model is estimated. The data are organized in a person-period file (Allison 1984), in which separate records are created for

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[3] This approach will underestimate some of the randomness in the process of educational attainment. However, given the highly stratified nature of the Dutch educational system, this assumption is reasonable.

each month that an individual was at risk, starting from age 15. Respondents are censored when they reach age 40 or at time of the survey, whichever comes first. Models are run for entry into first union and first marriage, separately for men and women.

The results testing hypotheses 1 through 5, are presented in four models, with each model building upon the previous one. The first model is the base model (Model A) and includes only the main variables and controls. The main variables included are parental education, age, and cohort. For age and cohort quadratic and cubic terms are included to account for non-linearity in the relationship with entry into a union. We control for survey differences using dummy variables for each survey (OG 1998 is the reference category). In the second model (Model B), respondent's education is included, to examine to what extent the influence of parental education is mediated by respondents' own education. The third model (Model C) includes the interactions of parental education with age, cohort and economic growth to account for respectively changes over the life course, changes over birth cohorts and periodic changes. Finally, for entry into marriage a fourth model (Model D) is estimated, including effects for unmarried cohabitation and its interaction with parental education.

For testing hypotheses 6 through 9, a multinomial logistic regression model is estimated based on the person-period file described above. In this analysis, marriage and unmarried cohabitation are treated as competing events. This analysis distinguishes three outcomes: unmarried cohabitation, marriage and remaining single. We will present the parameters for the comparison between unmarried cohabitation and marriage (with marriage being the reference category). We present three models (variables of models A,B and C), following the same logic as used for the discrete-time hazard analysis.

RESULTS

Table 3 shows the results of the base model of a discrete-time hazard logit model, regarding timing of first union and first marriage, separately for men and women. There is a statistically significant negative effect of parental education for both men and women, indicating that children with high educated parents have a lower rate of entry into a union and into marriage, and therefore are more likely to enter their first union and first marriage later in life, confirming H1. Although the effects appear to be small, differences between high and low educated parents are substantive. If we compare children with parents with an average of first tier of tertiary education (ISLED=77) and those with parents with an average of basic vocational training (ISLED=29), the odds of entering a first union for children with high educated parents relative to those with low educated parents are 0.81 for men and 0.64 for women. For entering the first marriage these odds are even lower, being 0.60 for men and 0.50 for women. There are two other notable results in Table 3. First, the effect of parental education is stronger for first marriage than for first union, implying that parental education delays entry into first marriage more strongly than entry into a first union. Second, the effect of parental education appears to be stronger for women than for men for both first union and first marriage. The coefficients for *age* and *cohort* illustrate the pattern of entry into first union and first marriage over respectively the life-course and historical time. The beta's for *age, age^2* and *age^3* create a curve in which the rate increases sharply until age 24 for women and 26 for men for first union and until respectively 23 and 25 for first marriage. The curve then shows a slight decrease that eventually stabilizes. The curve for cohort, which can be obtained using the coefficients of *cohort*, *cohort^2* and *cohort^3*, shows an increase, followed by a sharp decrease. The decrease is largest for marriage, in which the differences between men and women are small. This is in line with descriptive results in table 2. Most of the survey

variables are significant indicating that there are some differences between surveys that are not captured by the other independent variables. For both men and women, the greatest difference is observed between ESR telepanel and OG 2008..

[table 3 about here]

Table 4 presents the results from the additional models of timing of union formation for men. The results in Model B demonstrate that when the respondent's education is included, the effects of parental education change only slightly, as the decrease of the main effect is only around 11% and 7% for respectively first union and first marriage. Thus, these effects appear hardly to be mediated through men's own educational attainment. Model C contains the interactions of parental education with age, cohort and economic growth. The interaction with age is positive for both first union and first marriage, indicating that the negative effect of parental education attenuates with age. This supports H2, which stated that the delaying effect of parental education weakens as the respondent ages. In addition, we hypothesized the effect of parental education to decrease across cohorts (H4). However, there are no significant interaction effects between parental education and cohort. Thus, H4 cannot be confirmed. Furthermore, there is some support for H5. The main effect of economic growth and its interaction with parental education is positively significant in the model of first marriage. This is in line with H5, i.e. in times of economic crisis the influence of parental education is larger than in times of economic prosperity. However, the effect is not statistically significant when first union is the dependent variable. Finally, Model D allows a test of H3, that suggests that the influence of parental education on the timing of entry into marriage is weaker among men who already cohabit than among men who do not cohabit. The results show that unmarried cohabitation accelerates entry into marriage, as there is a

significant positive effect of unmarried cohabitation on timing of first marriage. More importantly, the interaction between unmarried cohabitation and parental education is positive and significant, meaning that the negative effect of parental education decreases when a man starts cohabiting with a partner, supporting H3.

