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Stockholm Research Reports in Demography 2012: 20

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First Births in Sweden: Objective and Self-perceived Constraints on Childbearing

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Abstract: In this paper the relative impact of education, income and housing on first birth propensities in Sweden from the early 1970s until 2009 is studied. Both objective and subjective measures of these three factors are used. Data is derived from The Swedish Housing and Life Course Cohort Study (HOLK, cohorts born 1956, 1964 and 1974) and the Young Adult Panel Study (YAPS, cohorts born 1968, 1972, 1976, and 1980). The analysis of objective measures indicates that educational attainment is of little importance for first birth propensities while income is of greater importance. Dwelling size is positively related to first birth propensities for all cohorts, while establishment on the housing market matter only for the 1974 cohort. In the analysis of the subjective evaluations of the three factors, having a sufficient income seems to be the most influential, even if having completed one's education and having a suitable housing situation also have positive effects. We conclude that our analyses give substantial support to the Hobcraft-Kiernan scheme of the necessary preconditions for the transition to parenthood in modern societies. Education, income, and housing are all important prerequisites for having a first birth, both when measured objectively and when we consider the individual's subjective evaluation of these factors.

Keywords: transition to parenthood, education, income, housing

Introduction

Most people in childbearing ages in Western societies that have not yet had children wish to have children (Goldstein 2003). However, the transition to parenthood is being postponed throughout Western societies (see e.g. Frejka and Sobotka 2008). Hobcraft and Kiernan (1995) suggest that five factors together form the prerequisites for childbearing in modern societies: *partnership, education, employment, housing and security*. In general, a stable relationship is a prerequisite for having children. Marriage rates in Sweden have declined from 1968 until today with some variations due to e.g. policy changes. While marriage is traditionally viewed as the more stable form of relationship a majority of firstborn children in Sweden are born within consensual unions.

A strong norm in Western societies is to postpone family formation until education is completed and a stable income is attained. During the 1990s enrolment in higher education dramatically increased in Sweden (Regnér and Öckert 2000). This resulted in a greater proportion of young adults with university education but possibly also postponement of childbearing in the same group.

A majority of fertility research within the social sciences relates to labor market and incomes. Several studies based on Swedish data indicate a strong positive association between income and first-birth propensities (see e.g. Hoem 1998; Andersson 2000). Two Swedish studies have also shown that fertility co-varies with unemployment rates (Hoem 2000; Andersson 2000). More women than men have temporary employment in Sweden, while more men than women are unemployed (Bygren et al. 2004).

Leaving the parental home is an important component in gaining independence for a young individual. Hobcraft and Kiernan (1995) argue that the typical Western family is a nuclear family, and that the norm is one such family per housing unit. Thus, is seems reasonable to assume that an independent residence is an important prerequisite for family formation in modern societies. However, the access of housing varies between societies and time periods. For example, individuals from different birth cohorts face

different possibilities of acquiring independent housing during an early stage of adult life partly due to variations in demand and supply on the housing market.

Finally, Hobcraft and Kiernan (1995) discuss "security" as a prerequisite for childbearing. By this they refer to whether the individual consider themselves to have sufficient resources to provide for and raise a child from infancy to early adulthood. The individual's own perception of future prospects regarding stable partnership, income and housing is probably interrelated to this. But Hobcraft and Kiernan also refer to "…whether society (through its agent government) will also make provisions for the rising generation of young people" (Hobcraft and Kiernan 1995:27). Policies regarding labor market, education, family and housing are such contextual factors that may influence the feeling of security. Such policies vary between time periods making a cohort perspective useful.

The aim of this paper is to study how the three factors education, labor market attachment and housing by themselves and combined affect the propensity to have the first child. We study Sweden from the 1970s until the early 2000s and use two different data sources: The Young Adult Panel Study and The Swedish Housing and Life Course Cohort Study. By using these two different data sources we gain access to both the respondents' subjective opinions of whether the educational attainment, income and housing are sufficient enough to enter parenthood, and objective measures of the same three factors based on normative assumptions. To our knowledge, the impact of these three factors on first births has not before been studied together.

Education, labor market and housing

The Western world has experienced a substantial expansion of higher education during the last decades. In particular, young women have increased their participation in higher education (see e.g. Blossfeld and Huinink 1991). That young men and women stay longer in the educational system is likely to delay family formation. The reasons are several. An individual is normatively considered to be adult and thus ready for parenthood after

completed education. To be a student is associated with limited financial resources which may constitute an obstacle to family formation. Higher education is also associated with a labor market career, which in some cases may be a competing ambition in relation to family formation (see e.g. Becker 1981). To be established on the labor market and to have an income sufficient to support a family is also considered to be a normative prerequisite for childbearing. In Sweden, only individuals established on the labor market at least eight months prior to childbirth are eligible for the higher compensation levels in the parental leave insurance. Those with very low or no incomes prior to childbirth are only eligible for a very low compensation level that typically would not be sufficient to support a family with a young child. Thus, establishment on the labor market is intimately related to family formation in Sweden (Oláh & Bernhardt 2008).

Regarding housing, the norm in Western societies is one couple only per housing unit (Hobcraft and Kiernan 1995). Before starting a family, young individuals are expected to form independent households. Establishment on the labor market is also likely to be a prerequisite for establishment on the housing market. Housing is typically the greatest separate cost in the household budget. Although Sweden has a generous system for financing living costs during higher education, an income from employment is almost always required to be able to pay for housing suited for a family with young children.

In the empirical social science research on childbearing, the vast majority of studies focus on the relationships between childbearing on the one hand and educational attainment and labor market attachment on the other hand. Blossfeld and Huinink (1991) study the impact of women's educational attainment and labor market careers on childbearing in West Germany. They use life-history data for almost 2 200 respondents from three birth cohorts born between 1929 and 1951. They find that female educational participation tend to delay the entry into parenthood. However, high educational attainment is also associated with high first birth rates. Thus, women's increased participation in higher education actually decreases the proportion of women that remains childless. Using data from the German Socioeconomic Panel 1984-1988 (GSP, 12245 persons from 5921

households in the first wave) Blossfeld and Jaenichen (1992) again study female participation in higher education and entry into parenthood. Their findings largely verify the findings by Blossfeld and Huinink (1991): highly educated women delay their entry into parenthood rather than abstaining parenthood.

