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**UNIVERSITÄT  
BERN**

Faculty of Business, Economics and  
Social Sciences

**Department of Social Sciences**

University of Bern Social Sciences Working Paper No. 25

# **Educational expansion and homogamy. An analysis of the consequences of educational upgrading for assortative mating in Switzerland**

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December 23, 2016

<http://ideas.repec.org/p/bss/wpaper/25.html>  
<http://econpapers.repec.org/paper/bsswpaper/25.htm>

## Educational expansion and homogamy

An analysis of the consequences of educational upgrading for assortative mating in  
Switzerland

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Zusammenfassung: Bildungsexpansion und Homogamie. Eine Analyse der Auswirkungen von Höherqualifikation auf Partnerwahl in der Schweiz

Für die Schweiz wird untersucht, wie sich der Zusammenhang zwischen Bildung und Partnerwahl zwischen 1970 und 2000 im Zuge der Bildungsexpansion gewandelt hat. Im Vordergrund steht die Frage, ob mit der Bildungsexpansion eine Öffnung der Heiratschancen einherging oder ob die Bedeutung des Bildungssystems für den Partnermarkt eher zugenommen hat. Für die differenzierte Beschreibung im Kohortendesign standen Volkszählungsdaten zur Verfügung. Im Zeitverlauf hat der Anteil Personen, die ohne Partner leben, zugenommen, zwischen den Bildungsschichten fand in Bezug auf Partnerlosigkeit jedoch eine gewisse Angleichung statt. Gleichzeitig beobachten wir relativ stabile Verhältnisse bezüglich der Gesamtrate an bildungshomogamen Partnerschaften, obwohl sich aufgeschlüsselt nach Bildungsniveaus unterschiedliche Trends ergeben: Die Bildungsexpansion hat einerseits zur vermehrten Heterogamie in den unteren Bildungsgruppen beigetragen, während in den mittleren und höheren Bildungsgruppen zunehmende Homogamie zu beobachten ist. In einer um die Gelegenheitsstruktur bereinigten Betrachtungsweise zeigt sich allerdings, dass die Neigung für Homogamie in den unteren Bildungsgruppen ausgeprägter ist als in den höheren und vor allem den mittleren Bildungsgruppen. In diesem Sinne kann von einer Polarisierung des Partnermarktes mit einer stärkeren Schliessung am unteren Ende der Bildungsskala und einer relativen Offenheit in den mittleren Bildungsschichten gesprochen werden, wobei das Ausmass an Polarisierung im Zuge der Bildungsexpansion eher etwas abgenommen hat.

Schlüsselwörter: Bildungsexpansion, Bildungshomogamie, Volkszählung, Kohortenanalyse, soziale Ungleichheit, Partnerlosigkeit

Abstract: Educational expansion and homogamy. An analysis of the consequences of educational upgrading for assortative mating in Switzerland

We analyze the changing relationship between education and assortative mating over the course of educational expansion in Switzerland between 1970 and 2000. The main question is whether educational expansion has resulted in increased openness of partnership opportunities or whether the educational system became increasingly important for assortative mating. Census data is used to describe this social change employing a cohort design. Over time and across cohorts, the proportion of people who live without a partner has increased, but the educational classes became more similar with respect to partnerlessness. At the same time, overall educational homogamy of partnerships has remained rather stable, although there were different trends for each of the educational levels. Educational expansion has contributed to increasing heterogamy for less educated and untrained persons while homogamy has increased for persons achieving intermediate and higher levels of education. However, after taking opportunity structure into account, the inclination for educational homogamy is actually more pronounced in the lower educational groups than in the higher and, in particular, the intermediate educational groups. In this respect, one can speak of a polarization of assortative mating with social closure at the lower end of the educational scale and relative openness for intermediate educational classes. This polarization, however, declined somewhat in the course of educational expansion.

Keywords: Educational expansion, educational homogamy, census, cohort analysis, social stratification, partnerlessness

Résumé: Expansion du système de formation et homogamie – analyse de l'impact des qualifications supérieures sur le choix du partenaire en Suisse

Dans le cas de la Suisse, il s'agit d'analyser l'évolution du lien entre formation et choix du partenaire entre 1970 et 2000 au cours de l'expansion du système de formation. La principale question est de savoir si l'expansion du système de formation a entraîné une augmentation des opportunités de mariage ou si le système éducatif a plutôt gagné en importance dans le choix du partenaire. La description différenciée par cohortes se base sur des données issues de recensements de la population. Au cours de la période susmentionnée, le nombre de personnes vivant sans partenaire a augmenté. Toutefois, l'écart entre les différents niveaux d'éducation s'est nettement réduit en ce qui concerne le nombre de personnes vivant sans partenaire. Parallèlement, nous observons un taux plutôt stable de partenariats caractérisés par une homogamie de formation, bien qu'une répartition par niveau de

formation révèle différentes tendances : l'expansion du système de formation a, d'une part, entraîné une plus grande hétérogamie dans les groupes au niveau de formation inférieur et, d'autre part, une plus grande homogamie dans les groupes au niveau de formation moyen et élevé. Après une prise en compte des opportunités différentielles, nous observons toutefois que le penchant pour l'homogamie est plus fort dans les groupes au niveau de formation inférieur que dans ceux au niveau de formation moyen et élevé. Nous pouvons donc parler d'une polarisation du marché de la recherche de partenaire avec une plus grande fermeture sociale pour les groupes au niveau de formation inférieur et une relative ouverture pour les groupes au niveau de formation moyen. Cette polarisation a toutefois plutôt diminué au cours de l'expansion du système de formation.

Mots-clés : expansion du système de formation, homogamie de formation, recensement de la population, analyse par cohortes, inégalité sociale, absence de partenaire

## 1. Introduction

Over the course of the educational expansion since the middle of the 20<sup>th</sup> century many societies experienced far-reaching changes in social structure (Hadjar & Becker 2011, 2009, 2006), particularly with respect to educational behavior (Huinink 2000; Müller 1998). Across cohorts, increased participation in continuing and higher education and longer stays in the educational system led not only to a gradually increasing level of qualification in the population (Breen et al. 2012, 2010, 2009), but also to different educational opportunities and career and lifestyle choices (Mayer & Blossfeld 1990) such as the postponement of marriage and family formation (Blossfeld & Huninik 1991; Diekmann 1990), changes in opportunities in the partnership and marriage market (Blossfeld 2009; Schwartz & Mare 2012), increased partnerlessness and childlessness (Konietzka & Kreyenfeld 2014; Huinink 2000), and socio-structural changes in marital stability (Diekmann & Schmidheiny 2001; Klein & Kopp 1999). Educational expansion has impacted the frequency, structure, and timing of these life events (Mayer 1996; Mayer & Blossfeld 1990).

