Educational differences in childlessness and multi-partnered fertility among men

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INTRODUCTION

Rising trends of childlessness in most European societies indicate that family formation and the transition to parenthood represents a greater challenge for today's and tomorrows young generations than for the first post-transition cohorts born in the mid and late1950s. Most of the research in this area has focused on female fertility and childlessness, but in order to understand more of the processes underlying these trends, we should also take into account the changes that have taken place in men's family formation and entrance into fatherhood. In general, more men than women remain childless, and the gender gap has increased in the younger cohorts, indicating that the threshold to become a father has become higher. In tandem with the rise in childlessness among men, there is also evidence of an increased propensity to have children with more than one partner (Skrede, 2003). This phenomenon has been referred to as *multi-partnered fertility* (Guzzo and Furstenberg Jr., 2007).

The link between education and fertility has been widely investigated, especially as far as women's fertility is concerned. Most of this research has focused on the educational level attained, but recently several authors have shown that educational level alone is not sufficient to explain the relationship between education and fertility, (e.g. Lappegård and Rønsen, 2005; Hoem et al., 2006a; Hoem et al., 2006b; Martín-García and Baizán, 2006). None of these studies focuses on men's fertility, however.

The aim of this paper is to investigate educational differentials in men's fertility pattern focusing on childlessness and multi-partnered fertility, using Norway as an example. We focus on both these outcomes, as we believe that the underlying mechanisms are similar; men's preferences for partnership and fatherhood on one side and their attractiveness to women as partners and potentially fathers to future common children. When analysing the link between education and fertility it is important to underline that the available data do not facilitate a disentangling of individual preferences. Nevertheless, in line with Hoem et al.

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(2006a) we believe that the choice of educational field does reflect personal preferences, including amongst others attitudes to childbearing. Field of education also largely determines the social and normative surroundings during a person's formative years. Furthermore, it is likely to be a good predictor of the type of job a person will hold in the future, including the labour market sector and work environment. All in all this implies that analyses of field of education may give us a much better insight into the reproductive behaviour of men as well as of women than studies of educational level alone.

POSSIBLE LINKS BETWEEN EDUCATION AND MEN'S FERTILITY

Differences in childlessness and multi-partnered fertility among men can be regarded as the outcome of different selection processes into fatherhood. A man's field of education will have decisive impact on his future labour market options. His resources for economic parenting (breadwinning) and practical parenting (childcare) is thereby reflected in his labour market position and his work-place environment. These are both features that can be important for his childbearing behaviour. Also, men's gender role attitudes can be reflected in the gender composition of the job and influence his preferences for economic parenting and practical parenting.

Job security

Different types of education lead to occupations with different employment security (Hoem et al., 2006a). Traditionally, in the Scandinavian countries, the public sector offer better job security than the private sector. Examples of educations that more likely will lead to work in the public sector are teaching, medicine, police and the military. In the private sector job security will vary due to business cycles, and some occupations can be considered to be more exposed than others. Examples here are constructions, business and finance. Most Norwegian men work in the private sector while the public sector is dominated by women. Obviously, a man's job security

influence his prospects of economic parenting, and we would expect that men with fields of education that lead to work in the public sector are more likely to become fathers that men with other types of education. Furthermore, the public sector in Norway offer better parental leave benefits than the private sector, and thereby increases fathers' opportunities for taking (longer) parental leave. Men's options to be engaged in childcare may also influence their childbearing behaviour, which may be reflected in more men with greater preferences for children in the public sector.

Income prospects

Different types of education lead to occupations with different income prospects. Examples of educations that we expect to be more likely to lead to jobs with high income potentials are engineering, business, finance and laws. In many industrialised countries there has been a move away from the traditional family type with a male breadwinner towards a more modern family type with dual breadwinning. Norway is characterised by the latter, but part-time adjustments in the labour market is still a very common strategy among mothers, and mothers do most of the household work (Kitterød and Pettersen, 2006). The Norwegian family model is therefore far from gender-neutral and has been described as 'gender-equal light' (Skrede, 2004; Rønsen and Skrede, 2006). In order to achieve such a family model, the income prospect of the job of the male partner becomes crucial. This means that men with higher provider ability can be seen as more attractive to women as partners and potential fathers to future common children.

