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Abstract: Post-secondary education has expanded dramatically around the world during the last sixty years. In Sweden, tertiary educational attainment tripled for women and doubled for men between the 1950 and 1980 cohorts. The expansion of higher education has been accompanied by increasing horizontal stratification within the highly educated group, as education leads individuals to different social and economic positions. This study contributes to our understanding of this stratification by examining differences in educational homogamy among the highly educated. I study men and women born in 1940, 1950, 1960, and 1970 and show how differences within the highly educated group based on previous experiences (measured by social class of origin), educational experience (measured by length of degree in years, and by traditional/newer university status), and socio-economic outcomes (measured by income and occupational prestige) are related to differences in the likelihood of educational homogamy. Women with longer degrees, higher class origin and higher income and occupational prestige are much more likely to enter homogamous unions. For men, few status markers are associated with homogamy outcomes over time, with the exception of degree length which has a strong positive association. Additionally, I examine whether educational expansion, and the emergence of a female-dominant gender imbalance in higher education, has led to a strengthening of the relationship between status covariates and homogamy across cohorts. I find no interaction effects between cohorts and status for women, and some interactions, particularly in degree length and income, for men.

Rates of college attendance have risen dramatically around the world during the last half century (Schofer and Meyer 2005). Greater access to higher education has generally benefited individuals as well as their societies (Hout 2012). However, not all graduates benefit equally from education. Researchers interested in social inequality have identified stratification within the highly educated group with regard to socio-economic outcomes, such as income or occupational prestige (Gerber and Cheung 2008) as well as demographic outcomes, such as union formation and childbearing (Hoem, Neyer, and Andersson 2006, Brand and Davis 2011, Musick, Brand and Davis 2011, Van Bavel 2010). This study contributes to the literature on stratification within this group by examining differences in educational homogamy among college graduates. Educational homogamy has major social consequences and has thus been a focus for sociological research (Blossfeld 2009). However, researchers have generally focused on *who* highly educated people partner with—whether they are homogamous or 'partner down'—while our understanding of *which* highly educated individuals enter homogamous unions remains incomplete.

Understanding this variation in educational homogamy within the group is important for two reasons. Firstly, educationally homogamous households tend to have a socio-economic advantage, and differences in the likelihood of homogamy have consequences for social inequality (Blossfeld 2009). Secondly, patterns of homogamy themselves serve as an indicator of social inequality. While inequality within the highly educated group is acknowledged to be important, discussion of this inequality has so far largely been focused on differences in achieved occupation or income. Patterns of homogamy provide a complementary understanding of social stratification within the group, because they reflect hierarchies based on perceived social status. Groups whose members often partner with each other can be considered social equals, while those whose members partner together rarely are arguably socially distant from each other (Kalmijn 1991, Blossfeld 2009). Analyzing differences between sub-groups who tend to partner equally, and those who tend to 'partner down' in terms of education, thus informs about the social boundaries within the group.

This study answers two questions: Which highly educated individuals enter a homogamous union?, and Have these characteristics changed over time? I use Swedish register data and study homogamy in first childbearing unions among highly educated men and women born in the years 1940, 1950, 1960, and 1970. I present descriptive findings and the results of logistic regression analysis regarding whether these men or women enter a homogamous or a hypogamous union. A major contribution of this study is the consideration of inequality along several dimensions: I consider differences related to background prior to higher education, experience during education, and outcomes following graduation. Specifically, I examine social class of origin, type of post-secondary institution attended (traditional versus new) and the length of the post-secondary degree achieved, occupational prestige and potential earnings. These factors are related to the drivers of homogamy: exposure to potential highly educated partners, strength of preference for such partners, and the ability to attract such partners. As shown in this manuscript, men and women with the same level of educational attainment, but different backgrounds, experiences, and outcomes, have very different opportunities to form a homogamous union.

In addition to identifying differences in homogamy within the group, I examine trends in which individuals enter a homogamous union over time. These trends are particularly interesting in the context of the changes in the dynamics of the marriage market over the last decades. Women have exceeded men in rates of higher educational attainment and thus have faced increasing competition for highly educated partners, whereas men have conversely experienced a greater number of potential homogamous partners. By examining the persistence and disappearance of social boundaries as a result of changes in the structure of the partner market, this study sheds light on the relative weakness or strength of the social divisions within the highly educated group.

Drivers of educational homogamy

Educational homogamy has long been of interest to researchers both as an indicator of social inequality, and a driver of such inequality. Similarly educated individuals tend to

form relationships with each other because education acts as key variable in partner selection: it is an easily measurable yet highly meaningful attribute which summarizes an individual's goals, values, experiences, socio-economic status and prospects (Kalmijn 1991, Mare 1991). Educational homogamy is a common social pattern: among contemporary cohorts in 22 European countries, for example, 50-75% of all spouses have a similar educational level (Domański and Przybysz 2007).

Patterns of homogamy in unions can be explained by three factors: individuals have greater exposure to those potential partners who share their attributes than to those who do not, they have stronger preferences for such partners, and they are more attractive to such partners than alternative suitors are (Kalmijn 1998, Schwartz 2013). Homogamy between the highly educated can be understood in terms of these three drivers. In terms of exposure, college-educated people tend to interact with each other more than with lower-educated people for a number of reasons (Blossfeld and Timm 2003). As men and women progress through their educational careers, they are increasingly surrounded by others who share their educational level and goals, while those who exit education are often in a more educationally heterogenous setting. Highly educated people also often enter careers that require education, and subsequently build professional and social networks where highly educated people are the majority. They are thus likely to encounter similarly educated individuals throughout their life.

Highly educated people often have a preference for a similar partner, and are more attractive to such partners than those with lower education. People tend to prefer highly educated partners because they seek to maximize socio-economic resources of their joint household, and higher education is typically associated with higher status (Mare 1991, Schwartz 2013). Additionally, highly educated individuals are motivated to choose partners with the same level of education out of the desire to find a social and cultural equal (Kalmijn 1994, Schwartz 2013). Confronted with several potential partners, one is more likely to choose someone who shares their experiences, values, and lifestyle, and these factors are strongly associated with education.

These three factors (exposure, preferences, attraction) drive educational homogamy in society, and are the key to understanding differences in educational

homogamy within the group. However, these drivers of homogamy are not easily disentangled, as there is correlation and interaction between them. For example, consistent exposure to highly educated individuals shapes individual expectations and preferences for partners. Likewise, the ability to attract a highly educated partner is increased by having similar lifestyle preferences—which are often a product of a higher-status environment. The argument in this study is thus logically consistent regardless of whether homogamy is primarily driven by exposure to or preferences for highly educated partners. Disentangling the effects of exposure and partnership preferences is beyond the scope of this study, which seeks to identify major divisions within the highly educated group rather than to pinpoint changes in preferences or opportunity structures specifically.

Heterogeneity within the educated group

Socio-economic class background

Social class of origin classes affects the challenges and opportunities students encounter within post-secondary education. Class background is linked to differences among university students with regard to selection of study discipline (Hällsten 2010, Werfhorst et al 2003) and of educational institution (Reimer and Pollack 2010), the likelihood of completing a degree (Reimer and Pollack 2010), level of completed fertility (Brand and Davis 2011), forming social networks at the university (Armstrong and Hamilton 2013) and the likelihood of entering marriage (Musick, Brand, and Davis 2012) or a high-paying or prestigious job after graduation (Gerber and Cheung 2008). Students from a lower class background have more to gain from attending university, as they have less ability to fall back upon the social and financial capital from their family. However, they also face disadvantages due to the constraints associated with their class background. With regard to the educational homogamy outcome, students from a higher status background have a systematic advantage, both in terms of exposure to highly educated partners and the likelihood of union formation (Blossfeld and Timm 2003, Musick, Brand, and Davis 2012).

