FAMILY INFLUENCE ON BECOMING A PARENT: BROTHER AND SISTER CORRELATIONS IN PROPENSITY TO ENTER PARENTHOOD FOR SWEDISH MEN AND WOMEN BORN 1936–1963

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ABSTRACT. We investigate if the link between family background and the propensity of becoming a parent in Sweden has changed for men and women born between 1936 and 1963 (1936 to 1958 for men). We do this by estimating brother and sister correlations in the propensity of entry into parenthood using multilevel event history models. Our main finding shows that the share of the variance in the propensity of becoming a parent that is attributable to family background, the so-called sibling correlation, has been more or less unchanged for the 23 male birth-cohorts we investigate. However, for the 28 female birth cohorts we investigate the sister correlation has slowly but steadily increased for each consecutive birth cohort. The correlation between brothers is throughout the studied period significantly lower than that of sisters. When controlling for education a significant part of the increase in sister correlation is explained.

Family influence on becoming a parent: Sibling correlations in propensity to enter parenthood for men and women born 1936–1958.

Social scientists from different disciplines have for a long time been interested in the association between family background and characteristics during adult life. When it comes to demographic research, the intergenerational research has received an increased attention over the past decade. E.g. Dronkers and Härkönen (2008), Gähler, Hong, and Bernhardt (2009) and Wolfinger (2011) have all shown an intergenerational transition of divorces. In fertility research, a large number of articles have shown that there is a strong intergenerational transition of teenage parenthood. E.g. Manlove (1997), Hardy et al (1998), Fagot et al (1998) Barber (2000, 2001). Also in fertility research, a large number of articles have shown that there exists an intergenerational transition of total fertility. E.g. Axinn, Clarkberg and Thornton (1994), Murphy and Wang (2001), Murphy and Knudsen (2002). All of these studies have in common that they have chosen to study the link between family of origin and demographic outcome during adult life, by in one or the other way measuring correlation between origin and destination.

Another approach to measure influence of origin on destination is to study how similar siblings are by estimating sister and brother correlations (Mian, Shoukri and Tracy 1991). In both economic and stratification research, much research has been done by estimating brother (and sometimes sister) correlation in income (e.g. Björklund, Jäntti and Lindquist 2009), school performance (e.g. Björklund, Lindahl and Sund 2003, Lindahl 2011), and social mobility (e.g. Erola, Härkönen and Jäntti 2008). A sibling correlation can be thought of as an omnibus measure of the importance of family and includes everything the siblings share - shared genes, parental influences, cultural inheritance, and neighborhood influences. Genetic traits not shared by siblings, differential treatment of siblings, time-dependent changes in neighborhoods and other things not shared by siblings are not captured by the sibling correlation. Brother and sister correlations provide a straightforward measure of the combined effects of family of origin on a particular outcome, in this case first birth propensity. The measure estimates the fraction of the overall variation that is attributable to family of origin. The more important the effects of shared family background factors, the higher the sibling correlation is (Hox 2010). By applying this type of method to demographic fertility research we can study how the impact of family of origin on fertility behaviors has changed over time.

The main purpose of this study is to examine trends in the importance of family of origin on the propensity to become a parent. By apply multi-level event-history techniques to longitudinal Swedish register data and calculating brother and sister correlations we examine how the effect of

family of origin on the propensity to become a parent has changed over time. In Sweden (SCB, 2002) as in many other industrialized countries (Martin 2000, Andersson et al., 2009), one of the most frequently used explanations for postponement of childbearing is education. Although siblings educational levels tend to be highly correlated, we include education in the analysis to see if this factor can explain any possible change in the sibling correlation over time.

