Socioeconomic differentials in multi-partner fertility among fathers

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ABSTRACT

Fertility research has traditionally been highly gendered with focus on women's childbearing. However, changing gender roles have brought more attention to fatherhood and men's role in fertility decisions. For Norway, previous cohort studies show that more men than women remain childless, with an increasing gender gap over the cohorts. Moreover, the propensity to have children with more than one partner is rising. In this paper we analyse socio-economic differentials in men's fertility behaviour over the life-course, using administrative register-data of Norwegian men born 1955-1984, focusing especially on multi-partner fertility. We use a discrete hazard rate model and a two-step procedure: First we analyse the risk of having a first birth versus no birth, and second we model the competing risk of having a higher-parity birth with a new partner (multi-partner fertility), a higher-parity birth with the same partner, or no more children. Our findings suggest that there are substantial differences in men's multi-partner fertility by income and educational attainment.

INTRODUCTION

Male fertility is an almost invisible topic in family demography, in spite of enormous changes in family structures throughout the industrialised and post-industrialised world, involving amongst others the shifting roles of men and women, both within the family and in relation to parenthood, and in the labour market. Two trends in particular highlight the importance of more in-depth analysis of men's fertility patterns. First, more men than women remain childless, and this gender gap has increased in the younger cohorts (Kravdal and Rindfuss 2008; Lappegård et al. 2008). This indicates that the threshold to become a father has become higher, and that there may be different selection processes *into* fatherhood based on e.g. provider ability and caregiver ability, as well as different self-selection processes *away from* fatherhood. Second, there is evidence of an increased propensity to have children with more than one partner, so-called multi-partner fertility (Carlson and Furstenberg 2006; Guzzo and Furstenberg 2007; Lappegård et al. 2008; Skrede 2004). This is amongst others a result of high divorce rates, and it has been argued that it is important to better understand the factors associated with multiple-partner fertility among men in particular because fathers are more likely than mothers to live apart from children by previous partners (Manlove et al. 2008).

Historically, men's fertility behaviour has been regarded as more or less constant, ascribing all variations to women (Goldscheider and Kaufman 1996). An obvious reason why fertility research has remained highly gendered and the main interest is still on female fertility 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 several analyses of female fertility have appeared introducing men as partners in a couple perspectives (e.g. Liefbroer and Corijn 1999; Sorensen 1989; Thomson and Hoem 1998; Winkler-Dworak and Toulemon 2007). Analyses of male fertility behaviour *per se* are more uncommon, however.

The main aim of this paper is to investigate socioeconomic differentials in multi-partner fertility among fathers. Previously, we have documented the prevalence of childlessness and multi-partner fertility in Norway, describing the change across male cohorts born 1935-1967 and exploring differentials by level and field of education (Lappegård et al. 2008). In this paper, we take the analysis one step further, introducing more determinants into the analysis and performing a multivariate analysis of the multi-partner process. As multi-partner fertility is conditional on having had a first birth, our modelling strategy is to use a two-step procedure: First we analyse the risk of having a first birth versus no birth, and second we model the competing risk of having a higher-parity birth with a new partner (multi-partner fertility), a higher-parity birth with the same partner, or no more children.

So far, most analysis on male fertility has been based on survey data, and some authors have questioned the quality of such data for studies of male fertility (Rendal et al. 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 and Le Bourdais 1999). In our analyses this is of little concern. We use 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 per cent of the total number of children has no registered father in our data.

PREVIOUS RESEARCH

For Europe, studies of multi-partner fertility is almost non-existent, but in a recent analysis of Norwegian men born 1935-1967, we found that 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 (Lappegård et al. 2008). The

analysis reveals sharp contrasts by educational level with larger proportions of multi-partner fertility among men with low education than among men with higher education. Men with low education also have higher proportions of ultimate childlessness than other men. This may seem at odds with previous analysis from Spain which suggests that there is a negative relationship between first births and men's education, i.e. the higher the level of men's education, the lower their first child probability (Martin-Garcia 2008). However, higher educated men may still become fathers at higher ages and recuperate some of the postponed births.

From the US there are more studies of multi-partner fertility. Estimates indicate that 8 per cent of American men aged 15-44 have children with more than one partner with sharp differences by age, race/ethnicity, and income (Guzzo and Furstenberg 2007). A common finding is that multi-partner fertility is associated with socioeconomic disadvantage (Carlson and Furstenberg 2006; Guzzo and Furstenberg 2007). This is in part due to the very different conditions in which men from disadvantaged groups enter parenthood. It has been argued that economic stability and relationship stability go hand in hand, and unmarried parents are more likely to have had a child by a previous partner than married parents (Carlson and Furstenberg 2006; Manlove et al. 2008). Men not in a co-residential union at the preceding birth are also more likely to have their next child with a new partner (Guzzo and Furstenberg 2007).