Students from higher status background are likely to have more opportunities to interact with highly educated individuals, because they access social networks built through high-status families and at higher-prestige educational institutions attended prior to post-secondary studies. Additionally, higher class background may be linked to a stronger preference for a highly-educated, high status partner, or a greater likelihood of being preferred by such a partner due to norms and shared experiences formed prior to university. Higher class backgrounds fosters tastes and cultural knowledge which is often valued by potential partners. Therefore, differences in class background among students are likely connected to differences in patterns of educational homogamy, with students from families with higher social standing being more likely to enter homogamous unions.

Educational experience

Colleges provide opportunities to meet potential partners directly, as well as to form social networks which can lead to future romantic opportunities. This role of colleges in facilitating relationships has been commonly cited as a factor explaining the high levels of educational homogamy among the highly educated (Mare 1991, Blossfeld 2009). However, there is significant variation in the social opportunities students encounter in different academic environments. Students attend programs which vary in length and intensity, at universities which vary in institutional prestige, quality, student demographics, and social culture. In this study, I consider two factors related to educational experience: the length of the academic degree earned, and the type of the educational institution attended. Both factors are likely related to the extent and intensity of exposure to potential partners. The study environment may also affect the importance of education for individual self-identity, and thus lead to stronger preferences for similar partners. Finally, some study experiences (longer degrees, more prestigious institutions) are more prestigious and thus may make individuals more attractive to potential partners.

Post-secondary studies in Sweden range in length from two to five years. Short programs (2 years) tend to be vocational in nature, and are similar to associates degrees in the United States and lower form tertiary education in other European countries. Medium length programs (3-4 years) are a standard bachelor's degree or a combined bachelor and

masters, and five year programs are professional education (e.g. medicine and architecture). Students pursuing longer degrees are exposed to their fellow students for a longer time than those studying for two or three year degrees, and will thus have more opportunities for sustained and focused interaction. Additionally, longer degrees (master's or professional degrees) are likely to carry more social prestige and be related to a stronger motivation for finding a highly educated partner, and/or a greater ability to attract such a partner.

The type of educational institution attended is also likely to be related to homogamy. Universities differ in prestige, size and focus. Traditional, older universities generally carry more prestige than newer schools or satellite schools that cater to local students and offer primarily vocational education. Different types of institutions vary in their student culture, the social opportunities they offer, and thus play a role in structuring interaction between students. In Sweden, there is a division between traditional and newer institutions. Traditional schools include the handful of universities and professional schools that were operating prior to a major university expansion in 1977, including Lund, Uppsala, Umeå and Stockholm Universities, and schools of business, technology, and medicine – while the "new" institutions are those that were opened or upgraded as a result of the education reforms (see Appendix 1 for an institutional classification). These new institutions include both general universities as well as specialized institutions for vocational degrees, and tend to draw students from the local population (Chudnovskaya and Kolk 2016). Traditional universities tend to attract students who are searching for a more intense academic and social experience, tend to offer more social and human capital, and act a signal of prestige, which can all make an individual more attractive to a potential partner (Gerber and Cheung 2008). On the other hand, students at newer or satellite institutions may encounter students who are less committed to the student lifestyle, or remain anchored in more educationally heterogeneous social networks. For these reasons, students from more traditional universities, and students completing longer degrees are more likely to form homogamous unions.

Socio-economic outcomes

The third distinction which can be drawn within the highly educated group is the status achieved by students after the completion of their degree. Post-secondary education is often motivated by the higher salary and social standing that graduates achieve, but there is major variation within the status achieved by graduates of different programs (Gerber and Cheung 2008, Prix 2013). These differences in status are likely to have consequences for partnership formation. High income and occupational status have universally been a desired trait in men, and increasingly so in women (Sweeney 2002, Oppenheimer 1988). Highly educated individuals choosing partners are expected to prefer a partner with a higher status, and status is therefore positively associated with educational homogamy. This association can be explained by considering the drivers of homogamy. Graduates with higher social status may have stronger preferences for a similarly high-status partner due to a desire for complementarities in life style and in career ambitions. Additionally, high status graduates are likely to have less social distance to potential highly-educated partners. In terms of exposure, individuals working in high prestige or high earnings occupations (e.g. law, medicine) are more likely to be continuously exposed to potential partners who also hold post-secondary degrees, whether directly or through social networks built up via employment or education.

In this study, I consider two measures of status: earnings potential, a measure of economic status, and occupational prestige, a measure of both economic and social status (Kalmijn 1994). Though these measures are correlated for elite professions, there are many jobs with a mismatch between income and occupational prestige. This is particularly the case for many occupations that began to require a college degree as a consequence of educational expansion—such as teaching or nursing. These occupations tend to be dominated by women, and lead to relatively low levels of pay compared to all university programs, but to average occupational prestige (Magnusson, 2009). Conversely, some graduates may take jobs which have a low level of prestige but lead to a high income. Differentiating between these two measures allows us to distinguish

between the relative importance of economic capital and perceived social standing as characteristics in the partner search.

Based on the discussion of status covariates above, the hypotheses in this study are that for both men and women, the likelihood of homogamy will be positively associated with

1) higher social class background
2) prestigious education – at traditional institutions, or longer length degrees
3) successful outcomes – higher occupational prestige or higher income.

Educational expansion and the partner search process

Educational homogamy among the highly educated was historically constrained by a sex-ratio imbalance: college-educated men outnumbered women in Sweden as in most other countries. However, the process of educational expansion first saw an increasing equality between men and women, followed by a new inequality as women became over-represented in higher education in most developed economies (Charles 2011, Van Bavel 2012). This shift has affected the ability and likelihood of men and women to form homogamous unions. Men from younger cohorts encountered a more favorable sex ratio, making it easier to find a homogamous partner. Additionally, men have become more likely to prefer such a partner, due to greater social emphasis on women's work and their contributions to household income (Sweeney 2002). Women, on the other hand, have experienced an increasingly constrained partner pool, as it has become impossible for all highly educated women to find similar partners. This shift in the sex-ratio in higher education has led to an increased level of educational homogamy, as well an increased rate of female educational hypogamy ('partnering down') in many countries around the world (Blossfeld and Timm 2003, Esteve, Garcia-Roman, Permaneyer 2012, Maenpaa and Jalovaara 2015).

This study examines whether this change in the level of educational homogamy, and the conditions of the partner search, has been accompanied by changes in the

characteristics of those most likely to enter homogamous unions. I examine four cohorts who were educated at different stages of the educational expansion process (born 1940, 1950, 1960, and 1970). In Sweden, a major higher educational reform occurred in 1977, after which women swiftly overtook men (See Appendix 2 for a figure of male and female educational attainment in Sweden). As a result of this reform, new educations were introduced (especially for nursing and teaching, as well as other vocational qualifications), new colleges were opened, and previously vocational schools were upgraded to become colleges. Thus the two older two cohorts in the study were educated and formed their partnerships pre-expansion, during a period of male-dominance in education, while the younger two cohorts did so during a time of female-dominance. I examine whether socio-economic background, educational experience, and socio-economic status have become more or less strongly linked to educational homogamy outcomes for men and women across these four cohorts by considering statistical models which interact cohort with status covariates.

Above, I have argued that some highly educated individuals are more likely to prefer and be preferred by homogamous partners, and that differences in the likelihood for homogamy constitute social boundaries within the highly educated group. Educational expansion has driven changes in the opportunity structure for homogamy for men and women, thus affecting how selective (or not) individuals can be during the partner search process. Studying changes in the strength of these preferences as a consequence of changes in partner availability reveals the relative strength or flexibility of these boundaries. Men have had more ability to choose among highly educated female partners over time. We could thus interpret a positive interaction effect between cohort and status covariates for women as a sign that men have become more discriminating among potential female partners as the partner choice pool has increased. The expectation that such effects exist is plausible following standard conceptions of partnership formation as an outcome of a competitive partner search. However, an emergence within the group would be found only if preferences for highly educated women remained relatively stable over the study period, and men became more selective within the group. The stability of preferences for highly educated women seems unlikely given the changes

in the position of women in the society and the growing importance of female resources for double-income households. Alternatively, if we do not observe an interaction effect we could conclude that the status covariates capture social differences among women that have remained consistent over the time of educational expansion. Thus, while changes over time are important to test, this study has no hypothesis on the interaction between cohort and status covariates.

