

The Impact of Education on the Transition to Parenthood in Belgium and the United Kingdom

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Paper prepared for the XXVI IUSSP International Population Conference

(Session 28: Timing of childbearing)

27 September – 2 October 2009, Marrakech (Morocco)

(first draft – please do not quote)

Abstract

This paper studies the relation between multiple dimensions of education and the transition to parenthood. Previous empirical research has predominantly focused on the effect of female educational attainment on the timing of first births. A positive effect has been reported: higher educated women postpone the entry into parenthood. However, this effect disappears or reverses its sign once the effects of educational enrolment or time elapsed since leaving education are taken into account. The principal aim of this study is to build upon current knowledge and develop new insights on the complex relation between education and the transition to parenthood. The original contribution of my study is to simultaneously consider the influence of educational level, educational enrolment, and time elapsed since leaving education on the transition to parenthood. Empirical results are compared for Belgium and the United Kingdom, using the Panel Study of Belgian Households and the British Household Panel Survey.

Introduction

The delay of entering motherhood has been one of the main trends in the evolution of fertility in the industrialised world in the last few decades (Billari, 2005; Frejka & Sardon, 2007). Apart from a rising age at first birth, the incidence of childlessness has increased substantially and the average family size has declined. Researchers have devoted considerable attention to the rate of recuperation of delayed first births (see for instance Lesthaeghe & Moors, 2000) and several studies suggest that the postponement of first births, childlessness and completed fertility are closely related (see for instance Morgan & Rindfuss, 1999; Köhler, Billari & Ortega, 2002).

Explanations for changes in the timing of entering motherhood have focussed on a large variety of factors, such as economic, cultural and institutional changes. In particular, considerable attention has been devoted to understanding the relation between women's educational attainment and the timing of becoming a mother. The reasons for this attention are multifold: women's educational attainment is associated with future income and occupations, career orientations, attitudes towards gender equality, and so on. Furthermore, individuals' educational level is routinely measured in surveys. However, despite the considerable interest in the link between educational attainment and first birth timing, much about this relation is yet unknown. This is perhaps best illustrated by the diverging results obtained by previous empirical research. Several studies have found negative and statistically significant effects of educational attainment on first birth rates (De Wit, 1994; Liefbroer & Corijn, 1991; Martin, 1992; Upchurch, Lillard & Panis, 2002; Martin-Garcia & Baizan, 2006; Nicoletti & Tanturri, 2008). In other words, there is a positive association between education and the timing of entering motherhood, indicating that highly educated women delay becoming a mother compared to lower educated women. In contrast, some studies have reported positive and statistically significant effects of educational attainment on first birth rates (Blossfeld & Huinink, 1991; Lappegard & Ronsen, 2005; Kreyenfeld, 2009). This finding has been interpreted as indicating that highly educated women postpone the first birth while studying, but catch up with their lower educated peers after leaving the education system. Finally, there are a few studies that have found non-linear effects of educational attainment on first birth rates, meaning that the rate of entering motherhood is the highest among both highly and low educated women (Santow & Bracher, 2001; Winkler-Dworak & Toulemon, 2007).

However, research looking at the reasons for the diverging effect of educational attainment on the transition to motherhood is scarce. The main aim of the current study is to explore some of the reasons for the diverging effects of educational attainment on the transition to motherhood. The literature review has signalled four possible factors: first, variation in the impact of educational enrolment; second, variation in the time interval between leaving the education system and entering motherhood; third, cross-national variation in the effect of educational attainment on first birth rates; and fourth, variation resulting from different measures of educational attainment. In order to investigate whether these four factors

influence the relation between educational attainment and the entry into motherhood, we have used two panel studies, the “Panel Studie van Belgische Huishoudens” (PSBH) and the “British Household Panel Survey” (BHPS), and analysed these data using methods for event history analysis. Separate models have been estimated for Belgium and the United Kingdom to investigate whether the impact of these four factors varies by country.

The following section reviews the literature on the relation between educational attainment and the transition to motherhood. Afterwards, we describe the data and methods, which is followed by the descriptive and inferential analysis. The final section summarises the main findings.

1. Literature review

This section reviews the empirical evidence of the impact of education on the transition to motherhood. Empirical studies have shown that several aspects of education influence the first birth process, amongst others educational attainment, educational enrolment, the type of engagement, the field of study, and the organisation of the education system (for instance, the compulsory school age, financial support, its flexibility, *etc.*). In the current discussion, most attention has been devoted to the impact of educational attainment and educational enrolment for reasons specified throughout the text. Furthermore, while there has been a debate about the possibly recursive relation between education and fertility (see for instance Hofferth, 1984; Rindfuss, St. John & Bumpass, 1984; Anderson, 1993; Upchurch, McCarthy & Ferguson, 1993), here we are only interested in the effect of education on entering motherhood, and not in the effect of becoming a mother on education (see for instance Upchurch & McCarthy, 1990; Hofferth, Reid & Mott, 2001).

Women’s educational attainment or level is a standard feature in the research on fertility and fertility change. Empirical studies conducted in the past thirty years covering a large number of industrialised countries have repeatedly reported a positive association between women’s educational attainment and the timing of first births (Rindfuss, Bumpass & St. John, 1980; Rindfuss & St. John, 1983; Marini, 1984; Rindfuss, Morgan & Swicegood, 1984; De Wit, 1994; Forest, Moen & Dempster-McClain 1995; Liefbroer & Corijn, 1999; Martín-García & Baizán, 2006; Kravdal & Rindfuss, 2008). In other words, highly educated women enter motherhood later than low educated women. This association has been reported for women born throughout the twentieth century and there are some indications that the relation between educational attainment and the timing of first births has become stronger over time, resulting in a growing heterogeneity in the timing of entering motherhood between women with different educational qualifications (Bloom & Trussell, 1984; Rindfuss, Morgan, Swicegood, 1984; De Wit, 1994; Martin, 2000; Lappegård & Rønsen, 2005). Furthermore, the relation between educational attainment and the timing of entering motherhood appears to be monotonic. For instance, 78.0 percent of low educated British women born in the sixties had

experienced a first birth by age 29, compared to 58.7 percent of middle educated women and 37.5 percent of highly educated women. Similar patterns can be observed in France and the Nordic countries as well as in older cohorts (Rendall *et al.*, 2005; Andersson *et al.*, 2008). In addition, the impact of educational attainment on fertility seems to be birth order-specific. Whereas educational attainment has been found to lower first birth rates (i.e. to postpone childbearing), there is some evidence that highly educated women have higher second birth rates than low educated women (Olah, 2003; Köppen, 2006; Gerster *et al.* 2007)¹.

Educational attainment is not only associated with the timing of childbearing, but also with the number of children women have. The incidence of childlessness is the lowest among women with low educational qualifications and the highest among women with high qualifications (Bloom & Trussel, 1984; Mencarini & Tanturri, 2006; Keizer, Dykstra & Jansen, 2008; Kravdal & Rindfuss, 2008). For instance, the proportion of childless women with the highest qualifications in Norway is double as high as those with the lowest qualifications (Kravdal & Rindfuss, 2008). A positive relation between educational attainment and the incidence of childlessness can also be observed in other West European countries² (Andersson *et al.*, 2008; Neyer & Hoem, 2008). Since high educated women delay the entry into motherhood and a substantial number remain childless, it has been suggested that both phenomena are related. According to Veevers (1973, quoted in Kravdal, 1994) voluntary childlessness is often the result of the sequential postponement of childbearing. While the measurement of (in)voluntary childlessness is not straightforward, this argument is supported by the facts that very few women aged under 30 wish to remain childless (see for instance Toulemon, 1996), as well as the increased use of fertility enhancing techniques (such as in vitro fertilisation) in recent years, in particular at advanced childbearing ages, and the over-estimation of fecundity after age 35 among women with university qualifications (Lampic *et al.*, 2006). Furthermore, since there is a negative association between the age at first birth and completed fertility (Morgan & Rindfuss, 1999; Köhler, Billari & Ortega, 2002), we would expect that average family size and educational attainment are negatively related.

While there is a positive *association* between educational attainment and the timing of first births, empirical studies show that the *statistical effect* of educational attainment on the transition to motherhood varies strongly between studies. The effect of educational attainment on the probability of experiencing a first birth varies from negative and significant in some studies (Martin, 1992; De Wit, 1994; Liefbroer & Corijn, 1999; Upchurch, Lillard & Panis, 2002; Martín-García & Baizán, 2006; Nicoletti & Tanturri, 2008) to negative and not significant in others (Blossfeld & Jaenichen, 1992). This is in sharp contrast with a number of

¹ Some studies have reported that the significance and sign of this effect change once the partner's educational attainment and selection effects are taken into account (Kravdal, 2001; Kreyenfeld, 2002; Prskawetz & Zagaglia, 2005; Köppen, 2006; Brodmann, Esping-Andersen & Güell, 2007; Kravdal, 2007). Furthermore, Kravdal (2007) has illustrated that the effect is sensitive to the measurement of educational attainment. However, after controlling for selection and using the current educational level instead of the educational level measured at age 39, Kravdal (2007) still finds a positive effect of educational level on second birth probabilities.

² However, in Finland and Sweden the incidence of childlessness in the youngest cohorts is higher for low educated women than for high educated women (Andersson *et al.*, 2008).

studies which report positive effects (Blossfeld & Huinink, 1991; Lappegård & Rønsen, 2005; Kreyenfeld, 2009). In the study by Blossfeld and Huinink (1991), the positive effect only appears after controlling for women's changing level of career resources over the life course. Furthermore, a few studies have observed non-linear effects, in particular, the form of the relation between educational attainment and first birth rates is U-shaped, which indicates that both low and high educated women experience the highest rates of entering motherhood (Santow & Bracher, 2001; Winkler-Dworak & Toulemon, 2007). Finally, two other studies have found that the impact of educational attainment on first birth rates varies by partnership status, with a negative effect apparent among single women and a positive effect among cohabiting or married women (Kravdal, 1994; Santow & Bracher, 2001).

In what follows, we explore some of the possible reasons for the diverging effect of educational attainment on the transition to motherhood. Four factors which may explain the range of effects are studied in more detail: the impact of educational enrolment, the time interval between leaving education and entering motherhood, cross-national variation in the effect of educational attainment on the transition to motherhood, and the measurement of educational attainment.

1.1. Educational enrolment

A first possible reason for the diverging effect of educational attainment on the transition to motherhood could be related to the extent to which the delaying effect of educational attainment on the timing of first births can be attributed to the impact of educational enrolment. Empirical studies that take into account the length of full-time studies consistently report a delaying effect of educational enrolment on the timing of first births³ (Blossfeld & Huinink, 1991; Blossfeld & Jaenichen, 1992; Kravdal, 1994; Liefbroer & Corijn, 1999; Santow & Bracher, 2001; Upchurch, Lillard & Panis, 2002; Lappegård & Rønsen, 2005; Martín-García & Baizán, 2006; Winkler-Dworak & Toulemon, 2007; Nicoletti & Tanturri, 2008; Kreyenfeld, 2009). In other words, the large majority of women delay the entry into motherhood until they have left the education system. The importance of the age at leaving education in explaining the timing of first births has been nicely illustrated by Skirbekk and colleagues (2004) in a natural experiment on how the organisation of the Swedish education system influences the timing of demographic events. In Sweden, compulsory school age starts in the year children turn age 7 and as a consequence children who are born in December and January belong to a different school cohort, leading to an 11 months difference in the age at graduation. Skirbekk and colleagues (2004) found that the age at first birth is on average 4.9 months *lower* among individuals born in December compared to those born in January, even though the age difference is just one month.

³ The impact of educational enrolment might be different for individuals enrolled in full-time and part-time studies, but to our knowledge no study has yet investigated this.

Furthermore, there are indications that the strength of the negative impact of educational enrolment on the transition to motherhood is dependent on the type of course women are engaged in. In an analysis of Norwegian register data, Lappegård and Rønsen (2005) found that the probability of experiencing a first birth among women enrolled in upper secondary education is lower in the academic than in the vocational fields. In the U.S., Upchurch, Lillard and Panis (2002) observed that women enrolled in college are less likely to conceive a child than women enrolled in school. However, a similar difference between enrolment in secondary and post-secondary studies was not reported in a Swedish study (Santow & Bracher, 2001).

The impact of enrolment in education on the transition to motherhood has also been found to vary with age. Kravdal (1994) found a weakening effect of educational enrolment on the transition to motherhood in successive age groups, though it was still negative in the oldest age group. In a comparative study of Flanders and the Netherlands, Liefbroer and Corijn (1999) reported a similar change in the effect of educational enrolment by age groups, which loses its statistical significance among Flemish females aged 24 to 30.