Job flexibility

Different types of education lead to occupations with different job flexibility. Generally, the public sector is characterised as being more flexible than the private sector, in the sense that there are more opportunities for part-time work. However, sometimes the public sector can be described as less flexible than the private sector as more occupations have very fixed working hours, e.g. teachers and hospital workers. Jobs with flexible working hours give more opportunities for practical parenting than jobs with fixed working hours, i.e. by enabling employees to take mornings off or staying home from work when the child is sick. We would therefore expect that men with an education that leads to jobs with high flexibility are more likely to have children than others. However, jobs with a high degree of flexibility also entrust employees with much responsibility and give opportunities for taking part in the formulation of strategies and planning of the future of the organization. This may result in work-places that have been referred to as "greedy" organisations, making high demands on their employees (Brandth and Kvande, 2002). If this implies longer hours at work, it contrasts sharply with making working life more compatible with family life.

Gender composition on job

The Norwegian labour market is very sex-segregated, partly as a result of traditional choices in fields of education. Some types of education leads to occupations that are female-dominated, e.g. pre-school teachers, nurses and social workers, while other types of education leads to occupations that are male-dominated, e.g. constructions, agriculture and police. The high degree of sex-segregation in combination with a high proportion of female part-time workers has been used to explain the high share of mothers continuing in the labour market after and between childbirths. As discussed above, there is not necessarily coherence between a female-dominated job (in the public sector) and a work-family adaptive job. Nevertheless, female-dominated jobs create work-place environments that are beneficial for both mothers and fathers of young children. For that reason we would expect that also men with educations that lead to female-dominated occupations are more likely to become fathers than men with other educations.

If we assume that a man's gender role attitudes can be reflected in the gender composition of the job, a "masculine" work culture may also be associated with strong preferences for fatherhood. If social norms of becoming a father are closely linked to the identity as man, such norms could also be maintained in a "masculine" work environment and lead to less childlessness among men in these maledominated areas.

DATA, METHODS AND CLASSIFICATIONS

Data

Our analyses are based on individual-level data extracted from the Norwegian Central Population Register, and the Norwegian Educational Database. The population database originates from the census held in 1960 and contains longitudinal information on each date of recorded childbearing of every person who has ever lived in the country since then. Individuals who died or emigrated (without a subsequent re-entry) prior to 1960 do not appear in our calculations. This means that the fertility rates for the oldest cohorts have been computed conditional on survival and non-migration until the census year. Earlier investigations have shown that this effect is negligible (Brunborg and Kravdal, 1986; Andersson and Sobolev, 2001). We have access to fertility histories up to 2007.

Individual data on childbearing histories have been linked to individual data on educational histories. These data originate from the Population Census held in 1970, and have thereafter been updated annually from 1974. The information we have access to include education up to 2005.

Methods

Our study are based on original male birth cohorts, i.e. we observe the birth histories of men born in the country and calculate cohort fertility measures from age-specific parity-progression rates cumulated over their life course (ages 15-59). The present analysis is based on native male cohorts born in 1935 or later. Age is defined as age by the end of a calendar year (calendar year minus birth year). Men who die or emigrate before age 59 are censored at the time of death or emigration.

In the analyses we concentrate on the educational level attained at age 30, when most men have finished their educational activity, and study the cumulated fertility outcome beyond that age. In this way we avoid most of the common problem of seeking to explain fertility behaviour at a certain age by the educational level reported and possibly attained at a later stage, which is a form of anticipatory analysis that can produce misleading results on the interrelationship between education and fertility (Hoem and Kreyenfeld, 2006a; Hoem and Kreyenfeld, 2006b). Since there is no information on educational attainment before 1970, cohorts born before 1940 are excluded from the analyses when studying the association with education. People with missing information on educational attainment have been excluded from our analyses, but they constitute a very small group (less than 1 per cent).