Data and Method

To analyze how divisions within the educated group are related to patterns of educational homogamy, I use high-quality data from Swedish registers. I use information on the socio-economic class of origin, the length of the academic degree and the type of educational institution attended, and the income and occupational prestige of individuals after graduation, and connect these covariates to the educational homogamy outcome. The analysis is done descriptively, and is supplemented by logistic regression analysis. Below I describe the construction of the sample, the status variables, and the analytical method.

The study population is men and women in Sweden born in the years 1940, 1950, 1960, and 1970. The analysis includes all persons who were born in or immigrated to Sweden prior to age 20, and is restricted to those who received a post-secondary degree prior to the formation of their first childbearing union. This study draws on Swedish register data to identify the cohorts, their educational histories and additional variables, and to link individuals to their partners.

Throughout the text, "partner" is used to refer to the partner with whom an individual had their first child. Individuals are linked to this partner using the intergenerational register, and both the individual's and the partner's education information is taken from the post-secondary education register. This definition of partnership is based both on practical and substantive grounds. There are no records of cohabiting partnerships without children, and thus these partnerships cannot be studied. Childbearing unions instead of marital unions are chosen because marriage in Sweden is not universal, and has changed in meaning quite dramatically for the cohorts in the study.

This definition of partner means that married men and women without children are classified as single throughout the study. Although educational homogamy in second (and higher order) partnerships is of interest, for the sake of simplicity this paper focuses on the first union formed. The time leading up to the formation of the first union is also likely to be the time when educational level is a key factor in the partner search, as individuals have had less time to establish careers and other lifestyle markers compared to unions formed later on.

The socio-economic background for the cohorts in this study is based on the highest status in their parents' household (Erikson 1984). This information is found using quinquennial census data (conducted 1960-1990), and for most individuals in the study this variable reflects their parents' status when they are aged twenty. In cases of missing data class, has been measured between ages ten and thirty. Class is coded directly from occupational and education information for the mother and the father in censuses 1960 and 1970. For later cohorts, class is converted from ISEI (International Socio-Economic Index), which is a variable in the censuses 1980, 1985, and 1990. This study uses the following seven classes following the main distinctions of the Erikson-Goldthorpe class scheme: upper service class, lower service class, routine non-manual workers, small employers and the self-employed, lower grade technicians, skilled working class, and the unskilled working class (Erikson and Goldthorpe 1992). For some individuals, particularly those born in 1940, occupational information for the parents is not available as both parents are listed as outside the labor force. These individuals are included in the study and coded as a separate group.

Educational characteristics of the individuals in the study and their partners refer to the highest education attained prior to the observation of the union formation (the first child). The post-secondary education register includes information on all post-secondary degrees earned after 1962. This register specifies the institution where the degree was earned, and I classify these institutions into "traditional" and "new" (See Appendix 1). The length of a degree program used in the study is based on the number of degree points earned by the program, and is taken from the register, rather than reflecting the number of years each individual attended a study program. The length ranges from two to five years,

with two years typically being shorter vocational programs, four years being degrees that include both a bachelor and a master's, and five years being advanced professional degrees.

The income measure is constructed based on the academic program each person attended, rather than being an individual measure of income. At the individual level, income is variable and is endogenous to union formation and childbearing, and therefore not as reliable of a measure of economic status. Instead, I calculate a measure of the average income earned by full-time employed graduates of each program in each year. I use yearly income data for the entire male and female population of workers aged 30-40, an age where earnings growth stabilizes in Sweden. I link the income information to the educational registers in order to calculate the average income for each major program (e.g. pre-school teacher, architect). The bottom 5% of the distribution in each year is dropped to account for part-time work or incomplete data. The total distribution (together for men and women) of incomes by major is then grouped into quintiles by year (0-20%, 20-40% and so on). Each person's income quintile thus reflects the average income of graduates from their program in the year prior to the birth of their child, compared to the graduates of every other program in that year. This measure captures the average full-time income that is possible for an individual graduating from that program, in comparison to other educations they could have pursued. It is an informative measure because it reflects the relative value of the degree, and the economic returns the person (and their potential partners) can reasonably expect.

The measure of occupational prestige is taken by finding individual occupation codes in the years prior to or immediately following the year of the union formation (birth of the first child). Occupational information is drawn from quinquiennial census data (1960-1990), where the entire population is covered. Thereafter, no occupational information was collected in Sweden until 1994, when the register provides information on all public sector employees and employees of large companies. Smaller companies (fewer than 500 employees) are randomly sampled each year, meaning every person has a reasonable chance of being found in the data. The occupational data is thus complete for all public sector and large-company employees but incomplete for private-sector workers

in smaller companies. Occupational prestige is thus measured for each individual at the time of union formation, rather than as expected occupational prestige based on all workers, which might be biased by this difference in data coverage.

For unions formed before 1994, I find the occupation in the most recent previous census, supplementing with the following census in the case of missing data. For unions formed after 1994, I search the seven years prior to and following the year of union formation for an occupational record. This search method may overestimate occupational prestige for some individuals while underestimating it for others, but this bias is unsystematic. The longer time window provides greater ability to capture occupational prestige for individuals working in smaller, private-sector companies, though coverage in the 1970 cohort is still far from complete. For individuals with multiple records, I take the year closest to the birth of the child, prioritizing years prior to the birth. Occupations in the Swedish registers are coded using a scheme similar to ISCO, and I convert these codes to the SIOPS occupational prestige scale (Ganzeboom, De Graaf, Treiman 1992). This occupational prestige scale in the study population ranges from 13 to 78 (examples of ranking are accountants ranking as 69, sales workers as 31), and aims to capture social stratification for each job, including aspects such as social approval and deference. The occupational prestige scores are then coded into terciles to capture the relative prestige of each individual compared to other graduates in the sample, and to make the results easier to interpret. Because the occupational prestige codes remain stable overtime, the terciles are based on the entire sample, rather than being cohort or period specific. The measure of occupational prestige thus captures the position each individual occupies around the time of union formation.

Table 1 below shows the composition of the study sample with respect to all of the covariates analyzed. In the two earlier cohorts, men outnumber women, but in the last two cohorts, more women than men received a post-secondary degree prior to forming their first childbearing union. Despite emphasis on diversity in socio-economic class background among students, the background of the studied cohorts did not change significantly across time. Individuals from the lower and upper service classes dominate across all cohorts. Some class backgrounds such as small employers/entrepreneurs and

lower grade technicians diminished in representation over time. In terms of degree length, there is great variation both within and across cohorts. Women and men from the 1960 birth cohort were particularly likely to earn two-year degrees, due to the popularity of two-year programs in the 1980s when these cohorts attended university. With regard to university type, the table clearly shows the increasing popularity of the newer institutions. While they were quite insignificant for the 1940 and even 1950 cohort, in the 1970 cohort nearly two thirds of men and more than half of women attended newer institutions.

The two status measures reflect heterogeneity in economic and social status returns to higher education. The differences between men and women in income distribution reflect the gendered trends in program attendance. Women have been clustered in the lowest income quintile (including jobs such as pre-school teachers and nurses). Men have increasingly been graduating from programs leading to jobs in the lower part of the distribution, but in general men are well represented across the distribution and somewhat overrepresented in the upper part. The 1960 cohort appears to be the most polarized, with 44% of men graduating from programs leading to the highest income quintile, and 42% of women in the lowest quintile. Considering the occupational prestige, men and women appear to be quite evenly distributed among the terciles. The number of men in the highest tercile remains relatively stable between the 1940 (24%) and 1970 (26%) cohorts. The trend for women is similar though the share of women in the highest tercile is lower (15% for those born in 1940 and 14% for the 1970 cohort).