In sum, there is substantial empirical evidence that educational enrolment strongly influences the timing of entering motherhood. The basic argument is that normative and structural constraints prevent young women from entering motherhood while being enrolled in education. Once they leave the education system, these constraints weaken or disappear. Highly educated women spend more time in the education system than low educated women, and hence delay entering motherhood longer. In this respect, the diverging effects of educational attainment on the timing of first births may result from differences in the underlying process which links educational attainment with the timing of first births: educational attainment might purely postpone childbearing, via the incompatibility of “studenthood” and motherhood. Alternatively, educational attainment might exert both a direct and an indirect effect on first birth rates through educational enrolment.

1.2. The time interval between leaving education and entering motherhood

Variation in the time interval between leaving education and entering motherhood between educational levels might provide a second explanation for differences in the effect of educational attainment on the transition to motherhood. The absence of a clear negative effect of educational attainment on first birth rates has generally been interpreted as indicating a catching-up of first births among higher educated women compared to their lower educated counterparts after leaving education (Blossfeld & Huinink, 1991; Kravdal, 1994; Lappegård & Rønsen, 2005; Kreyenfeld, 2009). This would mean that first birth rates among high educated women are not only similar to their lower educated peers, but also that high educated women enter motherhood at a quicker pace once they leave education. In other words, the average length of time between graduating and entering motherhood decreases as

the educational level increases. In this respect, in countries where high educated women accelerate childbearing upon leaving education, there is a positive effect of educational attainment, whereas in countries where high educated women do not accelerate childbearing after leaving education, there is a negative effect. Whether such an acceleration effect appears, may be dependent on the typical age at which women leave education and how long it takes to obtain particular qualifications. The expectation is that the higher this age is, or the longer the length of the courses, the more likely an acceleration effect will appear.

Earlier it was mentioned that there is a positive association between educational attainment and the timing of first births as well as the incidence of childlessness. In this respect, even if higher educated women accelerate childbearing after leaving education, one would still expect a negative effect of educational attainment on first birth rates. The explanation for the positive effect in the study by Blossfeld and Huinink (1991) is, in fact, that the incidence of childlessness did not differ markedly by educational level and because high educated women accelerated childbearing after leaving education. However, in Norway and Sweden, two countries for which positive effects of educational level have been reported in recent studies (Santow & Bracher, 2001; Lappegård & Rønsen, 2005), the incidence of childlessness increases with progressively higher levels of educational attainment (Kravdal & Rindfuss, 2008; Neyer & Hoem, 2008)⁴. Furthermore, among Norwegian and Swedish women who are still of childbearing age, the proportion of women who have had a first child at a certain age decreases as the educational attainment increases (Andersson *et al.*, 2008; Rendall *et al.*, 2005). We would therefore expect that in these countries the positive effect of educational attainment has become weaker over time. Indeed, Lappegård and Rønsen (2005) found that educational differences in the timing of first births among Norwegian women have become smaller over time and a similar weakening of the effect of educational attainment has been reported by Winkler-Dworak and Toulemon (2007) for France. Unfortunately, Santow and Bracher (2005) did not test for the presence of interaction effects between educational attainment and cohorts.

1.3. Cross-national variation in the effect of educational attainment on the transition to motherhood

Factors which vary *between* countries may mediate the relation between educational attainment and the transition to motherhood. Studies that have been carried out in the same countries but using different data and methods have largely returned similar results. González and Jurado-Guerrero investigated the (non-)transition to motherhood in France, Italy, Spain and West Germany using the European Community Household Panel (ECHP). For France, González and Jurado-Guerrero (2007) found a U-shaped pattern in the effect of educational

⁴ While in Sweden the differences in childlessness between educational groups are low, the incidence of childlessness is considerably higher among women with upper tertiary education and research degrees (Neyer & Hoem, 2008).

attainment on the timing of first births and a similar pattern can be seen in the study by Winkler-Dworak and Toulemon (2007). Further, the results for Spain obtained by González and Jurado-Guerrero (2006) and Martín-García and Baizán (2006) are very similar: both studies report a negative and significant effect of educational attainment on first birth rates. Finally, while both Blossfeld and Huinink (1991) and Kreyenfeld (2009) find a positive effect of educational attainment on first birth rates in West Germany, González and Jurado-Guerrero (2006) observe non-significant effects ranging from negative to weakly positive. Thus, within-country results are relatively similar. However, there are exceptions: for instance, Kravdal (1994) reported a negative gradient between educational level and first birth rates in Norway, whereas Lappegård and Rønsen (2005) observed a positive one. It could be that the estimates in the study by Kravdal (1994) are biased downwardly since the sample consists of women aged 17 to 30 and because the average age at entering motherhood among higher educated Norwegian women is around 30 years of age (see Kravdal & Rindfuss, 2008).

1.4. The measurement of educational attainment

Finally, the effect of educational attainment on the transition to motherhood may differ between studies as a consequence of different measures of educational attainment. Kravdal (2004, 2007), in two contributions on the impact of education on fertility in Norway, has illustrated how using different measures of educational level can produce entirely different results. The author found that the effect of educational attainment on fertility becomes less negative when using the *current* educational level rather than the *highest* educational level achieved⁵. With respect to first births, the effect of educational attainment becomes less negative (but remains significant) when using the current educational level instead of using the highest educational level. As far as second births are concerned, the effect of education changes from significantly negative in a model with the highest educational level to significantly positive in a model with current educational level. Furthermore, Hoem and Kreyenfeld (2006) calculated the median age at first birth using the educational level measured at the interview and the current educational level. They found that the median age at first birth for women with a university degree using the former measure was six years higher than when using the latter measure.

⁵ The current educational level is the educational level measured at a particular moment in time and thus changes over the life course, whereas the highest educational level usually refers to the highest educational level at the time of the interview.

2. Description of the data

Data from two panel studies have been used to investigate the effect of education on the transition to motherhood: the British Household Panel Survey (BHPS) for the United Kingdom (see Taylor, Brice, Buck & Prentice-Lane, 2009) and the Panel Study of Belgian Households (PSBH) for Belgium (see Jacobs, Loots, Marynissen & Scheipers, 1991). In both studies, a representative sample of private households in the population has been taken; persons living in collective households are not part of the sample. The BHPS sample is representative of the British population south of the Caledonian Canal (*i.e.* excluding Northern Ireland) in 1991 (Taylor *et al.*, 2009). The PSBH sample is representative of the Belgian population in 1992 (Jacobs *et al.*, 1991). This panel of households has been contacted annually and individual interviews were obtained with all household members aged 16 or older. A household reference person has provided information about the household in a separate questionnaire (Jacobs *et al.*, 1991; Taylor *et al.*, 2009). Children born after the first wave became automatically part of the panel⁶. Persons who joined a household after the first wave became part of the study as well, but they were only followed as long as they lived in the household⁷ (Jacobs *et al.*, 1991; Taylor *et al.*, 2009). The BHPS is an ongoing study and organised the first data collection wave in 1991. In this first wave, over 5500 households were interviewed, covering more than 13000 persons. For the current study, data from the first 15 waves have been used (1991-2005). The PSBH started in 1992 and the last wave was in 2002, thus a total of 11 waves are available. In the first wave, around 4500 households were interviewed, covering more than 11000 individuals. Here, data from all waves have been used.

2.1. The dependent variable: the transition to motherhood

The BHPS and the PSBH have collected data on women's fertility in two ways. First, the date of birth of the first child has been collected retrospectively in wave 2 in the BHPS and in wave 1 in the PSBH. Second, the birth of a first child between interviews has been observed in both studies. This retrospective and prospective data have been combined to reconstruct first birth histories up to the date of the last interview. The availability and combination of retrospective and prospective data offers the possibility to not only study the transition to motherhood during the panel, but also in the period before the panel. The date of birth of the first child refers to the first live birth (thus excluding stepchildren, adopted children, foster children, and stillbirths)⁸. Women with a missing value on their year of birth or the year of birth of the first child have been excluded from the sample. Missing values on women's month of birth or the month of birth of the first child have been set to June. The data have

⁶ In the PSBH, children adopted after wave 1 also became automatically part of the panel.

⁷ There is one exception to this rule in the BHPS: persons who are not original sample members, but have a child with a sample member, are followed after separation with the original sample member.

⁸ In the PSBH, for a small number of cases (n=70) it is not possible to make a distinction between biological and non-biological children. These cases are therefore excluded from the sample.

then been re-organised to obtain a person-period-file which contains one record for every month a woman is “at risk” of experiencing a first birth. Women are at risk of experiencing a first birth if they are childless and in their reproductive period, which is defined here as the period between the 14th and 45th birthday. Women are observed until the date of the first birth, or when they did not experience a first birth until the date of right-censoring or the month before they turn 45, whichever comes first.

2.2. The main independent variables: educational attainment, educational enrolment, and the time elapsed since leaving education

2.2.1. Educational attainment

The BHPS and PSBH have collected information on the highest educational qualification obtained by the respondent at the time of the last individual interview. We therefore know whether and how women’s educational attainment has changed *during* the panels, but not *before* the start of the panels. In principle, it would be possible to only select women for which we have information on the entire educational career. However, this would substantially reduce the sample size and limit the investigation to the youngest cohorts. It has therefore been decided to only use the information on the highest educational qualification obtained at the last interview.

One of the aims of this study is to investigate the relation between educational attainment and the transition to motherhood in Belgium and the United Kingdom as well as how this relation has changed over time. It is therefore important that the educational qualifications are comparable between the two countries and over time. Previous studies which have looked at the relation between educational attainment and fertility in more than one country have adopted a variety of techniques to enable a comparison of different education systems. Most previous studies have harmonised educational qualifications by using the International Standard Classification of Education (ISCED) (see for instance Bosveld, 2001; Schoenmaeckers, Lodewijckx & Van Peer, 2002; Rendall, *et al.*, 2005; González & Jurado-Guerrero, 2006; Neyer & Hoem, 2008). This classification was developed by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) amongst others to facilitate the cross-national comparison of educational levels and fields (UNESCO, 2006). Other studies have used the shortest or average length of time required to achieve a certain level (Liefbroer & Corijn, 1999; Gustafsson & Worku, 2005), as well as the age at which the highest level of education was completed (Nicoletti & Tanturri, 2008).

A categorical specification of the educational level variable has been chosen for two reasons. First, it enhances comparability with the results of previous studies since most use a categorical indicator of educational attainment. Second, previous research has reported both linear and non-linear effects of educational attainment on first birth rates. The ISCED

categorisation was adopted to facilitate the comparison of educational qualifications in Belgium and the United Kingdom. ISCED specifies 7 categories of educational attainment which have been rearranged into 3 groups: lower education (ISCED 0-2; lower secondary education and below), medium education (ISCED 3-4; upper secondary education) and higher education (ISCED 5-6; tertiary education). The higher education category has been subdivided into a non-university and a university category. Appendix 1 describes the education system in Belgium and the United Kingdom, as well as how the educational qualifications in both systems are categorised following ISCED. An important question was how to categorise those women who were still enrolled in education at the time of the last interview, which concerns 3.53 percent of the total sample in the BHPS, and 11.22 percent in the PSBH⁹. These women could be included in the lower secondary education category. However, women who were still studying at the time of the last interview are most likely enrolled in higher education. They are therefore more likely to postpone entering motherhood whereas those with lower educational qualifications who have left education are not (Hoem & Kreyenfeld, 2006). For this reason, a separate category for those enrolled in education at the time of the last interview has been created.

The final variable is time-invariant and has the following categories:

1. enrolled in education at the time of the last interview;
2. lower secondary education or below;
3. upper secondary education;
4. non-university higher education;
5. university higher education

2.2.2. Educational enrolment and the time elapsed since leaving education

In both the BHPS and PSBH persons were asked at what age they left education: in the BHPS the age at leaving education refers to the month of first leaving full-time education, and in the PSBH it refers to the age at which individuals stopped studying^{10/11/12}. The information on the age at leaving education is used to create a time-varying variable which indicates whether a

⁹ The proportion of women who are still enrolled in education at the last interview is larger in the PSBH than in the BHPS because the last wave of the PSBH was in 2002 whereas the last wave of the BHPS was in 2005. As a result, more women in the younger cohorts had left education by the time of the last interview in the BHPS than in the PSBH.

¹⁰ In the PSBH, the wording of the question changed between waves 1-3 and waves 4-11 from “*At what age did you end your studies?*” to “*At what age did you obtain your last diploma?*” For women who left education before wave 3, the age at leaving education refers to the age at which they ended their studies. For women who left education after wave 3, the age at leaving education refers to the age at obtaining the last diploma.

¹¹ For the BHPS, for women who had not left education in the first wave, the Halpin-files (Halpin, 1997, 2000) have been used to identify women who left education after the first wave and to collect the age at first leaving full-time education.