Kravdal (1994) uses survey data for over 4 000 Norwegian women from six birth cohorts born between 1945 and 1968. Although the results are not clear-cut, he finds a positive effect from educational attainment among women in their late 20s irrespective of union status. He interprets this as a "catching-up phenomenon" where women have their first child after completed education. In addition, childless women with low education make up a more selected group. Hoem et al. (2006) use Swedish register data for the entire birth cohort 1955-1959 to study educational field and childlessness. They report that the proportion of women remaining childless increase with educational level, but educational field explains childbearing behavior better than educational level. Women with an education that leads to employment in teaching and health care have the lowest permanent childlessness, while a very large proportion of women with educations in arts and humanities remain childless. They find that "educational orientation explains more than twice as much of the variation in childlessness than does the educational level" (Hoem et al. 2006: 347).

Focusing instead on labor market attachment, using individual level register data covering all women in Sweden born 1950 or later, Hoem (2000) studied the impact of individual incomes, individual level unemployment and local unemployment levels. She reports that the higher the woman's income is, the higher is the first birth propensity. While students have the lowest first-birth rates among all groups, unemployed women have somewhat surprisingly a relatively high fertility. On the macro-level, it is found that first-birth rates covaries with local unemployment levels. Using the same data set as Hoem (2000), Andersson (2000) reports that the impact of income are stronger for first births compared to second and third births. Students and women with low incomes from employment have lower propensities to have the first child compared to others. The

number of women enrolled in education and the number of women with low incomes increased during the 1990s. This increase is reflected in a lower number of recorded births during the same period.

Kravdal (1994) referred to above also studied the impact of incomes on first births. Annual income data was available for the period 1967 to 1988. The results show that women who have worked for less than a year have very low propensities to have the first child. The likelihood to have the first child substantially increases with up to four years of participation in the labor force. Work life experience of more than six years does not add to the propensity to have the first child. The finding that women with a weak attachment to the labor market have lower first birth propensities is in line with the Swedish results that low incomes are associated with low first birth rates. Studying Finland, Vikat (2004) use longitudinal register data that comprise ten percent of all women in reproductive ages during the years 1988-2000. Individual income levels are found to be positively related to both first and second birth propensities. Unemployment is found to be weakly related to fertility. Thus, these results are also in line with the empirical evidence found for Sweden.

The above summary of research focuses on "objective" measures of education and labor market attachment. These studies do not reveal how individual women and men themselves assess the impact of educational attainment and labor market attachment on childbearing. Barber (2001) use data from the Intergenerational Panel Study of Parents and Children (IPS) which is an eight-wave study beginning in 1961 and covering 31 years (participating in both 1962 and 1993 n=882). She reports that positive attitudes towards education and career have negative effects on the likelihood of having a first child. The effects are stronger for pre-marital first births compared to marital. The findings also indicate great similarities between women and men concerning the relationship between attitudes towards education and career and childbearing. Moors (2008) use the West-German panel study Familienentwicklung in Nordrhein-Westfalen from 1982, 1984 and 1986 (n=815). Performing a latent class analysis, he finds that

women oriented towards traditional families are most likely to become mothers. Women oriented towards egalitarianism are least likely to make the transition to motherhood. Egalitarianism is here defined as high valuation of personal autonomy and less than average importance given to traditional family values. Moors concludes that this "nicely corresponds with the profile that is sketched by the Second Demographic Transition theory, i.e. a non-traditional view on family attitudes combined with a focus on personal autonomy and self-actualization" (Moors 2008:53).

In 2000 and 2009, Statistics Sweden collected survey data on attitudes towards childbearing among Swedish women and men with and without children. In these surveys questions on reasons behind childlessness and delayed childbearing are asked. The sample size in 2000 was 3000 individuals and the response rate 67 percent or 2057 individuals (Statistics Sweden 2001). In 2009 the original sample was 7000 women and men and the response rate was 51 percent or 3570 individuals (Statistics Sweden 2009). Among childless women the most common reason for childlessness in both 2000 and 2009 was a prioritization of "doing other things" before having children (Statistics Sweden 2001; 2009). The second most common reasons in 2001 were "completing education" and "labor market situation, financial situation" (Statistics Sweden 2001). Correspondingly, in 2009 a common reason of childlessness among women was "financial situation" (Statistics Sweden 2009). Among those who had made the transition to parenthood, one third reported that completing education and getting a job or investing in the job were the most important reasons for delaying the decision to have a child (Statistics Sweden 2001). Thus, the results reported from these two surveys in large confirm the results reported in the studies referred to above based on "objective" data.

In social science research on childbearing the relationship between fertility intentions and actual fertility is sometimes studied. This research is closely related to research on attitudes towards childbearing and subjective evaluations of the impact of different factors on individual childbearing and will therefore be considered here. Kaufman and Bernhardt (2012) study fertility intentions and realized fertility among a sample of young

Swedish adults (YAPS, see detailed description below) 1999-2003. They find that women that assess their partner's pay to be well-paid are more likely to intend to have a child within the next five years compared to women who do not assess either their own job or their partner's job to be well-paid. However, while the male partner's pay has no significant effect on realized fertility men who report that they perceive their job as well-paid have higher odds of having their first child compared to men who report that neither themselves nor their partner have a well-paid job. In addition, men in couples where both partners have an education higher than upper secondary are more likely to enter parenthood compared to men in couples with lower education. Spéder and Kapitány (2009) use data from the Hungarian panel survey "Turning Points of the Life Course" 2001/2002 and 2004/2005. The subsample consisted of women and men aged 18-39 years at the time of the first interview, who answered questions on fertility intentions at the first interview, and participated in the second interview (n=4471). They report that men who were not employed at the time of the first interview were more likely not to realize fertility intentions or to have an unintended birth.