Classification

Field and level of education are classified using the Norwegian standard classification of education Statistics Norway (2001). We use a recent version of the standard where the levels of education have been revised to be more compatible with international standards (see http://www.ssb.no/utniv_en/). When fields of education are concerned, we have constructed groups that are meant to reflect differences in labour market prospects and work-place environments as discussed above. Since primary and secondary education is mainly general programmes without specific vocational directions, the educational field categories only include post-secondary and tertiary level education. The groups are as follows:

Humanities, Arts	Languages skills, theology, musicians, actor
Teaching, Health, Welfare	Teaching, medicine, dentists, social work
Social science, Journalism	Social science, journalism & information
Business, Finance, Law	Business & administration, finance, banking, management, law
Science, Computing	Biology, physics, computing
Engineering, Construction	Mechanics, electricity, construction
Agriculture	Farming, fishing, forestry
Sports, Transports, Protections	Sports, post, military, police, firemen

Table 1. Overview of educational field classification

The group *Humanities and Arts* captures both degrees that lead to no obvious set of occupations, e.g. general language skills, and degrees where there is a clearer link between the education and set of occupational outcomes, e.g. theology and musicians. In general the group can be characterized as educations that are headed towards occupations with low job security and low income prospects, i.e. educations with no clear job prospects or occupations that are more loosely connected to the labour market than others (maybe with the exception of theology). The group Teaching, Health and Welfare capture educations that in general lead to occupations within the public sector with good opportunities for both economic- and practical parenting. The group Social science and Journalism captures educations with both employment possibilities in the public sector, e.g. bureaucracy, and the private sector, e.g. media. The group Business, Finance and Law, Science and Computing, and Engineering and Construction captures educations that lead to occupations with high income prospects and thereby high provider ability. In general they can also be described as high-flexibility jobs, in the sense of flexible hours, but they vary in how exposed they are to business cycle fluctuations. The Agriculture group captures educations that lead to occupations within farming, fishing and forestry. For many of these occupations the income prospects may vary due to changing crops and harvests, but for many men within these occupations, the choice of life-style is probably more important than positions and income in the labour market. The agricultural population is also characterised by more traditional family forms and a closer attachment to their place of origin than people in general (Jervell, 2002). The last group *Sports, Transports and Protections* captures educations that generally lead to male-dominated occupations in a "masculine" work environment. Occupations within the police and the military are further in the public sector with good job security and ample opportunities for economic and practical parenting.

RESULTS

The overall picture

As has been reported elsewhere for selected Norwegian male cohorts (Skrede, 2005) or groups of cohorts (Kravdal and Rindfuss, 2008), the proportion childless was lower for men born in the mid and late 1940s than for men born in the beginning of that decade. Our calculations of completed fertility at ages 40, 45 and 50 years for single-year male cohorts born 1935 to 1967 show that childlessness was at its lowest among men born in 1943 with a fairly rapid decrease over cohorts born a few years before and a renewed increase over cohorts born later (Figure 1). Evidently, some men wait a long time before they become fathers, as is reflected in the reduction in the proportion childless from age 45 to age 50, and this pattern seems to be getting more pronounced in the younger cohorts. However, to be able to include those born in the early 1960s in our analyses, we shall mainly focus on completed fertility at age 45 in the following.

It is worth noticing that childlessness among men has accelerated in the younger cohorts. From a fairly low level of 13.3 per cent in the 1943 cohort, the proportion with no children rose to 15.9 per cent among those born 10 years later and to 19 per cent in the 1962 cohort. Judged by the observed childlessness in the 1967-cohort at age 40, this trends seems to continue, as 22.3 per cent of them had no

biological children, while the corresponding proportion among men born just five years before was 21.3 per cent.

Turning to multi-partnered fertility (Figure 2), we notice that the phenomenon has increased continuously across our cohorts. At age 45, the proportion of men who had children with more than one partner had risen from less than four per cent in cohorts born before the Second World War to about 11 per cent in cohorts born in the early 1960s. Calculated as percentage of those who had become fathers, multipartnered fertility rose from about five per cent in the oldest cohorts to about 13 per cent in the youngest cohorts.

