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FATHERHOOD AND FERTILITY

This paper demonstrates that education influences men's childbearing behaviour in multiple ways. Focusing particularly on childlessness and multi-partner fertility, key elements in our analyses are factors related to a man's capacity for economic and practical parenting, reflected e.g. through income prospects, job-security, job-flexibility and the gender-composition of the job. Our data covers all men living in Norway during 1970-2006 which allows for a detailed analysis of diversity along a wide range of different educational groups and cohorts. Childlessness among men is most pronounced among those with low education and least pronounced among those with high education, but at a given educational level, we also observe sharp contrasts between men within different fields of education. The educational pattern of multi-partner fertility is different from childlessness, as the propensity to have children with more than one woman is most pronounced among those with low education.

Keywords: men, fatherhood, childlessness, multi-partner fertility, Norway

This article is about men's childbearing behaviour, which is a relatively unexplored area in fertility research. Traditionally, this research has been highly gendered with a strong focus on women's childbearing. Consequently, shifting fertility trends have usually been ascribed to changes in female behaviour, while male fertility behaviour have been regarded as more or less constant (Goldscheider & Kaufman, 1996). An obvious reason why fertility research has remained highly gendered is that entry into parenthood continues to have more consequences for women than for men, as the mother is still the main caregiver. However, changing gender roles have brought more attention to fatherhood and men's role in fertility decisions and over the years more studies of female fertility have incorporated men in a couple perspective (e.g., Liefbroer & Corijn, 1999; Sorensen, 1989; Thomson and Hoem 1998; Winkler-Dworak & Toulemon, 2007). Still, analyses of male fertility behaviour *per se* are relatively uncommon, except for some recent contributions mainly from the U.S. (e.g., Guzzo & Furstenberg, 2007; Hynes, Joyner, Peters, & Delone, 2008; Manlove, Logan, Ikramullah, & Holcombe, 2008), and Europe (Martín-García, 2009; Puur, Olah, Tazi-Preve, & Dorbritz, 2008).

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Another reason why analyses of male fertility are few and far between is a lack of appropriate data. So far, most analyses of fertility behaviour have been based on survey data, but some authors have questioned the quality of such data for studies of male fertility (Rendal, Clarke, Peters, Ranjit, & Verropoulou, 1999). There seems to be a tendency of underreported men's biological children, especially if the father no longer co-resides with the child (Juby & Le Bourdais, 1999). We are in a better position in this respect, as we have access to high-quality, administrative, register data on the whole population of Norway where the underreporting of men's children is very modest. Only about 1-1.5 percent of the total number of children has no registered father in our data.

The focus of our study is on childlessness and multi-partner fertility–two phenomena that have been on the increase, especially among men (Lappegård, 2007; Skrede, 2005). Our point of departure is the various roles men and women play within families, and how these roles create different selection processes *into* fatherhood as well as different self-selection processes *away from* fatherhood. In countries like Norway, where the prominent provider model is the dual-earner/dual-carer family, we argue that two aspects in particular deserve attention, namely men's potentials as economic providers on the one hand (economic parenting) and their preferences and opportunities for child-caring on the other hand (practical parenting). Using register data, we do not know anything about personal preferences, nor do we have access to register information on income or occupation, but we do have detailed longitudinal information on an individual's level and field of education. Together these variables reflect both human capital resources and income potential, and the kind of job a man is likely to have in the labour market. The analysis is mainly descriptive and exploratory, that is we do not develop and test specific hypothesis, but when interpreted within a broader context as elaborated upon below, the results contribute to a broader understanding of education-related differentials in men's childbearing behaviour.

BACKGROUND

Changes in family structure in the industrialised and post-industrialised world involve unstable marriages, higher union dissolution rates, postponement of childbearing, rising trends of childlessness, and declining fertility. For instance, mean age at becoming first time fathers in Norway were 31 years in 2009, while it was 26 years in the beginning of the 1970s. Also, even if Norway is characterised as a country with highest-low fertility (Billari & Kohler, 2004), the total fertility rate has decreased from 2.25 children per women in the beginning of the 1970s to 1.98 in 2009. Decreasing fertility rates can be related to societal changes such as shifts in birth technology, female emancipation, and changes in norms and values with a greater emphasis on individualisation. One of the most important technological innovations for women in the last century was the introduction of new contraceptives which meant that women now got a genuine choice about whether and when to bear a child. At the same time, increased educational attainment and labour market participation led to greater female autonomy and more alternatives to marriage and parenthood than before. In tandem with changing gender roles and family structures new expectations towards parenthood emerged.