Philipov (2009) use a combination of survey and register data 2002 and 2005 covering Bulgarian women and men aged 18-34. He reports that plans to enter education hampers both the intentions to have the first child and the realization of this intention within a two-year-period. The same finding is reported for participation in education. In other words, to be a student hampers both fertility intentions and the likelihood to have the first child. For employment the relationship is quite the opposite. Plans to enter employment have a positive effect on fertility intentions. For men, actual employment also has a positive effect on fertility intensions. Toulemon and Testa (2005) use a French longitudinal survey on fertility intentions. A total of 783 women and men participated in surveys 1998, 2001 and 2003. They report that respondents with high education often want a child within the next five years. As a comparison, a majority of respondents with medium high incomes state that they do not want a child within the next five years. They also report that a postponement of fertility beyond five years is more common among unemployed respondents. Unemployment is also related to remaining undecided about

fertility intentions. Respondents who are living with a non-working partner often have a great desire to have a child in the near future. However, Toulemon and Testa (2005) also conclude that the relationship between fertility intentions and realized fertility is complex and that a large proportion of fertility intentions are never realized.

Compared to the body of research focusing on the interrelationships between childbearing on the one hand and education and labor market attachment on the other hand there is much less research on childbearing and housing. Mulder and Wagner (2001) study both West Germany and the Netherlands. They use three different surveys: The German Life History Study (GLHS) from 1981-1983, 1985-1988 and 1989 (pooled sample 5588), The ESR Survey from 1993 (n=3000) and the Netherlands Family Survey (NFS) from 1992-1993 (n=1000). They find that couples in the Netherlands postpone the birth of the first child subsequent to becoming home-owners. In other words, the acquisition of a home is not necessarily closely followed by the arrival of the first child. For West Germany, the authors find that couples tend to postpone the acquisition of a home until parenthood is close in time. Murphy and Sullivan (1985) use two data sources – The 1977 General Household Survey (n=538) and The 1976 Family Formation Survey (n=1639) – to study housing and childbearing in Great Britain. They find comparatively strong associations between tenure type and childbearing. Home-owners are older at the time of marriage, postpone the first child longer, and have fewer children compared with tenants. They also found that independent of tenure, couples living in detached one-family dwellings have a higher fertility compared with couples living in apartments. Using longitudinal register data for the period 1987-2000 (n=35391) Kulu and Vikat (2007) find elevated risks of first births among Finnish couples living in terraced or detached houses compared with those living in apartments. In addition, moving regardless of to which type of housing was associated with higher first birth risks. The results remain after controls for demographic factors such as union duration and educational level.

Ström (2010) uses a combination of register and survey data containing retrospective housing biographies for the three cohorts born in Sweden 1956, 1964 and 1974 (for a

detailed description of the data, see The Swedish Housing and Life Course Cohort Study below). She finds that number of rooms in the dwelling is consistently and positively related to first birth propensities. Mulder and Billari (2010) study the relationship between housing and fertility on the macro level for a number of Western countries. As housing indicators they use percent of homeowners, residential mortgage loans as percent of GDP, residential mortgage loans per capita. Their findings suggest that fertility is highest in societies with high levels of homeownership in combination with easy access to mortgage. Further, fertility is lowest in countries with a high degree of homeownership and difficult access to mortgages. In these countries it is also common that young individuals live in the parental home.

Considering the subjective opinions on housing and fertility, there are some findings based on Swedish survey data that deserves attention. Löfström (2003) collected survey data (Swedish women and men born between 1955 and 1970, n=2976) in 2000 on the reasons behind decreasing fertility in Sweden. The original sample was 5000 Swedish women and men born between 1955 and 1970 and the response rate was 60 percent or 2976 individuals. She reports that having a "good dwelling" is considered more important for the decision to have child than having completed one's education but less important than being employed and having a steady income. A greater proportion of women (65 percent) compared to men (53 percent) consider a "good dwelling" to be important. Separate analyses for those who had children prior to 1992 and 1992 and later shows that the proportion considering housing to be important for the decision to have a child is lower during the latter period but still important.

In the survey conducted by Statistics Sweden referred to above (Statistics Sweden 2009) respondents who believed they would have more children in the future but also believed that they would probably or definitely not have the number of desired children were asked about the reasons why they did not think they would have the number of desired children. Among those who replied that they are hesitant whether they will have the number of desired children 20 percent of the women and 18 percent of the men stated that

one of the reasons was that they needed a bigger dwelling if they were to have more children. On the one hand, this proportion is lower than those stating that they do not think it is physically possible for them to have more children, those who think their partner is dubious about having more children, and those believing that they could not afford more children. On the other hand, the proportion stating that housing is an obstacle is higher than those reporting that prioritizing other things in life or that the present number of children is sufficient is the obstacle to having more children. Among women stating that they will definitely or probably not have the number of desired children the most common reason is that the present number of children is sufficient and the second most common reply is "other reasons". Among the remaining alternatives (not physically possible, will probably not meet someone to have children with, partner is hesitant, do not think they can afford more children, prioritize other things in life) the most common reply among women is that they want to prioritize other things in life. The second most common reply among women is the housing situation (8 percent). Among men, the housing situation (8 percent) is the second most common answer next to that the present number of children is sufficient. The findings from these three surveys confirm the conclusion from the "objective" studies that housing indeed is important for the decision to have a child.

The empirical results of the "objective" and "subjective" studies referred to above are to a large degree but not completely unanimous. The majority of the research on "subjective" assessments (Kaufman and Bernhardt 2012; Statistics Sweden 2001; 2009; Löfström 2003; Spéder and Kapitány 2009;Philipov 2009) and the results reported in the "objective" studies on educational attainment (Blossfeld and Huinink 1991; Blossfeld and Jaenichen 1992; Kravdal 1994; Hoem et al. 2006), labor market attachment (Hoem 2000; Andersson 2000; Kravdal 2000; Vikat 2004) and housing (Mulder and Wagner 2001; Murphy and Sullivan 1985; Kulu and Vikat 2007; Ström 2010; Mulder and Billari 2010) all point in the same direction. Participation in education leads to postponement rather than relinquishment of childbearing, and establishment on the labor market is a prerequisite for childbearing rather than an obstacle. Housing is considered to be

important when starting a family by a substantial proportion among those asked. The results reported by Barber (2001) and Moors (2008) rather suggest that high ambitions regarding educational attainment and labor market participation has an inhibiting effect on childbearing. This might be a reflection of cultural differences, but also a reflection of the fact the neither Barber (2001) or Moors (2008) study completed fertility.