Data and Method

The data are collected from the Swedish multigenerational register and contains information on all Swedes born in Sweden from 1936 onwards, and who have been registered as resident in Sweden at any time since 1961. In total, the data used in this study contains information on 1 327 715 women born between 1936 and 1963 and their sisters (a total of 1 410 118 women), and on 1 110 873 men born between 1936 and 1958 and their brothers (a total of 1 238 667 men). To identify sisters and brothers, we use the multigenerational register which identifies biological and adoptive parents of these individuals, and thus also their siblings. For the first cohorts born in 1936 more than 85% of their mothers are identified and from the 1950's 99% of all mothers are identified. There are few adopted siblings and their frequency declined during the 1960s. Because of this we have excluded adopted sisters and brothers from our analysis and only included sisters and brothers how shares the same biological mother and father.

Survival analysis or event history analysis is a set of methods for modeling the length of time until the occurrence of some event. An important feature of survival data is that for some cases the final event is not yet observed and such observations are said to be censored. The basic time variable in this study is age of index person**.** Each individual are included regardless if they ever get a child or not. The age is given in year since fifteenth birthday and we follow all observations to a first birth or being censored. Each individual can be censored because of death, emigration or turning 40 (47 for men).

The time to event is implemented by using discrete time and the analysis can be thought of as a series of independent failure trials. In each interval *t* we observe a binary response indicating whether the event has occurred. Following Hedeker and Gibbons (2006) recommendation to use the complementary log-log link when applying multi-level event-history techniques to discrete time, the model specification can be expressed;

$$\text{cloglog}[h(t)] = \alpha(t)$$

where $\alpha(t) = \alpha_1 t_1 + \alpha_2 t_2 + \ldots + \alpha_{32} t_{32}$ and $t_1, t_2, \ldots, t_{32}$ are dummies for years 1, 2, . . . 32. To estimate the sibling correlation, we introduce a random effect which represents sibling-specific unobservables:

$$\text{cloglog}[h_j(t)] = \alpha(t) + \mu_{it} + \varepsilon_{ijt}$$

where $\alpha(t)$ captures the population mean, μ_{it} is the family-specific factor which is shared by all siblings in family *i*, and ε_{ijt} is an individual specific component which represents the individual's propensity to experience the event. With the discrete-time cloglog model, the share of variance in the propensity of becoming a parent at age *t* that can be attributed to family background is estimated by

$$\varrho = \text{Var}(\mu_{it}) / (\text{Var}(\mu_{it}) + (\pi^2/6)) = \text{intraclass correlation.}$$

Brother and sister correlation is calculated for all birth cohorts from 1936 through 1963 (1958 for men). In the analysis of the brother and sister correlation for each birth cohort all brothers/sisters who were born up to four calendar years earlier or later are included.

Educational information is categorized using the following categories; Compulsory school, Upper secondary school $\leq$2 years, Upper secondary school >2 $\leq$ 3 years, College/university <3 years, and College/university $\geq$3 years. The information on education is included as the individuals highest achieved level of education.

Results

Figure 1 and 2 shows that both the brother and sister correlations are somewhat modest but not negligible. The sister correlation is consistently higher than the brother correlation. This is consistent with earlier research that showed that family of origin has a stronger impact for women than for men (Booth and Edwards 1989, Amato 1996, Amato and Keith 1991). The sister and brother correlation is represented by the solid black line in Figure 1 and 2. The sister correlation is about 0.20 for the oldest birth cohorts and around 0.27 for the youngest birth cohorts. The brother correlation is throughout the studied period around 0.15. These results suggest that for women 20 to 30 % and for men around 15 % of propensity to become a parent can be explained by shared family characteristics.