More widespread multi-partner fertility is amongst others linked to increasing divorce rates, and one characteristic of the changing family structure in Europe is an increasing prevalence of stepfamilies. Several analyses of stepfamily fertility have appeared recently, but these have a slightly narrower perspective than analyses of multi-partner fertility, as they only consider children born within a new marriage or consensual union, and the woman or the couple is still the unit of analysis. Since men also father biological children outside formal or non-formal unions, we do not pursue the couple dimension here, but take a broader, one-sided, male perspective. Still, some findings from the literature on stepfamilies give valuable insights into the processes around new partnerships and multi-partner fertility. Both studies from Europe and the US show that stepfamily formation produces "extra" births; that is, net of the total number of children born to a women, her partner or the couple together, birth risks are elevated when the prospective child will be the couple's first or second (Buber and Prskawetz 2000; Henz 2002; Olah 2001; Thomson 2004; Thomson 1997; Vikat et al. 1999). These patterns have been interpreted in terms of the unique values of first and second shared children that overcome the costs of rearing larger numbers of children in stepfamilies (Thomson 2004). In a study of the fertility of the remarried, Griffith et al. (1985) developed two hypothesis linked to the value of a first child — the birth both confers the adult status of parenthood and demonstrates the commitment of the parent to each other. When partners bring previous children into a union, the first child born to the couple may confer parenthood status on neither partner, but the child still has commitment value whether this is the first, second, or some higher-order union. If one partner had no children before the current union, and the other did, and if stepchildren do not provide the same parental status as biological children, the parenthood status conferred by the first shared child may be strongly valued by the previously childless partner (Vikat et al. 1999).

ASSOCIATIONS BETWEEN SOCIOECONOMIC STATUS AND MULTI-PARTNER FERTILITY

As already mentioned, we focus on both childlessness and multi-partner fertility, as having a child with a new partner is dependent on having become a father in the first place. We believe that the underlying mechanisms behind both these outcomes are similar: 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. We shall argue that two aspects in

particular have become crucial in men's childbearing decisions, namely their ability for economic parenting (breadwinning) and practical parenting (childcare).

Traditionally, the argument has been that men with higher socioeconomic status will be more attractive as potential marriage partners and better equipped to support a family (Becker 1981). In a traditional male breadwinner/female caregiver family this is crucial, but 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 very common among mothers, and mothers continue to 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' (Rønsen and Skrede 2006; Skrede 2004). In order to achieve such a family model, the income prospects of the job of the male partner remain crucial. This means that men with higher provider ability generally will be regarded as more attractive to women as partners and potential fathers to future common children. Consequently, we assume that men with higher socioeconomic status (income and educational attainment) are more likely to have a(nother) child than other men.

For childless men this means that we expect those with higher income and educational attainment to have a higher likelihood of becoming fathers than those with lower income and educational attainment. Similarly, for fathers we expect that the likelihood of having another child with the same partner increase with higher socioeconomic status. However, when higher order births with a new partner are concerned, the relationship with socioeconomic status is less obvious. The fact that the proportion with multi-partner fertility is higher among men with low than among men with high education is one indication in this direction. Socioeconomic status may thus affect the likelihood of having another child with the same partner and the likelihood of having another child with a new partner differently. A key factor here is the selection related to union dissolution among men, where higher educational attainment has been associated with higher partnership stability in previous research from the Nordic countries (e.g. Hoem 1997; Jalovaara 2003; Lyngstad 2004). That is, men with higher education have a lower likelihood of partner dissolution than men with lower education. Hence, we might expect a lower likelihood of multi-partner fertility in the former group. The negative selection effect operating through union dissolution may thus cancel or outweigh the positive effect of socio-economic status posited above on the fathering of further children. For fathers who have never been married or in a union there is no intervening selection effect due to union dissolution, and one might expect to find the usual positive effects of higher education and income for never-married fathers. When analysing multi-partner fertility it may therefore be important to examine possible interaction effects between a father's marital status history and his socio-economic status.

Income and educational attainment are both part of men's socioeconomic status, but income may play a larger role in some educational groups than in others. Education may e.g. also be associated with gender equality attitudes and practices, and in previous research from Scandinavia, educational level has been found to have a positive effect on egalitarian attitudes (Berhardt 2000) and on the division of household labour (Kitterød 2002). This means that men with higher education may express more abilities for practical parenting and therefore be considered more attractive as potential partners and fathers to future common children, independent of their income prospects. Consequently, we would expect income to play a smaller role for the likelihood of becoming a father among highly educated men than among men with lower education. For higher-order births, there may also be differences between those who have a child with the same partner and those who have a child with a new partner in this respect.

From administrative registers we have only access to marital histories and not full union histories, which means that we do not know whether unmarried men have been living in a co-residential union or not. However, formal marriages have been found to be more stable than cohabiting unions, and previous analyses from Norway indicate that cohabiting couples with children split up about three times as often as married couples with children (Texmon, 1999). Consequently, we assume that men who have ever been married are more likely to become fathers and also more likely to father more children with the same partner than never-married men. For multi-partner fertility the association can be somewhat different, however. In line with findings from the US (Carlson and Furstenberg 2006; Guzzo and Furstenberg 2007), we expect fathers that have never been married to have a less stable partnership history and thereby a higher likelihood of having a child with a new partner than fathers that have ever been married.