Switzerland may be a special case in terms of the expected and unexpected consequences of educational expansion for demographic processes given the peculiarities of the course of educational expansion (Becker & Zangger 2013) and the specific social structures and inequalities (Jann & Combet 2012) in Switzerland. On the one hand, educational expansion was slower in Switzerland than in other Western European countries (Becker & Zangger 2013; Hadjar & Berger 2010; Pfeffer 2008; Buchmann et al. 2007; Stamm & Lamprecht 2005; Buchmann & Charles 1993; Blossfeld & Shavit 1993). With educational expansion, social inequality of educational opportunities was marginally reduced in Switzerland (Becker & Zangger 2013) compared with other Western European countries (Breen et al. 2012, 2010) and the intergenerational transmission of educational attainment and class decreased slightly (Jann & Combet 2012). Nevertheless, largely, educational reproduction (Zangger & Becker 2016) and social mobility have been stable (Falcon 2016). Furthermore, although female labor force participation increased over the course of the educational expansion and the tertiarization of the occupational and economic structure, a gendered division of labor continues to prevail in private households, which has been described as “modernized traditionalism” (Levy 2013: 236).

On the other hand, there are no reliable findings for Switzerland as to whether educational expansion was associated with an increased importance of the educational system in the partnership and marriage market, as was found for other Western European countries (see Schwartz & Mare 2012; Blossfeld 2009; Blossfeld & Timm 2003). There are a few cross-sectional studies available for Switzerland that report a distinctively pronounced educational homogamy (Katrnak et al. 2012; Domanski & Przybysz 2007; Smits et al. 1998).<sup>1</sup> However, these analyses consider neither the changes in marriage patterns nor the consequences of educational expansion for the choice of a partner and for marriage behavior in the Swiss population.

Changes in partnership search and marriage opportunities can be expected because women were disproportionately impacted by the educational expansion. In terms of the acquisition of higher education women have not only caught up with men (Zangger & Becker 2016), but in fact overtaken them (Imdorf & Hupka-Brunner 2015; Becker et al. 2013). Given the sporadic analyses for Switzerland, it remains unclear whether the gender-specific educational upgrading in general and the reversal of gender-specific educational chances and the changed

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<sup>1</sup> “Educational homogamy” or “homogamy” refers to the fact that individuals with a certain educational level marry partners with the same educational level. The choice of a partner with a different educational level is called “heterogamy”. “Hypergamy” is present if a woman marries a man with a higher education, while “hypogamy” means that a woman marries a man with a lower educational level.

work behavior of women on the job market in particular lead to changes in education-specific marriage patterns, for example, due to increased bargaining power of women (Schwartz & Han 2014). While in the past parents invested in the education of their daughters in order to prepare them for the marriage market (Breen & Goldthorpe 1997), following educational expansion it might be that women invest more in their education to further their careers (Imdorf & Hupka-Brunner 2015: 261), to foster economic independence in case of separation, divorce, or widowhood, and to optimize the compatibility of family and work (Levy 2013) or, more generally, to be able to shape their lives independently of a partner (see Becker 2014; DiPrete & Buchmann 2013).

Answers to these questions are interesting from a socio-structural point of view because the extent of educational homogamy as well as the structural change of educational heterogamy in the course of educational expansion provide additional information about the reproduction of social inequality (Blossfeld 2009; Mare 1991). Such indicators can be interpreted as evidence for the openness of the social structure of a society (Blau et al. 1982).<sup>2</sup> In the same way as the educational expansion occurred through birth cohorts, better educated women and men may be the cultural bearers of the changes in partnership markets and the social structure of education-specific marriages and, concomitantly, of changes in the openness of societies. Since particularly women – in spite of the continued horizontal segregation of educational opportunities and benefits by gender (Imdorf & Hupka-Brunner 2015) – profited from the educational expansion in Switzerland, the rate of educational homogamy probably increased – more for women than for men – because of the shift of their negotiating power on the partnership and marriage market (Diekmann 1990). Tertiary vocational and especially university education may be an important asset on a partnership market that is structured increasingly by the educational system. However, whether the educational expansion in Switzerland (where the educational system is characterized by a high degree of stratification and segmentation) led to social closure or opening of the partnership and marriage markets, is a question that has yet to be answered empirically (see Blossfeld 2009).

The objective of the present contribution is therefore to describe the changes in educational homogamy across birth cohorts over the course of the educational expansion in the second half of the 20<sup>th</sup> century. The socio-historical process of educational expansion and changing educational homogamy is illustrated using a cohort design based on data from the Swiss censuses of 1970, 1980, 1990 and 2000. Indirectly, the idea is to answer whether the educational system has gained in importance as a partnership market in Switzerland and to identify the extent to which educational upgrading led to social closure or opening in assortative mating. Finally, we are interested in whether women disproportionately profited from this development. From a socio-structural point of view, findings on the latter question are relevant because they provide empirical evidence for changes in the bargaining power of the sexes on the partnership and marriage markets.

The article is structured as follows: The second section focuses on the state of research and the theoretical background; the third contains a description of the data and variables; the fourth covers the empirical findings; and the fifth section includes a summary and concluding discussion.

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<sup>2</sup>Furthermore, they give an indication of the socio-structural changes in life courses in general and in family-demographic processes such as partnership, marriage, separation, divorce, or family formation in particular. This allows one to reconstruct the change in the social structures in the sense of a differentiated social history of societies.

## 2. State of research and theoretical background

Sociological research regarding the connection between education and the choice of a partner, between educational expansion and marital age, as well as between the educational system and the partnership market has a long tradition (see Schwartz 2013; Blossfeld 2009; Kalmijn 1998; Blau 1977). Findings vary greatly, depending on the used data and the design of the analyses as well as on the observed countries and historical periods. On the one side there are older international comparative studies that document not only a close connection between the educational level and the choice of a partner (Ultee & Luijckx 1990; Kalmijn 1991), but also the gender-specific differences of this connection (Schwartz & Han 2014; Schwartz & Mare 2012). In this literature educational homogamy is emphasized repeatedly as a structural characteristic of modern societies. With respect to heterogamy, typical findings are that women usually marry men with the next higher educational level, while men prefer women with a lower education (Wirth 1996). Men with little education tend to remain single and women are seldom partnered with men with less education (Lichter et al. 1995; Blossfeld & Timm 1997). Seen in this way, the partnership and marriage markets are characterized by a social, cultural, and economic closure based on the educational success and educational attainment of the potential partners. The attractiveness of the people who are successful in the educational system correlates also with their expected economic success and future lifestyle (Arum et al. 2008).