[table 4 about here]

Table 5 shows the additional results on timing of first union and first marriage for women. Model B demonstrates that, contrary to men, for women the effect of parental education appears to be partially mediated by women's own educational attainment, as the effects of parental education decrease substantially for first union and first marriage around respectively 28% and 26%, when respondent's education is included. The results for women in model C are quite similar to those for men. The most important difference is that for women there is no support for H5, as the interaction with economic growth is not significant for first union or first marriage. Model D shows that also for women entering unmarried cohabitation decreases the effect of parental education, confirming H3. Interestingly, the interaction of parental education and cohort is significant and negative, indicating that across cohorts the influence of parental education on postponement of marriage has increased. Generally, we can conclude that there is abundant support for H1, H2 and H3, while there is little support for H4 and H5.

[table 5 about here]

Table 6 shows the results of the competing risks analysis, comparing the risk of unmarried cohabitation in relation to the risk of marriage for men and women. Model A shows positive

significant effects for parental education for both men and women. These results indicate that higher education of the parents results in a higher odds of choosing unmarried cohabitation over direct marriage, confirming H6. Model B demonstrates that including the effect of respondents' education decreases the effect of parental education mostly for women. However, this decrease is quite small indicating that there is little mediation. Model C, in which the interactions of parental education with age, birth cohort and economic growth are included, shows a significant negative effect of the interaction with age and only for men a significant negative effect of the interaction with cohort. The interaction with economic growth is not significant for both men and women. Thus, there is ample support for H7, i.e. that the influence of parental education on the choice for unmarried over married cohabitation decreases with age, while only for men H8 is supported indicating that across cohorts the influence of parental education on the choice between married and unmarried cohabitation has decreased. H9 is not supported, indicating that economic crises do not alter the influence of parental education on the choice between married and unmarried cohabitation.

[table 6 about here]

SUMMARY AND DISCUSSION

The aim of this study was to provide a more extensive overview of how parental education influences the union formation process, and to what extent this influences changes over the life-course, across cohorts and periods. Because of the rise in unmarried cohabitation, we examined the influence of parental education on both unmarried cohabitation and marriage. The study was conducted in the Netherlands, which can be considered a country with relatively high levels of unmarried cohabitation compared to other European countries.

This study examined not only the influence of parental education on the timing of the first union, but also its influence on the timing of first marriage. As expected in H1, individuals with high educated parents postpone the timing of their first union and their first marriage compared to peers with lower educated parents. This finding is in line with previous research that found that parental education delays the timing of the first union (Mulder et al. 2006; Wiik 2009; Cavanagh 2011) and of the first marriage (Axinn and Thornton 1992; South 2001; Uecker and Stokes 2008). In line with previous studies (Wiik 2009; Cavanagh 2011), the effect of parental education of the parents is only partially mediated by children's own educational attainment, implying that the influence of educated parents is not just a result of the intergenerational transmission of education. Although not hypothesized, the effects of parental education appear stronger for first marriage than for first union. Given that the consequences of the decision to marry are often somewhat greater than those of the decision to cohabit, it may be that parents will put more effort in trying to influence the decision to marry, that their children will pay more attention to their parents' preferences, or that a combination of both processes will be at play.

Regarding changes over the life-course, the effect of education of the parents on timing of the first union and first marriage sharply decreases with age, as indicated by H2, which in line with previous research (South 2001; Wiik 2009). Furthermore, as expected in H3, unmarried cohabitation decreases the effect of parental education on the timing of first marriage, indicating that life-course events, such as the start of an unmarried cohabiting relationship, decrease the influence of parents on their children's marriage timing. On the other hand, we find no indication for a decrease of the effect of parental education on the timing of first union and first marriage across cohorts. This is contrary to H4 and findings of previous research that found that the effect of mother's education and father's social status decreased over time (South 2001; Sassler and Goldscheider, 2004; Wiik 2009). The influence

of parental education is stronger during economic crises only for men in their timing of their first marriage, providing little support for H5.