To sum up, the three factors education, labor market attachment and housing are all interrelated. People typically get an education before they establish themselves on the labor market. A steady and sufficiently high income is a prerequisite for obtaining housing that is perceived as suitable for a family. A quite reasonable assumption is that most people postpone childbearing until after they have completed their education. In the scenario of limited resources childbearing and housing may be competing costs (Courgeau and Lelièvre 1992). Childbearing and labor market career has also been suggested to be competing activities. However, to our knowledge these three factors and their relative impact on first birth propensities have not before been studied together. We study these factors both from a subjective perspective – whether or not respondents themselves assess their circumstances as appropriate for having a child – and from an objective perspective using survey and register data.

The Swedish Housing and Life Course Cohort Study (HOLK)

For the analyses of objective measures The Swedish Life Course and Cohort Study (HOLK) (see Ström et al. forthcoming) is used. The HOLK-data are a combination of survey and register data.[1] The sample consists of 3 600 individuals born in Sweden, and is divided between the three cohorts born in 1956, 1964 and 1974. The cohorts are selected in order to reflect different historical periods in Swedish housing policy and labor market. The oldest cohort included in this study (1956) enters early adulthood during the mid 1970s. During their early adult years they experienced a housing surplus

[1] The questionnaire and register extract have been designed by Sara Ström in collaboration with Elizabeth Thomson (Stockholm University and University of Wisconsin-Madison), and Statistics Sweden in Örebro and Stockholm.

due to the Million Programme (a governmental act resulting in one million new dwellings during the period 1965-1974). The cohort born in 1964 enters early adulthood by the mid 1980s when Sweden had recently experienced an economic crisis. The youngest cohort (1974) become young adults during the beginning of a de-assembly of Swedish housing policy. In contrast to the oldest cohort, they experience very difficult access to housing in particular in the larger cities.

The data collection was carried out during the spring of 2005 and was administered by Statistics Sweden in Örebro. The method of collection was postal questionnaires with one postal follow-up and subsequent telephone follow-up. The response rate was 62 percent or 2 242 individuals. As a whole, the material presents a clear picture of partner biographies, education and labor market attachment, childbearing and last but not least housing. Register data have been linked for each respondent, legally married partners, and for unmarried cohabitants with common children the child's other parent. At the time of the data collection, register data could only be linked for partners with whom the respondent was either legally married to or had a child with. The central part of the questionnaire is the housing biographies. The housing biographies have been complemented with register data on residential moves including information on year, month and location. Another important component is the partner- and marriage biographies that enables us to determine when individuals are "under risk" of childbearing. These self-reported biographies have been complemented with register data on changes in civil status. Information on education has been gathered from register data for both the respondent and partners (for present partners also through the questionnaire). Extensive register data on incomes and transfers have also been linked. Finally, data on biological and adopted children have been linked. (For a more thorough description of HOLK, see Ström 2010.)

The focus in this study is the transition from the childless state to parenthood over time. The most appropriate way to study this transition is to use intensity regression. The dependent variable used in the empirical analyses is the hazard rate:

$$h(t / X(t)) = \lim_{\Delta t \to 0} \frac{P(t, t + \Delta t \mid T \geq t, X(t))}{\Delta t}, \qquad (1)$$

where T is the time of the birth of the respondent's first child subtracting ten months, t is any fixed point in time under risk, while p*(t, t+Δt)* is the probability that the event occurs in the interval [*t, t+Δt),* and *x(t)* is a vector of covariates, given that the event has not occurred before t. The observation window opens the year the respondent turns 16, and closes either at the time of the first birth subtracting ten months, at age 30, or at the time of data collection. The first child's birth subtracting ten months is studied since we want to study what affects the decision to have a child. Changes in housing status (measured as year and month of registered move), income and education (both measured annually) are treated as time-varying covariates. Only episodes when the respondent is cohabiting or married are included. The year and month of first births has been collected through register data from Statistics Sweden. In cases of adoption the respondent is censored at the time of the birth and the event is thus not included. Births of twins and triplets are treated as single-child births. Information on gender and age has been collected through register data from Statistics Sweden.

Household *income* is defined as income from employment and includes income from both partners in a union if they are married or otherwise can be linked in the registers. For the other cases the partner's income has been estimated from the respondent's income. Information on income is included from the year of entering shared residence. Information on household income has been collected from Statistics Sweden. Incomes are divided into three categories. The first category consists of incomes below or equal to the norm of economic support (previously social assistance). Historical information about this norm has been complemented with average rents for rental apartments (http://www.scb.se). This first category represents low incomes. The second category contains incomes above the norm of economic support but below incomes that are defined as high incomes in the third category. High incomes – the third and last category – are defined as incomes that are taxed with state income tax. However, state income tax

was introduced in 1991. In other words, it is not possible to construct variables comparable over time. Therefore, we have used the breakpoint for state income tax for 2003 to define high incomes for all years. *Educational level* is also grouped into three categories. The first category consists of grade school education or equivalent, the second category upper secondary education and the third and last category consists of completed university educations.[2] Two different measures of *housing* are included in the analyses. First, establishment on the housing market is defined as either homeownership or firsthand rental contract. Second, the size of the dwelling is included. Dwellings with three or more rooms and kitchen are separated from dwellings with one or two rooms and kitchen. This is in line with the norm that children should have their own room (prop. 1968/87:48; Swedish National Board of Housing, Building and Planning 2004).

Results: Objective measures

We begin the report of the empirical results by discussing some descriptive statistics of the "objective" measures.

[2] Elementary/compulsory school: shorter than 9 years, 9 (10) years or equivalent. Upper secondary education: at most 2 years, more than 2 years but 3 years at most. University/college: shorter than 3 years, 3 years or more, postgraduate education. Educational biographies have been created by using register data on highest completed education and year of completion. When information on year of completion is missing it is assumed that year of completion equals the year when the education first appears in the data. For respondents (mainly the cohorts born 1956 and 1964) when the first completed education is upper secondary education missing values before age 20 have been replaced with elementary/compulsory school. Educational biographies where a higher education is succeeded by a lower education have been excluded.

Table 1. Descriptive statistics education, income and housing, by cohort, HOLK 1972-2004. Percentage.