In much of the public debate in Nordic societies, a family model where both fathers and mothers combine income generating work and unpaid family work has been an implicit ideal (Kitterød & Kjeldstad, 2003). New norms of motherhood and fatherhood challenged the old breadwinner model with the father as the main income provider and the mother as the main caregiver, bringing on an influx of mothers into the labour market and in the public sphere, and more involvement from fathers in household tasks, in particular in childcare. New expectations to the fatherhood role have also promoted the introduction of novel legislative rights that have strengthened men's positions as fathers. The right of fathers to share most of the parental leave was, for example, introduced as early as in the mid to late 1970s in most Nordic countries. In the 1990s, Norway and Sweden furthermore reserved four weeks of the common parental leave for the sole use of the father (the so-called "daddy-quota"), and if not taken by the father, the family will forfeit this part of the leave. These changes has led to more father involvement and strengthened fathers' position.

On the other hand, increasing divorce and union dissolution rates have led to more single living and more lone-parent households. In Norway in 2008, 21 percent of marriages that have lasted for 10 years were estimated to end in divorce, given today's divorce pattern. In 1981 the same proportion was 13 percent and in 1960 5 percent (Statistics Norway, 2009a). Also, in 2008, 25 percent of all children aged 0-17 years were not living with both biological parents. Among these, 64 percent were living primarily with the mother, while 16 percent were living primarily with the father (Statistics Norway, 2009b). Since children often end up living mainly with their mother after union dissolutions, increasing divorce and union dissolutions have led to a more distant father role, which contrasts sharply with the political goal of more father involvement as described above.

In this connection, a couple of trends in male fertility arouse further interest. First, more men than women remain childless, and this gender gap has increased in younger cohorts (Lappegård, 2007; Kravdal & Rindfuss, 2008). This indicates that the threshold to become a father has become higher. Second, there is evidence of an increased propensity to have children with more than one partner, so-called multi-partner fertility, a phenomenon that has also been observed in the U.S. (see Carlson & Furstenberg, 2006; Guzzo & Furstenberg, 2007). In this article we shall look closer at these trends and their manifold associations with education, distinguishing between both level and field of education. Level of education or educational attainment is commonly used as a predictor of fertility behaviour, but recent analyses show that field of education may be at least as powerful a predictor as educational level (Hoem, Neyer, & Andersson, 2006a, 2006b; Lappegård, 2002; Lappegård & Rønsen, 2005; Martín-García, 2009; Martín-García & Baizán, 2006; van Bavel, 2010). Educational attainment reflects primarily human capital resources and income prospects, while field of education has been shown to be related to several aspects of men's lives such as political orientation, lifestyle and labour market outcomes (van de Werfhorst, 2004). Being closely correlated with future occupation, a man's field of education will also say something about the type of job he is likely to have, indicating for example whether it will be secure, well

paid, and family friendly and flexible. Besides, the choice of educational field reflects personal preferences, which may also be related to men's attitudes to childbearing (Hoem et al., 2006b). All these features might have important bearings on men's childbearing behaviour.

CONCEPTUAL FRAMEWORK

An underlying assumption of our analysis is that male fertility is closely linked to men's preferences for partnership and fatherhood on the one side and their attractiveness to women as partners and potential fathers to future common children on the other. In societies with a growing dual-earner/dual-carer family structure, the opportunities for both economic parenting (breadwinning) and practical parenting (childcare) become crucial. A man's resources for economic and practical parenting will amongst others be reflected in his position in the labour market and in his work-environment. We take into account that there might be aspects that may affect the relationship between educational attainment and childbearing behaviour through the link between education and the labour market. Different features such as income prospects, job security, job flexibility and the gender composition of the job may be more or less important for a man's capacity for breadwinning and childcare, and thereby more or less important for his attractiveness as potential marriage partner and father of future common children. These characteristics are not easily observable, however, but all of them are closely associated with occupation and sector of work. As mentioned, we do not have access to information on occupation or sector of work, but use level and field of education as proxies. Below we elaborate on these associations and discuss how a man's capacity for economic and practical parenting can be related to the complex interrelationships existing between childbearing behaviour and educational attainment (level) and educational orientation (field).