Educational expansion, according to the available evidence (Blossfeld 2009), shifted the average age at the first marriage because of the longer time spent in the educational system (structural effect in terms of a delayed timing of the first marriage)<sup>3</sup> and also affected the prevalence of educational homogamy (level effect in terms of normative preferences for a partner with same education).<sup>4</sup> The findings with respect to the historical trends of educational homogamy, however, are inconsistent and the conclusions are mixed (Schwartz 2013). On the one hand, long trends of modernization with declining homogamy rates and an increased opening of the social structures are shown (Ultee & Luijckx 1990). On the other hand, for individual countries – such as, for instance, the United States or West Germany – increasing rates of homogamy (in particularly for the higher educational levels) have been found (Schwartz & Mare 2005). Furthermore, different developments are reported for one and the same country, depending on the cross-sectional trend data or longitudinal data in use. While Blossfeld (2009), Timm (2006), or Blossfeld & Timm (1997) report a rising educational homogamy for successive birth cohorts in Germany based on life course data, Wirth (1996) finds relatively constant rates of educational homogamy over time by means of

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<sup>3</sup> The postponement of the marital age caused by the educational expansion and/or the longer period spent in the educational system is sociologically interesting because – as argued, for instance, by Diekmann (1990) – the marital age is a key socio-demographic factor that is interrelated with various other social and demographic variables. For example marital age correlates with birth rate and also affects the gap between generations, as well as the risk of divorce, the date when the children move out of the parents' home, the career behavior and the income distribution, and the distribution of household sizes. Marital age also impacts the educational system, the housing market, the job market, and the government welfare systems. In general, the shift of the partnership and marriage age has far-reaching effects on various events and transitions in the life course of the adults and their children (Arum et al. 2008: 108).

<sup>4</sup> According to official statistics the average marital age in Switzerland fell between 1950 and the beginning of the 1970's from 26 to 24 years among women and from 28 to 26.5 years among men, but then increased continually until 2014 to 29 years for women and 32 years for men. Although the actual change is overestimated using period estimates rather than cohort estimates (Huinink 1995), this development can be interpreted as one of the consequences of the educational expansion. Considered from a life history perspective, however, the shift in marital age also has consequences for the measurement and interpretation of changes in educational homogamy. One could argue that changes in homogamy could best be observed by comparing people at the time when they leave the educational system, not necessarily by comparing them at the same age (Timm 2006; Blossfeld & Timm 2003, 1997; Schwartz & Mare 2012).

comparative-static micro census data. Moreover, Klein (2000) arrives at the conclusion that the homogamy rates decline if both sexes profit from educational expansion; the latter being true for West Germany (see Becker 2014). Domanski & Przybysz (2007) find high rates of educational homogamy in Switzerland based on cross-sectional data of the European Social Survey for 2004-05, but do not answer whether this is a consequence of educational expansion. Switzerland appears to be a country with low mobility rates as well as a small openness and opening of the class structure even in the recent past (Falcon 2016; Jann & Combet 2012). The high intergenerational reproduction of education (that is, the low educational mobility between the generations) may be one reason why the rate of educational homogamy is very pronounced, for example, compared to 28 other countries analyzed by Katrnak et al. (2012). Furthermore, the declining hyper- and hypogamy rates in women, that followed educational expansion in other countries, are accompanied by a rising stability of educationally homogamous marriages, while heterogamous marriages (in particular, if the women has the higher education) are unstable (Schwartz & Han 2014). This finding for the USA is confirmed for Switzerland by Diekmann & Schmidheiny (2001).

Empirical studies agree on the fact that due to educational expansion the educational system – compared with the workplace, the neighborhood, family networks, or clubs (Kalmijn & Flap 2001) – has become the most important marriage market (Blossfeld & Timm 2003; Kalmijn 1991: 791).<sup>5</sup> Its importance extends not only to direct opportunity structures (Mare 1991), according to which potential spouses meet in the classroom, but also to indirectly selective opportunities through extracurricular social areas such as social networks, neighborhoods, and workplaces. The patterns of educational homogamy, however, are determined primarily by the vertical dimension of the educational levels (Mare 1991: 15-16) such that the educational system structurally and normatively organizes educationally segregated partnership markets and homogamous partner choice. Educational expansion has significantly increased the chances that partners with similar education, who are the same age, find one another in the educational system or on other markets after completing their educations. Above all, the changing economic role of women – according to Blossfeld (2009) – makes their educational level and career ever more important for finding a “*match*” on the marriage markets within and outside the educational system. Nevertheless, as mentioned already above, beside this “structural effect” there is still a “level effect” (Blossfeld & Huinink 1991), according to which homogamy norms still have considerable relevance for partner choice and marriage patterns (Huinink 2000: 217). Equally important is the norm in most capitalist countries to marry and establish a family only after having completed education (Blossfeld & Huinink 1991). These norms did not become invalid due to the increase in the quality of women’s human capital investments.

Nielsen & Svarer (2009), for instance, argue that values (e.g. with respect to the qualifications of the children, the stability of marriage, and the labor force participation of women), norms

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<sup>5</sup> Already Max Weber pointed out that education has always been a strategic resource. According to Weber (1980: 577), educational certificates not only allocate privileges, they also serve in forming a privileged service class – in terms of market standing and occupational activity, but also in terms marriage relations as a tool for social mobility: The possession of an educational certificate „stützt den Anspruch auf Konubium mit den Honoratioren (auch im Kontor werden naturgemäß Vorzugschancen auf die Hand der Töchter der Chefs davon erhofft), auf Zulassung zum Kreise des ‚Ehrenkodex‘, auf ‚standesgemäße‘ Bezahlung statt der Entlohnung nach der Leistung, auf gesichertes Avancement und Altersversorgung, vor allem aber auf Monopolisierung der sozial und wirtschaftlich vorteilhaften Stellungen zugunsten der Diplomanwärter“. However, this means that marriages are not a priori based exclusively on free will and the emotions of the marriageable persons, but that their social context (for instance, the parents, relatives, and other reference groups with their expectations with respect to the choice of partner) undoubtedly affects the social structure of marriage relationships. But the order of magnitude of these effects compared with other influences – as for instance by the educational system – is a question that needs to be investigated empirically.

(such as that marriage should occur only after the completion of education) and preferences for educational homogamy (e.g., when educationally similar people appear more attractive) are shaped by education (cf. also Kalmijn 1991: 790). In addition, the nonrandom choice of a partner due to the preference and systematic search for a similar partner (e.g. same educational level) is reinforced by the opportunities for meeting such a partner in the educational system (*matching hypothesis*). At the same time, the educational system offers an arena for competition for the most attractive partners, who, as a minimum, have the same educational level (*competition hypothesis*) (cf. Schwartz 2013; Klein 2000). In both cases homogamy will be the predominant partnership relationship if the education of the sexes is distributed evenly, if better educated economically active women do not forgo a relationship because they see no additional benefit in the traditional division of labor in the private household, and if those wanting to get married do not suspect that there are better options left among the “singles” (cf. Blossfeld & Timm 1997). In case of an uneven educational distribution, differences become more likely, but partnerships will still form among those with relatively close educational levels. Furthermore, differences are strengthened by the fact that men typically marry at a somewhat older age than women. Coupled with the postponement of marriage until after completion of education, this means that the marriage market can become increasingly difficult for highly educated women across their life course (Huinink 2000).