Cohort	1956	1964	1974
Education			
Compulsory	5.6	7.8	17.0
Upper secondary	71.0	73.7	51.7
University/college	23.4	18.5	31.3
Total	*100*	*100*	*100*
Income			
Low	11.5	7.1	12.6
Medium	86.4	87.2	76.9
High	2.1	5.7	10.5
Total	*100*	*100*	*100*
Housing			
Established (no)	12.6	17.0	19.2
Established (yes)	87.4	83.0	80.8
Total	*100*	*100*	*100*
Housing			
1 room	28.1	30.5	32.3
2 rooms	39.6	35.4	36.1
3+ rooms	32.3	34.1	31.6
Total	*100*	*100*	*100*

Table 1 shows descriptive statistics for "objective" measures of educational attainment, income and housing. The most common educational level is upper secondary which makes up between almost 52 percent (cohort 1974) and almost 74 percent (cohort 1964) of the total. The cohort 1974 is overrepresented both when it comes to compulsory education and university education.[3] As expected the vast majority belongs to the middle income category representing neither very low or very high incomes (76,9 – 86,4 percent). The cohort born 1974 is overrepresented in the highest income category compared to the two older cohorts. It is much more common to be established on the housing market compared to not being established. However, for the cohort born 1974 it is more common not to be established (over 19 percent) compared to the two older cohorts (12,6 – 17,0 percent). It should be noted that the descriptive statistics in Table 1 is based on episode data used in the intensity regressions (Tables 2-4) and not data on the individual level.

[3] Register data on education are encumbered with some problems. Among those problems are missing values. For the cohort born 1956 about half of the observations lack valid data for education. For the two younger cohorts the proportion of missing values are 21,6 percent (1964) and 5,9 percent (1974). This is also the explanation of the varying number of respondents in the different models of Table 2

To study the relative impact of education, income and housing on first births we perform the analysis in seven steps or models: (1) education (2) income (3) housing (4) education and income (5) education and housing (6) income and housing (7) education, income and housing. All analyses are cohort specific and control for age and gender.

Table 2. First births, education, income and housing. *Cohort 1956,* HOLK 1972-2005. Piecewise constant hazard regression. Hazard ratios.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age							
16-20	REF	REF	REF	REF	REF	REF	REF
21-25	0.80	**1.69*** **	**1.35***	0.94	0.67	**1.41****	0.80
26-30	**1.68***	**3.27*** **	**2.70*** **	**1.81****	1.30	**2.61*** **	1.46
Sex (woman)	**1.32****	**1.31*** **	**1.32*** **	**1.31****	**1.29****	**1.30*** **	**1.29****
Education							
Compulsory	REF			REF	REF		REF
Upper secondary	**4.31*** **			**3.71*** **	**4.64*** **		**3.95*** **
University/college	**5.37*** **			**4.74*** **	**5.79*** **		**5.03*** **
Income							
Low		REF		REF		REF	REF
Medium		**1.86*** **		**1.51****		**1.68*** **	**1.40***
High		1.53		**2.25*** **		1.40	**2.14****
Housing							
Established (yes)			1.25		0.92	1.10	0.92
Housing							
1 room			REF		REF	REF	REF
2 rooms			**1.56***		1.34	**1.54***	1.29
3+ rooms			**2.44*** **		**2.07****	**2.32*** **	**1.91***
n (individuals)	369	562	556	368	365	555	364
n (events)	268	409	402	268	262	402	262
-2 LL	-119.36	-321.37	-311.62	-114.50	-114.34	-303.94	-110.50

* p<0.10 ** p<0.05 *** p<0.01

In Table 2 the analyses for the cohort born 1956 are depicted. All models where educational attainment is included (Models 1, 4, 5 and 7) show a clear and consistent effect of education on first birth propensities: the higher the attained education the higher is the propensity to have the first child. The results for household income (Models 2, 4, 6 and 7) consistently indicate that medium incomes are related to higher first birth propensities compared to the lowest income category. Belonging to the highest income

category is associated with higher first birth propensities in Model 4 (educational attainment and income) and Model 7 (the complete model including educational attainment, income levels and housing situation). As for education, the results concerning housing in terms of dwelling size of three or more rooms are consistent across the models. Residing in a dwelling with three or more rooms is positively associated with first birth propensities compared to living in a dwelling with only one room and kitchen. Living in a dwelling with two rooms and kitchen is positively and significantly associated with first birth propensities only when housing is studied alone (Model 3) or together with income (Model 6). Establishment on the housing market seems to be of no importance for first birth propensities among the respondents born in 1956. The oldest age group (26-30) has a higher propensity to have the first child in all models except Model 5 (educational attainment and housing) and Model 7 (the complete model). In the cohort born 1956, women have a higher first birth propensity compared to men.

Table 3. First births, education, income and housing. *Cohort 1964***,** HOLK 1972-2005. Piecewise constant hazard regression. Hazard ratios.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age							
16-20	REF	REF	REF	REF	REF	REF	REF
21-25	1.49	**2.43*** **	**1.95*** **	1.63	1.36	**2.14*** **	1.51
26-30	**3.55*** **	**4.30*** **	**4.38*** **	**2.88*** **	**2.98*** **	**3.57*** **	**2.53** **
Sex (woman)	**1.41*** **	**1.53*** **	**1.40*** **	**1.50*** **	**1.41*** **	**1.49*** **	**1.47*** **
Education							
Compulsory	REF			REF	REF		REF
Upper secondary	1.49			1.45	1.53		1.45
University/college	1.70			1.46	**1.84***		1.55
Income							
Low		REF		REF		REF	REF
Medium		**2.60*** **		**2.65*** **		**2.44*** **	**2.52*** **
High		**4.78*** **		**4.81*** **		**4.16*** **	**4.18*** **
Housing							
Established (yes)			1.25		1.20	1.20	1.16
Housing							
1 room			REF		REF	REF	REF
2 rooms			**1.59** *		**1.61***	1.45	1.42
3+ rooms			**2.64*** **		**2.48*** **	**2.29*** **	**2.11*** **
n (individuals)	468	535	531	468	466	531	466
n (events)	327	374	370	327	324	370	324
-2 LL	-180.76	-230.39	-234.22	-159.51	-167.56	-214.14	-150.58

* p<0.10 ** p<0.05 *** p<0.01

For the cohort born in 1964 (Table 3) we find virtually no effects of educational attainment. The exception is a positive effect in Model 5 (educational attainment and housing) of having a university degree. The effects of income on first birth propensities are completely consistent across the models: having a medium or high income compared to having a low income is positively associated with the propensity to have the first child. Furthermore, first birth propensities are higher for individuals in the highest income category compared with medium incomes. As for the cohort born in 1956, living in a dwelling with three rooms or more compared to living in a dwelling with one room and kitchen is positively associated with first birth propensities in all models. Living in a dwelling with two rooms and kitchen is positively associated with first birth propensities in Model 3 (housing only) and Model 5 (educational attainment and housing). Being

established on the housing market in terms of either owning the dwelling or renting it with a firsthand lease seem to be of no importance for first birth propensities. The oldest age group (26-30) is consistently more prone to have their first child compared to the youngest age group (16-20). Across the models, women also have a higher first birth propensity compared to men.