¹² Note that the actual age at achieving the highest educational qualification may be lower or higher than the reported age at leaving education for two reasons. First, it will be lower for persons who drop out from a course which was started after achieving their highest educational qualification. Second, it will be higher for persons who return to education and achieve their highest educational qualification during these educational episodes.

woman is enrolled in education, as well as the time elapsed since leaving education. Women are coded as being enrolled in education until the age at which they left education. Those women who had not left education at the time of the last interview are coded as being continuously enrolled in education. This variable is time-variant and is categorised as follows:

1. enrolled in education;
2. between 0 to 4 years after leaving education;
3. between 5 to 8 years after leaving education;
4. between 9 to 12 years after leaving education;
5. more than 12 years after leaving education

2.2.3. A combined measure of educational attainment and educational enrolment

In order to investigate whether a different measurement of educational attainment influences the effect of education on the transition to motherhood, an indicator for the *current* educational level has been constructed, in addition to the *highest* educational level. The main difference between the two is that the former indicates the educational level obtained at a certain age, whereas the latter indicates the highest educational level obtained at the last interview. Such an indicator has for instance been used by Kravdal (2004, 2007). However, since retrospective education histories are not available in the BHPS and PSBH, it is unknown whether and how women's educational level has changed before the start of the panel. Hoem and Kreyenfeld (2006) were confronted with a similar problem and addressed this issue by allocating a woman's educational level after she had left education. Until that time, women are coded as being continuously enrolled in education¹³. This strategy has been adopted here as well. The result is a time-variant categorical variable measuring the current educational level which has the following categories:

1. enrolled in education;
2. lower secondary education or below;
3. upper secondary education;
4. non-university higher education;
5. university higher education

2.3. Control variables

2.3.1. Partnership status

Retrospective partnership histories were collected in the BHPS in wave 2, and in the PSBH in waves 1 and 2. These can be updated with the partnership information obtained during the panel. In the BHPS, persons were asked about their current and previous marriages and

¹³ Appendix 2 illustrates the coding on this variable for a hypothetical woman who left education at t_5 and has a qualification of upper secondary education.

cohabitation episodes as well as the start and end dates. This information is updated during the panel. In the PSBH, persons were asked about their current and previous marriages, *current* cohabitation, and the start and end dates. Information on *previous* cohabitation episodes is limited to the cohabitation status prior to marrying, and start dates of these episodes are unavailable. There is no information about previous cohabitation episodes not followed by marriage. The main consequence of the lack of information on previous cohabitation is that women might be coded as being single while they are actually cohabitating. In other words, there will be an underestimation of the total length of time women lived together with a partner. However, in wave 1 persons were asked whether they were currently cohabiting and when this started. The underestimation of total partnership duration (cohabitation + marriage) therefore only applies to marriages started (and ended) before the first wave in 1992. Furthermore, preliminary analyses showed that, out of all women who married at least once, around 80 percent did not cohabit before the first marriage, compared to 13 percent who did¹⁴. The underestimation of total partnership duration will therefore be limited to a relatively small proportion of women.

After combining the retrospective and prospective data¹⁵, a time-variant variable was created which indicates the partnership status for every month a woman is at risk of experiencing a first birth. Missing values on the month of the start or end date of marriage or cohabitation episodes have been set to June. The partnership status variable has the following categories:

1. single;
2. cohabiting;
3. married (1st marriage);
4. married (2nd or later marriage)

2.3.2. Family background

The BHPS and PSBH collected information on the family background of persons. A number of time-invariant indicators for which comparable information was available have been constructed:

- **father's and mother's educational attainment:**

1. other / unknown;
2. no secondary qualifications;
3. secondary education;
4. higher education

- **father's and mother's occupation** (at age 15 in the PSBH, and at age 14 in the BHPS):

1. not working;

¹⁴ The cohabitation status is unknown for around 7% of women who married at least once.

¹⁵ For the BHPS, Pronzato (2007) has reconstructed partnership histories up to the last interview and these files have been used for the current analysis.

2. farmer;
3. manual worker;
4. employee;
5. self-employed;
6. manager;
7. other / unknown;
8. father or mother deceased

- **family intact at age 16?:**

1. yes;
2. no

- **number of siblings:**

1. no siblings;
2. 1;
3. 2;
4. 2+

2.3.3. Religious denomination and religious attendance

Two indicators referring to a woman's religion have been constructed: religious denomination and religious attendance. With respect to **religious denomination**, in the PSBH, a distinction has been made between women who say they are not religious, Roman Catholic, or believe in another religion. The indicator for religious denomination in the BHPS has an additional category for women who indicated Church of England / Anglican. Apart from religious denomination, an indicator measuring the **frequency of attendance to religious services** has been included in the analysis. This variable has the following categories:

1. (almost) never;
2. irregularly / special occasions;
3. monthly;
4. weekly

2.3.4. Ethnicity, nationality, place of birth

Both the PSBH and BHPS asked persons where they lived at the time of birth. This information has been used to construct an indicator showing whether a woman was born in or outside Belgium or the United Kingdom. However, while the PSBH asked about nationality at birth and any changes in nationality during the life course, the BHPS only collected information on ethnicity. As a consequence, it is not possible to control for women's nationality or ethnicity.

2.3.5. Birth cohort

Finally, an indicator for birth cohort membership has been created. This time-invariant variable has the following categories:

1. 1930-1939;
2. 1940-1949;
3. 1950-1959;
4. 1960-1969;
5. 1970-1979;
6. 1980-1989

2.4. The sample for the analysis

The selection of the sample for the analysis is slightly different in the BHPS than in the PSBH. This is because the date of birth of the first child has been collected retrospectively in wave 2 in the BHPS and in wave 1 in the PSBH.

For the BHPS, all women who were aged 16 or over at the time of the interview in *wave 2* and who have completed a full individual interview in wave 2 have been selected. Those who were aged less than 16 at the time of the interview in wave 2, and have therefore not completed a full individual interview in this wave, are selected if they turned 16 during the panel and have completed at least one full individual interview after wave 2.

For the PSBH, all women who were aged 16 or over at the time of the interview in *wave 1* and who have completed a full individual interview in this wave have been selected. Women who have been enumerated in the first wave, but were aged less than 16 at that time and have thus not completed a full individual interview in wave 1, are retained if they completed at least one full individual interview after wave 1.

The sample is further restricted to women without missing information on their year of birth, the year of birth of their (first) child, their highest educational level, and their age at leaving education. Furthermore, since women are only observed from age 14 to 45, three women in the BHPS and two women in the PSBH who had their first child before age 14 are excluded from the sample. Finally, in order to avoid survival bias, women born between 1930 and 1989 are selected. This means that all women in the sample became of childbearing age after the end of the Second World War. This results in a sample size for Belgium of 3734 women (2484 first births) and for the United Kingdom of 4847 women (3242 first births). Due to missing values on the control variables, this sample size is reduced in the models which include the control variables. Appendix 3 shows the total number of women by cohort, and total exposure times for all independent variables.

3. Methods

A discrete-time complementary log-log hazard model has been used to estimate the effect of educational attainment and enrolment on the transition to motherhood. One of the main advantages of the complementary log-log model is that it is analogue to the continuous-time hazard model (Singer & Willet, 2003). The discrete-time hazard model is written as follows:

$$\text{clog-log } h(t_{ij}) = [\alpha_1 D_{1ij} + \alpha_2 D_{2ij} + \dots + \alpha_j D_{Jij}] + [\beta_1 X_{1i} + \beta_2 X_{2ij}]$$

where $h(t_{ij})$ is the discrete-time hazard function of experiencing a first live birth for individual i in time period j conditional upon not having experienced a first live birth before j ; $[\alpha_1 D_{1ij} + \alpha_2 D_{2ij} + \dots + \alpha_j D_{Jij}]$ represents the baseline hazard function; $\beta_1 X_{1i}$ is a time-invariant predictor and $\beta_2 X_{2ij}$ is a time-variant predictor (Singer & Willett, 2003). A piecewise constant specification of the baseline hazard has been chosen. In particular, it is assumed that the hazard rate is constant within yearly intervals, but differs between years. This strategy has been adopted for two reasons: first, because a first birth does not occur in all intervals, and second, to reduce computational time. Women are assumed to be at risk of experiencing a first birth from the month in which they turn 14 until the month before their 45th birthday. It is possible that the entry into motherhood influences educational attainment and enrolment, rather than the other way around. In order to exclude the possibility that having a first birth influences education, the dependent variable has been backdated by 9 months so it coincides with the timing of the conception. Women are observed until the date of the first birth, or when they did not experience a first birth until the date of right-censoring or the month before they turn 45, whichever comes first. In all models, the coefficients have been antilogged and represent hazard ratios which are also called relative risks.

Models have been estimated separately for Belgium and the United Kingdom. The independent variables have been included in the model in a stepwise manner in order to investigate whether and how the effect of educational attainment changes when including another variable. All analyses have been carried out with Stata®.

4. Descriptive analysis

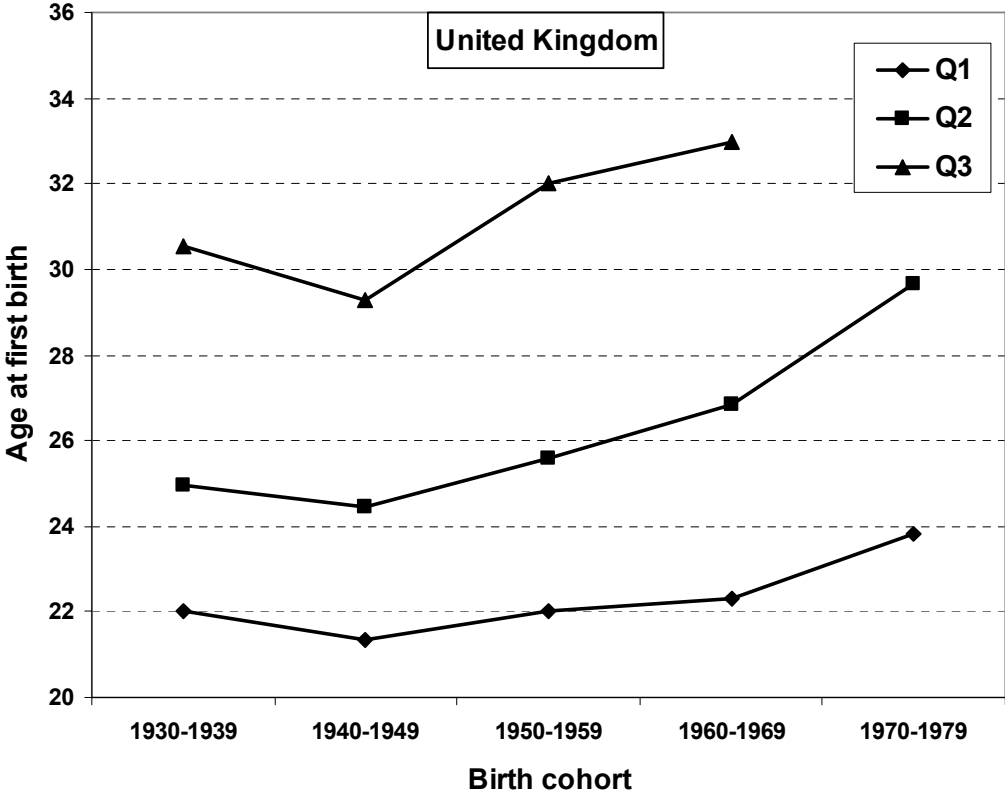
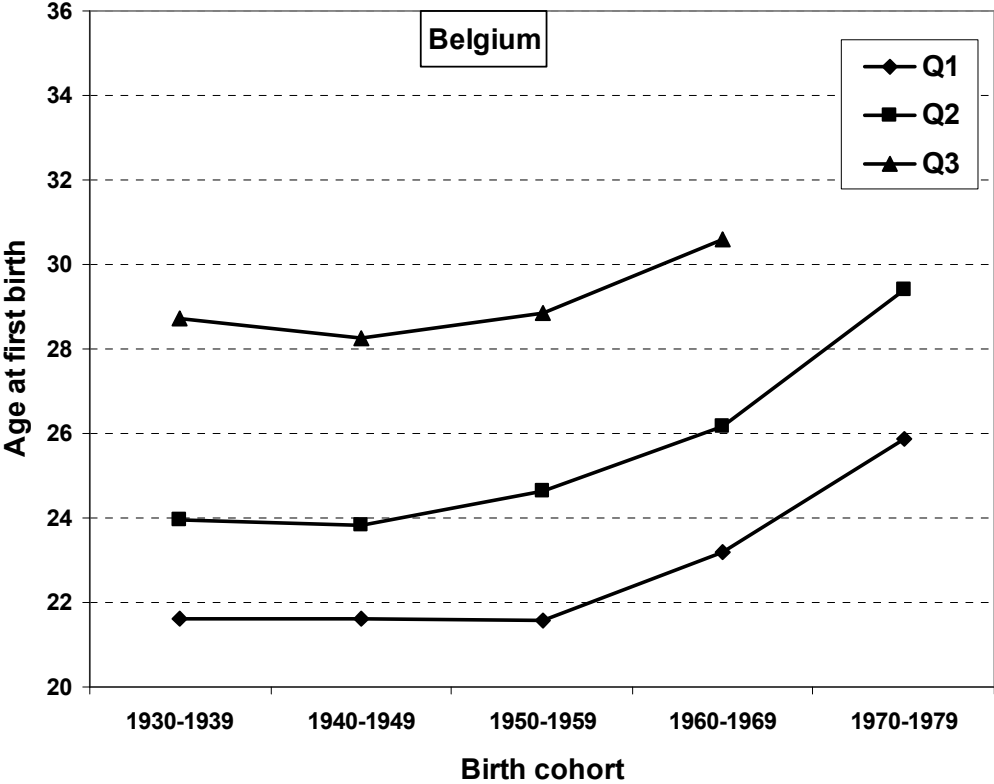
The aim of this section is to describe the evolution in the transition to motherhood and educational attainment, as well as to gain a first insight into the relation between on the one hand the timing of first births and on the other educational attainment and enrolment.