As mentioned above, we believe that men's childbearing decisions are not only influenced by his ability for economic parenting or breadwinning, but also by his ability for practical parenting or childcare. Field of educations is a good predictor of the type of job a man will hold in the future, including the labour market sector and work environment, reflecting his resources for both economic and practical parenting. Lately, several authors have argued that field of education is as powerful a predictor of fertility behaviour as educational level, and empirical analyses of female fertility has confirmed this to be so for several countries (Hoem et al. 2006a, 2006b; Lappegård and Rønsen 2005; Martín-García and Baizán 2006). In a recent study of Spain (Martín-García 2008), field of education has also proven to be a valuable indicator of male fertility behaviour, demonstrating, for instance, that men trained in areas leading to 'male-occupations' had an earlier entry into fatherhood than other men.

Work-related factors such as income prospects, job security, job flexibility and gender composition of the work-place vary between jobs and provide different opportunity structures and work environments. Obviously, a man's job security influences both his prospects of economic parenting and his provider ability. The public sector in Scandinavia has traditionally offered better job security than the private sector. In the private sector job security will vary with the business cycle, and some occupations can be considered to be more exposed than others. Most Norwegian men work in the private sector while the public sector is dominated by women. The public sector in Norway offers better income replacement during parental leave than the private sector, enabling fathers to take more parental leave, and increasing their options to be engaged in childcare. Fathers working in the public sector have also been found to take longer parental leave than fathers working elsewhere (Lappegård, 2008). Besides, 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. On the whole, jobs with flexible working hours give more opportunities for practical parenting and improved childcare ability than jobs with fixed working hours, e.g. by enabling employees to take mornings off or to stay home from work when the child is sick. However, jobs with a high degree of flexibility also entrust employees with much responsibility and give opportunities for involvement 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 a more compatible work-family life balance.

The last factor that may provide a different structure and work environment is the gender composition on the job. The Norwegian labour market is very sex-segregated, partly as a result of traditional choices in fields of education. As already discussed, there is not necessarily 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. A "masculine" work culture may also be associated with strong preferences for fatherhood, however, as the gender composition of the job is likely to reflect gender role attitudes. If social norms of fatherhood are closely linked to the identity as man, such norms may also be prominent in a "masculine" work environment and lead to less childlessness among men in male-dominated areas.

Based on the above arguments, we therefore expect the likelihood of having a(nother) child to differ with men's field of education with a higher likelihood among men within fields of education that can be associated with better income prospects, job security and job flexibility. Generally we expect the associations to be similar for the propensity to have a first child and the propensity to have another child with the same partner. However, as for educational level and income, the associations are less obvious when multi-partner fertility is concerned. We have no previous evidence that there is a negative selection effect operating through more union dissolutions in some fields of education than in others. Based on an assumption that there is no selection effect, we may expect to find the same associations between field of education and multi-partner fertility as for same-partner fertility, i.e. better income prospects, job security and job flexibility will be related to higher birth-rates. If, on the other hand, men holding jobs that are less compatible with a work-family life balance are more exposed to union dissolution than others, and we may expect the likelihood to have a child with another partner to be lower among men within fields of education that are associated with less job security and job flexibility.

DATA, METHOD AND VARIABLES

Data

Our analyses are based on individual-level data extracted from the Norwegian Central Population Register, the Norwegian Educational Database, and the Tax Settlement Database of The Directorate of Taxes. 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. We have access to fertility histories up to 2007. Individual data on childbearing histories have been linked to individual, longitudinal data on education, income and marital status. The educational histories originate from the Population Census held in 1970, and have thereafter been updated annually from 1974. The income and marital status histories are also extracted from administrative registers containing annual information from 1967 and 1965, respectively. For these variables we have access to data up to and including 2005.

Method

Since childbearing is an ongoing process, and we have access to long time-series of longitudinal data, we model these dynamics by means of hazard rate regression. We use a discrete hazard rate model, as most of our data are recorded on an annual basis. To illuminate both the process of becoming a father, and the process of fathering further children with either the same or with a new partner we use a two-step procedure. First, we model the chance of becoming a biological father versus not becoming a biological father. Next, we analyse the chance of having further

biological children with (i) the same or (ii) a new partner, versus no more biological children. That is, we treat multi-partnered fertility as a competing risk to the two other possible events following first fatherhood, having another child with the same women or having no more children.

The cohorts included in the analyses are men born in Norway from 1955 to 1984. We exclude older cohorts as we have no information on their educational histories before 1970, younger cohorts because they have very short birth-histories, and foreign-born because we lack information on their life-histories before immigration. The last year of observation is set to 2006, as we only have information on education, income and marital status up to 2005, and in the models we lag these variables with one year. The maximum age of observation in our data extract is therefore 51 years.