The analytical method is descriptive findings, followed by logistic regression analysis. The first set of the results are descriptive and show the changes in distribution of men/women with tertiary education according to their partnership status: no partner (childless by 2012), partner with secondary or less education, and both tertiary. The descriptive results provide a view of the changing outcomes for educated men and women in the partner search process. I show how class background, educational experience, and status outcomes have been related to homogamy outcomes for men and women across the four cohorts. The second stage of the analysis is fitting basic logistic regression models to the homogamy data. Regression models are performed separately for men and women, as they have experienced different trajectories of educational

expansion and different patterns of educational homogamy. The outcome studied using the regression models are a partner with tertiary education (in contrast to a partner with lower education). The models include covariates for the socio-economic class of origin, the length of the study program, the type of institution attended, the income quintile achieved, and the occupational prestige tercile achieved. I present the results of a model which includes all of the covariates. To test the changes in the significance of the status covariates over time, I perform logistic regressions with an interaction term between the cohort and the status variables (results shown in Appendix 3).

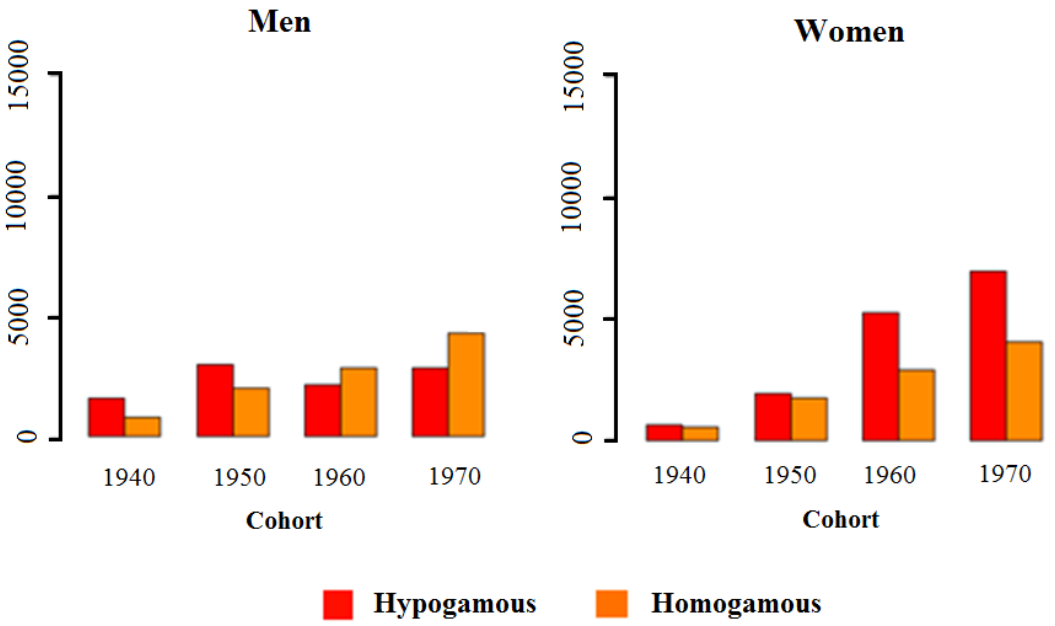
Table 1: Descriptive characteristics of study population

	Men				Women			
Cohort	**1940**	**1950**	**1960**	**1970**	**1940**	**1950**	**1960**	**1970**
N	2165	4512	4614	6249	1057	3376	7962	9915
Socio-economic background								
Upper Service	21%	20%	31%	36%	25%	18%	23%	31%
Lower Service	23%	30%	26%	29%	22%	30%	25%	28%
Route Non-Manual Workers	10%	12%	9%	8%	9%	11%	9%	9%
Small Employers / Entrepreneurs	9%	5%	6%	4%	10%	6%	7%	4%
Lower Grade Technicians	7%	4%	4%	2%	9%	7%	6%	2%
Skilled Working Class	8%	11%	8%	8%	7%	11%	11%	10%
Unskilled Working Class	10%	11%	11%	8%	6%	12%	14%	10%
Not Available	12%	6%	4%	3%	11%	6%	5%	4%
Degree length								
2 years	10%	10%	25%	18%	22%	19%	56%	29%
3 years	51%	45%	30%	32%	64%	57%	28%	43%
4 years	34%	35%	38%	46%	10%	17%	12%	25%
5 years	5%	10%	7%	4%	3%	7%	4%	3%
University type								
Traditional	0%	8%	26%	36%	1%	15%	51%	46%
New	100%	92%	74%	64%	99%	85%	49%	54%
Income quintile (by program)								
1 (lowest)	8%	9%	11%	22%	37%	33%	42%	54%
2	21%	20%	11%	10%	34%	33%	31%	14%
3	19%	25%	13%	12%	16%	15%	8%	6%
4	12%	18%	15%	18%	4%	9%	6%	6%
5 (highest)	39%	26%	44%	29%	10%	9%	11%	13%
missing	0%	2%	5%	8%	0%	1%	3%	6%
SIOPS Tercile								
1 (lowest)	32%	33%	28%	42%	34%	37%	29%	34%
2	42%	37%	35%	14%	51%	30%	31%	37%
3 (highest)	24%	28%	21%	26%	15%	31%	27%	14%
missing	2%	3%	16%	18%	1%	3%	13%	15%

Results

I begin by presenting the differences in patterns of homogamy across cohorts, and the differences in homogamy across the different sub-groups. I then continue by presenting the results of the logistic regression model which further confirms the relevance of the different factors for the homogamy outcome. Figure 1 below shows the basic trend in homogamy for men and women over time. Among men, the share in educationally homogamous unions has increased. In the 1940 and 1950 cohorts, the majority of men with a post-secondary education had a partner with lower education. This pattern reversed for the 1960 cohort and among the 1970 cohort, a clear majority of men are in a homogamous union, as would be expected by the greater availability of educated female partners. Among women, the trend has been different. Even among the earliest cohorts, the number of women in a hypogamous union is greater than the number of women in a homogamous union. Over time, this disparity has become ever greater, and in the 1970 cohort, a majority are partnered with a man who has lower education. While the absolute number of women in homogamous unions has grown over time, there is a clear trend for women to partner down educationally. This trend is a consequence of the gender gap in post-secondary education.

Figure 1: Number of men and women by cohort and by union type



To understand the differences within the educated group, I present figures showing the share of men and women in an educationally homogamous union, by cohort and according to the differences in background, experience, and achieved status. The following figure shows the trends in homogamy according to social class of origin. The social class of origin has here been condensed into three groups (non-manual workers, farmers/self-employed, and manual workers) for clarity. The overall levels for all groups reflect the cohort trends: men of all classes are more likely to enter in a homogamous union and women of all classes are less likely to enter a homogamous union over the cohorts. There is also a clear and stable advantage for men and women coming from non-manual worker backgrounds. Among women those coming from households of manual workers are less likely to be in homogamous unions than those coming from farmer/self-employed households, a trend which is not as stable for men.

Figure 2: Percentage of men and women in educationally homogamous union, by cohort and social class of origin.