Apart from examining the influence of parental education on the timing of union formation, this study also investigated its influence on the choice between married and unmarried cohabitation. In line with H6, higher education of the parents is associated with an increased odds of choosing unmarried cohabitation rather than marriage as a first union. This offers support to the SDT argument that individualism, often valued by the educated, increases the propensity for people to choose cohabitation over marriage. This is in line with previous research in the Netherlands, which stated that unmarried cohabitation originated among the higher educated classes (De Feijter 1991). The PoD argument would have predicted children from lower educated classes to predominantly opt for unmarried cohabitation, but our results do not provide support for this mechanism. In accordance with H7, we find evidence for an age-related decrease in the effect of parental education on the choice between married and unmarried cohabitation. Only for men the influence of parental education on the choice for unmarried cohabitation over marriage decreased over time, providing limited support for H8. Furthermore, the influence of parental education on the choice for unmarried cohabitation was not found to be influenced by the economic business cycle, providing no support for H9.

A key finding of this study is that the influence of parental education on the union formation process is relatively stable over time. This contrasts with results for the US (South 2001; Sassler and Goldscheider 2004) and Norway (Wiik 2009). However, these studies did not find strong changes in effects. South (2001) only finds changes over time when indicators of socio-economic background were included separately in the model, but not when they were included together. Wiik (2009) only finds changes in the effect of mother's education over time and not for father's. Furthermore, De Graaf and Kalmijn (2006) found no change

over time in the effect of education of the parents on divorce in the Netherlands. Given that the Netherlands appears to be rather similar to other Western European countries in terms of the rise of unmarried cohabitation and educational expansion, it is questionable whether our surprising finding can be attributed to the Dutch context only. Theoretically, the answer to that question is important given that contrasting views on the changing roles of parents have been put forward. On the one hand, one may be tempted to infer from literature on the influence of individualization on relationship formation (Giddens 1992; Gross 2005) to expect that the role of parents is diminishing. On the other hand, in an individualistic society people may have smaller social networks and given that parents are likely to still be part of these smaller networks, their relative importance may even have increased. Clearly, comparative research is needed to examine this issue in greater detail.

The effect of parental education appeared to be somewhat stronger for women than for men. Women are possibly somewhat more susceptible to family influences, because gender socialization may teach women to be more obedient to family demands (Wiik 2009). However, mediation through own education was clearly present for women, whereas not for men. Possibly the link between parental education and children's education is stronger for women than men. Furthermore, the effect of parental education appeared to be more strongly attenuated by age and unmarried cohabitation for women than for men, indicating that for women the influence of parental education is more life-course dependent than for men. Thus, the gender difference in the strength of parental influence is large at young ages, but diminishes as young adults age.

The large number of respondents in the analysis (N=32,032) provided the analysis with great statistical power. However, the data consisted of eight different surveys and most of these surveys proved to be significantly different from one another in terms of timing of entry into first union and first marriage. This is surprising, because each survey claimed to be

nationally representative, implicating that survey differences should be minimal as they target the same population. This study demonstrates that controlling for survey differences remains important, even when pooling nationally representative surveys.

This study does have a number of limitations. First, we were not able to distinguish to what extent the influence of parental socio-economic background can be attributed to financial resources or socialization, as there was no information on family income in our data and only two surveys (FE 2003 and FE 2009) contained information about the occupational status of the parents. Second, we used quite a crude indicator for periodic changes in economic prosperity. For instance, information on youth unemployment would have been preferable. However, there was no information on youth unemployment reaching further back than the 1970s. Furthermore, our measure for respondent's education was somewhat ambiguous as a synthetic time-varying education variable was constructed, based on the final educational level. However, the data did not have information on school enrollment. Finally, it would be interesting to examine to what extent the age-related decrease in the influence of parents results from young adults experiencing other relevant life events that increase their independence, like leaving home or entry into the labor market.

In summary, the surprising finding is that the influence of parental education has hardly changed over cohorts and periods, while differences over the life-course appear to be strong. Future research on life-course related change in the effect of parental education should aim to disentangle whether the influence of family characteristics change because of a gradual psychological maturation process or the experience of demographic transitions. Furthermore, this life-course approach should not limit itself to the relationship formation process, but could also serve as a new approach to understanding the relationship between parental background and other demographic transitions, such as parenthood and divorce. Finally, internationally comparative research is important, as changes in the influence of

parental resources over the life-course are likely to be different depending on the societal context. Expanding research in these directions will provide a clearer picture of how parental background continues to influence decisions on demographic transitions and how it impacts on intergenerational inequality.