When modelling first birth, we follow the men from the year they turn 16 years old and until they father a first biological child or, if not, until the end of the observation period (2006). When modelling the competing risk of further children with the same or with another partner, we follow the men from the year of birth of their last biological child and until the year of a new birth, or in the case of no further children, to the end of the observation period. That is, we model the exposure to second or higher order births together, analysing births up to the fifth biological child, and include parity as covariate in the model. In all models, we censor individuals who die or emigrate during the follow-up period at the time of death or emigration. We also censor men who enter a same-sex partnership at the time of that event, as their risk of fathering further biological children with a female partner is minute.

COVARIATES

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 comprise post-secondary and tertiary level education. The groups are as follows:

Table 1. Overview of educational field classification

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*

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 employment possibilities both 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 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.

In education is a time-varying dummy variable that takes on the value one if the person has been engaged in any educational activity lasting a month or more in a given year. It therefore encompasses both shorter and longer courses at all levels of education.

Marital status is highly correlated with the likelihood of having children, and for first birth we regard the process of marrying and having children as being too simultaneous to warrant the inclusion of marital status as an exogenous variable, even if it is lagged by a year. For second and higher-order births we use marital status as a time-varying variable, but only as a dummy indicating whether the person has ever or never been married. This should alleviate some of the endogeneity problems, and yet capture some of the past relationship history which has proved an important determinant of multi-partner fertility in previous research (Guzzo and Furstenberg 2007; Manlove et al. 2008).

Income is a person's gross annual income in Norwegian Kroner (1 NOK = about 9 € or 6.4 US$ according to present exchange rates). In the models we use log income in real terms, i.e. the amount each year is adjusted according to the consumer price index with 2005 as the basis year.

Social background is based on information of the educational level of the parents of the father. If possible, the father's education is used, if not the mother's education serves as basis. Social background has three levels: low, medium and high. Low corresponds to educations at the primary level, medim to educations at the secondary level and high to educations at the university level.

Region also reflects a person's situation during adolescence, based on information of his municipality of residence at age 16. The municipalities have been grouped into wider regions based on a standard regional classification for Norway.

In the first-birth model, the process time is the person's own *age*, measured at the end of the calendar year and categorised into broader 5-year intervals (except for the last which contain ages 45-51). In the higher parity models, duration is measured by time since last birth which is equivalent to the *age of the youngest child*. It is measured in years and entered as a continuous variable with a square term to catch possible non-linearities. The higher-parity model also controls for *age at first birth*, which has been shown to be an important determinant of continued childbearing in much previous research (e.g. Manlove et al. 2008). Furthermore, the higher-parity model includes *parity* (number of previous children) as a separate covariate to control for variations in the timing of different higher-order births, from the second (parity one) and up to the fifth (parity four).

RESULTS

For each of the birth-transitions we study, we run two models, one with control for level of education only (Model I), and one where we have grouped levels and fields of education into broader clusters as shown in Table 2A (Model II). Because of the large amount of data we are able to distinguish between several levels of education in Model 1, also between short and long university education (undergraduate and post-graduate level), which is often not possible with smaller data sets. To examine differentials by educational level, we therefore first turn to Model I.

Level of education

As has been shown for men's cohort fertility patterns before (Rindfuss and Kravdal 2008; Lappegård et al. 2008), there is a positive association between educational level and male fertility. In the present analyses, this turns up in higher first-birth rates for university educated men, and in particular for those with a post-graduate degree (Table 2A, Model I). The same pattern is found for higher-parity births in stable relationships (same partner – Model I, Table 3A), where the positive association is even stronger. However, when it comes to multi-partner fertility, we observe quite the opposite pattern. It is the low-educated fathers that have the largest chance of conceiving a child with a new partner, whereas there is little difference between fathers at higher educational levels in this respect. This corroborates the findings from previous research of male fertility in the US that multi-partner fertility is often associated with socioeconomic disadvantage (Carlson and Furstenberg 2006; Guzzo and Furstenberg 2007).

Field of education

Examining closer educational differentials between various fields of education, we now turn to Model II. For first birth (Table 2A), we notice that men with a post-secondary education in humanities and arts actually have lower first-birth rates than the reference group of primary- and secondary educated men, and this group is the only post-secondary group exhibiting this pattern. All other fields of education at this level have higher first-birth rates than men at the primary and secondary level, but there are large variations between the groups. Men educated for teaching jobs and positions in the health and welfare sector have particularly high first-birth rates, as have men who are educated for the agricultural sector. On the other end of the positive scale we find men educated for social science and journalism. Not surprisingly, our present findings corroborate what we previously have established in our cohort study of ultimate childlessness (Lappegård et. al 2008), but it is interesting to see that the results hold even in a multivariate setting with controls for more determinants, including income.