This means that the educational expansion leads to a change in the socio-structural conditions mentioned by Blau (1977), according to which, apart from the age distribution and the sex ratio in consecutive birth cohorts, the educational distribution of marriageable women and men (which changes over time) affects the chances to meet and get to know a potential partner with the preferred characteristics. Thus the educational expansion shapes the scope in which individual decision-making takes place by systematically and arithmetically changing the opportunities and restrictions on the societal marriage market. Therefore, due to the structurally conditioned social segregation in the marriage market, the educational expansion – apart from the normative rules and individual preferences embedded into the opportunity structures – probably also has a direct effect on the behavior with regard to partner choice and marriage patterns. With the changes in gender-specific educational distributions and benefits, which are also ongoing in Switzerland and can be seen as a direct consequence of the educational expansion, the traditional education gradient between the marriage partners (i.e., the man having a higher educational level than the woman) will probably decline in the succession of the birth cohorts. With the rising number of better educated women, homogamous partnerships become more likely if the choice of a partner and the demands on a partnership are structured by the similarities in the characteristics of the partners (Klein 2000). In this process – as demonstrated by significant empirical evidence (Blossfeld 2009) – better educated women, depending on the options on the marriage market, would often rather remain single than choose a less educated man, while less educated men without potential partners generally have the lowest chances on the partnership and marriage market. Therefore, in the course of the educational expansion, partnerlessness should be particularly often observable among these men.

To summarize: Education is, with regard to the choice of a partner and marriage, an indicator for socio-cultural preferences and socio-economic success (cf. Blossfeld 2009). Concerning cultural preferences Kalmijn (1998: 412) comes to the conclusion that over the course of the educational expansion and the higher qualification of women, the competition between men and women with the same educational level has intensified. Especially better educated women who are more likely to be economically active and who fetch comparatively higher educational benefits on the labor market are particularly attractive for more highly educated men because of their socio-economic resources. According to Kalmijn (1991), given the opportunity structures and the increased attractiveness of better-educated women on the

marriage market, an increasing educational homogamy can be expected, especially at higher educational levels. Therefore, with the continued educational expansion, a cohort differentiation of increasing educational homogamy in the younger cohorts should be observed.

Overall, the educational system is considered a very efficient marriage market (Nielsen & Svare 2009: 1067). With the density of potential partners at the different educational levels (cf. Blau et al. 1982) and based on comparatively fewer frictions than in other local marriage markets, the search costs and the uncertainties associated with the choice of a partner are significantly reduced (also for risk-averse actors). However, one cannot simply jump to the conclusion that the importance of the educational system as a marriage market, which increased due to the educational expansion, has replaced the strategic role of the marriage for maintaining the intergenerational status of women in the sense of the “*status attainment hypothesis*” (Smits et al. 1998) in favor of “romantic love” (“*general openness hypothesis*” according to Smits 2003: 256) (cf. Ultee & Luijkx 1990). According to a study carried out by Arum et al. (2008), better-educated women would rather marry partners with strong income potential and a higher education level, while better-educated men rather prefer women from families with a higher status (see also Blossfeld 2009).

The mechanisms described above should have strengthened with the sustained educational expansion in a modern society like Switzerland. On the one hand, increasing educational homogamy can be expected to intensify the social inequality of the chances on the partnership and marriage market. On the other hand, via socially selective marriage and family formation, it should also contribute to the reinforcement of socially unequal educational opportunities in subsequent generations of children (see Hillmert 2012; Becker 2009, 2007). For example, Hillmert (2012) shows that a large part of the intergenerational reproduction of the educational attainment can be attributed to socio-demographic processes such as educationally homogamous marriage and family formation by the parents and grandparents. This could be another explanation for the rather hesitant educational expansion and moderate decline in educational inequalities across successive generations in Switzerland (cf. Zangger & Becker 2016; Becker & Zangger 2013).

### 3. Data, variables and methodical approach

#### *Database*

The empirical analyses are based on harmonized data from the *Swiss census* in 1970, 1980, 1990 and 2000 (see Sheldon 2005; Stamm & Lamprecht 2005). Because of the large number of cases and the long time span, these censuses allow a differentiated analysis of the consequences of the educational expansion for the partnership patterns of women and men in different age groups. The census covers all persons and households of Swiss residents (residence is determined by the economic and civil domicile). Because data on household structures and on all household members is collected, married couples, single people, and cohabitation can all be identified. Together with other characteristics such as gender, educational level, and date of birth it is possible to trace the presumed consequences of the educational expansion in Switzerland for family-demographic processes in the second half of the 20<sup>th</sup> century.

Even though census data are cross sectional, the dynamics of the processes of change can be illustrated by distinguishing birth cohorts. Yet, only a comparative-static analysis of the civil statuses “married” versus “not married” or of the partnership status is possible. For example, no differentiation is possible between first marriage and remarriage. For a more dynamic analysis of different partnership and marriage episodes, event-history data would be required (cf. Blossfeld & Timm 1997). Despite these methodological limitations, however, census data

are well suited for a differentiated analysis of the relationship between educational expansion and education-specific partnership patterns. Due to a high degree of standardization, comparability of variables, and a large number of observations, precise results on the relevant developments can be obtained. Note that all analyses below are based on complete population data. As such, we do not present confidence intervals or other measures of statistical precision.

### *Analytic population*

Our analyses are limited to persons aged 25 to 64 years.<sup>6</sup> An overview of the size of the analyzed population in the different years is given in Table A1 in the Appendix. In order to avoid the distorting influence of a declining tendency to marry, which is not necessarily associated with a declining likelihood to form a partnership, we record for these persons whether they live in a partnership or not, irrespective of their civil status. However, both for married persons and persons living in a consensual partnership, couples can only be identified if both partners live in the same household. Partnerships can be formed in the census based on the recorded information on the positions of the household members within the household. In each household, in which a couple lives, there is a person called head of household and/or reference person and a person called partner of the reference person. This information does not depend on whether the persons are married to each other or not.<sup>7</sup> A further division into married and unmarried couples would be possible on the basis of the data but is not used in the analyses below because, as indicated above, we are interested in educational homogamy across all (permanent) partnerships, irrespective of civil status.

The representation of partnerships in the census data is incomplete. On the one hand, as indicated, partnerships between persons living in different households cannot be identified. On the other hand, for certain household settings, even partnerships within a household cannot or can only partially be identified. An example is households composed of several couples. In general, in such cases only one couple is identified and the other persons are recorded as being partnerless. Also, there might be households in which the two persons making up the partnership do not include the reference person of the household. Such couples can be identified only if they are the (in-law) parents of the reference person. To simplify matters we assume in such cases that a couple exists if there are exactly two parents of different gender in the household who are both married. Overall, due to a pluralization of living arrangements, it could be that partnerships within households are increasingly under-reported over time. In any case, however, the effect on our results should be negligible.