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Tables and Figures

Table 1 *An overview of surveys used in this study*

	Non-response rate	Age range	Percentage of women
NESTOR 1992	38%	54-89	51
ESR telepanel 1993	43%	18-89	48
OG 1993[a]	50%	18-42	55
OG1998	27%	18-52	54
OG 2003	43%	18-62	52
OG 2008	40%	18-62	51
FE 2003	47%	18-70	55
FE 2009	49%	18-90	51

[a] survey description states a non-response of at least 50% percent

Table 2 *Descriptive information on union formation variables, by gender and 10-year birth cohort*

Birth cohort	Median age first union		Median age first marriage		% Unmarried cohabitation for first union	
	Men	Women	Men	Women	Men	Women
1931-1940	28	26	28	26	5	2
1941-1950	25	23	25	23	19	15
1951-1960	25	23	27	24	50	39
1961-1970	26	23	32	27	78	71
1971-1980	26	24	35	31	86	82
1981-1990	27	24	.	.	85	85

Table 3 *Parameter estimates of a discrete-time hazard model of first union and first marriage, Model A for men and women*

	Model A for men				Model A for women			
	First Union		First Marriage		First Union		First Marriage	
	b	SE	b	SE	b	SE	b	SE
constant	-4.253**	0.024	-4.734**	0.026	-3.777**	0.020	-4.406**	0.021
Age	0.162**	0.004	0.088**	0.004	0.010*	0.004	-0.037**	0.004
Age^2	-0.047**	0.001	-0.040**	0.001	-0.040**	0.001	-0.030**	0.000
Age^3	0.002**	0.000	0.002**	0.000	0.002**	0.000	0.002**	0.000
Cohort	-0.019**	0.002	-0.058**	0.002	-0.017**	0.002	-0.055**	0.002
Cohort^2	0.003*	0.001	-0.005**	0.001	-0.001	0.001	-0.008**	0.001
Cohort^3	0.048**	0.008	0.034**	0.007	0.037**	0.008	0.028**	0.006
NESTOR	-0.007	0.110	-0.221*	0.106	-0.232*	0.107	-0.372*	0.101
ESR telepanel	-0.355**	0.048	-0.443**	0.054	-0.384**	0.046	-0.418**	0.051
OG93	0.083**	0.031	0.008	0.036	0.057*	0.027	0.036	0.029
OG98 (ref)	-	-	-	-	-	-	-	-
OG03	0.106**	0.029	0.080*	0.033	0.047	0.027	0.098**	0.029
OG08	0.187**	0.030	0.232**	0.033	0.166**	0.027	0.198**	0.029
FE03	-0.251**	0.062	0.358**	0.063	-0.345**	0.053	-0.316**	0.053
FE09	-0.077	0.058	0.087	0.050	-0.129*	0.050	-0.043	0.045
Parental education	-0.004**	0.001	-0.011**	0.001	-0.009**	0.001	-0.015**	0.001
-2 log likelihood	132,590		109,293		149,338		127,714	
χ^2(df)[a]	4,563**(14)		5,421**(14)		6,497**(14)		7,108**(14)	

**p<0.01, *p<0.05,
a) Wald test

Table 4 *Parameter estimates of a discrete-time hazard model of first union and first marriage, Models B,C and D for men*