For second and later births, we observe the same patterns for field of education as we did for level of education. The associations are positive for those who have another child with the same partner and mainly negative for those who have another child with a new partner. But again there are fairly large differentials between various fields of education at the post-secondary level. Fathers educated for the agricultural sector have especially high birth-rates with the same partner, but this partly also concerns fathers who are educated as teachers, health- and welfare workers, as well as within science and computing. For men within the agriculture field of education this can be linked to the fact that this field generally are characterised with a more traditional family form and closer attachment to their place of origin (Jervell, 2002). For teaching, health- and welfare this can be linked to the fact that these fields often leads to occupations within the public sector with good opportunities for economic- and practical parenting. For the fields of science and computing the interpretation is not as obvious, but these fields often leads to jobs with good income prospects and job flexibility, indicating also good opportunities for economic as well as practical parenting. When multi-partner fertility is concerned, two groups stand out as more inclined to have another child with a new partner, namely journalists and social scientists, and men educated for jobs within sports, transport and protection. Above we argued that there might

be a selection effect through union dissolution for men holding jobs that are the less compatible with a work-family life balance. The first of the two former groups belongs to a sector with much temporary work, irregular working hours and much exposure to new people and environments, and the above selection argument therefore seems appropriate in this case. Jobs within sports, transport and protection on the other hand, are fairly male-dominated and in a masculine environment. Previously we argued that social norms of fatherhood are closely linked to the identity of being a man, and that such norms would be more prominent in a masculine work-environment. Furthermore, this group is dominated by fields of education leading to jobs within the police and the military, which are public-sector occupations with high job security and ample opportunities for economic- and practical parenting.

Income

As predicted, a man's income has a positive and statistically significant effect on entry into fatherhood and having another child with the same partner. There were no significant effects for higher-order births with a new partner. These finding suggest that there are different mechanisms behind the propensity to father a child in a new relationship and the propensity to have another child in a stable relationship. The strongest income effect is on the likelihood of having a first child, however. This indicates that economic considerations are more decisive for men's chance of ever becoming a father than for their likelihood of having more children. This may in part reflect men's own preferences and choices, but may also reflect differential selection processes into fatherhood by women based on their attractiveness as partners and income providers. For multi-partner fertility our findings suggest that income prospect and provider ability has less influence, but as we have discussed, it might be a negative selection effect through union dissolution that cancel or outweigh the positive effect of income on having a child with a new women. This indicates possible interaction-effects between income and marital status history, which we will return to soon.

Other covariates

The other model covariates are mainly included as control variables, and will only be commented upon briefly here. As in previous studies, we find that men who come from a low social background become fathers at younger ages than men who grew up in higher social status families. When higher-party births are concerned, men from more disadvantaged families are less inclined than men with higher social status to have another child with the same partner, while there are no social background differentials in higher-parity births with a new partner. The increasing negative effect on first birth across birth-cohorts reflects the ongoing postponement process of first birth by younger male cohorts, but as for women, there seems to be some recuperation going on, as the younger cohorts have slightly rising higher-parity birth rates, both when same-partner fertility and multi-partner fertility is concerned. Finally, and as expected, men who have ever been married are more likely to father another child with the same partner, and less likely to have a child with a new partner.

Interactions between education and income

Earlier on we argued that the effect of income may not be the same in all educational groups. Future income and career prospects may e.g. vary, and income may be more important for those with a lower than for those with a higher education, and for those with less flexible jobs and fewer opportunities for practical parenting. To check these assumptions we have also run models with interactions between income and educational level and field, respectively.

The results are displayed in Table 2B for first birth and in Table 3B for higher-order births. The estimates show computed total effect between education and income. The interaction effects between income and level of education are significant in all birth transitions, but the pattern is

different for first and later births. For first birth, the effect of income becomes more positive the higher the education, but only up to the lowest university level (undergraduate level). Among men at the highest university level (post-graduate level), the interaction effect turns negative, suggesting that income is less important for men with top education. For higher order births with the same partner, the income effect becomes less positive the higher the education, implying that income is more important for men with lower than for men with higher education. For higher order births with a new partner, however, the interaction effect is mainly positive, implying that the positive income effect is stronger the higher the education. This may be due to the selectivity of men with higher education, as they are less likely to divorce or separate in the first place. Thus income may be more important the more select these educational groups are.

Interactions between socioeconomic status and marital status
Because of the selection process related to union dissolution, we moreover argued initially that the associations with socio-economic status and higher-order births with a new partner might vary with marital history. For higher order births, we have therefore also run models with interactions between marital status, and education (level and field) and income respectively. These are reported in Table 3C.

When educational level is concerned, the only significant interaction effect for multi-partner fertility appears among men with secondary education, and the effect is negative, indicating that education is less important for those who have ever been married than for those who have never been married. That is, having some education past primary level seems to increase the propensity to father another child with a new partner more among never-married than among ever-married men. Interestingly, among men with a university degree there seems to be no effects of whether they have been married or not for their propensity to father a child with a new partner. On the other hand, there is a strongly negative and significant interaction effect between marital status and educational level for higher-order births with the same partner. This means that the positive effect of higher education is smaller for ever-married than for never-married men, implying that education is more important for the same-partner births-risks of never-married men.

When interactions between income and marital status are concerned, there are no differences between higher-order births with the same partner and higher-order births with a new partner. The interaction effect is negative in both cases, implying that higher income is less important for the chance of having another child if the father has ever been married than if he has never been married.