### *Dependent and independent variables*

Main variables are the *partnership status* (0/1) as well as the *highest educational attainment* of the target person and its partner. As indicated above, we can only identify partnerships if both partners live in the same household; people with a stable relationship to a person outside the household are treated as single. Furthermore, following the usual conventions and considering the lack of details in the collected data, a distinction is made between the following educational levels (cf. Zangger & Becker 2016; Becker & Zangger 2013; Jann &

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<sup>6</sup> We use persons, not partnerships, as the units of analysis because those without partners must also be included. We therefore examine for all persons aged 25 to 64 years whether a partnership was present at the time of the census and, if so, record the relevant information of the respective partner. No age restriction is imposed when identifying the partners.

<sup>7</sup> One limitation is that consensual couples do not seem to have been recorded in the 1970 census, presumably because households containing a consensual couple were rare at that time. This implies that the increase in the proportion of persons without partner was probably somewhat more pronounced between 1970 and 1980 than indicated in the results below, particularly for the younger cohorts.

Combet 2012): (1) compulsory schooling or less, (2) professional certificate on the secondary level II, (3) general education certificate on the secondary level II, (4) professional tertiary certificate and (5) academic tertiary certificate (including certificates from universities of applied sciences).<sup>8</sup>

On the basis of a comparison of the educational levels of the two people in a partnership, a *homogamy variable* with the following categories is also formed: (1) The target person has a higher educational attainment than the partner; (2) both partners have the same educational attainment; (3) the target person has a lower educational attainment than the partner. For some observations the value of the homogamy variable cannot be determined due to lack of information on the educational level for at least one of the partners (see Table A1 in the Appendix). Since in Switzerland mixed-sex partnerships are still the rule, all analyses are done separately by gender.

In order to isolate *cohort effects*, all analyses are separated by *age groups*, using five-year intervals (25-29-year olds, 30-34-year olds, etc.). By combining year of birth, partnership status, and educational level, the cohort design allows one to determine the impact of educational expansion on the choice of a partner and marriage patterns (Timm 2006; Blossfeld & Timm 1997; Diekmann 1990). Because one cannot link observations across censuses, it is not possible to follow individuals over time, considering the dynamics of the processes of partner choice and other family-demographic processes.

#### *Methodical approach*

In the empirical part the changes in the educational distribution as well as the educational homogamy are represented over time along the categories of the homogamy variable described above. In a further step, an attempt is made to isolate structural influences on educational homogamy, that is, influences of the changing marginal distributions due to educational expansion. For this purpose we first calculate the *observed homogamy* or *gross homogamy*  $H$  as

$$H = \frac{\sum_j N_{jj}}{N}$$

with  $N$  as the size of the population (number of partnerships) and  $N_{jj}$ ,  $j = 1, \dots, 5$ , as the number of partnerships in which both partners have educational level  $j$  (diagonal cells in a cross table of the educational levels of both partners). Next we calculate the *extent of random homogamy*  $C$  that would be expected if partners were matched randomly (among the people who were in a partnership at that time) as

$$C = \frac{\sum_j \frac{N_{j\cdot} \cdot N_{\cdot j}}{N}}{N}$$

with  $N_{j\cdot}$  as the number of target persons with educational level  $j$  and  $N_{\cdot j}$  as the number of potential partners with that educational level. The educational expansion has a direct structural effect on the random homogamy  $C$ , because it leads to a change in the marginal distributions.

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<sup>8</sup> Educational attainment is unknown for a minority of observed individuals. See Table A1 in the Appendix. For the classification of the highest educational attainment we use the harmonized variable HABGB (highest attainment gross) of Chaze (2005), which should be comparable over time for the age groups analyzed here. Alternatively, the variable HABGN (highest attainment net) could also be used. Both variables lead to virtually the same result for the analyses below.

Taking into consideration the *highest possible homogamy*  $M$  given the marginal distributions (or, conversely, the minimally necessary heterogamy),

$$M = \frac{N - \frac{\sum_j |N_{j.} - N_{.j}|}{2}}{N}$$

it is then possible to calculate to what extent the available “homogamy potential” (i.e. the difference between the highest possible homogamy  $M$  and the randomly expected homogamy  $C$ ) is exhausted by the actually occurring homogamy (*relative homogamy* or *net homogamy*  $R$ ):