Contrasts by educational level

A well-established finding from studies of female cohort fertility in most countries is that women with short education have lower childlessness and more children than women with longer education. For men, we see the opposite pattern: In all cohorts from the early 1940s to the early 1960s the highest proportion with no children is found among men with compulsory schooling only (primary and lower secondary level) and the lowest proportion among men with a higher university or college degree (postgraduate tertiary level) (Figure 3). At age 45, 22.1 per cent of men with compulsory schooling and 13.2 per cent of men with a postgraduate degree were childless in the youngest cohort (1960-62). Traditionally, high levels of education have been linked to high income prospects and thereby good provider abilities. The persistent differences in childlessness by educational level therefore suggest that provider ability is still an important determinant of men's reproductive behaviour.

There has been an increase in childlessness in all educational groups, also among those with high education. In fact, childlessness has increased most among men with an undergraduate tertiary education, and least in the group with compulsory education. In the former group the proportion with no children rose from 9.8 per cent in the 1940-44 cohort to 16.9 per cent in the 1960-62 cohort, while the proportion in the latter group increased from 18.9 to 22.1 per cent. Here it is important to underline that there are great variations in where men at same level of education are heading for in the labour market, and different positions in the labour market might give different opportunities for economic and practical parenting. In order to get better insight into the reproductive behaviour of men we also need to study variations due to field of education.

In spite of the fact that men with low education are the most likely to remain childlessness, multi-partnered fertility is more widespread in this group than in the other educational groups. At age 45, about 15 per cent of all men in the 1960-62 cohort with a compulsory education had had children with more than woman, compared to about 5 per cent among men with a tertiary degree. If looking at fathers only (Figure 4), the pattern becomes even more pronounced. At the lowest educational level, 19.3 per cent of those who had become fathers, had children with more than one woman, compared to 6.1 per cent of those at the highest educational level. In the following we shall stick to fathers only, since this does not change the main pattern, but merely enhances the contrasts.

Like childlessness, multi-partnered fertility has increased across cohorts, but unlike childlessness it has increased more among men with lower education than among those with higher education. From the 1940-44 cohort to the 1960-62 cohort the proportion of fathers who had children with more than one woman more than doubled (from 8.9 to 19.3 per cent in the compulsory schooling group), while it only rose by about 30 per cent in the highest tertiary group, from 4.7 to 6.1 per cent. There has also been almost a doubling of multi-partnered fertility in the upper secondary groups (from 6.5 to 12-13 per cent) and about a 70 per cent increase in the lowest tertiary group, from 4.7 to 8 per cent.

Multi-partnered fertility is obviously closely linked to marital and non-marital union dissolution. A common finding from the Nordic countries is that there is an inverse relationship between educational attainment and union dissolution: the lower the education of either partner, the higher the break-up rates (Hoem, 1997; Jalovaara, 2001; Lyngstad, 2004). This gradient is clearly reflected in the multipartnered fertility pattern reported above. However, considering both childlessness and multi-partnered fertility together, we would like to stress the more bifurcated pattern of the lower educated group: While more than twenty per cent never become fathers, those who do so are much more likely than higher educated men to have children with more than one woman. This is an indication that the family formation and dissolution processes are more selective among those with low education, and that this group may be more heterogeneous than the other educational groups. One potentially confounding factor that we have not been able to control for so far is income differentials, and this is an obvious task for future. However, we suspect that there will still be a lot of remaining unobservable heterogeneity in this group.