Table 4. First births, education, income and housing. **Cohort 1974**, HOLK 1972-2005. Piecewise constant hazard regression. Hazard ratios.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Age							
16-20	REF	REF	REF	REF	REF	REF	REF
21-25	**2.21****	**3.89*****	**2.37*****	**2.35****	1.74	**3.02*****	**1.87***
26-30	**5.26*****	**4.54*****	**4.91*****	**2.75*****	**3.59*****	**3.31*****	**2.05***
Sex (woman)	**1.24***	**1.43*****	**1.22***	**1.40****	1.19	**1.39****	**1.37*****
Education							
Compulsory	REF			REF	REF		REF
Upper secondary	1.16			1.19	1.16		1.20
University/college	1.18			1.17	1.20		1.20
Income							
Low		REF		REF		REF	REF
Medium		**3.07*****		**3.13*****		**2.78*****	**2.85*****
High		**6.80*****		**6.94*****		**5.85*****	**6.03*****
Housing							
Established (yes)			**1.78****		**1.81****	**1.51***	**1.54***
Housing							
1 room			REF		REF	REF	REF
2 rooms			1.41		1.46	1.31	1.35
3+ rooms			**2.65*****		**2.70*****	**2.28*****	**2.31*****
n (individuals)	604	611	607	604	600	607	600
n (events)	320	325	317	320	312	317	312
-2 LL	-303.44	-268.73	-290.66	-256.05	-279.42	-251.81	-239.94

* p<0.10 ** p<0.05 *** p<0.01

For the cohort born in 1974 (Table 4) we find no effects at all of educational attainment on first births. However, the effects of income levels are clear and consistent. Having either medium or high income compared to having low income is positively associated with the propensity to have the first child. This finding is congruent with the findings for the cohort born in 1964 (Table 2). In contrast to the findings for the cohorts born in 1956

and 1964, we find a positive effect in all models (although statistically significant only on the 10 percent level in Models 6 and 7) of being established on the housing market. Being either a homeowner or a firsthand tenant is thus associated with a higher first birth propensity. As for the two older cohorts, we find a positive effect on first birth propensities across the models of living in a dwelling with three or more rooms. However, for the cohort born in 1974 we find no positive effect on first births of living in a dwelling with two rooms compared to living in a dwelling with one room and kitchen only in any of the models. Being either 20-25 (except in Model 5, educational attainment and housing) or 26-30 is associated with a higher first birth propensity compared to being 16-20. Women have a higher first birth propensity compared to men except in Model 5 (educational attainment and housing).

In summary, educational attainment seems to be of importance in relation to first births only for the oldest cohort born in 1956. The higher the education attainment, the higher is the first birth propensity. Income levels appear to be of great importance for all three cohorts but the results for income are completely congruent only for the two youngest cohorts born in 1964 and 1974. The higher the income level is, the more prone one is to have the first child. Living in a dwelling with three or more rooms is associated with higher first birth propensities among all three cohorts and across all models. Being established on the housing market in terms of either being a homeowner or a firsthand tenant is linked to higher first birth propensities only for the youngest cohort born in 1974.

This summary gives rise to two speculations. The first concerns the finding that educational attainment matters only for the cohort born in 1956 and that the results for income levels is somewhat weaker for this cohort compared to the others. Could this be a reflection of harsher conditions on the labor market for the two younger cohorts? Were the individuals born in 1956 more reassured to establish themselves on the labor market later on and therefore more willing to have children before having a steady job and high income? The second speculation concerns the finding that establishment on the housing

market in relation to first birth propensities matters only for the cohort born in 1974. Is this a reflection of a more difficult housing market for the youngest cohort, or a reflection of increased importance given to housing? It should also be noted that these analyses do not take into account in which order the respondents complete their education and establish themselves on the labor and housing markets. Neither do the analyses reveal how the different factors affect each other**.**

The Young Adult Panel Study (YAPS)

The Young Adult Panel Study (www.suda.su.se/yaps) is a combination of survey data and register information. Three waves of data collection have been carried out, in 1999, 2003 and 2009. The survey has information on attitude and norms, as well as the work and family situation of the respondents in the first phases of young adult life in Sweden in the beginning of the 21st century. Based on a nationally representative sample, YAPS contains information about approximately 3500 individuals. Four specific birth cohorts are included, namely those born in 1968, 1972, 1976, and 1980. In the present study we will use survey information from the 2003 survey, when the respondents were 22, 26, 30 and 34 years old, combined with register information on births in the six years following the survey.

As many studies of the transition to adulthood have shown, there is a density of transitions in young adulthood (Rindfuss 1991; Corijn & Klijzing 2001; Cook & Furstenberg 2002; Settersten et al 2005): young men and women leave home, pursue education, establish themselves in the labour market, form their first co-residential unions, and become parents. In most cases the majority of these transitions occur within a limited age range, between 18 and 30. In the current Swedish context, 90 percent have left the parental home by age 22, and 85 percent have formed a first co-residential relationship by age 30. However, increasing proportions of women are starting childbearing after age 30, and this is already the case for a majority of men. As for non-demographic transitions, close to 90 percent of the 30-year olds say they have completed

their education (the corresponding figures for 22- and 26-year olds are 28 and 65 percent).

From the YAPS survey (second wave in 2003) we have information about self-perceived constraints on childbearing, based on responses to the question: *Do you think that the following circumstances apply to you right now? a) I live in a good partner relationship, b) I (we) have a dwelling suitable for a child, c) I have completed my education, and d) I (we) have a sufficient income to support a child.* The respondent could answer 'yes' or 'no' to these questions.