$$R = \frac{H - C}{M - C}$$

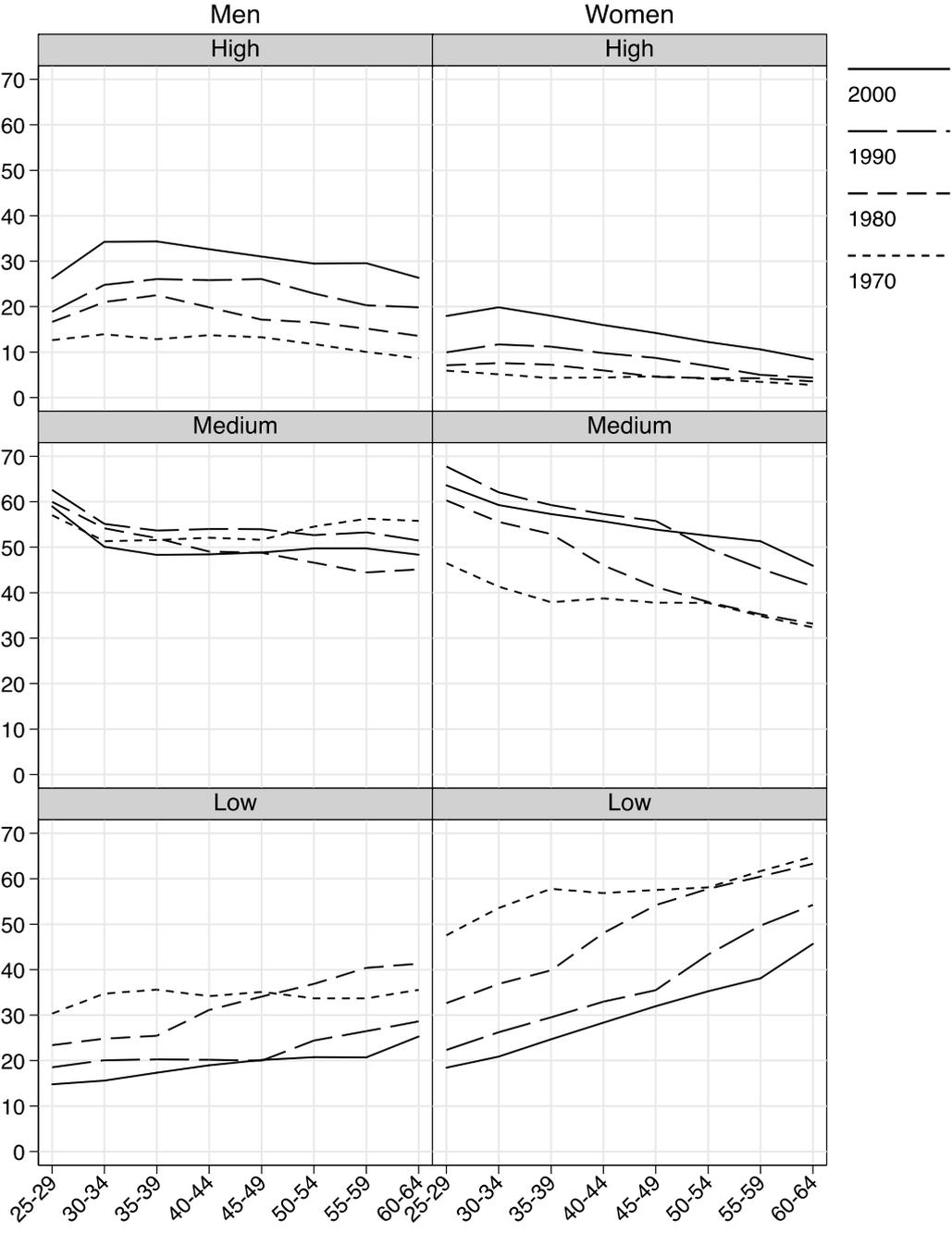
Tracing these measures –  $H$ ,  $C$ ,  $M$  (or  $1 - M$ ) and  $R$  – over time (period and cohort) reveals to what extent the changes in observed homogamy are a consequence of purely structural effects and to what extent there are additional changes in the inclination to form educationally homogamous partnerships that are not due to structural effects. Note that the described method focuses on how the rate of *agreement* between the educational levels of the partners in couples changed over time. A supplementary approach that is often followed in the literature would be to analyze how the strength of the *association* between the partners’ educational levels changed in general, irrespective of whether the levels coincide or not. Log-linear models are often used for this type of analysis. We focus here on the first approach because it more closely resembles the conceptual idea of educational homogeneity within partnerships. The second approach that aims at the strength of association rather than the strength of agreement would make more sense, for example, when analyzing intergenerational educational mobility.

## 4. Empirical results

### *Educational expansion in Switzerland in the second half of the 20<sup>th</sup> century*

First we briefly present results on the extent of the educational expansion in Switzerland. *Figure 1* shows the distribution of an educational variable reduced to three categories (high: tertiary education, medium: secondary II education, low: compulsory schooling or less) by gender, five-year age groups and survey year (respondents for whom the highest educational attainment is unknown have been excluded from the computations). Changes over time become evident by a vertical comparison of the displayed curves. For example in 1970 of 14 percent of 30–34 year old men had a tertiary education. In the year 2000 this share had risen to 34 percent. Over all age groups, there was an expansion of tertiary education for men from slightly more than 10 percent to about 30 percent. Similarly, there was also a significant increase in tertiary education for women, whereby the rise started somewhat later and was concentrated more among the younger age groups.

Figure 1: Educational distribution by gender, age and year



At the other end of the educational scale the share of people without post-compulsory education (compulsory schooling or less) declined significantly both for men and women. No clear trends are discernible for men in the medium educational category, while for women the share with a medium education increased significantly, in particular between 1970 and 1990.

In sum, the changes for men can be described as follows: strong expansion of the share of tertiary education coupled with a strong decline of those without post-compulsory education in all age groups during the entire period. For women there was a strong expansion of secondary II certificates with a simultaneous decline in the number of those without post-compulsory education across all age groups mostly during the period 1970-1990, and a somewhat delayed expansion of the tertiary education after 1980, particularly among younger age groups.

### *Changes in partnership and educational homogamy*

How has the likelihood of having a partner with a similar educational background changed? It is noteworthy, as can be seen in *Figure 2*, that the partnerless share has increased for men over time in all age groups (for example, men aged 40–44 years show an increase in the partnerless share from 16.9% in 1970 to 23.6% in 2000). In part this might be an artifact of a greater under-reporting of household-internal partnerships in more recent years due to the pluralization of the household types. More plausible, however, is the interpretation that household-internal partnerships have indeed declined substantially. The reason might be that there has been an overall decline in the ratio of partnership bonds over time (at least partially as a result of increased divorce rates). Another possible reason could be that relationships – for example, also because of tax advantages – shifted more toward partnerships across households (“*living apart together*”). Both phenomena probably contribute to the decrease in partnerships observed on the basis of the censuses.

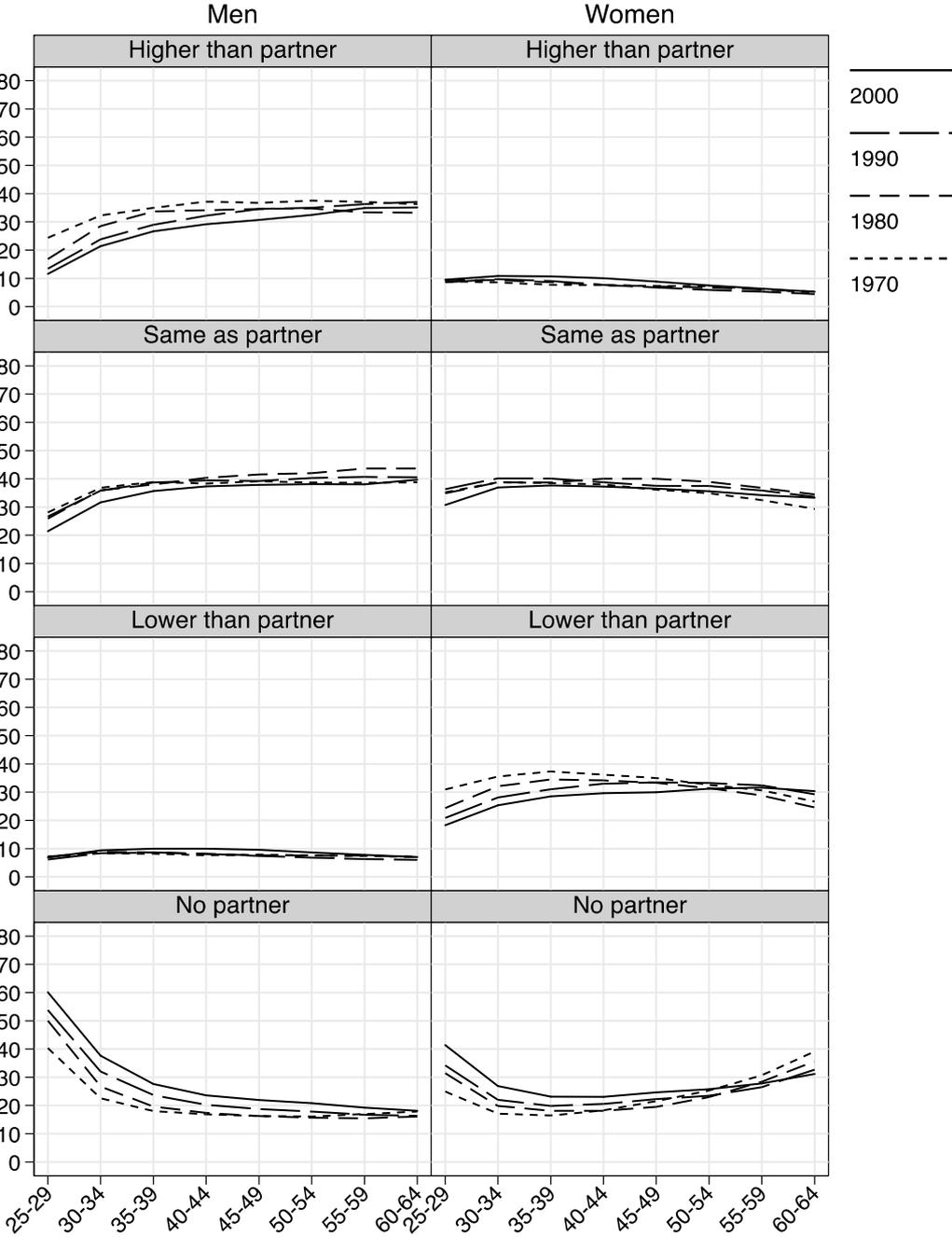
An increase in partnerlessness over the decades can also be observed for women, though only among younger age groups, as older women had a simultaneous decline in widowhood (see *Figure A1* in the Appendix). Because of the relative increase of the life expectancy for men one can even see a net decline in partnerlessness among women aged around 60 years between 1970 and 2000.