Contrasts by field of education

The childlessness pattern of men within various fields of post-secondary education (supplementary education to upper-secondary, undergraduate and postgraduate tertiary level) is displayed in Figure 5. The highest childlessness in these groups is found among men with an education within humanities and arts (e.g. language skills, music and performing arts, theology etc.). In cohorts born since the mid 1950s the proportion with no children at age 45 is approaching 25 per cent, which is even higher than in the group with compulsory schooling discussed above. Other fields of education with relatively high male childlessness are social science and journalism, science and computing and general programs. On the other end of the scale, we have fields of education like agriculture, sports, transport and protection and partly also teaching, health and welfare, which have childlessness proportions ranging from 10.5 to 13 per cent in the youngest cohorts. This is even lower than among men with high tertiary education in general (ref. last section). Like for level of education, we observe a rising trend of childlessness across cohorts, and the increase has been particularly large

for humanities and arts, and science and computing. It is interesting to observe that the rising trend across cohorts seem to have been broken for two groups of men, namely those within the sports, transport and protection fields and those within agriculture. This may partly be due to a changing composition of the groups, as a closer investigation reveals that there are fewer men within transport and more men within protection in the younger than in older cohorts, and in the agricultural field there has been a switch from farming to fishing.

When multi-partnered fertility is concerned (Figure 6), it is worth noticing that the behaviour of the groups with lowest childlessness, the sports, protection and transport field, and the agricultural field, is quite opposite. Whereas the former group has the very highest proportion of fathers who have children with more than one woman, the latter group has the very lowest proportion. In fact, none of the educational level groups discussed above have a multi-partnered fertility that is as low as within the agricultural field, and the sports, transport and protection fields have a proportion that is on par with fathers with an upper-secondary education. Obviously, we here have an example of two groups with very different family formation and family dissolution patterns and practices. As previously discussed, multi-partnered fertility is closely linked to marital and non-marital dissolution. Unfortunately we do no not have findings indicating a lower break-up rate in the agriculture group than the group of sports, transport and protection, but it is likely that this is a factor. In the latter group, the multi-partnered fertility has increased substantially in the youngest cohort. As indicated above, there has been a switch in the composition of this group with a larger proportion belonging to fields within protection, e.g. police, firemen. The majority of the men in this group are to be found in male-dominated jobs with a "masculine" work environment. These are also occupations to be found in the public sector with good job security and thereby good opportunities for economic parenting and practical parenting.

CONCLUSION

Our analysis of childlessness and multi-partnered fertility among men in Norway demonstrates that education influence men's childbearing behaviour in multiple ways. In contrast to the well-documented positive relationship between educational level and childlessness among women, childlessness among men is most pronounced among those with low education and least pronounced among those with high education. This is in line with economic theories suggesting that a man with higher earnings power (education) is potentially more able to support a family and therefore more attractive as a partner and father to a future child. But at a given educational level, we also observe contrasting behaviour between men within different fields of education. These contrasts have become more pronounced over time, and may be related to at least three factors.

First, provider availability of the male partner still seems to be crucial among couples, and this is reflected in his labour market position and work-place environment. Different positions in the labour market give different opportunities for economic parenting. Since job security and income prospects are important ingredients in provider availability, we expected two groups in particular to be more likely to become fathers than others. Due to better job security, the first group would be men with educations leading to work in the public sector, and due to higher income potential, the second group would be men with educations within engineering, business, finance and law. Both groups turn out to be at the very low end of the childlessness scale, which indicates that provider availability is still a determining element in men's reproductive behaviour. During the last decades, the labour market has become more competitive, and this might explain why the fertility behaviour of men at the same educational level, but with different fields of education, has become more divergent.

Second, during the last decades, more women participate in the labour market, also when they have small children, and the compatibility between family life and work life have become crucial, for both women and men. Different positions in the labour market also give different opportunities for practical parenting. Generally, the public sector offers better opportunities for childcare, e.g. better parental leave benefits, and therefore we expected to find men with stronger preferences for children in the public sector. Furthermore, men's gender role attitudes can be reflected in the gender composition of the job and influence his desire for economic parenting and childcare. Female-dominated work-places may create environments that are beneficial for parents of young children, whereas masculine work-places may create environments where fatherhood is a social norm. The fact that the lowest childlessness proportions were found among men with educations for the agricultural- and the transport- and protection sector confirms that social norms play a part, as the former sector is characterised by strong traditions and family-orientation, and the latter by a distinct masculine work environment.