The Economic Parenting Argument

Traditionally, men have a strong identity as main breadwinners and their role as fathers is embedded in their availability to support a family (Nolan, 2005). One feature that is obviously important for a man's ability to support a family is his income prospects, and previous research from the U.S. corroborates that income is an important determinant factor of multi-partner fertility among men (Carlson & Furstenberg, 2006; Guzzo & Furstenberg, 2007; Manlove et al., 2008). In a traditional family with gender-specific division of labour, men specialize in market work and women in housework and childrearing. According to economic theory, the spouses specialize in the fields in which they have a comparative advantage and by doing so they maximize the joint utility of the household (Becker, 1981). Other theories contend that the gender division of work is determined by the gender system, constituted by common beliefs, norms and practices that define the meaning of being men and women (Mason, 2001). Within the "doing gender" theory the basic argument is that both men and women con-

tinuously construct and reconstruct their gender identity (West & Zimmermann, 1987). In couples this means that men and women "do gender" as part of dialectic process, interpreting and interacting with their partners. For men this entails undertaking activities that are seen as typical masculine tasks such as economic breadwinning, and avoiding activities with feminine connotations such as childcare.

Women's work role has changed during the last few decades, and as a result, the work-family dynamic of both men and women have changed. However, even though women increasingly contribute to the family-income, men are still the main providers in most couples and are also expected to be so. Although dual breadwinning has become an ideal and a more common family type in Norway, part-time adjustments in the labour market are still very common among mothers, and mothers continue to do most of the household work (Kitterød & Pettersen, 2006). The Norwegian family model is therefore far from gender-neutral, and the division of labour between women and men has been characterised as "gender-equality light" (Rønsen & Skrede, 2006). In order to achieve such a family model, the income prospect of the male partner still plays a crucial role. Generally, level of education is a good predictor of a man's income potential, but field of education gives additional information, as some jobs at a given level are paid better than others, for example engineering, business, finance and law.

Job security is another important feature that influences a man's prospects of supporting a family. In the Scandinavian countries, the public sector in general offers better job security than the private sector and examples of fields of educations that leads to job with high job security are teaching, health-care and protection (police and firemen). Most Norwegian men work in the private sector, while the public sector is dominated by women. In the private sector, job security will vary with the business cycle, and some sectors may be more exposed than others. If the downturn is global, jobs within the export industry will e.g., be particularly hard hit, whereas a more national-specific decline in demand also will affect other types of private sector jobs, e.g., within engineering and construction, and business and finance. Other fields of education commonly lead to jobs that score low on several dimensions, e.g. educations in arts and music that generally are associated with very low job security and also relatively poor income prospects.

The Practical Parenting Argument

Care-giving is part of the new father's role, and a man's sector of employment may also influence his opportunities to be engaged in childcare. The public sector in Norway offers better parental leave arrangements than the private sector, thereby increasing fathers' opportunities to take (longer) parental leave. Another feature that is obviously important for a man's prospects of being an active care-giver is job flexibility. Generally, the public sector is characterised as 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, for example, by enabling employees to take mornings off or staying home from work when the child is sick. However, jobs with a high degree of flexibility also entrust employees with much responsibility and encourage their active involvement in the formulation of strategies and plans for 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 & Kvande, 2002). If this implies longer hours at work, it contrasts sharply with a more compatible work/family-life balance.