We use logistic regression to analyze the effect of fulfilled preconditions regarding housing, income and education on the transition to a first birth among a sample of 979 childless young adults[4] who have a partner, i.e. they have a stable, non-coresidential relationship, are cohabiting or married.

Results: Subjective measures

In Table 5 we present the percentages that agree that these prerequisites for the transitions to parenthood are fulfilled, by age, for those still childless. About half (51 percent) of the 22-year old respondents reported that they lived in a good (co-residential, either cohabiting or married) relationship. This becomes more frequent among the 26- and 30-year olds, and then decreases somewhat. It is worth remembering, however, that for the 34-year olds a higher percentage of these relationships are more committed, i.e. 14 percent of those with a partner are married, while this is true for only one percent among the 22-year olds.

[4] The percentages childless by ages are 93 percent (age 22), 80 percent (age 26), 50 percent (age 30) and 25 percent (age 34).

Table 5. Fulfilled prerequisites by age, childless young adults. YAPS 2003.

	Age 22	Age 26	Age 30	Age 34	All
Good partner relationship	51	64	59	53	57
Completed education	26	61	76	81	53
Sufficient income	22	50	66	72	44
Suitable housing	24	39	47	57	36

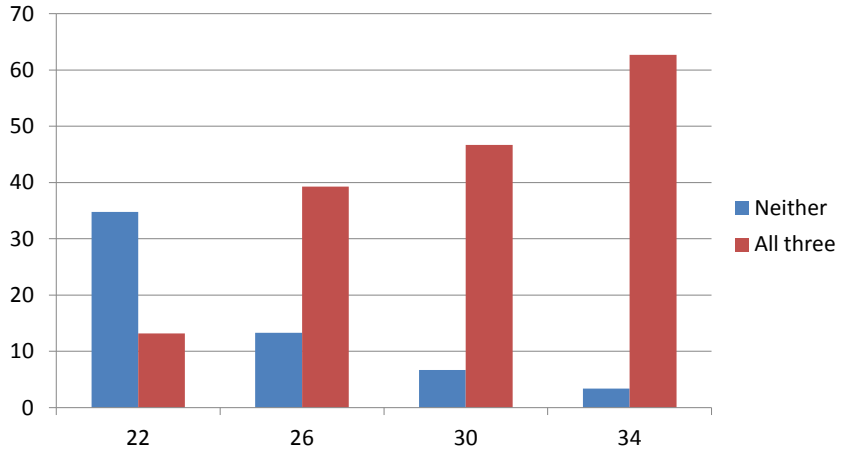
Among the 22-year olds it is much less common to report that they have completed their education (26 percent), have a sufficient income (22 percent) or a suitable housing situation (24 percent). Then there is a big jump between age 22 and age 26, as regards completed education in particular, but also regarding income and housing. Further increases occur between age 26 and age 30, and 4 in 5 of the 34-year olds report having completed their education, 72 percent consider their income sufficient to support a child, and 57 percent think they have a housing situation suitable for a child.

Thus between age 22 and age 34 the constraints on childbearing are gradually lessened, as more and more find themselves in a situation where the above-mentioned four prerequisites are fulfilled, according to their own subjective evaluation. Age is clearly an important factor to take into account in the analysis of the effect of self-perceived constraints on childbearing on the transition to parenthood. In addition to regressions including age as a control variable, we will also run regressions separately for the different age groups (22, 26 and 30+34; the two later will be combined because of the small number of still childless at those ages).

In Figure 1 we can see how different combinations of fulfilled prerequisites vary by age, for those who live with a partner, and thus have fulfilled one of prerequisites for childbearing. We illustrate with the two extremes – none, i.e. neither education, nor income, nor housing, are fulfilled, and at the other end, all of them, that is the respondents have completed their education, have a sufficient income and a suitable housing situation. At age 22, about one-third lack all three of the preconditions, while this category almost disappears for the 34-year olds. On the other hand, having all three of the

prerequisites fulfilled increases from about 10 percent at age 22 to over 60 percent among the 34-year olds.

Figure 1. Combinations of prerequisites by age among childless young adults with a partner



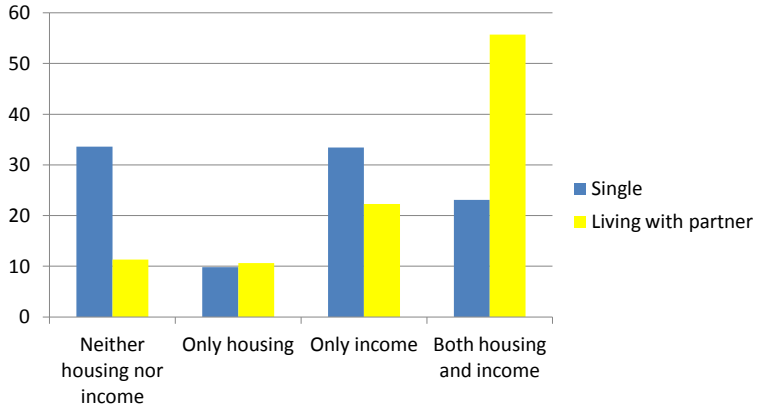
The four preconditions – partner, completed education, sufficient income, suitable housing – are to some extent related in some intricate ways. If a person is single and still undergoing education, it is very unlikely that he or she will report having a sufficient income and a suitable housing situation (see Figure 2). As much as 4 in 5 of those single and in education report lacking both income and housing. On the other hand, more than half of those who have completed their education and have a partner consider that both their income and housing situation is adequate for starting a family (Figure 3).

In addition to age (and of course gender), we will therefore in our modeling take into account each one of the three preconditions education, income, and housing separately as well as in different combinations. Our sample will consist of those still childless who have a stable relationship to a partner, thus removing one of the necessary prerequisites according to the Hobcraft-Kiernan model. What is then the importance of having completed one's education, having a sufficient income to support a child, and/or of having a housing situation that is suitable for a child? And do these effects vary by age?