Turning to the lower panel of Table 3C and to the estimated interaction effects between field of education and marital status, we note that they are also mainly negative for higher-order births with the same partner, whereas they are more mixed for higher-order births with a new partner. One group only exhibits a positive and significant interaction effect for same-partner births, namely men with a post-secondary education in humanities and arts. In this group the propensity to have another child is higher for ever-married than for never-married men, i.e. having never been married decreases the likelihood that a man with this type of education will have another child with the same partner.

The same is true for the multi-partner fertility pattern of men within humanities and arts. The interaction effect with marital status is positive, implying that ever-married men in this group have a greater chance than never-married men of fathering a child with a new woman as well. However, for multi-partner fertility three other groups also exhibit a similar pattern. The strongest positive effect appears among men educated for social science and journalism, but the groups educated for sports, transport and protection, and business, finance and law also exhibit

positive interaction effects with marital status. Other groups exhibit quite the opposite pattern. The negative effect is particularly strong among men educated for the agricultural sector, but it is also apparent among those with an education for engineering and construction jobs and for science and computing jobs. The latter is not quite significant, however, due to a relatively large confidence interval.

Summing up, we may conclude that the selection process related to the past marital history impacts different educational groups in different ways. Fathers who have ever been married have higher multi-partner birth-risks than never-married fathers if they have been educated for jobs within humanities and arts, social science and journalism, or sports, whereas they have lower multi-partner birth-risks is they have been educated for jobs within agriculture, engineering and construction, and possibly also science and computing. The fields of education leading to jobs within humanities and arts, social science and journalism are not associated with the greatest opportunities for economic- and practical parenting, while the fields of educations leading to jobs within agriculture, engineering and construction, and possibly also science and computing do. One interpretation of this might be that ever-married men express commitment ability and partnership stability, which might outweigh less ability for economic- and practical parenting. For the groups educated for sports, transport and protection commitment potential also seems to be of importance, even if many occupations in these groups are associated with good opportunities for economic- and practical parenting,

CONCLUDING REMARKS

Our analyses of entry into fatherhood and higher-order births among men in Norway demonstrate considerable differences among men with holding different socioeconomic status, and the mechanisms behind having another child the same partner and having a child with a new partner are not the same. Based on the available data, we are not able to determine whether the outcomes are a result of men's preferences for partnership and fatherhood on the one side and their attractiveness to women as partners and potential fathers to future children on the other. Yet, the findings indicate that the abilities for economic parenting (breadwinning) as well as practical parenting (childcare) are crucial determinants of men's childbearing pattern. There are three main findings. First, there are strong socioeconomic differences in entry into fatherhood, and groups that are socio-economically disadvantaged have the lowest chances of becoming fathers. However, these groups are also the most likely to experience multi-partner fertility. There seems to be a selection based on socioeconomic status affecting both the likelihood of ever becoming a father and, via union instability, also the likelihood of having children with more than one partner. Second, socioeconomic differentials in the chances of having another child with the same partner indicate that the ability for economic parenting is still an important factor. Third, differences across fields of education indicate that other job-related factors are also important for men's childbearing behaviours, as fields of educations with good opportunities for practical parenting are associated with higher entry-rates into fatherhood and higher chances of further children with the same partner.

Fatherhood is not only associated with provider ability, but shifting family structures have led to new expectations to the fatherhood role, and care-giving is a central part in this picture. The factors increasing men's attractiveness to women as partners and potential fathers to future children have changed, but whether this has also changed men's preferences for partnership and fatherhood is an open question that has to be left for future research.

Table 2A. First birth. Discrete hazard rate model - odds ratio estimates.

	Model I	Model II
Education –level only		
Primary	1	
Secondary	1.01 (1.01-1.02)	
University 1st level	1.15 (1.14-1.16)	
University 2nd level	1.46 (1.44-1.48)	
Education – level and field		
Primary and Secondary		1
Post-secondary:		
Humanities and arts		0.91 (0.89-0.92)
Teaching, health and welfare		1.56 (1.53-1.59)
Social science and journalism		1.12 (1.09-1.15)
Business, finance and law		1.20 (1.19-1.22)
Science and computing		1.39 (1.33-1.46)
Engineering and construction		1.21 (1.20-1.23)
Agriculture		1.45 (1.38-1.52)
Sports, transport and protection		1.30 (1.27-1.32)
Educational activity		
In education (ref=not in education)	0.63 (0.63-0.64)	0.64 (0.93-0.64)
Log income (NOK, 2005-prices)	1.14 (1.14-1.14)	1.14 (1.14-1.14)
Social background (parents education)		
Low	1.21 (1.20-1.22)	1.18 (1.17-1.19)
Medium	1.16 (1.15-1.17)	1.13 (1.12-1.14)
High	1	1
Age (years)		
16-19	1	1
20-24	4.65 (4.55-4.74)	4.67 (4.58-4.77)
25-29	9.16 (8.97-9.35)	9.13 (8.95-9.32)
30-34	9.79 (9.58-10.00)	9.81 (9.60-10.02)
35-39	5.91 (5.77-6.05)	5.93 (5.79-6.06)
40-44	2.40 (2.33-2.47)	2.40 (2.33-2.48)
45-51	0.74 (0.70-0.79)	0.74 (0.70-0.79)
Birth cohort		
1955-59	1	1
1960-64	0.92(0.91-0.93)	0.92 (0.91-0.93)
1965-69	0.87 (0.86-0.88)	0.87 (0.86-0.88)
1970-74	0.78 (0.77-0.79)	0.78 (0.77-0.79)
1975-79	0.62 (0.61-0.63)	0.62 (0.61-0.63)
1980-84	0.47 (0.46-0.47)	0.46 (0.45-0.47)
Region		
Oslo area	1	1
Inland Eastern	1.07 (1.06-1.08)	1.05 (1.04-1.07)
South Eastern	1.13 (1.12-1.15)	1.12 (1.11-1.13)
Southern	1.25 (1.24-1.27)	1.24 (1.22-1.25)
Western	1.17 (1.16-1.19)	1.16 (1.15-1.17)
Mid	1.28 (1.26-1.30)	1.27 (1.25-1.29)
Northern	1.23 (1.22-1.25)	1.22 (1.20-1.23)
Number of observations	12,854,257	12,854,257