4.1. The transition to motherhood in Belgium and the United Kingdom

This paragraph describes the evolution in the timing of entering motherhood in Belgium and the United Kingdom. The main interest is in the typical age at becoming a mother as well as its evolution over time, and the main differences between the two countries. Figure 1 shows the quartiles derived from the Kaplan-Meier survivor function for first births by birth cohorts (1930-1979) for Belgium and Britain¹⁶. The first (Q1), second (Q2) and third quartile (Q3) indicate the age at which 25 percent, 50 percent (median) and 75 percent respectively of all women have experienced a first birth, or likewise the age at which 75 percent, 50 percent and 25 percent have not (yet) experienced a first birth. The 1980-89 cohort is not included in the graphs since these women did not yet reach the first quartile. In both countries, there is a clear and ongoing trend towards delaying the entry into motherhood. The lowest median age at first birth is observed among women born between 1940 and 1949. Between the 1940-49 and 1960-69 cohorts, the median age at first birth has increased noticeably by approximately 2.5 years in both countries, reaching 26.2 in Belgium and 26.9 in Britain, up from 23.8 and 24.4 respectively. Furthermore, the overall age pattern of entering motherhood is younger in Belgium than in Britain. For instance, the age at which 75 percent of those born between 1950 and 1969 have experienced a first birth is at least 2.4 years higher in Britain than in Belgium. Finally, the interquartile range (Q3-Q1) shows that differences in the timing of becoming a mother are larger among British than among Belgian women. In sum, women in both countries have been postponing the entry into motherhood, though the delay of first births is more pronounced in Britain than in Belgium.

¹⁶ The quartiles have been obtained by linear interpolation: for instance, $Q2$ (median) = $I_1 + ((\hat{S}_{t11} - 0.5) / (\hat{S}_{t11} - \hat{S}_{t12})) * (\hat{S}_{t11} - \hat{S}_{t12})$ where the interval $[I_1, I_2[$ contains $\hat{S}=0.5$ and \hat{S}_j is the estimated survivor function (see Singer & Willett, 2003).

Figure 1. Quartiles derived from the Kaplan-Meier survivor function for first births by birth cohort (1930-1979), Belgium and the United Kingdom



Sources: Panel Studie van Belgische Huishoudens (1992-2002) and British Household Panel Survey (1991-2005)

4.2. The evolution in educational attainment

Women's educational attainment has risen considerably over the past decades (see appendix 3): most Belgian and British women born between 1930 and 1939 only obtained a qualification of lower secondary education (or below). In contrast, most women in the youngest cohorts have at least a qualification of upper secondary education. Furthermore, there is a continuing increase in the percentage of higher educated women: in the 1960-69 cohort, 40 percent of Belgian women and almost 50 percent of British women have a higher education qualification, compared to less than 25 percent in the oldest cohort.

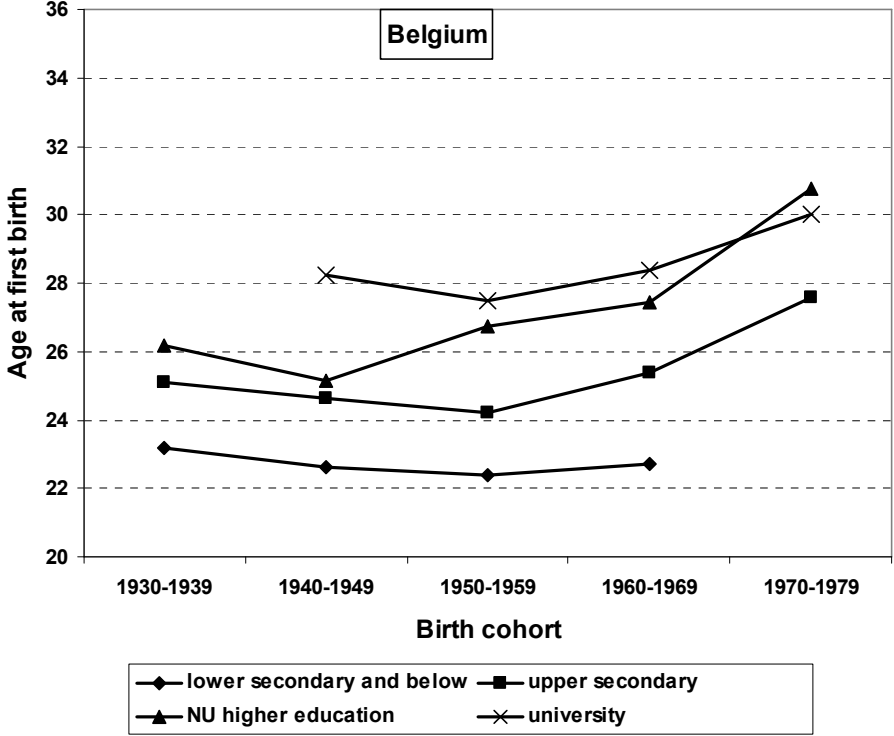
The overall percentage of lower educated women in Belgium is higher than in Britain. Around one third of Belgian women have a qualification of lower secondary education or below, compared to less than one fifth of British women. British women who went to school until age 15 or 16 will have obtained GCSE's or equivalent, which has been defined as upper secondary education. On the other hand, Belgian women who went to school until age 15 will have obtained a qualification of the first cycle or grade of secondary education, which has been defined as lower secondary education. Thus, by definition, some British and Belgian women who left education at the same age have different educational levels. The difference in the proportion of lower educated women between the two countries is probably also influenced by the different timing and type of compulsory school age reform in both countries: in Belgium the compulsory school age was raised in 1983 from age 14 to 18, while in the United Kingdom it was raised a decade earlier in 1972, from age 15 to 16. This means that British women born after 1956 had to stay in school until age 16, whereas the Belgian reform affected women born after 1968. The relatively high percentage of lower educated women in Belgium compared to Britain may thus be a direct consequence of the later change in compulsory school age in Belgium. Furthermore, the data suggest that more British women than Belgian women have obtained a university degree. This corresponds with the data compiled by the Organisation for Economic Co-operation and Development (2009).

4.3. The transition to motherhood by educational level

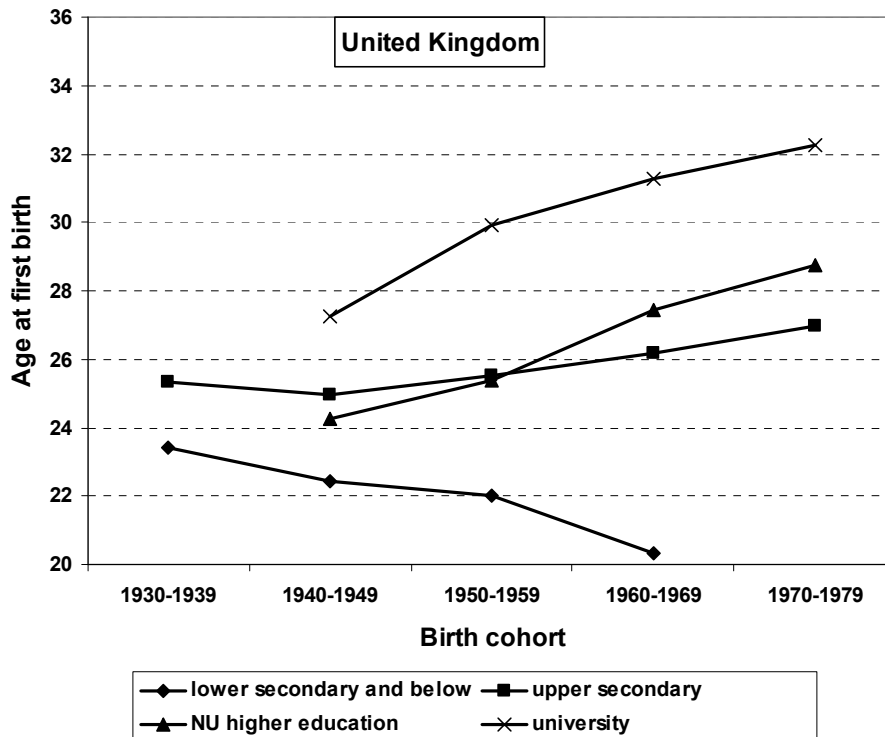
The descriptive findings in the previous paragraphs show that as women are increasingly pursuing higher levels of education, they are also delaying the entry into motherhood. The current and following paragraphs investigate the relation between these two phenomena. The following questions are addressed in the current paragraph: how does the timing of first births vary by educational level, how large (or how small) are the differences between educational categories, how has the relation between first birth timing and educational attainment changed over time, and what are the main similarities and differences between Belgium and Britain? Figure 2 graphs the median derived from the Kaplan-Meier survivor function for first births

by birth cohorts (1930-1979) and educational level for Belgium and the United Kingdom respectively¹⁷.

Figure 2. Median derived from the Kaplan-Meier survivor function for first births by birth cohort (1930-1979) and educational level, Belgium



¹⁷ As before, the median age at first birth by educational level has been derived by linear interpolation.



Notes: NU higher education = non-university higher education / categories with small numbers are not shown in graph

Sources: Panel Studie van Belgische Huishoudens (1992-2002) and British Household Panel Survey (1991-2005)

First, a comparison of the median between educational levels and within cohorts reveals that the timing of first births is positively related to educational attainment: for all cohorts combined, the median age is 22.7 and 22.3 for lower educated women in Belgium and Britain respectively, compared to 28.4 and 30.3 for university educated women (not shown in graph). This general association between educational attainment and first birth timing does not vary between cohorts. However, the difference between the lowest and highest educated has increased over time in Britain (but not in Belgium). For instance, in Britain, the difference in the median age between the lowest and highest educated was lower than five years in the 1940-49 cohort, but has increased to more than 10 years in the 1960-69 cohort. Second, a comparison of the median within educational levels and between cohorts indicates that the median age at first birth has increased over time in all educational categories, with exception of the lower educated, and that this rise has been most marked among the higher educated. For instance, in Britain, the median age at first birth has increased by two years among women with upper secondary education between the 1940-49 and 1970-79 cohorts, compared to an increase of five years among university educated women. In Belgium, the median has increased by three years among those with upper secondary education in the same period, compared to almost six years for women with non-university higher education. The median rose at a lower pace among women with a university degree. As a result, the median age at

first birth among higher educated Belgian women without and with a university degree converges over time and is practically equal in the youngest cohort (1970-79).

These results confirm the findings of previous studies that the relation between educational attainment and the timing of first births has become stronger over time (Bloom & Trussell, 1984; Rindfuss, Morgan, Swicegood, 1984; De Wit, 1994; Martin, 2000; Lappegård & Rønsen, 2005). In other words, educational differences with respect to the timing of entering motherhood have become larger.

While the median age at first birth among women with non-university higher education is remarkably similar in both countries, the median age at having the first child among university educated British women is at least 2 years higher compared to Belgian women with similar qualifications. Furthermore, the differences between educational categories are considerably larger in the United Kingdom than in Belgium. Finally, the median age at first birth has increased most sharply among women with university education in the United Kingdom and among women with non-university higher education in Belgium. As far as the latter are concerned, there is no appreciable difference in the timing of entering motherhood between higher educated women with non-university higher education or university degrees in the 1970-79 cohort.