Figure 2. Fulfilled prerequisites depending on partner status, if education is not completed



Figure 3. Fulfilled prerequisites depending on partner status, if education is completed



In Table 6, we show the results of logistic regressions on education, income and housing on the transition. Only childless respondents with a stable partner are included. In the first panel (panel A) in Table 6, we show the effect of having completed one's education, having a sufficient income, or a suitable housing situation, separately and in different combinations, controlling for age and gender.

Table 6. Self-perceived constraints of completed education, sufficient income and suitable housing on first births. YAPS 2003. Logistic regression.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
A. All ages (n=979)							
Completed education	2.49***			1.80***	2.21***		1.73**
Sufficient income		2.84***		2.27***		2.45***	2.03***
Suitable housing			2.06***		1.79***	1.62**	1.54**
B. Age 22 (n=331)							
Completed education	3.56***			2.54**	3.04***		2.30**
Sufficient income		3.42***		2.38**		2.91***	2.15**
Suitable housing			2.67***		2.13**	2.15**	1.92*
C. Age 26 (n=376)							
Completed education	2.53***			1.75*	2.28***		1.69*
Sufficient income		2.97***		2.36**		2.71***	2.24**
Suitable housing			1.78**		1.45*	1.34	1.24
D. Ages 30+34 (n=272)							
Completed education	1.17			1.02	1.13		1.02
Sufficient income		1.57		1.56		1.41	1.40
Suitable housing			1.43		1.42	1.29	1.29

* <0,05, ** <0,01, *** <0,001

All three of the self-perceived constraints have a strong and significant effect on the transition to parenthood, most of all for having a sufficient income (models 1, 2 and 3). Combining the income effect with the effects of completed education and suitable housing, respectively, weakens the effect of having a sufficient income, but it remains strong and significant (models 4 and 6). When all three factors are combined in one model (model 7), it becomes clear that having a sufficient income is the most important

of the three prerequisite, although the effects of having completed one's education and having a suitable housing situation remain substantial (and significant).

Running an interaction with gender (not shown), shows that having a sufficient income is significantly more important for men's transition to parenthood than for women's, likely reflecting the pervasive strength of the male provider role ideology in Sweden (in the minds of young men anyway).

From panels B, C, and D, we can draw the conclusion that there are remarkable differences in the effects of the subjective constraints by age. Generally speaking, the effects are strongest for the 22-year olds, weaken for the 26-year olds, and more or less disappear for the 30+34 year olds. From model 7, we can see that having a sufficient income is the most important factor only for the 26-year olds, while the 22-year olds consider the completion of their education as the most important. For those beyond the mean childbearing age, i.e. those 30 and 34 year old – and still childless – other factors than completed education, sufficient income or suitable housing will determine whether they will make the transition to parenthood or not.

In summary, among the three self-perceived constraints to childbearing, having a sufficient income to support a child seems to be the most influential factor, in particular for the young men. But having completed one's education and living in a dwelling suitable for a child (according to the subjective evaluation of the individual) also have positive effects on the transition to parenthood. In general, the younger the age of the individual (within the 22 to 34 age range) the stronger are the effects. In fact for those aged 30 and above, the fulfillment of the prerequisites for childbearing (completed education, sufficient income, suitable housing) is no longer of any importance.

Summary and discussion

In this paper we study the relative impact of education, income and housing on first birth propensities in Sweden, using both objective and subjective measures of these three

factors, which are included among the five prerequisites for childbearing in modern societies, suggested by Hobcraft and Kiernan (1995). Using the HOLK data set, it is possible to investigate changes over time in the effect of the objective measures, covering the period from the early 1970s to 2005, and contrasting the experiences of three birth cohorts, those born in 1956, 1964 and 1974. With the YAPS data set from 2003, we have information about the subjective evaluations of completed education, sufficient income to support a family, and suitable housing, and can analyze their effect on having a first birth in the following six years.

Clearly, objective measures of education, income, and housing are likely to capture different aspects of these characteristics than how the individuals subjectively evaluate whether they have completed their education, have a sufficient income to support a family, and a housing situation suitable to raise a child. It is interesting, therefore, that all three factors are of importance for the transition to a first child, regardless of whether we look at objective or subjective measures. Our results clearly corroborate the Hobcraft-Kiernan scheme of prerequisites for childbearing in modern societies.

The results from the two approaches, however, give rise to some reflections. From the analysis of the objective measures, we can learn that there are interesting changes over time. Being established on the housing market in terms of being either a home-owner or a firsthand tenant was found to result in higher first birth propensities only for the youngest cohort, born in 1974. They were likely to enter the housing market in the mid-1990s, when the housing situation had become a lot tougher, in particular in the larger cities. Moreover, educational attainment was found to matter only for the oldest cohort, born in 1956, and the results for the income level was weaker for this cohort compared to the other two. This is likely to be a reflection of harsher conditions on the labour market for the two younger cohorts.

In the analysis of the subjective evaluations of the three factors, on the other hand, having a sufficient income seems to be the most influential, even if having completed one's education and having a suitable housing situation also have positive effects. This may have to do with the sequencing of these events. Obtaining an adequate housing situation

(to raise a family) is something that can be arranged once the couple has formulated definite birth plans (given that they have a satisfactory economic situation), while a sufficient income (from a subjective perspective) is likely to be a prerequisite for the formulation of such birth plans.

We conclude that our analyses give substantial support to the Hobcraft-Kiernan scheme of the necessary preconditions for the transition to parenthood in modern societies. Education, income, and housing are all important prerequisites for having a first birth, both when measured objectively and when we consider the individual's subjective evaluation of these factors. The relative importance of these factors, however, seems to vary over time, depending for example on variations in the housing market. Finally, as one might expect, the relative importance of these factors varies over the life course, with completed education being the most influential when the individual is in the early twenties, while a sufficient income gains importance when the individual is in the mid- to late twenties. Once the individual has passed the mean age of childbearing, other factors than education, income and housing seem to determine whether there is a transition to parenthood or not.

Acknowledgements

We thank Social Policy and Family Dynamics in Europe (SPaDE) and Swedish Council for Working Life and Social Research grant 2008-0489 for financing the research work. We also thank Byggnads, Folksam, HSB, Hyresgästföreningen Riksförbundet, Riksbyggen, and Svenska Byggnadsutvecklingsfonden for financing the collection of HOLK.

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