	Model B				Model C				Model D	
	First union		First marriage		First union		First marriage		First marriage	
	B	SE	b	SE	b	SE	b	SE	b	SE
constant	-4.228**	0.026	-4.692**	0.028	-4.218**	0.029	-4.814**	0.033	-5.252**	0.036
Age	0.163**	0.004	0.089**	0.004	0.163**	0.004	0.098**	0.004	-0.052**	0.004
Age^2	-0.047**	0.001	-0.040**	0.001	-0.047**	0.001	-0.041**	0.001	-0.040**	0.001
Age^3	0.002**	0.000	0.002**	0.000	0.002**	0.000	0.002**	0.000	0.002**	0.000
Cohort	-0.019**	0.002	-0.058**	0.002	-0.019**	0.002	-0.058**	0.002	-0.070**	0.004
Cohort^2	0.003	0.001	0.005**	0.001	0.003*	0.001	-0.006**	0.001	-0.003	0.001
Cohort^3	0.048**	0.008	0.035**	0.007	0.049**	0.008	0.040**	0.007	0.050**	0.007
Economic growth					-0.004	0.006	0.044**	0.007	0.048**	0.007
cohabitation									1.116**	0.062
NESTOR	-0.039	0.111	-0.273*	0.107	-0.038	0.112	-0.166	0.110	-0.221*	0.109
ESR telepanel	-0.376**	0.049	-0.477**	0.055	-0.371**	0.049	-0.453**	0.055	-0.410**	0.055
OG93	0.077*	0.031	-0.003	0.036	0.078*	0.031	0.010	0.036	-0.036	0.036
OG98 (ref)	-	-	-	-	-	-	-	-	-	-
OG03	0.100**	0.029	0.068*	0.033	0.101**	0.029	0.067*	0.033	0.053	0.033
OG08	0.181**	0.030	0.219**	0.034	0.180**	0.030	0.223**	0.034	0.183**	0.034
FE03	-0.271**	0.062	0.394*	0.064	-0.272**	0.062	-0.382**	0.064	-0.351**	0.064
FE09	-0.090	0.058	0.110*	0.050	-0.095	0.058	-0.110*	0.050	-0.089	0.050
Parental education	-0.004**	0.001	-0.010**	0.001	-0.005**	0.001	-0.018**	0.001	-0.026**	0.002
Education	-0.001**	0.001	-0.002**	0.001	-0.002**	0.001	-0.003**	0.001	-0.003**	0.000
Parental education*Age					0.001**	0.000	0.002**	0.000	0.002**	0.000
Parental education*Cohort					-0.000	0.000	0.000	0.000	0.000	0.000
Parental educ.*Ec. growth					0.000	0.000	0.002**	0.000	0.002**	0.000
Parental education*Cohab.									0.009**	0.002
-2 log likelihood	132,582		109,277		132,544		109,035		107,001	
χ²(df)^a	7.388**(1)		16.35**(1)		38.52**(4)		242.08**(4)		2,033**(2)	

**p<0.01, *p<0.05,

a) log-likelihood test based on a comparison of current model with previous model, e.g. model B compared to model A, C compared to B etc.

Table 5 *Parameter estimates of a discrete-time hazard model of first union and first marriage, Models B,C and D for women*

	Model B				Model C				Model D	
	First union		First marriage		First union		First marriage		First marriage	
	B	SE	b	SE	b	SE	b	SE	b	SE
constant	-3.642**	0.022	-4.230**	0.022	-3.611**	0.025	-4.291**	0.026	-4.733**	0.029
Age	0.014**	0.004	-0.034**	0.004	0.012**	0.004	-0.031**	0.004	-0.064**	0.004
Age^2	-0.041**	0.001	-0.031**	0.000	-0.042**	0.001	-0.032**	0.000	-0.030**	0.000
Age^3	0.002**	0.000	0.002**	0.000	0.002**	0.000	0.002**	0.000	0.002**	0.000
Cohort	-0.014**	0.002	-0.052**	0.002	-0.014**	0.002	-0.051**	0.002	-0.062**	0.002
Cohort^2	-0.002	0.001	-0.009**	0.001	-0.001	0.001	-0.009**	0.001	-0.006**	0.001
Cohort^3	0.037**	0.008	0.029**	0.007	0.037**	0.008	0.032**	0.007	0.045**	0.007
Economic growth					-0.013**	0.005	0.024**	0.006	0.029**	0.006
Cohabitation									0.872**	0.022
NESTOR	-0.378**	0.108	-0.555**	0.102	-0.403**	0.107	-0.456**	0.105	-0.430**	0.103
ESR telepanel	-0.508**	0.047	-0.570**	0.052	-0.505**	0.047	-0.544**	0.052	-0.491**	0.052
OG93	0.018	0.027	-0.019	0.030	0.012	0.027	-0.017	0.030	-0.036	0.030
OG98 (ref)	-	-	-	-	-	-	-	-	-	-
OG03	0.013	0.027	0.045	0.029	0.012	0.027	0.047	0.029	0.057	0.029
OG08	0.111**	0.028	0.124**	0.029	0.105**	0.028	0.121**	0.029	0.091**	0.030
FE03	-0.408**	0.054	-0.412**	0.054	-0.408**	0.054	-0.390**	0.054	-0.308**	0.054
FE09	-0.198**	0.050	-0.141**	0.046	-0.209**	0.050	-0.145**	0.046	-0.123**	0.046
Parental education	-0.007**	0.001	-0.011**	0.001	-0.004**	0.001	-0.010**	0.001	-0.021**	0.001
Education	-0.009**	0.001	-0.011**	0.001	-0.009**	0.001	-0.011**	0.001	-0.011**	0.001
Parental education*Age					0.001**	0.000	0.003**	0.000	0.002**	0.000
Parental education*Cohort					0.000	0.000	-0.000	0.000	-0.000**	0.000
Parental educ.*Ec. growth					-0.000	0.000	0.000	0.000	0.001**	0.000
Parental education*Cohab.									0.018**	0.001
-2 log likelihood	149,077		127,338		148,964		126,977		125,345	
χ^2(df)^a	260.61**(1)		376.71**(1)		113.73**(4)		360.61**(4)		1,632**(2)	