4.4. Educational enrolment and the transition to motherhood

Previous studies have found that the duration of educational programmes contributes to the positive relation between educational attainment and the timing of entering motherhood. The percentage of women experiencing a first birth while being enrolled in the education system is low, in both countries less than 3 percent. Thus, the large majority of women postpone entering motherhood until they have left education. However, while most women leave education before becoming a mother, this does not mean that the causal effect runs from education to fertility. First, it is possible that a woman conceives a child while being enrolled in a course and drops out as a consequence of the conception. In the PSBH and BHPS, 4 to 5 percent had a first child while being enrolled or within a year of leaving education. Second, even if obtaining the qualification and leaving the education system predate the conception of the first birth, some women might anticipate having a first child and leave education prematurely or lower educational goals to have children (Marini, 1985). In both situations fertility influences education, rather than the other way around.

A Kaplan-Meier survival analysis of leaving education by educational level was carried out to investigate the age at which women with different educational qualifications leave education. Appendix 4 illustrates the third quartile by educational level for Belgium and the United Kingdom. This graph shows that the age at which 75 percent of all women have left education, given a certain educational level. As expected, the age at leaving education

increases with educational attainment. Interestingly, British women finish higher education somewhat earlier than Belgian women. For instance, 75 percent of British women with a university degree have left education at age 21.9, compared to age 23.4 for Belgian women.

In sum, since most women delay the arrival of the first child until they have left education, and because studying takes time, higher educated women will postpone entering motherhood longer than lower educated women.

4.5. The time interval between leaving education and entering motherhood by educational level

Some studies have found a positive effect of educational attainment on first birth rates. This has been interpreted as a catching-up effect, meaning that higher educated women accelerate childbearing once they leave the education system. This implies that the length of time between leaving education and entering motherhood should decrease as educational attainment increases. In order to investigate this, a Kaplan-Meier survival analysis with the time since leaving education functioning as the survival time was carried out. In the previous analyses, the survival time was the number of months elapsed since the 14th birthday, whereas for the current analysis it is the number of months elapsed since leaving education. The analysis has been carried out separately for each educational level. The results of these analyses are displayed in Figure 3 which shows the survivor function for first births at four points, namely at 4, 8, 12, and more than 12 years after leaving education, by educational level^{18/19}. The graphs show that, the longer the time elapsed since leaving education, the higher the percentage of women that has entered motherhood. This overall pattern is similar for women with different educational qualifications and in both countries. However, first birth rates by educational level within eight years after leaving education differ between Belgium and the United Kingdom.

In Belgium, the percentage of women who have experienced a first birth within four years after leaving education is positively related to educational attainment. For instance, 31 percent of university educated women have had a first child within this period, compared to 17 percent of lower educated women. After eight years of leaving education, these figures are 62 percent and 54 percent respectively, indicating that lower educated women reduce, but not close, the gap between five and eight years after leaving education. This confirms the findings of previous studies that higher educated women accelerate childbearing after leaving the education system (Blossfeld & Huinink, 1991; Lappegård & Rønsen, 2005; Kreyenfeld, 2009). The crossing of the curves indicates that after 8 years of leaving education, first birth rates are higher among the lower educated than among the higher educated. Thus, while

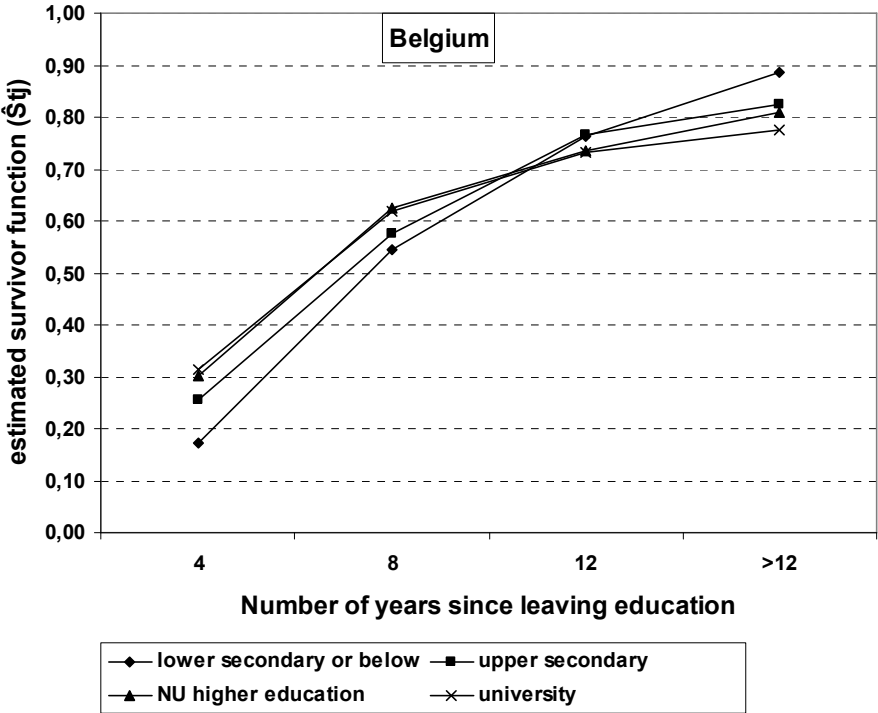
¹⁸ Women who were still enrolled in education at the time of the last interview, and who experienced a first birth before or in the month of leaving education, are excluded from the analysis.

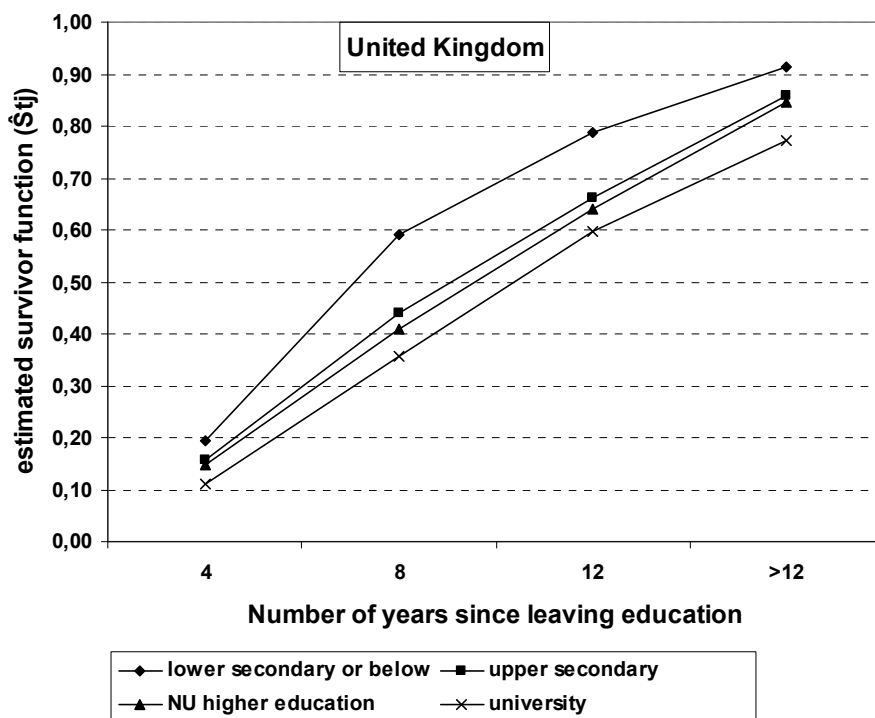
¹⁹ Appendix 5 illustrates for a certain educational qualification to which age these four time points correspond, assuming that women take the shortest possible route to obtain a certain qualification.

higher educated women advance childbearing after leaving education, first birth rates decrease as the educational level increases.

In the United Kingdom, the percentage of women who have experienced a first birth within four years after leaving education is negatively related to educational attainment. Four years after leaving education, only 11 percent of women with a university degree had a first child, compared to 19 percent of lower educated women. After eight years of leaving education, almost 60 percent of lower educated women have experienced a first birth, compared to 36 percent among university educated women. After 12 years since graduation the difference between the lowest and highest educated is practically the same. Thus, in sharp contrast to Belgium, higher educated women do not accelerate the transition to motherhood. On the contrary, higher educated women wait longer with having the first child after leaving education than lower educated women.

Figure 3. Kaplan-Meier survivor function for first birth by time elapsed since leaving education and educational level, Belgium and the United Kingdom (birth cohorts 1930-1989)





Notes: NU higher education = non-university higher education

Sources: Panel Studie van Belgische Huishoudens (1992-2002) and British Household Panel Survey (1991-2005)

4.6. Summary of the descriptive analysis

As elsewhere in Western Europe, Belgian and British women born after 1950 are increasingly delaying the entry into motherhood. Furthermore, more women delay the first birth until after turning age 30 in Britain than in Belgium. During this period of demographic change, women remained longer in school and an increasing number pursued higher education. All women in the younger cohorts, except for the lower educated, waited longer with having the first child than women in the older cohorts, but the delay of first births is most noticeable among the higher educated, which has resulted in a widening disparity in first birth timing between women with the lowest and highest educational qualifications. The variation in the timing of entering motherhood in general and specifically between the educational categories is larger in the United Kingdom than in Belgium. In particular, university educated British women delay motherhood considerably longer than their Belgian counterparts.

In both countries, almost all women postpone childbearing until they have left education, and since studying takes time, the higher educated will wait considerably longer than the lower educated with having the first child. However, the different length of time required to obtain a university degree in Belgium and the United Kingdom does not seem to explain the different timing of entering motherhood between Belgian and British higher educated women. On the contrary, while university education in Belgium takes more time than in Britain, university

educated Belgian women generally have their first child earlier than British women with similar qualifications. The analysis of the length of time between leaving education and entering motherhood indeed confirms that higher educated Belgian women accelerate childbearing once they leave the education system. They not only catch up with lower educated women who have left education sooner, they also catch up and overtake British women with similar qualifications.

5. Inferential analysis

The main aim of the current section is to analyse the impact of educational attainment and enrolment on the transition to motherhood. A second aim is to investigate whether higher educated women accelerate childbearing after leaving the education system. A final aim is to explore whether using a different measure of educational attainment influences the results. Table 1 shows the results from the complementary log-log discrete time hazard analysis of first births in Belgium and the United Kingdom respectively. In total, 6 difference models for Belgium and Britain have been tested. The following paragraphs discuss the results of each model in detail.

5.1. Highest educational level

Model 1 only includes the highest educational level (apart from the baseline hazard) and therefore shows the effect of educational attainment on the transition to motherhood without controlling for educational enrolment or for any other factors.

First, there is a negative and significant effect of educational attainment on the risk of experiencing a first birth. The estimated hazard of becoming a mother for university educated women is 41 percent and 34 percent of the hazard for women with lower secondary education (or below) in Belgium and Britain respectively. Among women with non-university higher education the hazard is 51 percent and 53 percent compared to the reference category. In other words, educational attainment and the timing of entering motherhood are positively related, which is in line with the descriptive findings. Similar results have been found for the Flemish region by Liefbroer and Corijn (1999) as well as by Van Bavel and De Wachter (2007), and for Britain by Ekert-Jaffe *et al.* (2002) and by Nicoletti and Tanturri (2008).

Second, the results indicate that the first birth hazard is the lowest for women who are still enrolled in education at the last interview: the estimated hazard is 5 percent and 12 percent of the hazard for women with lower secondary education (or below).

The results of this analysis are displayed in Figure 4 which shows the fitted hazard functions of the complementary log-log discrete time hazard analysis for first births in Belgium and the United Kingdom. Note that model 1 only includes the baseline hazard and educational attainment. The curves show that, at all ages, the first birth hazard decreases as the educational level increases. Women who are still enrolled in education have the lowest first birth hazard.