As discussed above, the gender division of work is determined by the gender system, which means that the gender practises in the work-place may influence a man's desire for fatherhood and availability for care-giving. The Norwegian labour market is very sex-segregated, partly as a result of traditional choices in fields of education. The high degree of sex-segregation and a high proportion of female part-time workers have been used to explain the high share of mothers continuing in the labour market after and between childbirths (Ellingsæter & Rønsen, 1996). But as discussed above, there is no obvious coherence between a female-dominated job (in the public sector) and a work-family adaptive job. Nevertheless, female-dominated jobs tend to create work-place environments that are beneficial for both mothers and fathers of young children. If social norms of becoming a father are closely linked to his identity as a man, such norms may also be maintained in a "masculine" work environment with a large share of male workers. A "masculine" work culture may therefore also be associated with strong preferences for fatherhood.

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-register system has a long history of full and reliable coverage of the resident populations and their vital events. Each resident has a unique identifying code, which makes it possible to link information from different data sources to each other. The population database originates from the census held in 1960 and contains longitudinal information on each date of recorded childbirth of every person who has ever lived in the country since then, including the personal identification number of the mother and the father of the respective child. For each childbirth, we are therefore able to link the father to the mother to determine whether the respective birth is with the same or with a new partner. 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 (Andersson & Sobelev, 2001; Brunborg & Kravdal, 1986). 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 condition 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 & Kreyenfeld, 2006a, 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%).

Classification

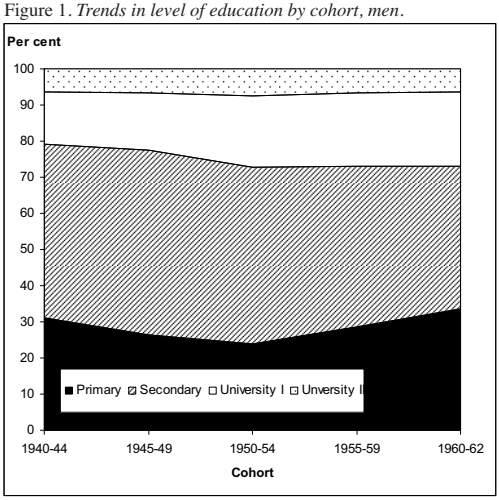
To illuminate important contrasts in men's fertility behaviour, we have constructed several groups based on level and field of education that are meant to capture the various dimensions of a man's capacity for economic and practical parenting. Field and level of education are classified using the Norwegian 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/) and distinguish between the following four levels: (i) primary and lower secondary (10 years of compulsory schooling, labelled "Primary" in figures), (ii) upper secondary and post-secondary, non-tertiary (11-13 years of schooling, labelled "Secondary" in figures), (iii) lower tertiary (some college or university, up to and including a bachelor's degree, 14-17 years of schooling, labelled "University I"), and higher tertiary university II (all college or university education taking 5 years or more, i.e., 18 years or more of schooling, labelled "University II"). 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 lower and upper secondary education mainly are general pro-

grammes without specific vocational directions, we do not subdivide these levels further into fields of education, and two avoid too small groups, we collapse all post-secondary and tertiary level education before splitting into fields of education. The resulting cross-tabulation of level and field of education are as follows:

LEVEL OF EDUCATION	FIELD OF EDUCATION	DETAILS OF FIELD OF EDUCATION
Primary and lower secondary		
Upper secondary		
Post-secondary and tertiary	Humanities, Arts	*Language skills, theology, musicians, actors*
	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, Transport, Protection	*Sports, post, military, police, firemen*

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 fields of education that lead to occupations with low job security and low income prospects, i.e., fields of education 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 fields of education 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 fields of education with both employment possibilities in the public sector, e.g., bureaucracy, and the private sector, e.g., media. The groups *Business, Finance and Law, Science and Computing*, and *Engineering and Construction* captures fields of education 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 job-security as some occupations are more exposed to business cycle fluctuations than others. The *Agriculture* group captures fields of education 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 fields of education 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.