Concerning educational homogamy, one can see from *Figure 2* that partnerships in which the man has a higher educational level than the woman (hypergamy) declined noticeably due to the educational expansion, at least in the younger age groups (as evident in the topmost subgraph for men and in the third subgraph for women).<sup>9</sup> By contrast, partnerships in which the woman has a higher educational level than the man (hypogamy) increased slightly (which however can barely be seen in the diagrams because the frequency of such configurations is still low). The number of couples in a relationship of educational homogamy also increased slightly between 1970 and 1980. However, a reversal of the trend is discernible between 1980 and 2000, with the result that in 2000 a slightly smaller share of persons is in an educationally homogamous partnership than in 1970, at least in the younger age groups.

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<sup>9</sup> Observations for which the homogamy variable is undetermined (due to lack of information on educational attainment for at least one of the partners; see Table A1 in the Appendix) have been excluded from the results in *Figure 2*. Excluding these observations reduces the number of people with a partner in the data and thus inflates the proportion of partnerless people. To avoid such a bias and preserve the proportion of partnerless people at its true level, we proportionally rescaled the results from the homogamy variable. The correction is based on the assumption that the excluded observations are uninformative (missing at random). That is, we assume that the distribution of the homogamy variable is the same between the excluded observations and the observations for which we have complete data.

Figure 2: Educational homogamy and partnerlessness (living without a partner in the same household) by gender, age and year

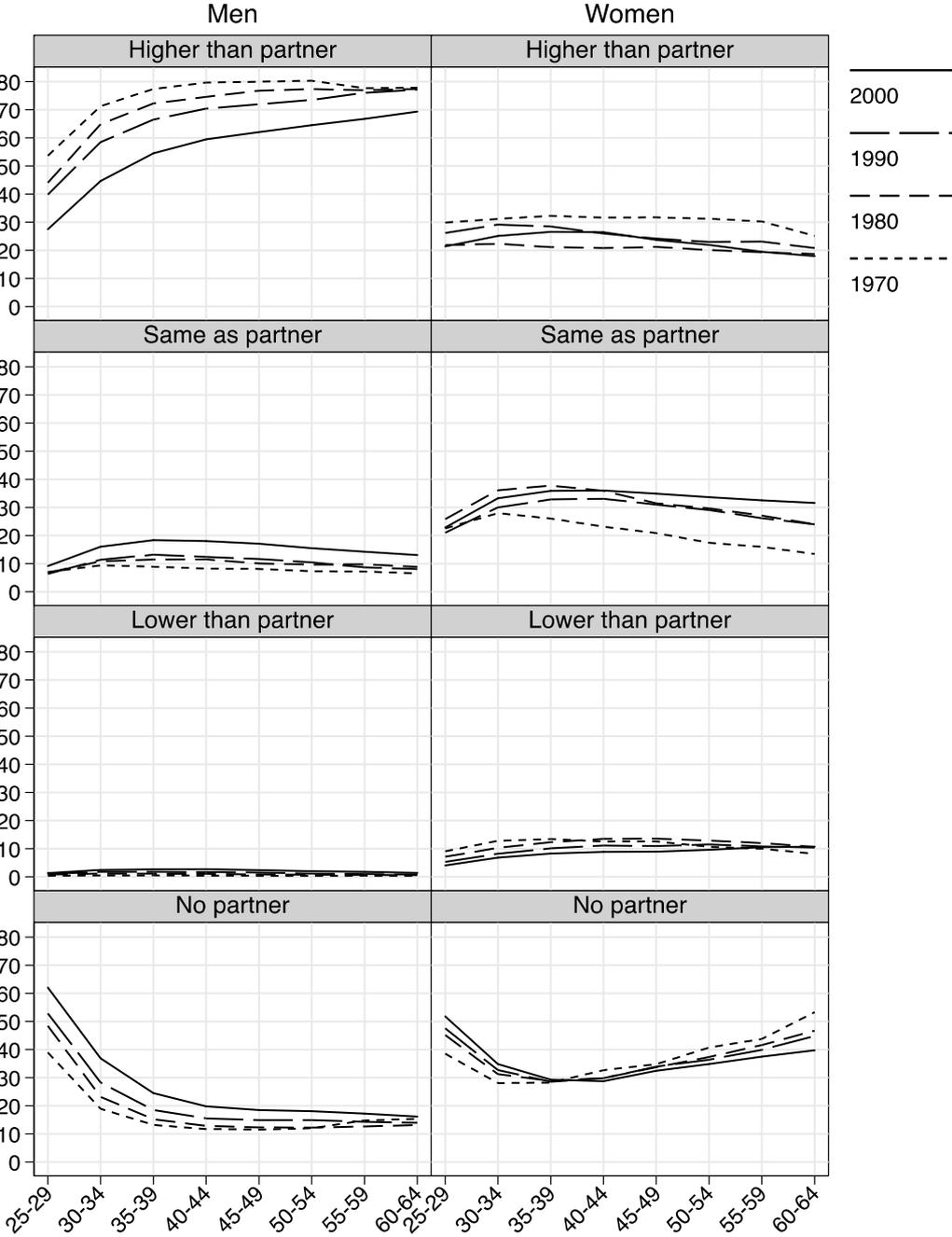


Overall, the changes in homogamy, hypergamy, and hypogamy during the 30-year period are moderate. Larger shifts, however, are disclosed when looking at the rates by educational level (Figures 3, 4, and 5).