Table 1. Complementary log-log discrete time hazard analysis for first births, Belgium and the United Kingdom

	Belgium						United Kingdom					
	model 1	model 2	model 3	model 4	model 5	model 6	model 1	model 2	model 3	model 4	model 5	model 6
educational attainment (time-invariant)												
- enrolled in education at the last interview	0.05 ***	0.18 ***	0.15 ***	----	0.48 *	----- ³	0.12 ***	0.28 *	0.39	----	0.74	----- ³
- lower secondary education (or below) (ref. cat.)	1.00	1.00	1.00	----	1.00	1.00	1.00	1.00	1.00	----	1.00	1.00
- upper secondary education	0.66 ***	0.71 ***	0.72 **	----	0.78 ***	0.77 ***	0.58 ***	0.64 ***	0.97	----	0.64 ***	0.70 ***
- non-university higher education	0.51 ***	0.63 ***	0.53 ***	----	0.82 ***	0.81 **	0.53 ***	0.60 ***	0.93	----	0.61 ***	0.68 ***
- university	0.41 ***	0.61 ***	0.37 ***	----	0.86	0.83	0.34 ***	0.47 ***	0.55 ***	----	0.51 ***	0.59 ***
time elapsed since leaving education												
- enrolled in education	----	0.26 ***	0.29 ***	----	0.26 ***	0.25 ***	----	0.38 ***	0.22 ***	----	0.33 ***	0.31 ***
- 0-4 years (ref. cat.)	----	1.00	1.00	----	1.00	1.00	----	1.00	1.00	----	1.00	1.00
- 5-8 years	----	1.16 **	1.02	----	1.05	1.00	----	1.68 ***	1.27 **	----	1.71 ***	1.64 ***
- 9-12 years	----	0.90	0.78 **	----	0.81 **	0.81 *	----	1.82 ***	1.03	----	1.91 ***	1.74 ***
- > 12 years	----	0.59 ***	0.59 ***	----	0.49 ***	0.46 ***	----	1.45 ***	0.87	----	1.60 ***	1.25 ***
interaction between educational attainment (time-invariant) and time elapsed since leaving education												
lower secondary education (or below) * 0-4 years (ref. cat.)	----	----	1.00	----	----	----	----	----	1.00	----	----	----
upper secondary education * 0-4 years	----	----	0.90	----	----	----	----	----	0.49 ***	----	----	----
non-university higher education * 0-4 years	----	----	1.00	----	----	----	----	----	0.48 ***	----	----	----
university * 0-4 years	----	----	1.46	----	----	----	----	----	0.47 ***	----	----	----
lower secondary education (or below) * 5-8 years (ref. cat.)	----	----	1.00	----	----	----	----	----	1.00	----	----	----
upper secondary education * 5-8 years	----	----	0.92	----	----	----	----	----	0.59 ***	----	----	----
non-university higher education * 5-8 years	----	----	1.40	----	----	----	----	----	0.57 ***	----	----	----
university * 5-8 years	----	----	2.10 **	----	----	----	----	----	0.80	----	----	----
lower secondary education (or below) * 9-12 years (ref. cat.)	----	----	1.00	----	----	----	----	----	1.00	----	----	----
upper secondary education * 9-12 years	----	----	1.22	----	----	----	----	----	0.80	----	----	----
non-university higher education * 9-12 years	----	----	1.33	----	----	----	----	----	0.79	----	----	----
university * 9-12 years	----	----	2.24 **	----	----	----	----	----	1.52 **	----	----	----

Table 1. Complementary log-log discrete time hazard model for first births, Belgium and the United Kingdom (continued)

Educational attainment (time-variant)									
- enrolled in education				0.15 ***					0.18 ***
- lower secondary education (or below) (ref. cat.)				1.00					1.00
- upper secondary education				0.74 ***					0.62 ***
- non-university higher education				0.71 ***					0.57 ***
- university				0.73 ***					0.44 ***
Partnership status									
- single (ref. cat.)				1.00					1.00
- cohabiting				2.30 ***					2.14 ***
- married (1 st marriage)				3.37 ***					3.71 ***
- married (2 nd or later marriage)				1.19					3.47 ***
Father's educational attainment									
- other/unknown									1.04
- no qualifications of secondary education (ref. cat.)									1.00
- secondary education									0.95
- higher education									0.97
Mother's educational attainment									
- other / unknown									1.16
- no qualifications of secondary education (ref. cat.)									1.00
- secondary education									0.87 **
- higher education									0.90
Father's occupation¹									
- not working									1.13
- farmer									0.93
- manual worker (ref. cat.)									1.00
- employee									0.91
- self-employed									0.88 *
- manager									0.86 *
- other / unknown									0.82
- father deceased									0.89

Table 1. Complementary log-log discrete time hazard model for first births, Belgium and the United Kingdom (continued)

Mother's occupation¹									
- not working									0.85 *
- farmer									0.74
- <i>manual worker (ref. cat.)</i>									1.00
- employee									0.82 ***
- self-employed									0.81
- manager									0.97
- other / unknown									0.75
- mother deceased									0.87
Dissolution of parents' partnership during childhood?									
- <i>no (ref. cat.)</i>									1.00
- yes									1.21 ***
Number of siblings									
- <i>0 (ref. cat.)</i>									1.00
- 1									1.11
- 2									1.14
- 3 or more									1.27 ***
Religious denomination									
- <i>not religious (ref. cat.)</i>									1.00
- Roman Catholic									1.26 **
- Church of England / Anglican ²									1.19 **
- other									1.19 **

Table 1. Complementary log-log discrete time hazard model for first births, Belgium and the United Kingdom (continued)

Frequency of attendance to religious services							
- (almost) never (ref. cat.)	----	----	----	1.00	----	----	1.00
- irregularly / on special occasions	----	----	----	0.99	----	----	1.39
- monthly	----	----	----	1.07	----	----	1.39
- weekly	----	----	----	1.09	----	----	1.47 *
Place of birth							
- Belgium / United Kingdom (ref. cat.)	----	----	----	1.00	----	----	1.00
- outside Belgium / United Kingdom	----	----	----	1.11	----	----	1.07
Birth cohort							
- 1930-1939	----	----	----	0.98	----	----	0.76 ***
- 1940-1949 (ref. cat.)	----	----	----	1.00	----	----	1.00
- 1950-1959	----	----	----	1.06	----	----	0.98
- 1960-1969	----	----	----	0.92	----	----	1.01
- 1970-1979	----	----	----	0.47 ***	----	----	0.87 *
- 1980-1989	----	----	----	0.15 *	----	----	1.40 ***

1. PSBH: at age 15; BHPS: at age 14

2. Only included in the model for the United Kingdom

3. In the PSBH, since some of the background variables are only available in wave 1 and 2, women in the youngest cohort (1980-89) who became eligible for a full individual interview in wave 5 are automatically excluded from the analysis. Furthermore, none of the women who were still enrolled in education at time of the last interview experienced a first birth. As a consequence, the category "enrolled at the last interview" is dropped from the analysis. In the BHPS, none of the women who were still enrolled in education at the time of the last interview have no missing values on the control variables. As a consequence, these women are excluded from the analysis.

Sources: Panel Studie van Belgische Huishoudens (PSBH) (1992-2002) and British Household Panel Survey (BHPS) (1991-2005)

5.2. Educational enrolment

It was suggested that the delaying effect of educational attainment on the timing of first births might be attributed to the differential length of time spent in the education system for women with different educational qualifications. If this is the case, then the negative effect of educational attainment in model 1 should weaken or disappear after taking into account the influence of enrolment in education. Model 2 therefore includes a categorical variable capturing the time since leaving education, which is equal to zero until the month before leaving education.

First, being in education strongly reduces first birth risks: the estimated first birth hazard of being enrolled in education is 26 percent and 38 percent of the hazard of not being enrolled in education for Belgium and Britain respectively. In other words, women postpone having the first child at least until they have left the education system. A similar effect has been found for the Flemish region by Liefbroer and Corijn (1999) and for the United Kingdom by Nicoletti and Tanturri (2008), as well as in several other studies and countries (Blossfeld & Huinink, 1991; Kravdal, 1994; Santow & Bracher, 2001; Upchurch, Lillard & Panis, 2002; Martín-García & Baizán, 2006; Winkler-Dworak & Toulemon, 2007).

Second, the negative effect of educational attainment has weakened in model 2, though it remains significant. This indicates that both the duration of education and the educational level influence first birth rates. Negative effects of both educational attainment and enrolment for Belgium and the United Kingdom have been reported in previous studies (Liefbroer & Corijn, 1999; Nicoletti & Tanturri, 2008) and have been found in other countries as well (Upchurch, Lillard & Panis, 2002; Martín-García & Baizán, 2006). However, some studies only found a negative and significant effect of educational enrolment (Blossfeld & Huinink, 1991; Blossfeld & Jaenichen, 1992; Lappegård & Rønsen, 2005; Santow & Bracher, 2001; Winkler-Dworak & Toulemon, 2007).

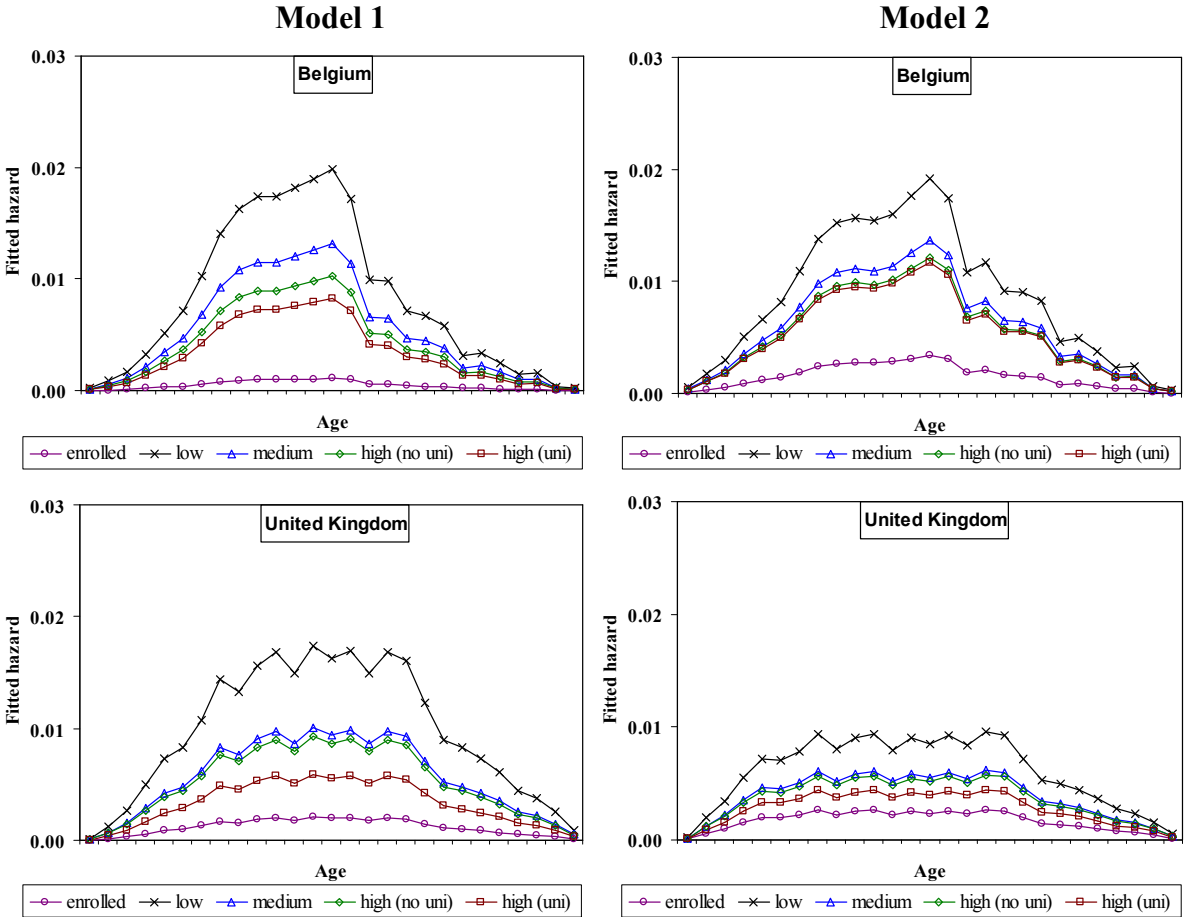
Third, the effect of educational level has changed the least for those with upper secondary education and the most for those with university education. This suggests that the influence of the length of studying on the timing of entering motherhood is stronger for the higher educated than for the lower educated. Interestingly, in Belgium, the coefficients for university and non-university higher educated women are practically equal in model 2. The descriptive analysis showed that the median age at first birth is higher in the former than in the latter group among women born between 1940 and 1979. This finding might therefore indicate that the differences in the timing of entering motherhood between university and non-university higher educated women can largely be explained by the longer duration of university studies compared to non-university studies.

Finally, first birth risks increase between 0 and 8 years after leaving education, peak between 5 and 8 years, and decline afterwards.

Figure 4 also shows the fitted hazard functions for model 2, which controls for the effect of educational enrolment. If educational enrolment indeed explains some (or all) of the delaying effect of educational attainment on the transition to motherhood, then the distance between the hazard functions in model 1 should become smaller (or disappear completely). The graphs

show that the distance between the curves becomes smaller, but some differences remain. This means that the negative effect of educational attainment on the risk of experiencing a first birth is not entirely explained by educational enrolment.