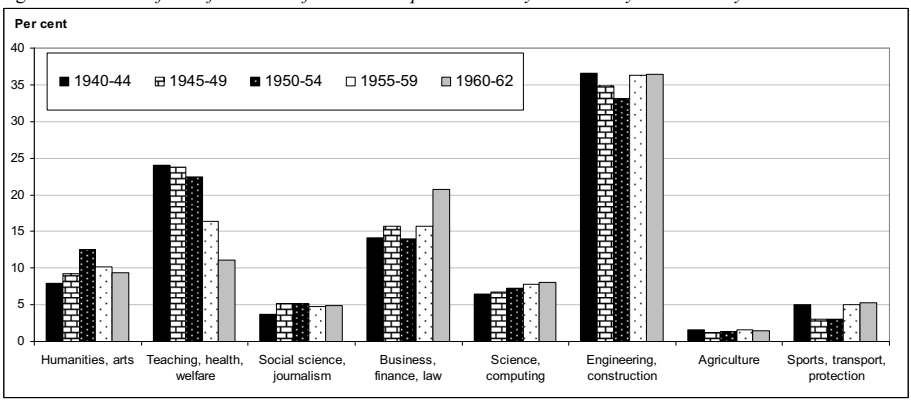
Figure 1. *Trends in level of education by cohort, men.*



There has been an increase in the proportion of men that complete higher levels of education among the cohorts included in our analysis (Figure 1). From the cohorts 1940-44 to the cohorts 1960-62 the proportion with higher education increased from 21 to 27 percent. This is mostly due to a higher proportion with lower tertiary education. The higher proportion with primary education in the youngest group is mainly an artefact of the new standard of education, however. Because of several changes in the school system since the early 1970s, the new standard assign courses to different categories depending on the calendar period in which they were completed, and if completed after the mid 1970s, short courses at the secondary level have been assigned to the primary level.

The composition of fields of education at the post-secondary and tertiary level has also changed (Figure 2). In particular, there has been an increase in the proportion of men within business, finance and law, while there has been a decrease in the proportion of men within teaching, health and welfare.

Figure 2. *Trends in field of education for men with post-secondary and tertiary education by cohort.*



RESULTS

The Overall Picture

As has been reported elsewhere for selected Norwegian male cohorts (Skrede, 2005) or groups of cohorts (Kravdal & 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 3). Evidently, some men wait a long time before they become fathers, as is reflected in the reduction in the proportion childless from age 40 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 percent in the 1943 cohort, the proportion with no children rose to 15.9 percent among those born 10 years later and to 19 percent in the 1962 cohort. Judged by the observed childlessness in the 1967-cohort at age 40, this trends seems to continue, as 22.3 percent of them had no biological children, while the corresponding proportion among men born just five years before was 21.3 percent.

Turning to multi-partner fertility (Figure 4), we notice that this 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 4 percent in cohorts born before the Second World War to about 11 percent in cohorts born in the early 1960s. Calculated as percentage of those who had become fathers, multi-partner fertility rose from about 5 percent in the oldest cohorts to about 13 percent 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

Figure 3. *Childlessness at age 40, 45 and 50 year by cohort, men.*

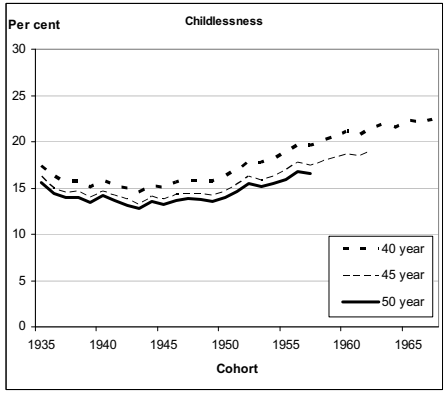
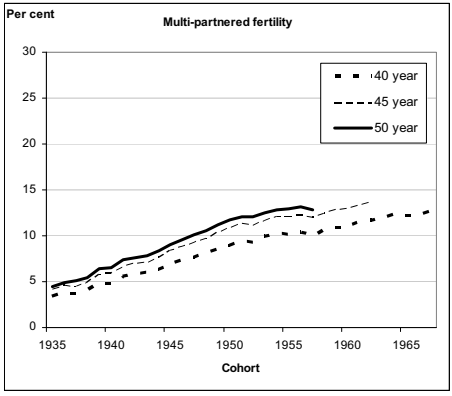