Fig. 1 - sister correlation first birth

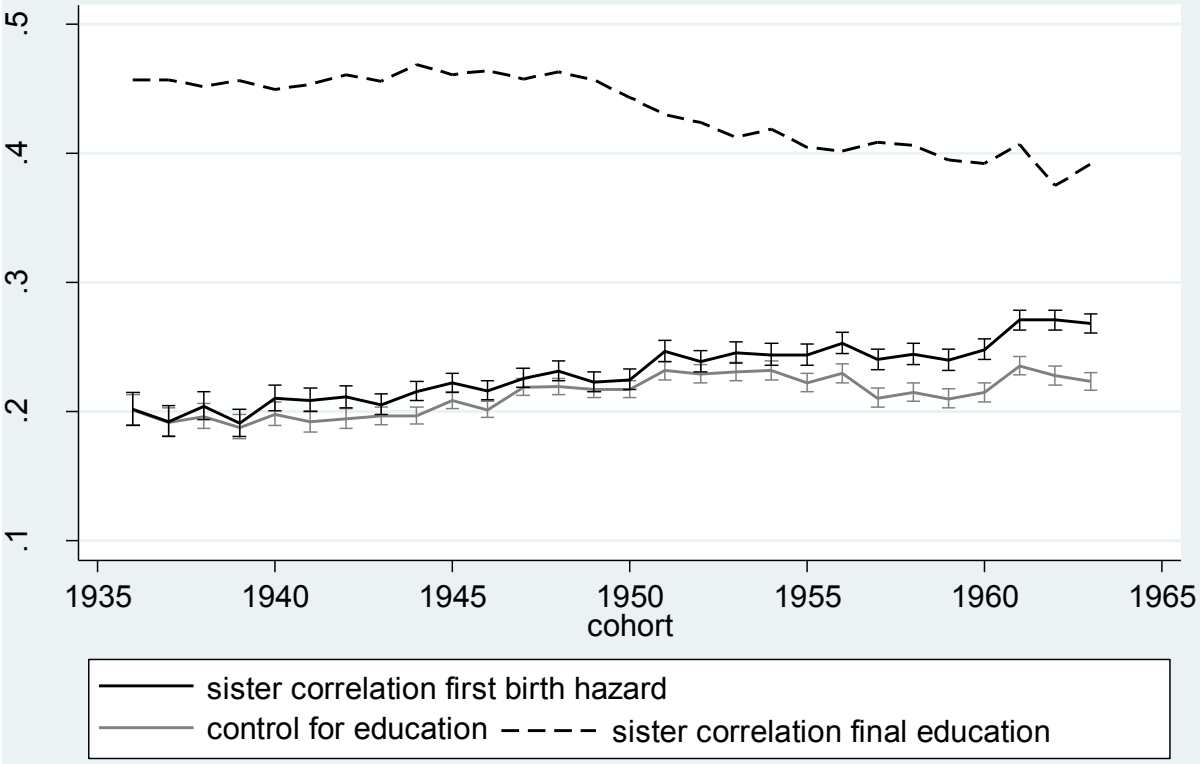
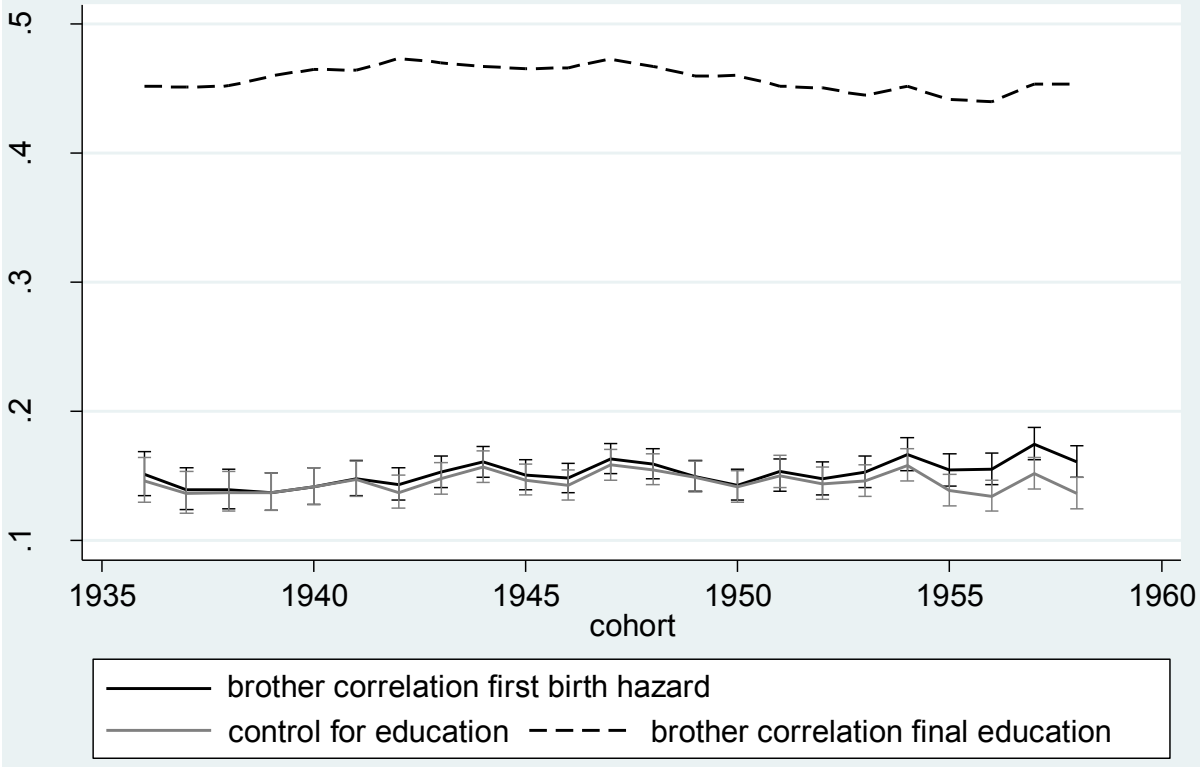