Figure 4. Fitted hazard functions for the complementary log-log discrete time hazard analysis for first births, Belgium and the United Kingdom (model 1 and 2)



Sources: Panel Studie van Belgische Huishoudens (PSBH) (1992-2002) and British Household Panel Survey (BHPS) (1991-2005)

5.3. Time elapsed since leaving education

Some studies have found positive effects of educational attainment on first birth rates (Blossfeld & Huinink, 1991; Santow & Bracher, 2001; Lappegård & Rønsen, 2005; Winkler-Dworak & Toulemon, 2007), a finding which has been interpreted as indicating an acceleration of entering motherhood after leaving the education system among the higher educated (Blossfeld & Huinink, 1991; Kravdal, 1994; Lappegård & Rønsen, 2005). This would mean that the pattern of entering motherhood after leaving education differs by educational level. This is tested in model 3 which adds an interaction effect between the educational level and the time elapsed since leaving education.

For the United Kingdom, the interaction effects between educational level and 0-4 as well as 5-8 years after leaving education are significant and negative, whereas only the interaction effect between university education and 9-12 years after leaving education is significant, and positive. This indicates that first birth risks within 8 years of leaving education are the highest among the lowest educated, while between 9 and 12 years first birth risks are highest among the highest educated. Thus, higher educated women wait longer with entering motherhood after leaving education than lower educated women.

None of the interaction effects for Belgium are significant, with exception of 5-8 and 9-12 years after leaving education for the higher educated. This means that higher educated women do not catch-up on first births after leaving education compared to their lower educated counterparts. This is in contrast with the descriptive analysis which indicated that Belgian higher educated women accelerate childbearing after leaving education.

However, it is possible that first birth rates decline with educational level, but that the pace of entering motherhood after leaving education is quicker among the higher educated than among the lower educated. Such an acceleration effect would not appear by interacting educational level with the time elapsed since leaving education. In order to investigate whether the pace of entering motherhood after leaving education differs by educational level, we estimate a model containing educational enrolment and the time elapsed since leaving education for each educational level separately. The results of this analysis are shown in Table 2. This analysis shows that the hazard of first births after leaving education differs by educational level. In Belgium, the hazard increases monotonically for lower educated women, whereas for higher educated women it peaks between 5 and 8 years after leaving education and declines afterwards. In contrast, in the United Kingdom, the hazard increases monotonically for all women, except among the lowest educated women, and most strongly among the higher educated.

Table 2. Complementary log-log discrete time hazard model of first births by time elapsed since leaving education, Belgium and the United Kingdom

	Time elapsed since leaving education (years)				
	0	0-4 (ref. cat.)	5-8	9-12	>12
Belgium					
educational attainment (time-invariant)					
lower secondary education (or below)	0.22	1.00	1.44	1.77	2.06
upper secondary education	0.27	1.00	0.95	1.03	0.77
non-university higher education	0.45	1.00	1.13	0.67	0.54
university	0.45	1.00	1.07	0.63	0.31
United Kingdom					
educational attainment (time-invariant)					
lower secondary education (or below)	0.34	1.00	1.03	0.93	0.69
upper secondary education	0.28	1.00	1.50	1.60	1.88
non-university higher education	0.25	1.00	1.60	2.01	2.38
university	0.12	1.00	2.01	2.86	2.48

Sources: Panel Studie van Belgische Huishoudens (PSBH) (1992-2002) and British Household Panel Survey (BHPS) (1991-2005)

5.4. Highest versus current educational level

Previous studies looking at the relation between educational attainment and fertility have illustrated that using a different measure of educational attainment may substantially alter the results and the conclusions derived from the analysis. In order to investigate this, we have constructed two measures of educational attainment: the first measure is time-invariant and indicates the highest educational level obtained by a woman at the time of the last interview. The second measure is time-variant, codes women as being in education until the month before leaving education, and assigns the educational level after women have left the education system. Model 1 to 3 used the highest educational level. Model 1 has been re-estimated using the current educational level instead and the results are shown in model 4 in Table 1. For both countries, in model 1 and 2, there is a significant and negative effect of the *highest educational level* on first birth rates. This effect becomes weaker in model 2, but remains significantly negative. For Belgium, model 4 shows that there is still a negative and significant effect of the *current educational level* on first birth rates. However, there is no longer any appreciable difference between women with upper secondary, non-university or university higher education. That is, with exception of the lower educated, it seems that using the current educational level eliminates educational differences with respect to the relative first birth risks. In contrast, for the United Kingdom, comparing model 1 and 2 with model 4 shows that the coefficients are relatively insensitive to the measurement of educational level.

5.5. Control variables

Model 5 introduces partnership status and birth cohort to the model with educational attainment and the time elapsed since leaving education. The results show that cohabiting and being married exert a strong and positive significant effect on the risk of experiencing a first birth. Furthermore, being married has a stronger influence than cohabiting: For Belgium, the hazard of first births for married women is 3.37 times the hazard for single women, whereas the first birth hazard for cohabiting women is 1.53 times the hazard for single women. For Britain, these figures are 2.14 and 3.71 respectively. In Britain only, there is a positive and significant effect of being married more than once on the first birth hazard.

The final and sixth model 6 also includes indicators referring to the family background, religion and place of birth. Interestingly, in Belgium, father's and mother's educational attainment exert opposite effects on a woman's risk of experiencing a first birth: whereas there is a positive and significant effect of father's educational attainment on the first birth hazard, there is a negative and significant effect of mother's educational attainment. In Britain, the effect of father's educational attainment is not significant, though women whose mother has a degree of secondary education are significantly less likely to enter motherhood than women whose mother has low educational qualification.

Furthermore, the model contains a variable indicating whether a woman lived longer than one year with only one biological parent before age 16. In both Belgium and Britain this effect is significant, but has opposite signs. In Belgium, the first birth hazard is lower for women who did not live with both biological parents until age 16 compared to women who did, whereas in Britain the first birth hazard is higher.

Next, in both countries, women with 3 or more brothers or sisters have higher first birth risk than women who grew up without siblings.

Finally, the indicators for religion are only significant in Britain. The results suggest that religious women have a higher first birth hazard than non-religious women.

Main conclusion

The main aim of this study was to investigate why the effect of educational attainment on the transition to motherhood varies between empirical studies. Four possible explanations for this variation were identified: first, educational enrolment; second, the pattern of entering motherhood after leaving education by educational level; third, cross-national variation in the effect of educational attainment on first birth rates; and fourth, the measurement of educational attainment. We have analysed two panel studies using event history methods to investigate whether the effect of educational attainment on the transition to motherhood is influenced by these four factors.

First, the results have shown that there is a negative and significant effect of educational level on first birth rates. In other words, there is a positive association between educational attainment and the timing of entering motherhood, indicating that highly educated women delay the entry into motherhood longer than low educated women, with middle educated women occupying an intermediate position. Furthermore, a similar effect was observed in both countries. These findings confirm the results of earlier studies on Belgium and the United Kingdom, as well as the results of studies carried out in other countries.

Second, there is a strongly negative and significant effect of educational enrolment on first births rates. This means that most women delay becoming a mother at least until they have left the education system. Furthermore, this effect is stronger than the effect of educational attainment, as has been reported in previous studies. We were particularly interested in whether accounting for the delaying impact of educational enrolment influences the main effect of educational attainment on first birth rates. The results indicate that the effect of educational attainment becomes weaker in a model with educational enrolment, but remains negative and significant. This suggests that the positive association between educational level and the timing of entering motherhood can only be explained to a certain degree by the length of time spent in the education system. While this is in line with the results obtained by previous studies for Belgium and the United Kingdom, some other studies only found a negative effect of educational enrolment.

Third, some studies reported a positive effect of educational attainment on first birth rates, which has been interpreted as indicating a catching up of first births among the highly educated upon leaving the education system compared to their lower educated counterparts. We found evidence for such a pattern for Belgium, but not for the United Kingdom.

Fourth, it was suggested that the effect of educational attainment on the transition to motherhood might be sensitive to the measurement of educational attainment. We constructed two measures of educational attainment, the first measure indicated the highest educational level obtained at the last interview and the second measure indicated the current educational level. It was then tested whether using a different measure substantially alters the results. We found that using the current educational level instead of the highest educational level changes the results of Belgium but not for the United Kingdom. In particular, the results suggest that there are no substantial differences in first birth rates between Belgian women with upper secondary, non-university and university education.

Acknowledgements

This work was supported by the Economic and Social Research Council [award number PTA-031-2006-00309].

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Appendices

Appendix 1. The education system in Belgium and the United Kingdom

In this section we discuss some of the main characteristics of the education system in Belgium and the United Kingdom. Special attention has been devoted to the educational qualifications, the length of study, as well as the organisation of education programmes and the compulsory school age. Each of these aspects has been shown to be important in the relation between education and the transition to motherhood. Furthermore, the educational qualifications have been mapped onto ISCED in order to create a single variable for educational attainment. Finally, attention has been paid to how the systems have changed over time²⁰.

United Kingdom

Compulsory school age: children are currently of compulsory school age in the United Kingdom between age 5 and 16²¹. Children go to primary school from age 5 to 11 and to secondary school from age 11 to 16.

ISCED 0-2 (pre-primary, primary and lower secondary education): no qualifications at these levels.

ISCED 3 ((upper) secondary education): at the end of secondary school, typically at the age of 15 or 16, individuals have examinations in certain subjects, such as English, maths or science. Afterwards, they receive a qualification which mentions the subjects and grades achieved in these exams. Access to certain post-compulsory education courses may be conditional upon having passed exams in one or more subjects as well as having achieved a certain grade. In England and Wales, this qualification is currently called the “General Certificate of Secondary Education” (GCSE), with grades ranging from A* (“A-star”) to G²².

After completing secondary education, individuals can choose between a large number of courses, programs and schemes and a main distinction can be made between academic and vocational programmes.

Between age 16 and 18, those who follow the *academic* track will prepare for examinations in a number of subjects. Admission to these courses could be dependent on good grades in a

²⁰ The information in this paragraph has been drawn from various sources. A comprehensive overview of the education system in Belgium and the United Kingdom has been compiled by Eurydice (2008a-e). For more information concerning ISCED see UNESCO (1975) and UNESCO (1997).

²¹ The compulsory school age was raised from 15 to 16 in 1972, with effect from September 1973. Before 1997, some 16-year olds could leave school before the end of the school year, whereas since 1997 pupils need to stay in school until the end of the school year in which they turn 16. There are proposals to extend the compulsory school age to 18 in the next decade.

²² The GCSE was introduced in 1988. Until 1951 students were awarded the “School Certificate” or “matriculation”, which was replaced by the “General Certificate of Education Ordinary level” (GCE O-level). Between 1965 and 1987 there was also a “Certificate of Secondary Education (CSE)” which existed alongside the GCE O-levels. In Scotland, the current qualification is the “Scottish Certificate of Education (SCE) Standard Grade”, which was earlier the “Scottish Leaving Certificate (SLC) lower grade” (until 1962) and the “Scottish Certificate of Education (SCE) Ordinary Grade” (from 1962 until the 1990s).

certain number of GCSE's (or equivalent). This leads to a qualification which mentions the subjects as well as the grades achieved in the exams for these subjects. In England and Wales, these qualifications are called the "General Certificate of Education (GCE) Advanced level" (A-level)²³. A-levels in certain subjects as well as a good grade are usually required to apply to university.

Individuals who follow the *vocational track* can choose between a large number of schemes and courses of various lengths. The most important schemes between age 16 and 18 are the Youth Training scheme (1-2 years, until the 1990s), (trade) apprenticeships (various lengths), training for clerical and commercial occupations (for instance secretary, hairdressing, typing; up to three years), City and Guilds certificates (three levels with progressively increasing duration as the level increases), and the Business and Technology Education Council National Diploma (BTEC ND) (two years full-time). The BTEC ND can be used to apply to a university.

ISCED 5-6 (tertiary education): the ISCED classification makes a difference between theoretical and practical-oriented tertiary qualifications. Practical tertiary educational qualifications include the BTEC "Higher National Certificate" (HNC) and "Higher National Diploma" (HND). Entry to these courses may depend on having obtained other qualifications (such as A-levels or a BTEC ND). The HNC and HND are usually started at age 18 and older, take between one and two years to complete and can be used to apply university. Theoretical tertiary educational qualifications are offered by universities. These are bachelor degrees (three years), master's degrees (one year) and doctoral degrees (three to four years).

Belgium

Compulsory school age: the compulsory period of education in Belgium is currently between ages 6 and 18²⁴. Children enrol in the first year of primary education on the first of September in the year of their sixth birthday and may leave school at the end of the school year in which they turn 18 or upon achieving the diploma of secondary education. The length of primary and secondary education is six years each (from age 6 to 12 and 12 to 18).

ISCED 0-1 (pre-primary and primary education): individuals receive a certificate of primary education after completing primary education.