Figure 4. *Multi-partner fertility at age 40, 45 and 50 year by cohort, men.*



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 postgraduate university or college degree (higher tertiary level) (Figure 5). At age 45, 22.1 percent of men with compulsory schooling and 13.2 percent 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 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 a lower tertiary education, and least in the group with compulsory education. In the former group the proportion with no children rose from 9.8 percent in the 1940-44 cohort to 16.9 percent in the 1960-62 cohort, while the proportion in the latter group increased from 18.9 to 22.1 percent. However, it is important to underline that educations at the same level may lead to a variety of jobs in different segments of the labour market with different opportunities for economic and practical parenting. In order to get better insight into the reproductive behaviour of men we therefore also need to study variations due to field of education, which we return to shortly.

In spite of the fact that men with low education are the most likely to remain childlessness, multi-partner fertility is more widespread in this group than in the other educational groups. At age 45, about 15 percent of all men in the 1960-62 cohort with a compulsory education had had children with more than one woman, compared to about 5 percent among men with a tertiary degree. If looking at fathers only (Figure 6), the pattern becomes even more pronounced. At the lowest educational level, 19.3 percent of those who had become fathers, had children with more than one woman, compared to 6.1 percent 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.

Figure 5. *Childlessness at age 45 by level of education and cohort, men.*

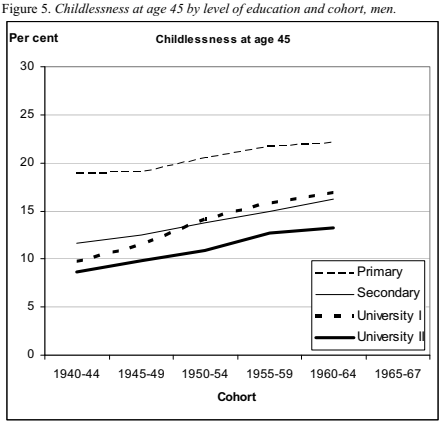
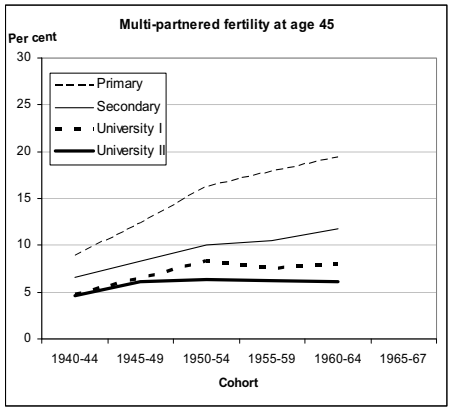


Figure 6. *Multi-partner fertility at age 45 by level of education and cohort, men.*



Like childlessness, multi-partner 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%) in the compulsory schooling group, while it only rose by about 30% in the highest tertiary group, from 4.7 to 6.1 percent. There has also been almost a doubling of multi-partner fertility in the upper secondary groups (from 6.5% to 12-13%) and about a 70 percent increase in the lowest tertiary group, from 4.7 to 8 percent.