Fig. 2 - brother correlation first child



In comparison to other brother correlations these result are slightly lower but as mentioned not negligible. For example, the brother correlation in income in the Nordic countries is about 0.25 (Björklund et al. 2002), in school grades around 0.5 (Lindahl 2011), and the brother correlations in social class is about 0.4 (Erola, Härkönen and Jäntti 2008). For men there is no significant change in the brother correlation over the studied period. However, for women we see a weak but clear upward trend in the sister correlation throughout the studied period.

When broader definitions of siblings is used (sister and brothers defined as up to 6 or 8 years older and younger), both sister and brother correlation is reduced. The more narrowly we define sisters and brothers the higher the correlation between sisters and brothers is. However, the observed trend remains the same. That is, a slight but steady increase in sister correlation and no change in the brother correlation through the studied period. When the definition of sibling changes from based on having the same biological mother and father to only be based on information about the biological mother, the sister and brother correlation decreases. However, also in this case the observed trend remains.

As shown by the dashed line in Figure 1 and 2 the brother correlation in final educational level is stable during the studied period while the sister correlation in final educational level is stable up until the 1950 birth cohort and then steadily decrease. The gray line in both Figures 1 and 2 shows the brother and sister correlation when individual educational information is included in the analysis. The brother correlation is not affected by including educational information. However, in the case of sister correlation, including information about education seems to affect the results. Especially for the ten youngest birth cohort, education seems to explain some of the increase in sister correlation. When the information about education is included in the analysis only a small part of the increase in the baseline sister correlation remains. For the last nine birth cohorts (1955 through 1963) the difference between the sister correlation of the baseline and when controlling for education is statistically significant. For men, none of the observed differences between the baseline and when controlling for education is statistically significant.

Conclusions

Overall we can say that the results show that the family of origin has a greater impact on women's first birth propensity than on men's first child propensity. The results also indicated that family of origin has a slightly greater impact on women's first birth propensity for younger birth cohorts than for older ones. For men there has not been any change over the studied birth cohorts: the influence of family of origin on the men's first child propensity stays the same over

the cohorts. Education, which is often presented as the single most important explanatory variable for the postponement of parenthood, appears to be able to explain large parts of the increase in sisters correlation among the younger birth cohort. From the 1950 birth cohort and onwards, as sisters become less and less alike in terms of education, individual education begins to show a negative impact on the sister correlation in first birth.

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