Continuing to educational experience, the figures below present trends of homogamy broken down by the length of the degree and the institutional type. Degree length (Figure 3) shows a strong correlation with the likelihood of homogamy, and there is a clear positive gradient in the percentage of men and women in educationally homogamous unions over all cohorts; the one exception being men from the 1940 cohort. The gradient is much steeper for women than for men, but in general, graduates of longer degree programs are much more likely to be in a homogamous union. For institutional type (Figure 4), we see differences for men and women. For women, starting already with the 1950 cohort, a clear difference emerges between those who attended newer and traditional institutions. Graduates of traditional institutions are significantly more likely be in educationally homogamous unions. Once this trend emerges, there does not appear to be any significant change over time. Among men, thre is a difference in the 1960 and 1970 cohort, but the pattern is much less stable. Only for the 1960 cohort of men is the difference in levels of homogamy for graduates of new and traditional universities as significant as it is for women.

Figure 3: Percentage of men and women in educationally homogamous union, by cohort and length of degree achieved.

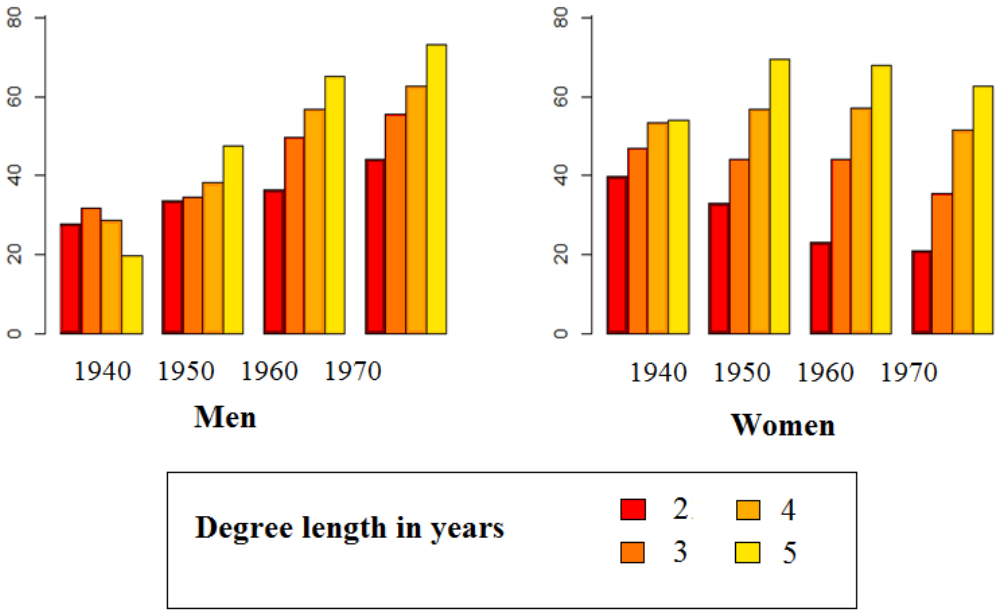
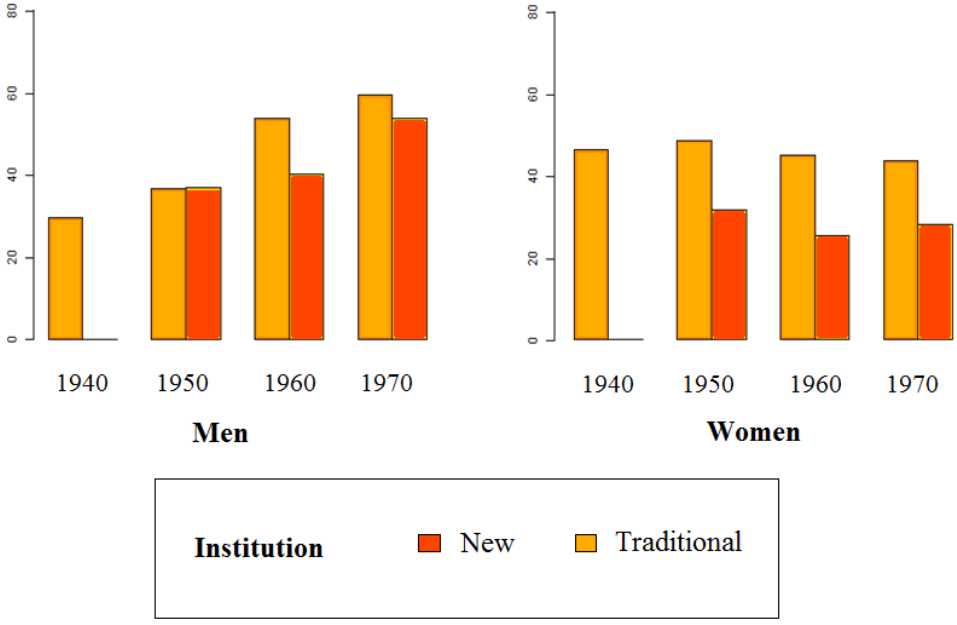
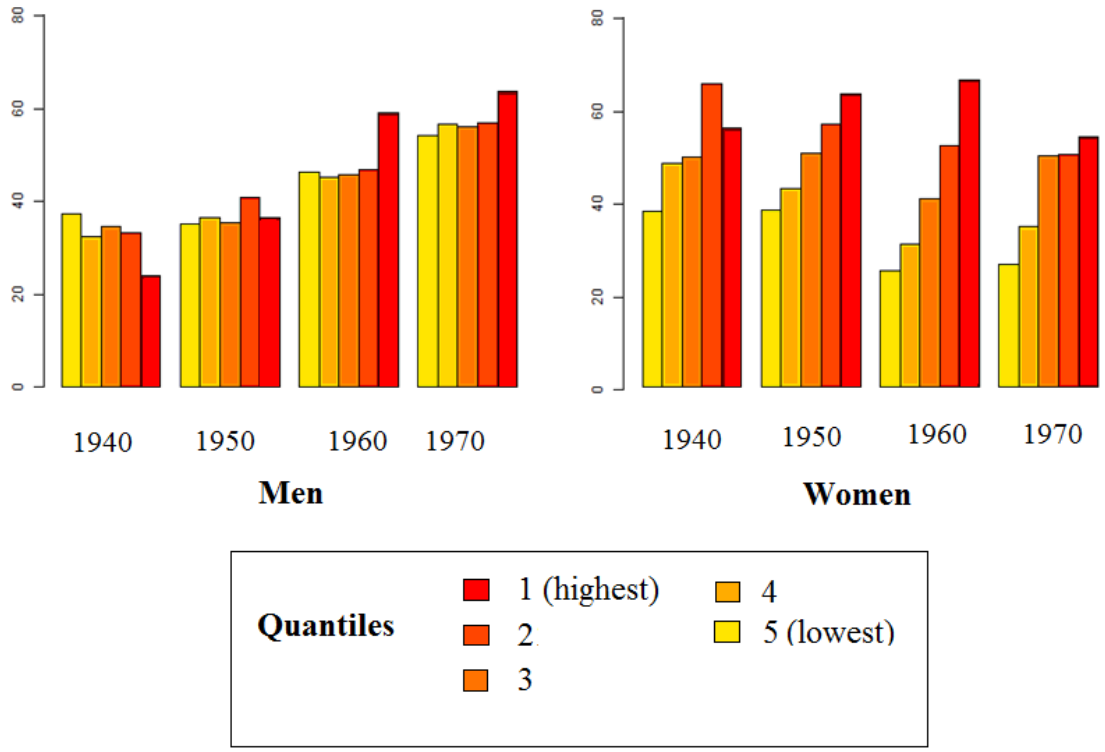


Figure 4: Percentage of men and women in educationally homogamous union, by cohort and type of educational institution attended.