**p<0.01, *p<0.05,
a) log-likelihood test based on a comparison of current model with previous model, e.g. model B compared to model A, C compared to B etc.

Table 6 *Parameter estimates of a multinomial logit model comparing the risk of unmarried cohabitation relative to marriage, by gender*

	Model A				Model B				Model C			
	Men		Women		Men		Women		Men		Women	
	B	SE	b	SE	b	SE	b	SE	b	SE	b	SE
constant	0.603**	0.048	0.537**	0.041	0.520**	0.053	0.308**	0.044	0.672**	0.061	0.405**	0.050
Age	0.007	0.008	0.101**	0.008	0.005	0.008	0.095**	0.008	0.004	0.008	0.084**	0.008
Age^2	0.025**	0.002	0.015**	0.001	0.025**	0.002	0.016**	0.001	0.026**	0.002	0.017**	0.001
Age^3	-0.001**	0.000	-0.001**	0.000	-0.001**	0.000	-0.001**	0.000	-0.001**	0.000	-0.001**	0.000
Cohort	0.108**	0.005	0.101**	0.004	0.108**	0.005	0.097**	0.004	0.113**	0.005	0.100**	0.004
$Cohort^2$	-0.023**	0.003	-0.017**	0.003	-0.022**	0.003	-0.016**	0.003	-0.019**	0.003	-0.013**	0.003
$Cohort^3$	0.018	0.024	0.074**	0.024	0.018	0.024	0.076**	0.024	0.005	0.023	0.067**	0.024
Economic growth									-0.015**	0.035	-0.043**	0.011
NESTOR	0.307	0.560	-0.821	1.069	0.412	0.561	-0.566	1.069	0.120	0.554	-0.810	1.072
ESR telepanel	0.122	0.097	0.134	0.093	0.193	0.099	0.351**	0.095	0.202*	0.099	0.346**	0.095
OG93	-0.028	0.063	-0.073	0.053	-0.007	0.063	0.005	0.053	-0.013	0.063	0.002	0.053
OG98 (ref)	-	-	-	-	-	-	-	-	-	-	-	-
OG03	0.074	0.059	-0.142*	0.054	0.095	0.059	-0.067	0.054	0.099	0.059	-0.066	0.054
OG08	-0.144*	0.061	-0.183**	0.055	-0.119	0.061	-0.062	0.055	-0.119	0.061	-0.068	0.055
FE03	0.286*	0.119	-0.092	0.105	0.360**	0.120	0.043	0.106	0.362**	0.121	0.033	0.106
FE09	-0.081	0.108	-0.267**	0.096	-0.030	0.108	-0.102	0.096	-0.044	0.109	-0.113	0.096
Parental education	0.022**	0.001	0.025**	0.001	0.020**	0.001	0.020**	0.001	0.029**	0.003	0.022**	0.002
Education					0.005**	0.001	0.014**	0.001	0.005**	0.001	0.014**	0.001
Parental educ.*Age									-0.001**	0.000	-0.002**	0.000
Parental educ.*Cohort									-0.001**	0.000	0.000	0.000
Parental educ.*Ec. gr.									-0.001	0.001	0.001	0.001
-2 log likelihood	144,768		163,641		144,745		163,234		144,543		163,006	
$\chi^2(df)^a$	7,457**(28)		9,496**(28)		23.462**(2)		407.79**(2)		201.82**(8)		228.32**(8)	

$**p<0.01$, $*p<0.05$,
a) Model A, Wald test, for Models B and C a likelihood ratio tests comparing with the previous model

Figure 1 Development of GDP growth volume change from 1949 to 2009