Table 2B Computed total effects between education and income. First birth. Odds ratio estimates

Education	Log income (NOK)
Level only (Model I with interaction terms)	
Primary	1.13
Secondary	1.14
University 1st level	1.17
University 2nd level	1.08
Level and field (Model II with interaction terms)	
Primary and Secondary	1.14
Post-secondary:	
Humanities and arts	1.13 ns
Teaching, health and welfare	1.12
Social science and journalism	1.17
Business, finance and law	1.17
Science and computing	1.14 ns
Engineering and construction	1.11
Agriculture	1.12 ns
Sports, transport and protection	1.12 ns

Note: ns = not significant at .001 level

Table 3A. Higher-order births. Discrete hazard rate model - odds ratio estimates.

	Model I		Model II	
	Same partner	New partner	Same partner	New partner
Education –level only				
Primary	1	1		
Secondary	1.19 (1.18-1.20)	0.81 (0.80-0.83)		
University 1st level	1.45 (1.13-1.46)	0.78 (0.76-0.81)		
University 2nd level	1.72 (1.70-1.75)	0.85 (0.81-0.89)		
Education – level and field				
Primary and Secondary			1	1
Post secondary:				
Humanities and arts			1.23 (1.21-1.26)	0.94 (0.88-1.00)
Teaching, health and welfare			1.42 (1.40-1.44)	1.00 (0.94-1.05)
Social science and journalism			1.25 (1.21-1.28)	1.09 (1.00-1.19)
Business, finance and law			1.29 (1.28-1.31)	0.92 (0.88-0.97)
Science and computing			1.54 (1.47-1.61)	0.84 (0.70-1.01)
Engineering and construction			1.28 (1.27-1.29)	0.84 (0.80-0.87)
Agriculture			1.76 (1.68-1.84)	0.84 (0.68-1.04)
Sports, transport and protection			1.20 (1.17-1.22)	1.08 (1.01-1.14)
Education activity				
In education (ref=not in education)	0.86 (0.85-0.87)	1.02 (0.99-1.05)	0.87 (0.86-0.88)	0.99 (0.96-1.01)
Log income (NOK, 2005-prices)	1.03 (1.02-1.03)	1.01 (1.00-1.01)	1.03 (1.03-1.03)	1.00 (1.00-1.01)
Social background (parents education)				
Low	0.96 (0.95-0.97)	0.98 (0.95-1.01)	0.92 (0.91-0.93)	1.03 (1.00-1.06)
Medium	0.97 (0.97-0.98)	0.99 (0.96-1.02)	0.95 (0.94-0.96)	1.00 (0.98-1.03)
High	1	1	1	1
Age (years)				
16-24	1	1	1	1
25-29	1.45 (1.43-1.48)	1.12 (1.07-1.16)	1.46 (1.43-1.48)	1.10(1.06-1.15)
30-34	1.63 (1.60-1.67)	1.05 (0.99-1.11)	1.64 (1.60-1.67)	1.04 (0.98-1.09)
35-39	1.29 (1.26-1.32)	0.80 (0.74-0.85)	1.29 (1.26-1.33)	0.79 (0.73-0.84)
40-44	0.78 (0.75-0.80)	0.52 (0.48-0.56)	0.78 (0.75-0.81)	0.51 (0.47-0.55)
45-51	0.45 (0.43-0.47)	0.38 (0.34-0.42)	0.45 (0.43-0.47)	0.37 (0.34-0.42)
Birth cohort				
1955-59	1	1	1	1
1960-64	1.03 (1.02-1.04)	1.13 (1.10-1.16)	1.03 (1.02-1.04)	1.13 (1.10-1.16)
1965-69	1.03 (1.02-1.04)	1.17 (1.13-1.20)	1.04 (1.03-1.05)	1.16 (1.12-1.19)
1970-74	1.05 (1.04-1.07)	1.17 (1.14-1.21)	1.07 (1.06-1.08)	1.15 (1.11-1.18)
1975-79	1.01 (0.99-1.03)	1.19 (1.13-1.25)	1.03 (1.01-1.05)	1.16 (1.10-1.21)
1980-84	0.84 (0.81-0.88)	0.95 (0.85-1.05)	0.84 (0.81-0.88)	0.94 (0.85-1.05)
Region				
Oslo area	1	1	1	1
Inland Eastern	1.19 (1.17-1.20)	0.86 (0.82-0.89)	1.18 (1.16-1.20)	0.85 (0.82-0.89)
South Eastern	1.02 (1.01-1.03)	0.95 (0.92-0.98)	1.01 (1.00-1.03)	0.94 (0.92-0.97)
Southern	1.34 (1.33-1.36)	0.99 (0.96-1.03)	1.34 (1.32-1.36)	0.98(0.94-1.01)
Western	1.44 (1.42-1.46)	1.03 (1.00-1.06)	1.43 (1.42-1.45)	1.02 (0.99-1.05)
Mid	1.29 (1.27-1.31)	1.07 (1.03-1.11)	1.29 (1.28-1.31)	1.05 (1.01-1.09)
Northern	1.21 (1.20-1.23)	1.18 (1.14-1.22)	1.20 (1.19-1.22)	1.16 (1.13-1.20)
Age of youngest child	2.71 (2.70-2.72)	1.76 (1.75-1.77)	2.71 (2.69-2.72)	1.76 (1.75-1.77)