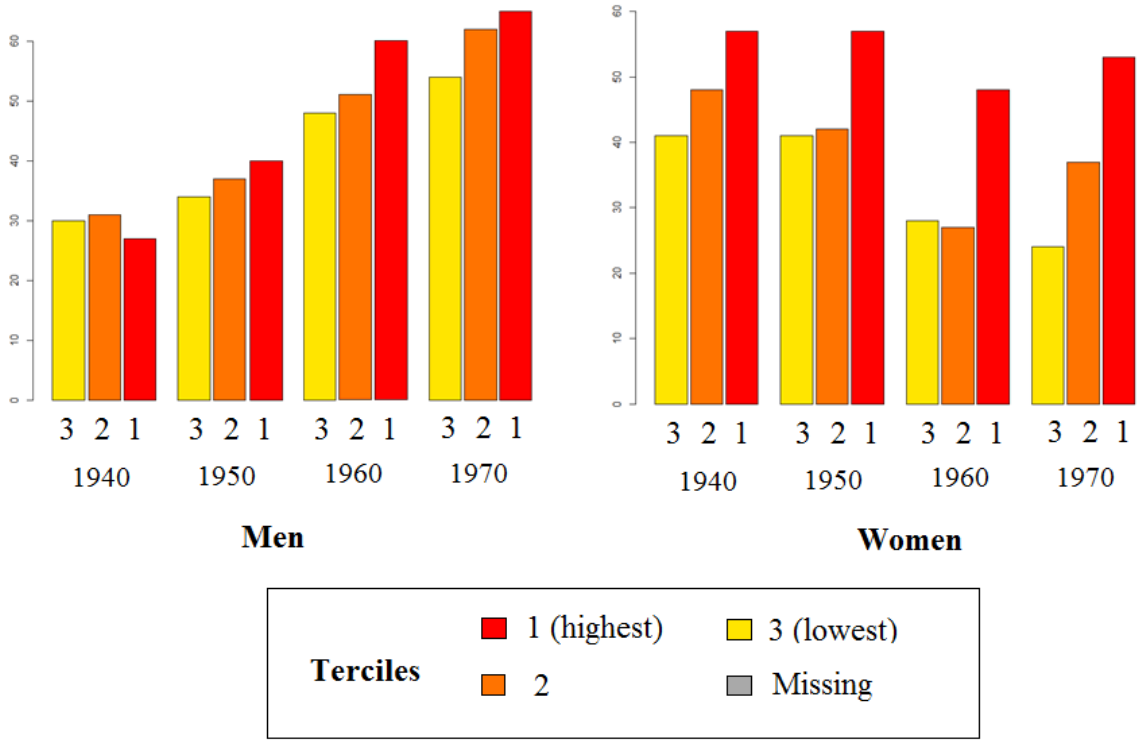
The last descriptive results show the levels of homogamy based on socio-economic status outcomes. Figure 5 shows the trends based on income quantiles. As described above, these income variables capture the average earnings that can be expected for each man and woman's academic degree, based on full-time earnings of men and women aged 30-40. The patterns for income and homogamy among men and women are different and develop differently over time. For men, in the 1940 cohort there is a positive gradient in income and homogamy. In the 1950 cohort, the gradient is almost flat, and continues to be flat for the 1960 and 1970 cohorts with the exception of a significantly higher tendency for homogamy among men in the highest quantile. For women, there is a positive gradient between income and homogamy, and this gradient is quite stable over time. In the 1970 cohort, women in the highest income quantile have a lower advantage over the other quantiles compared to other cohorts, but overall the gradient is very stable across the cohorts.

Figure 5: Percentage of men and women in educationally homogamous union, by cohort and income quantile.



Continuing to the results for occupational prestige, Figure 6 shows the trends for men and women. For men, across all cohorts the propensity for homogamy increases across the cohorts, and in the later three cohorts there is a positive gradient in occupational prestige and the occurrence of homogamy. Among the 1940 cohort of men however, the men with the highest occupational prestige are actually slightly less likely to be in a homogamous union than those with lower educational prestige. Among women, a positive gradient is present across all four cohorts, and in particular the group with the highest occupational prestige has a consistent and much higher occurrence of educational homogamy compared to the other groups. Women from cohorts 1960 and 1970 who are in the lowest two terciles of the occupational prestige distribution are less commonly in a homogamous union than women from the same position in the distribution from the 1940 and 1950 cohorts.

Figure 6: Percentage of men and women in educationally homogamous union, by cohort and occupational prestige tercile.



The descriptive results show that the divisions within the educated group are linked strongly to the homogamy outcome. The following table shows the results of the logistic regression analysis which further explores the relationship between the likelihood of an educational homogamous union for individuals based on the covariates discussed above. The odds ratios from the model largely represent the descriptive trends shown above. In terms of the cohort, men's likelihood to enter a homogamous union has increased dramatically over time, while the likelihood for women born in 1950 was not statistically significant from those born in 1940. For women born in 1960 and 1970, the likelihood of a homogamous union was significantly lower than for those from older cohorts.

For social class of origin, men and women from the upper service class (the reference category) have a significantly higher likelihood of being in a homogamous union, followed by men and women from the lower service class, and then followed by all other classes. For the degree length, results are similar for men and women, and there is a clear positive gradient in the association between the length of the degree and the homogamous union outcome. For university type, there is a large difference for women in the institution type and the likelihood of homogamy, but no significant difference for men. Results for socio-economic status outcomes also differ for men and women. For both income and occupational prestige, there is a significant and strong positive gradient between status and the likelihood of homogamy for women. For men, there is no pattern for income, and the only significant result is that men in the lowest tercile of the occupational prestige distribution have a significantly lower likelihood of entering a homogamous union.

Table 2: Logistic regression output: outcome "highly educated partner"

	Men	*95 CI*		**Women**	*95 CI*	
Cohort						
1940	Ref (1.00)			Ref (1.00)		
1950	1.36	1.21	1.52	0.94	0.82	1.09
1960	2.70	2.41	3.03	0.75	0.66	0.87
1970	3.50	3.12	3.93	0.65	0.57	0.75
Family SES						
Upper service class	Ref (1.00)			Ref (1.00)		
Lower service class	0.84	0.77	0.91	0.82	0.76	0.88
Routine non-manual workers	0.80	0.71	0.89	0.76	0.68	0.85
Small employers / self-employed	0.74	0.64	0.85	0.77	0.68	0.88
Lower grade technicians	0.88	0.74	1.04	0.74	0.64	0.86
Skilled working class	0.76	0.68	0.86	0.71	0.63	0.79
Unskilled working class	0.79	0.71	0.89	0.64	0.58	0.71
Missing	0.76	0.66	0.89	0.81	0.71	0.93
Degree length						
2 years	0.65	0.59	0.72	0.58	0.54	0.63
3 years	Ref (1.00)			Ref (1.00)		
4 years	1.21	1.12	1.31	1.45	1.33	1.57
5 years	1.62	1.40	1.88	1.76	1.50	2.06
University type						
Traditional	Ref (1.00)			Ref (1.00)		
New	0.97	0.89	1.06	0.77	0.71	0.82
Income (quantile)						
5 (lowest)	0.94	0.85	1.04	0.77	0.69	0.86
4	0.93	0.84	1.04	0.84	0.75	0.93
3	Ref (1.00)			Ref (1.00)		
2	1.01	0.91	1.13	1.12	0.97	1.29
1 (highest)	0.95	0.84	1.06	1.22	1.08	1.38
Missing	0.90	0.77	1.06	0.92	0.77	1.08
Occupational prestige (tercile)						
3 (lowest)	0.86	0.79	0.93	0.84	0.78	0.91
2	Ref (1.00)			Ref (1.00)		
1 (highest)	1.01	0.92	1.11	1.24	1.14	1.34
Missing	0.94	0.84	1.06	1.15	1.04	1.27
Intercept	0.52	0.45	0.60	1.34	1.14	1.57

The results of the logistic regression thus show that patterns are similar for men and women in terms of background and educational experience, but that post-education status variables are much more strongly correlated with homogamy for women than they are for men. Additionally, as is to be expected, the likelihood for women to enter a homogamous union has declined, while for men it has risen dramatically across the cohorts. To test for the changing relationship between the status covariates and the homogamy outcome over time, I conducted additional analyses including interaction effects between cohort and the status covariates. The results of likelihood-ratio tests comparing the models with interactions to the standard model are shown in Table 3. For women, there is not a statistically better fit when the models include an interaction variable. However, for men, models including interactions between cohort and status covariates produce a statistically better fit for all covariates except occupational prestige. A full model showing the coefficients for the full model which includes interactions between all status variables and birth cohort is presented in Appendix 3. The results of the interaction analysis show that among later cohorts compared to the 1940 cohort, the likelihood of partnering homogamously has become higher for men who have five year degrees and degrees which lead to the highest incomes, as well as men coming from lower service class (II) or unskilled worker class (VI) households. These results suggest that there has been increasing stratification among men along some dimensions over the period of educational expansion—though this has not been the case for women.