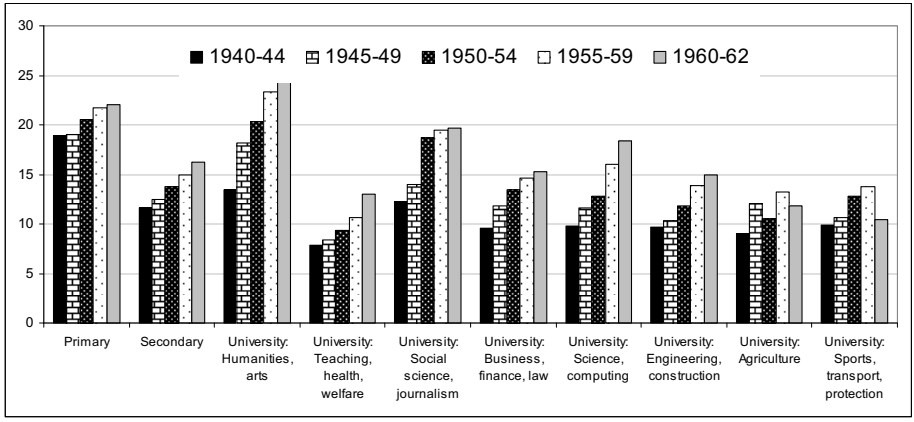
Multi-partner fertility is obviously closely linked to marital and non-marital union dissolution. A common finding from the Nordic countries is that there is an inverse relationship between educational attainment and union dissolution: the lower the education of either partner, the higher the break-up rates (Hoem, 1997; Jalovaara, 2003; Lyngstad, 2004). This gradient is clearly reflected in the multi-partner fertility pattern reported above. However, when considering both childlessness and multi-partner fertility together, we would like to stress the more bifurcated pattern of the lower educated group: While more than 20 percent never become fathers, those who do so are much more likely than higher educated men to have children with more than one woman. As mentioned earlier, the majority of children end up living without their father in the household after union dissolution, and therefore it has been argued that it is important to better understand the factors associated with multi-partner fertility among men in particular (Manlove et al., 2008). The growing trend towards increasing multi-partner fertility in the lowest education group is an indication that the family formation and dissolution processes among men have become more selective, and the low-educated group may be more heterogeneous than the other educational groups. This raises important questions about men's capacity for economic parenting and the implication for children's outcomes. In a study of multi-partner fertility in the U.S. it is argued that to the extent that childrearing across households diminishes parental resources, multi-partner fertility can have important negative consequences for children's well-being (Carlson & Furstenberg, 2006). Our results indicate that the consequences may be particularly grave if the fathers have low education. 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 research. However, from an earlier analysis based on Norwegian Tax Register data we know that the income differences between men living with and providing for children (own or stepchildren) and men not living with children were larger among men with only compulsory education than for among men with longer education (Skrede, 2002). This indicate that there is a stronger selection by income into co-resident fatherhood among men with only compulsory education, but we also suspect that there is a lot of remaining unobserved heterogeneity in this group.

Contrasts by Field of Education

The childlessness pattern of men within different levels and fields of education is displayed in figure 7. Using register data with such a vast number of observations, most of these differences are significant both within and between cohorts. The highest child-

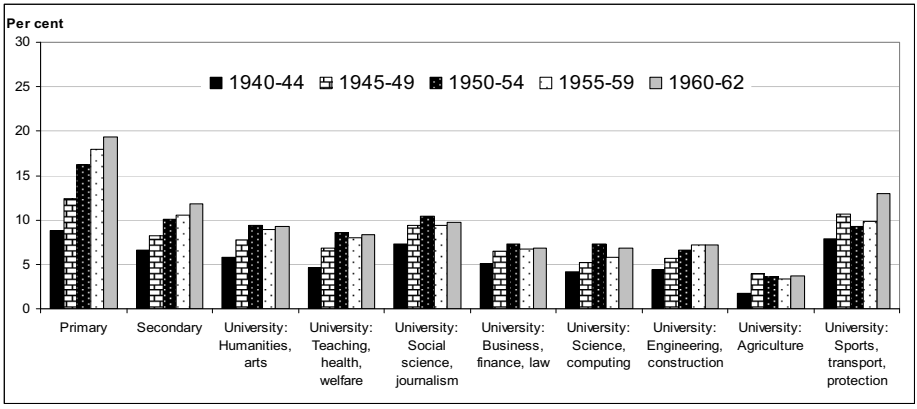
lessness of all groups is found among men with an education in humanities and arts (e.g., language skills, music and performing arts, theology etc.). In cohorts born since the mid 1950s the proportion with no children at age 45 is approaching 25 percent, which is even higher than in the group with compulsory schooling only. Other fields of education with relatively high male childlessness are social science and journalism, and science and computing. 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 percent in the youngest cohorts. This is even lower than among men with high tertiary education in general (ref. last section). Most of the differences within the cohorts are significant, especially within the youngest cohorts. There are however no significant differences between men within social science and journalism and men within science and computing, and between men within business and finances and men within engineering and agriculture in the youngest cohort. In line with the results 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. This trend is significant across the cohorts for more or less all groups. However, among men within business and finances, and within social science there are no significant differences between the 1950-54 cohort and the two youngest cohorts, indicating a stable level of childlessness among men within these two fields of education in the younger cohorts. It is interesting to observe that the rising trend across cohorts seem to have been broken for two groups, namely for men within sports, transport and protection and for men within agriculture, although the difference between the 1955-59 cohort and 1960-62 cohort is not significant for the agricultural group. A changing composition of the groups may also have contributed to the observed pattern, as closer investigations reveal 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, mainly because of growing job opportunities in the expanding fish faming industry.