The educational pattern of multi-partnered fertility is different from childlessness, and the propensity to have children with more than one woman is most pronounced among those with low education. However, similar to childlessness, there is much variation across fields of education. Becoming a father is a more selective process for men with low education than for men with higher education, but having become fathers, multi-partnered fertility is most pronounced in the former group. Obviously, multi-partnered fertility is closely linked to union dissolution, but we should underline that some of these men have never been in a stable relationship with the mother. The timing of fatherhood is also important for the likelihood of having a child with another woman.

The contrasting outcome across fields of education suggests that the underlying mechanisms behind both childlessness and multi-partnered fertility are similar, as we suggested in the beginning of this paper; on one side preferences for partnership and fatherhood and on the other side their attractiveness to women as partners and potential fathers to future common children. Depending on their work- and family-life strategies, some women may have stronger preferences for provider availability, while others may have stronger preferences for a co-childcarer. In order to get a better understanding of educational differentials in men's childbearing behaviour (as well as women's) we would need data on couples and explore fertility outcomes among couples with different combinations of educational level and -field. This will be a natural next step and a task for future research.

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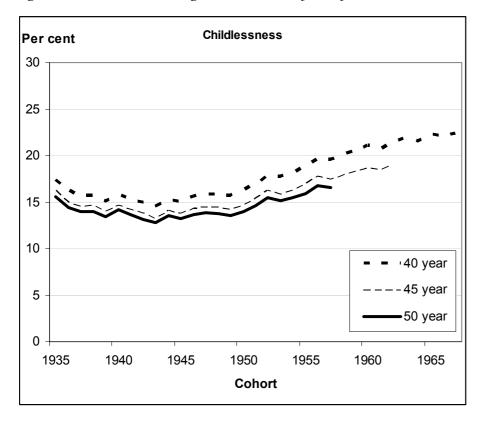
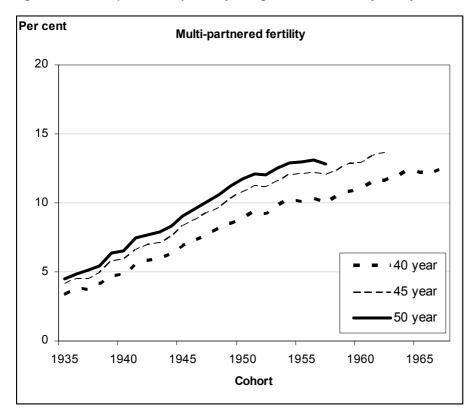


Figure 1. Childlessness at age 40, 45 and 50 year by cohort, men. Per cent.

Figure 2. Multi-partnered fertility at age 40, 45 and 50 year by cohort, men. Per cent.



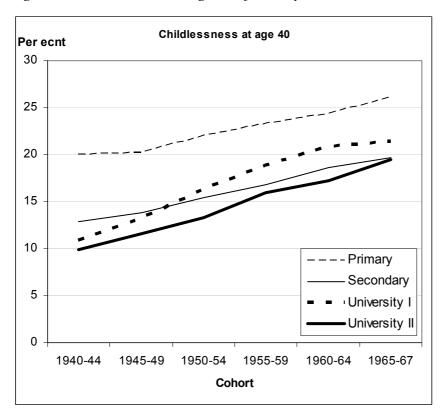
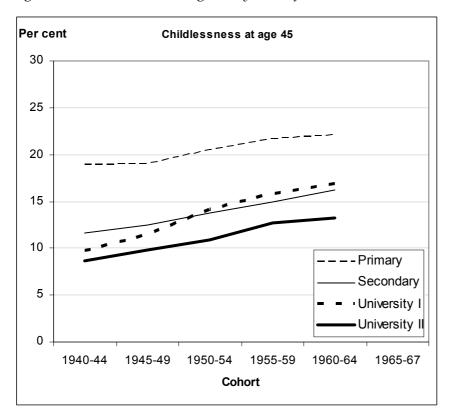


Figure 3A. Childlessness at age 40 by level of education and cohort, men. Per cent.