Table 3: Results of likelihood-ratio tests of the interactions between birth cohort (dummy specification) and specified status covariates for men and women.

	Men		Women	
	LR Chi-squared	Pr > ChiSq	LR Chi-squared	Pr > ChiSq
Model 1: socio-economic background (ΔDF 21)	48.69	0.000	16.9	0.710
Model 2: institution type (ΔDF 3)	14.35	0.003	3.34	0.342
Model 3: length of degree (ΔDF 9)	51.68	0.000	17.93	0.036
Model 4: projected income (ΔDF 15)	46.61	0.000	17.9	0.211
Model 5: occupational prestige (ΔDF 9)	13.22	0.153	8.9	0.447
Model 6: all covariates included in M1-M5 (ΔDF 57)	144.94	0.000	63.69	0.224

Discussion

Over the last decades systems of higher education have expanded around the world, and women have gone from being a minority to a majority among the highly educated. The expansion of higher education has led to a greater heterogeneity in the highly educated group with regards to patterns of partnership formation and socio-economic outcomes (Gerber and Cheung 2008, Musick, Brand and Davis 2012). This study contributes to our understanding of stratification within the highly educated group by examining the variation in homogamy within the educated group. Using Swedish

register data which provides information on the education and partner history for the entire population, I analyzed homogamy in childbearing partnerships formed by highly educated men and women born in 1940, 1950, 1960, and 1970. Among the earlier two cohorts, men outnumbered women in higher education. This balance was reversed in the latter two cohorts as Swedish women overtook men in terms of educational attainment.

Educational homogamy is driven by greater exposure to equally educated partners, and by stronger preferences for, and the ability to attract those partners (Schwartz 2013). In this study I have argued that systematic differences exist within the highly educated group, which are related to these drivers of homogamy. The three dimensions of difference examined in the study are socio-economic background, educational experience, and socio-economic outcomes of graduates. The results of the logistic regression analysis found that social class background and educational experience are associated with differences in partnership outcomes for both men and women. Higher class background, longer duration of study, and attendance of traditional universities (particularly for women) are associated with a higher likelihood of forming a union with a highly educated partner. In terms of socio-economic outcomes, income and occupational prestige are strongly linked to forming a homogamous partnership for women, but not for men.

The importance of the educational experience for the homogamy outcomes of men and women is an important finding in light of the increasing diversity in post-secondary experiences. Given that finding a homogamous partner can be interpreted as a sign of greater social belonging to the highly educated group, it is reasonable that the educational experience itself is an important factor for this outcome. It is possible that longer degrees and attendance at traditional universities attract students who are most interested in developing their intellectual and cultural identity as students, and who would be most interested in finding a similar partner. These results may also mean that higher education is a more transformative experience which leaves the individual with stronger preferences for a similar partner, and a way of thinking and being that makes the formation of such a union more likely. This result might be possible to interpret with additional research on the differences between students who choose to attend—and/or are

accepted to attend—programs and universities of different levels of competition and prestige.

The strong association between women's occupational prestige and income for the homogamy outcome—but the lack of such an association for men—are striking. Although recent research has argued for the increasing importance of women's employment and income as an asset in the partner search process (Sweeney 2002), it is surprising that socio-economic resources are more strongly associated with women's partnership outcomes than men's. A plausible explanation for the results found for women is related to social norms on partner selection which discourage women from 'partnering down'. Women with high income and high status careers may experience a larger social distance to men with lower education, and may have a stronger preference for, and motivation to find, a partner who is their social equal. An additional explanation could be that women compete for scarce highly educated men, and that socio-economic resources are an asset in this competition. However, the lack of significant interaction effects between cohort and income/SIOPS, as well as the results of the interaction analysis (see Appendix 3) suggest that the relationship has not become stronger as educated men have become relatively scarce. It is also counter-intuitive that high status does not seem to be associated with homogamy among highly-educated men, given the traditional emphasis on socio-economic resources as a factor in women's partner choice. The results suggest that men with higher education are attractive partners to highly educated women, regardless of their income or occupational status. It thus seems that the achievement of education itself is a valuable resource for men. Higher education can be a desired partner characteristic insofar as it captures an intellectual orientation. Education is also a time for the formation of social networks which lead to future partnerships. Perhaps men are more likely to form such networks regardless of their eventual socio-economic status, leading to a weak association between status and homogamy.

Likewise, the results of the models testing interaction between birth cohort and status covariates are counter-intuitive to the trends observed in the partner market. As the number of potential highly educated partners has decreased for women and increased for men, we might expect that greater differences would emerge among highly educated

women. Instead, we find that there is no significant interaction between cohort and status covariates for women. This result implies that for women, the divisions within the highly educated group map onto social divisions which have not changed over time. Women from higher class backgrounds, with more prestigious educations and careers seem to have had a stronger preference or ability to form a homogamous union regardless of the level of competition for highly educated partners. For men, some interactions are significant, and status variables have become more strongly correlated with homogamy outcomes across cohorts. This finding could be a consequence of the greater availability of female partners in elite educational programs (those which are five years in length and lead to the highest incomes).

The findings of this study have implications beyond understanding stratification among the highly educated in Sweden. The strategies for educational expansion—the pacing of the expansion, the types of new institutions opened and educations upgraded to tertiary status, the changes in the composition of the student body—vary across countries. However, drivers of educational homogamy appear to function in a generally similar way across different countries and educational contexts (Blossfeld and Timm 2003, Schwartz 2013). Thus while the nature of differences between students probably varies across countries, the broad categories of difference identified in this study (social origin, educational experience, post-graduation outcomes) are likely to be related to differences in partnership outcomes, and to be useful for understanding stratification within the highly educated group.

Although this study includes four different cohorts, I do not study changes in the composition of the different sub-populations as a consequence of educational expansion. Changes over time in homogamy are a product of both changes in the composition of the highly educated group, and in the behaviors of the different sub-groups. The design of this study does not, however, explicitly measure changes in the composition of the group, or attempt to measure changes in the preferences of men or women for homogamous partnerships. Rather, this study contributes a theoretical explanation of how differences in homogamy within the group can be understood. Some researchers have considered how changes in the composition of the partner market lead to changes in preferences for

partners (Grow and Van Bavel, 2015), but much work remains to be done to disentangle the effects of changing opportunity and preference structures.