Figure 7. *Childlessness at age 45 by level and field of education and cohort, men.*



When multi-partner fertility is concerned we saw that the general trend was increasing (Figure 4). However, from the 1950-54 cohort and onwards there are few significant differences across cohorts within fields of education (Figure 8). The differences between fields of education within cohorts hold for all cohorts though. One point worth noticing is 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-partner 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-partner fertility is closely linked to marital and non-marital dissolution. Unfortunately we are not aware of any studies relating union dissolution to different fields of education, so we have no evidence of lower break-up rates in the agriculture group than in the sports, transport and protection group, but it is likely that this is a confounding factor. In the latter group, multi-partner fertility has increased substantially in the youngest cohort. As already mentioned, 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 in male-dominated jobs with a "masculine" work environment. As argued initially, social norms of fatherhood may be strong in such environments, and closely linked to men's identity as men. Besides these occupations also mainly belong to the public sector, and are characterised by good job security and fairly family friendly work schedules. Thus there are good opportunities for both economic and practical parenting.

Figure 8. *Multi-partner fertility at age 45 by level and field of education and cohort, men.*



CONCLUSION

Our analysis of childlessness and multi-partner 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 an education leading to work in the public sector, and due to higher income potential, the second group would be men with an education 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 and work has become crucial, for women as well as for men. Different positions in the labour market also give different opportunities for practical parenting. Generally, the public sector offers better arrangements for childcare, e.g., better parental leave benefits, and therefore we expected to find lower childlessness among men in the public sector. Furthermore, men's gender role attitudes can be reflected in the gender composition of the job and influence their 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 strong social norm. The fact that the lowest childlessness proportions were found among men with educations for respectively the agricultural- and the transport- and protection sectors 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-partner fertility is different from childlessness, as the propensity to have children with more than one woman is most pronounced among those with low education. Becoming a father is thus more of a selective process for men with low education than for men with higher education, but having become fathers, low-educated men are much more likely to have another child with a new partner. Obviously, multi-partner fertility is closely linked to union dissolution, but we should un-

derline that some of these men have never been in a stable relationship with the mother (Skrede, 2005). This has grave implication both for the children and the fathers themselves. Similar to childlessness, there is much variation across fields of education in multi-partner fertility. Interestingly, one of the groups with the lowest proportion of childlessness, men within transport and protection, have the highest proportion of multi-partner fertility. These fields of education mainly lead to public sector jobs with good opportunities for both economic and practical parenting. Furthermore, these jobs are usually in "masculine" work environment where fatherhood is a strong social norm and closely linked to their identity as men.

The contrasting outcomes across fields of education suggests that the underlying processes behind both childlessness and multi-partner fertility are similar, depending on the one side on men's preferences for partnership and fatherhood and on the other side on their attractiveness to women as partners and potential fathers to future common children. Conditional on their work- and family-life strategies, some women may have stronger preferences for a main provider, 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 analysis has two main limitations. First, using register data we only have access to observable behaviour and no information about the men's attitudes and preferences towards fatherhood and economic and practical parenting. In order to get better insights into how these mechanisms are influencing the processes into as well as away from fatherhood we need data that illuminate more of the factors that determine men's fertility behaviour. The second limitation is linked to our use of field of education as a proxy of the type of job a man is likely to hold in the labour market. Even if there is likely to be a large correspondence between field of education and occupation for the majority of our population extract, some will have ended up in other jobs than they are educated for. Moreover, field of education tells us little about the occupations of men with primary or secondary education, as these are mainly general programmes with no job-specificity. For a more comprehensive analysis of the direct relationship between men's position in the labour market and their capacity for economic parenting and practical parenting we would therefore need data on occupation, as well as information about income.

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