ISCED 2 (lower secondary education): at current, the six years of secondary education are subdivided into three grades which have a length of two years each. The first two years of secondary education are the same for everyone and a certificate of the first grade is awarded upon completion.

²³ Until 1951 the "Higher School Certificate" was awarded. In Scotland, the "Scottish Leaving Certificate" (SLC) was succeeded by the "Scottish Certificate of Education (SCE)" Higher Grade in 1962, and existed alongside the separate "Certificate of Sixth Year Studies" (CSYS). The latter two qualifications have been replaced by the "Scottish Qualification Certificate (SQC) Higher" and "Advanced Higher" during the 1990s and 2000s.

²⁴ The compulsory school age was changed from age 14 to 18 in 1983.

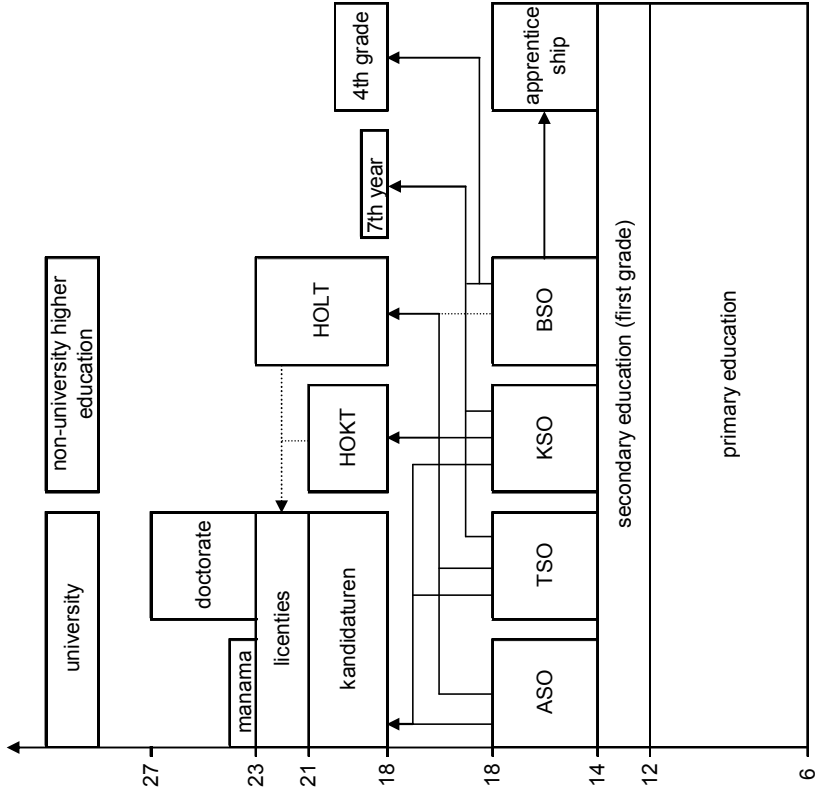
ISCED 3 ((upper) secondary education): the remaining four years of secondary education are divided into four subgroups: general (ASO), technical (TSO), vocational (BSO) and art (KSO). These subgroups differ in the type of courses they offer: ASO mainly offers general courses (e.g. languages, maths, sciences); TSO provides a mix of general and practical courses; BSO prepares for certain occupations; and students in KSO receive a combination of general and art-related courses. Students following TSO, BSO or KSO have the option to specialise further in a seventh year. In BSO, students can switch to an apprenticeship in the third year of secondary education, and they can also study another two years in what is called the “fourth grade”. The diploma of secondary education is awarded upon completion of secondary education and provides access to higher education²⁵.

ISCED 5-6 (tertiary education): higher education in Belgium can be followed at non-university higher education institutions (“HOBU”) and at university. Non-university higher education courses are mainly vocational, whereas university courses are predominantly theoretical. Higher education programmes at non-university institutions last 2-3 years (“Hoger Onderwijs van het Korte Type” HOKT) or 4-5 years (“Hoger Onderwijs van het Lange Type”, HOLT). The length of university courses is four or five years. Before the Bologna-reforms, university courses of four years were subdivided into two years “kandidaturen” and two years “licenties”, whereas university programmes of five years were subdivided into three years “kandidaturen” and two years “licenties”. Following the Bologna reform, the “kandidaturen” were replaced by three years bachelor degrees and “licenties” by one or two year(s) master degrees. It is possible to further specialise in supplementary master courses (“master-na-master”) or to do a doctorate (usually four years). Before the Bologna-reforms, someone with a non-university higher education degree could start with the “licenties” after following a one-year transfer program.

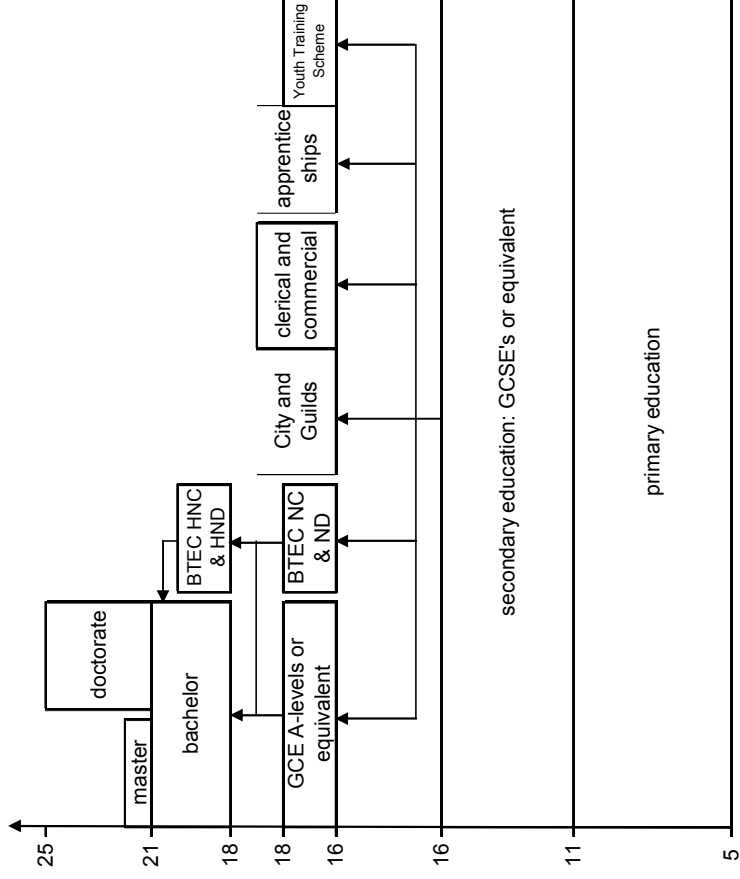
²⁵ In BSO, this certificate is only awarded after a seventh specialisation-year.

Graphical representation of the education system in Belgium and the United Kingdom

Belgium



United Kingdom



Appendix 2. Highest educational level versus current educational level

time	time of leaving education	highest educational level	current educational level
1	5	3	0
2	5	3	0
3	5	3	0
4	5	3	0
5	5	3	3
6	5	3	3
7	5	3	3
8	5	3	3
9	5	3	3
10	5	3	3

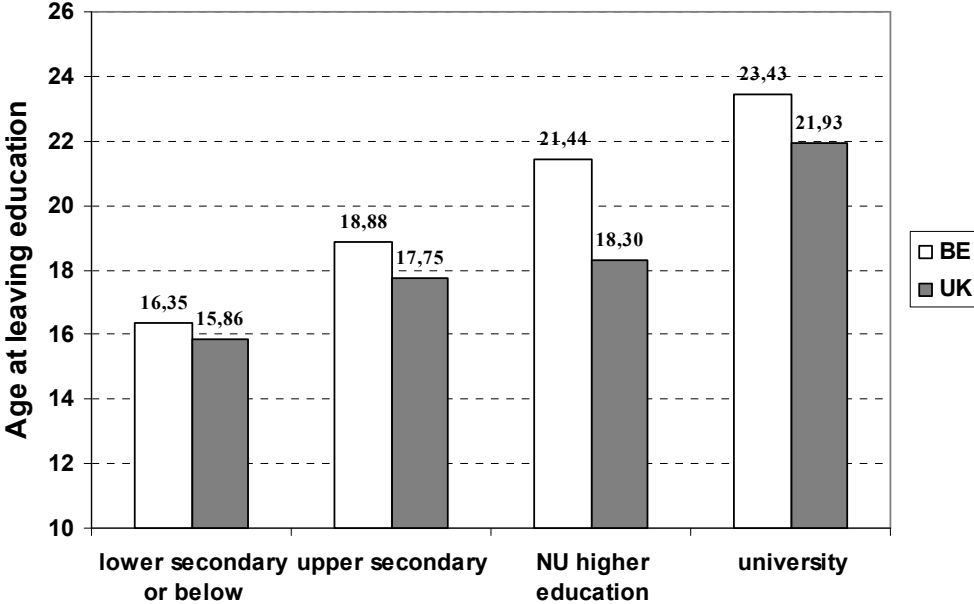
Appendix 3. Sample size and number of first births by birth cohort, educational level by birth cohort, total exposure for all independent variables (PSBH and BHPS)

Belgium	1930- 1939	1940- 1949	1950- 1959	1960- 1969	1970- 1979	1980- 1989	total
sample size	558	641	811	890	606	228	3734
number of first births	475	551	699	653	105	1	2484
educational level (time-invariant)							
enrolled at the last interview	1 0,2%	0 0,0%	1 0,1%	25 2,8%	198 32,7%	194 85,1%	419 11,2%
lower secondary education (or below)	342 61,3%	289 45,1%	303 37,4%	198 22,2%	77 12,7%	10 4,4%	1219 32,6%
upper secondary education	130 23,3%	178 27,8%	247 30,5%	306 34,4%	166 27,4%	17 7,5%	1044 28,0%
non-university higher education	70 12,5%	140 21,8%	176 21,7%	264 29,7%	106 17,5%	6 2,6%	762 20,4%
university	15 2,7%	34 5,3%	84 10,4%	97 10,9%	59 9,7%	1 0,4%	290 7,8%
total	558 100%	641 100%	811 100%	890 100%	606 100%	228 100%	3734 100%
educational level (time-invariant)		total exposure					
enrolled at the last interview	27282						
lower secondary education (or below)	147956						
upper secondary education	144808						
non-university higher education	123733						
university	49814						
total	493593						
time elapsed since leaving education							
enrolled in education	199135						
0-4 years (ref. cat.)	128934						
5-8 years	73612						
9-12 years	35553						
>12 years	56359						
total	493593						
educational attainment (time-variant)							
enrolled in education	199135						
lower secondary education (or below)	123654						
upper secondary education	88988						
non-university higher education	62334						
university	19482						
total	493593						

United Kingdom	1930- 1939	1940- 1949	1950- 1959	1960- 1969	1970- 1979	1980- 1989	total
sample size	563	840	910	1122	782	630	4847
number of first births	477	739	773	856	320	77	3242
educational level (time-invariant)							
enrolled at the last interview	0 0,0%	0 0,0%	0 0,0%	3 0,3%	13 1,7%	155 24,6%	171 3,5%
lower secondary education (or below)	282 50,1%	245 29,2%	180 19,8%	116 10,3%	31 4,0%	9 1,4%	863 17,8%
upper secondary education	148 26,3%	295 35,1%	312 34,3%	477 42,5%	335 42,8%	308 48,9%	1875 38,7%
non-university higher education	57 10,1%	164 19,5%	232 25,5%	309 27,5%	221 28,3%	98 15,6%	1081 22,3%
university	76 13,5%	136 16,2%	186 20,4%	217 19,3%	182 23,3%	60 9,5%	857 17,7%
total	563 100%	840 100%	910 100%	1122 100%	782 100%	630 100%	4847 100%
educational level (time-invariant)		total exposure					
enrolled at the last interview	7081						
lower secondary education (or below)	102291						
upper secondary education	248937						
non-university higher education	160246						
university	156652						
total	675207						
time elapsed since leaving education							
enrolled in education	193896						
0-4 years (ref. cat.)	194879						
5-8 years	125170						
9-12 years	67259						
>12 years	94003						
total	675207						
educational attainment (time-variant)							
enrolled in education	193896						
lower secondary education (or below)	86549						
upper secondary education	181134						
non-university higher education	117440						
university	96188						
total	675207						

Sources: Panel Studie van Belgische Huishoudens (PSBH) (1992-2002) and British Household Panel Survey (BHPS) (1991-2005)

Appendix 4. Kaplan-Meier survival analysis of leaving education: age at which 75% have left education (third quartile), by educational level, Belgium and the United Kingdom



Notes: NU higher education = non-university higher education

Sources: Panel Studie van Belgische Huishoudens (PSBH) (1992-2001) and British Household Panel Survey (BHPS) (1991-2005)