Figure 3B. Childlessness at age 45 by level of education and cohort, men. Per cent.



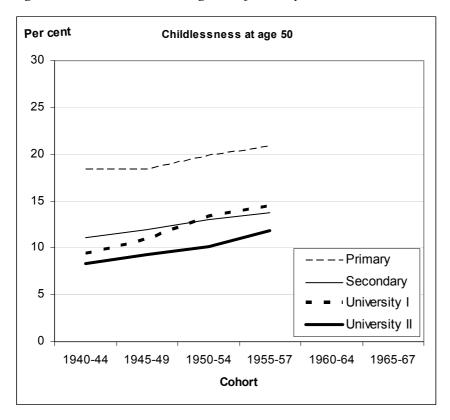
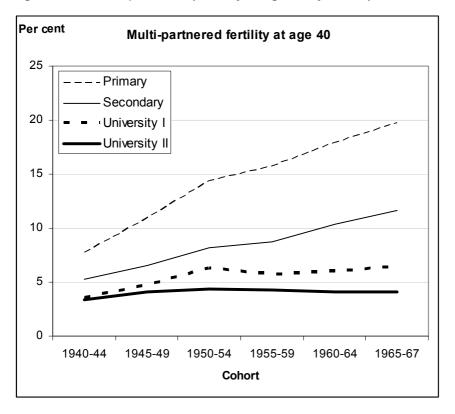


Figure 3C. Childlessness at age 50 by level of education and cohort, men. Per cent.

Figure 4A. Multi-partnered fertility at age 40 by level of education and cohort, men. Per cent.



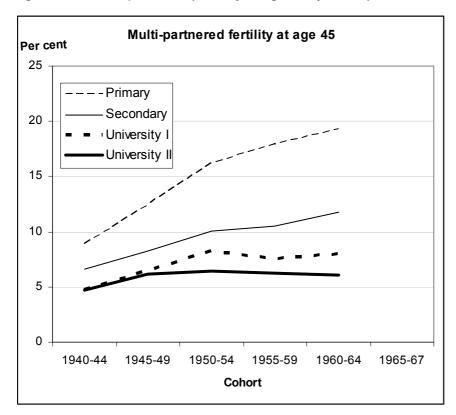
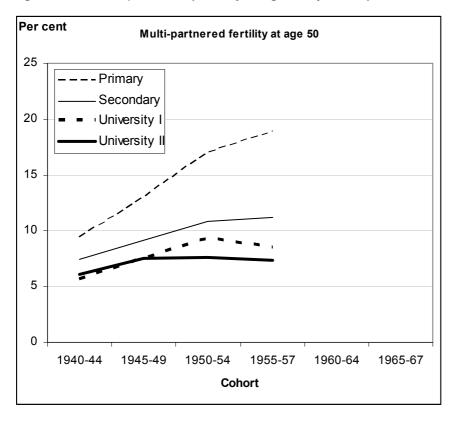


Figure 4B. Multi-partnered fertility at age 45 by level of education and cohort, men. Per cent.

Figure 4C. Multi-partnered fertility at age 50 by level of education and cohort, men. Per cent.



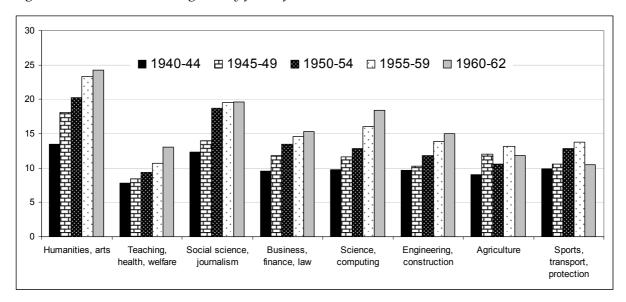


Figure 5. Childlessness at age 45 by field of education and cohort, men. Per cent.

Figure 6. Multi-partnered fertility at age 45 by field of education and cohort, men. Per cent.