Age of youngest child squared	0.89 (0.89-0.89)	0.98 (0.98-0.98)	0.89 (0.89-0.89)	0.98 (0.98-0.98)
Ever married (ref= never married)	1.89 (1.88-1.91)	0.67 (0.66-0.68)	1.92 (1.91-1.93)	0.66 (0.65-0.67)
Parity (number of previous children)				
One	1	1	1	1
Two	0.28 (0.28-0.28)	0.41 (0.40-0.42)	0.28 (0.28-0.28)	0.41 (0.40-0.42)
Three	0.15 (0.14-0.15)	0.28 (0.26-0.29)	0.15 (0.15-0.15)	0.27 (0.26-0.29)
Four	0.16 (0.16-0.17)	0.31 (0.29-0.34)	0.17 (0.16-0.17)	0.31 (0.29-0.33)
Age at first birth	0.92 (0.91-0.93)	0.90 (0.88-0.92)	0.93 (0.92-0.94)	0.89 (0.87-0.91)
Age at first birth squared	1.01 (1.01-1.02)	1.00 (1.00-1.01)	1.01 (1.01-1.01)	1.00 (1.00-1.01)
Number of observations	7,494,820		7,494,820	

Table 3B. Computed total effects between education and income. Higher-order births. Odds ratio estimates

Education	Log income (NOK)	
Level only (Model I with interaction terms)	Same partner	New partner
Primary	1.04	1.01
Secondary	1.02	1.00
University 1st level	1.02	1.03
University 2nd level	0.99	1.04
Level and field (Model II with interaction terms)		
Primary and Secondary	1.04	1.00
Post secondary:		
Humanities and arts	1.01	1.06
Teaching, health and welfare	1.01	1.02 ns
Social science and journalism	1.02	1.05 ns
Business, finance and law	1.00	1.03 ns
Science and computing	1.01 ns	1.04 ns
Engineering and construction	1.01	1.00 ns
Agriculture	0.97	1.05 ns
Sports, transport and protection	1.01	1.01 ns

Note: ns = not significant at .001 level

Table 3C. Interaction effects between education and income and marital status. Higher-order births. Odds ratio estimates

	Same partner	New partner
Education - level only (Model I with interaction terms)		
Primary * ever married	1	1
Secondary * ever married	0.89 (0.88-0.90)	0.90 (0.87-0.93)
University 1st level * ever married	0.84 (0.82-0.86)	0.99 (0.94-1.05)
University 2nd level * ever married	0.77 (0.75-0.80)	1.00 (0.90-1.10)
Log income * ever married	0.95 (0.95-0.96)	0.96 (0.95-0.96)
Education - level and field (Model II with interaction terms)		
Primary and Secondary * marital status	1	1
Post secondary:		
Humanities and arts * ever married	1.15 (1.10-1.20)	1.30 (1.14-1.48)
Teaching, health and welfare * ever married	0.93 (0.90-0.97)	1.01 (0.90-1.13)
Social science and journalism * ever married	0.89 (0.84-0.94)	1.37 (1.15-1.64)
Business, finance and law * ever married	0.85 (0.82-0.87)	1.10 (1.00-1.22)
Science and computing * ever married	0.81 (0.73-0.89)	0.71 (0.48-1.04)
Engineering and construction * ever married	0.86 (0.84-0.88)	0.91 (0.84-0.98)
Agriculture * ever married	0.80 (0.72-0.88)	0.64 (0.42-0.97)
Sports, transport and protection * ever married	0.88 (0.85-0.92)	1.15 (1.02-1.30)

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