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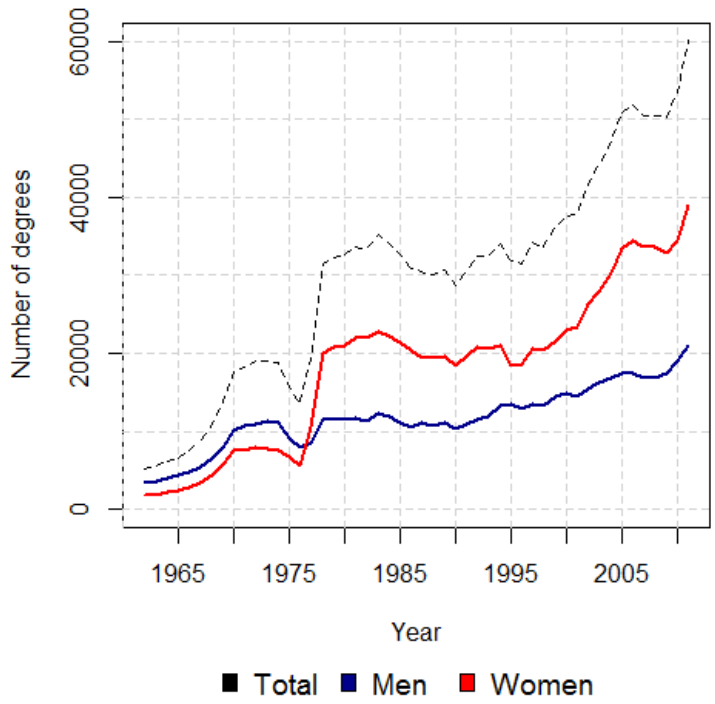
Appendix 1: Post-secondary institutions classified as “traditional”

Chalmers tekniska högskola
Göteborgs universitet
Handelshögskolan i Stockholm
Karolinska institutet
Kungliga Tekniska högskolan
Lärarhögskolan i Stockholm
Linköpings universitet
Lunds universitet
Stockholms universitet
Sveriges lantbruksuniversitet
Umeå universitet
Uppsala universitet

Appendix 2: Post-secondary educational attainment for men and women in Sweden over time



Appendix 3: Results of logistic regression model with interaction effects between birth cohort and status covariates for men and women.

	MEN			WOMEN		
Covariate	OR	95% CI		OR	95% CI	
Cohort						
1940	ref					
1950	0.908	0.639	1.290	1.312	0.820	2.099
1960	1.986	1.376	2.866	0.805	0.516	1.258
1970	2.193	1.514	3.176	0.819	0.532	1.260
Social Class Background						
1	ref			ref		
2	0.637	0.482	0.840	0.765	0.535	1.093
3	0.691	0.485	0.985	0.780	0.486	1.250
4	0.612	0.417	0.897	0.762	0.478	1.214
5	0.759	0.510	1.129	0.610	0.376	0.989
6	0.315	0.203	0.490	0.660	0.381	1.144
7	0.660	0.463	0.942	0.563	0.322	0.984
10	0.752	0.542	1.042	0.728	0.468	1.133
University Type						
Traditional	ref			ref		
New	0.512	0.106	2.462	0.575	0.107	3.091
Degree length						
2	0.907	0.610	1.351	0.718	0.504	1.024
3	ref			ref		
4	1.148	0.886	1.487	1.278	0.790	2.065
5	0.756	0.422	1.356	0.831	0.342	2.020
Income Quintile						
1 (lowest)	0.956	0.656	1.394	0.954	0.629	1.445
2	1.033	0.777	1.373	1.128	0.773	1.647

3		ref			ref		
4		0.785	0.537	1.147	1.904	0.859	4.223
5 (highest)		0.583	0.424	0.801	1.358	0.719	2.564
missing		4.121	0.365	46.532	0.837	0.663	1.057
Occupational Prestige							
1		1.050	0.833	1.324	0.859	0.619	1.191
2		ref			ref		
3		1.057	0.789	1.415	1.279	0.813	2.014
missing		1.030	0.554	1.915	0.517	0.125	2.146
Interaction: Cohort and Social Class							
1950	2	1.399	1.007	1.943	0.943	0.623	1.427
1950	3	1.126	0.741	1.712	0.930	0.540	1.602
1950	4	1.373	0.846	2.229	0.870	0.492	1.541
1950	5	1.033	0.617	1.729	1.018	0.572	1.812
1950	6	2.697	1.643	4.429	0.925	0.499	1.713
1950	7	1.376	0.903	2.097	0.934	0.503	1.735
1950	missing	1.333	0.866	2.051	0.885	0.511	1.533
1960	2	1.347	0.979	1.853	1.142	0.778	1.676
1960	3	1.263	0.831	1.920	0.959	0.576	1.597
1960	4	1.334	0.835	2.129	1.248	0.749	2.079
1960	5	1.019	0.610	1.701	1.466	0.858	2.505
1960	6	2.508	1.522	4.132	1.140	0.637	2.039
1960	7	1.044	0.691	1.577	1.253	0.699	2.246
1960	missing	0.806	0.516	1.259	1.111	0.673	1.832
1970	2	1.378	1.015	1.871	1.072	0.737	1.558
1970	3	1.191	0.794	1.785	0.986	0.598	1.625
1970	4	1.067	0.670	1.699	0.835	0.497	1.403
1970	5	1.970	1.104	3.517	1.114	0.631	1.968
1970	6	2.843	1.755	4.605	1.103	0.621	1.957
1970	7	1.367	0.911	2.052	1.179	0.659	2.108
1970	missing	0.872	0.564	1.347	1.282	0.784	2.096

Interaction: Cohort and University Type							
1950	New	2.297	0.468	11.259	1.149	0.211	6.261
1960	New	1.719	0.354	8.340	1.318	0.244	7.113
1970	new	2.080	0.430	10.052	1.443	0.268	7.775
Interaction: Cohort and Degree length							
1950	2	1.002	0.632	1.588	0.842	0.559	1.268
1950	4	1.099	0.808	1.494	1.015	0.599	1.719
1950	5	2.591	1.367	4.911	1.652	0.630	4.332
1960	2	0.639	0.413	0.990	0.702	0.481	1.026
1960	4	1.118	0.827	1.512	1.078	0.650	1.790
1960	5	2.213	1.162	4.214	2.244	0.888	5.672
1970	2	0.732	0.478	1.122	0.872	0.599	1.270
1970	4	1.062	0.795	1.420	1.227	0.749	2.009
1970	5	2.916	1.493	5.693	2.415	0.957	6.096
Interaction: Cohort and Income quintile							
1950	0	0.231	0.019	2.755	0.596	0.302	1.174
1950	1	0.961	0.610	1.513	0.802	0.499	1.290
1950	2	0.974	0.694	1.368	0.684	0.442	1.059
1950	4	1.173	0.762	1.806	0.533	0.226	1.256
1950	5	1.425	0.977	2.076	0.880	0.430	1.804
1960	0	0.219	0.019	2.521	1.255	0.843	1.868
1960	1	1.147	0.732	1.798	0.937	0.592	1.483
1960	2	0.885	0.607	1.289	0.825	0.541	1.260
1960	4	1.165	0.749	1.812	0.709	0.307	1.634
1960	5	1.584	1.084	2.314	1.036	0.529	2.030
1970	0	0.232	0.020	2.649	1.000		
1970	1	0.996	0.654	1.516	0.713	0.453	1.121
1970	2	1.013	0.708	1.449	0.657	0.428	1.007
1970	4	1.295	0.847	1.979	0.495	0.216	1.133
1970	5	2.047	1.418	2.953	0.785	0.403	1.527

Interaction: Cohort and Occupational prestige tercile							
1950	1	0.792	0.601	1.045	1.054	0.726	1.531
1950	3	0.896	0.639	1.258	1.055	0.642	1.731
1950	4	1.230	0.602	2.513	1.729	0.387	7.718
1960	1	0.890	0.674	1.174	1.040	0.728	1.484
1960	3	0.992	0.704	1.398	0.906	0.562	1.459
1960	4	0.898	0.471	1.713	2.196	0.524	9.206
1970	1	0.763	0.575	1.013	0.890	0.630	1.259
1970	3	0.951	0.676	1.338	0.959	0.596	1.542
1970	4	0.877	0.459	1.676	2.243	0.537	9.365
Intercept		0.719	0.537	0.963	1.134	0.771	1.667