Figure 3 shows the changes for persons with a high educational level (tertiary education). While in 1970 approximately 80 percent of the highly educated middle-aged men were in a hypergamous partnership, this share declined by the year 2000 to approximately 60 percent. In turn, the share of highly educated middle-aged men in an educationally homogamous partnership increased from about 10 percent to 20 percent. This is a direct consequence of the expansion of the number of women with a higher educational level. That is, as a result of the equalization of the educational distributions, fewer men were forced to “marry down” in 2000

than was the case in 1970. Furthermore, across all age groups, there is also a noticeable increase in partnerlessness for highly educated men. For highly educated women the trends are less clear. The share of women with a high educational level who were in a partnership with a less educated partner ranged between 20 and 30 percent in all years and age-groups. That is, similar to men, also a substantial share of highly educated women has partners with less education. At the same time the share of highly educated women in an educationally homogamous partnership increased significantly, primarily between 1970 and 1980. The most striking result, however, is the relatively large share of highly educated women without a partner: in the middle-aged groups, this share amounts to about 30 to 40 percent. This phenomenon is likely due to the persisting traditional division of family roles and the unsatisfactory compatibility between family and work, which may make it unattractive for highly educated women to form or maintain a permanent partnership (see Imdorf & Hupka-Brunner 2015; Levy 2013). It should be noted, however, that this kind of partnerlessness has receded slightly over the years, except for the youngest age groups.

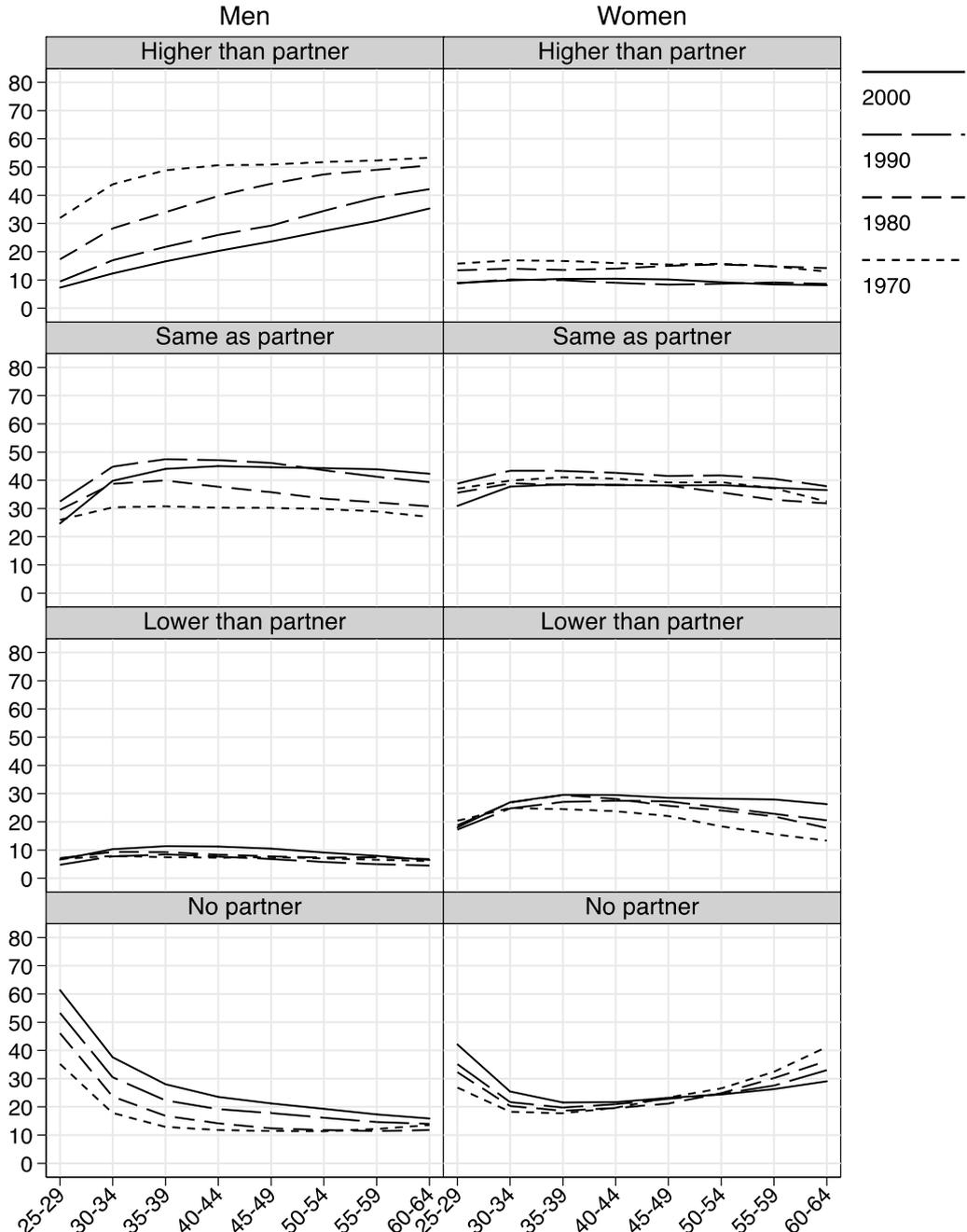
Figure 3: Educational homogamy and partnerlessness (living without a partner in the same household) for persons with high educational attainment by gender, age and year



Men with a medium educational level (*Figure 4*) have similar trends as men with a high educational level. While in 1970 approximately half of the middle-aged men with a medium educational level lived in a hypergamous partnership, this share dropped dramatically to between 10 and 30 percent in 2000. By contrast – with the exception of the youngest age group – the share of men with a medium education who lived in an educationally homogamous partnership increased from 30 percent to approximately 45 percent. Furthermore, we also see a slight increase in hypogamous partnerships and, much more pronounced, in partnerlessness (in the middle-aged groups this share increased from a little bit over 10 percent to more than 20 percent). A more mixed picture emerges for women with a medium educational level. The share of these women who lived in a homogamous relationship remained relatively stable (approximately 40 percent), while relations to a partner

with a lower educational level trended down and relations to a partner with a higher educational level trended up. Partnerlessness among women with a medium educational level is significantly lower than among the highly educated women, although there has been a slight equalization over time.

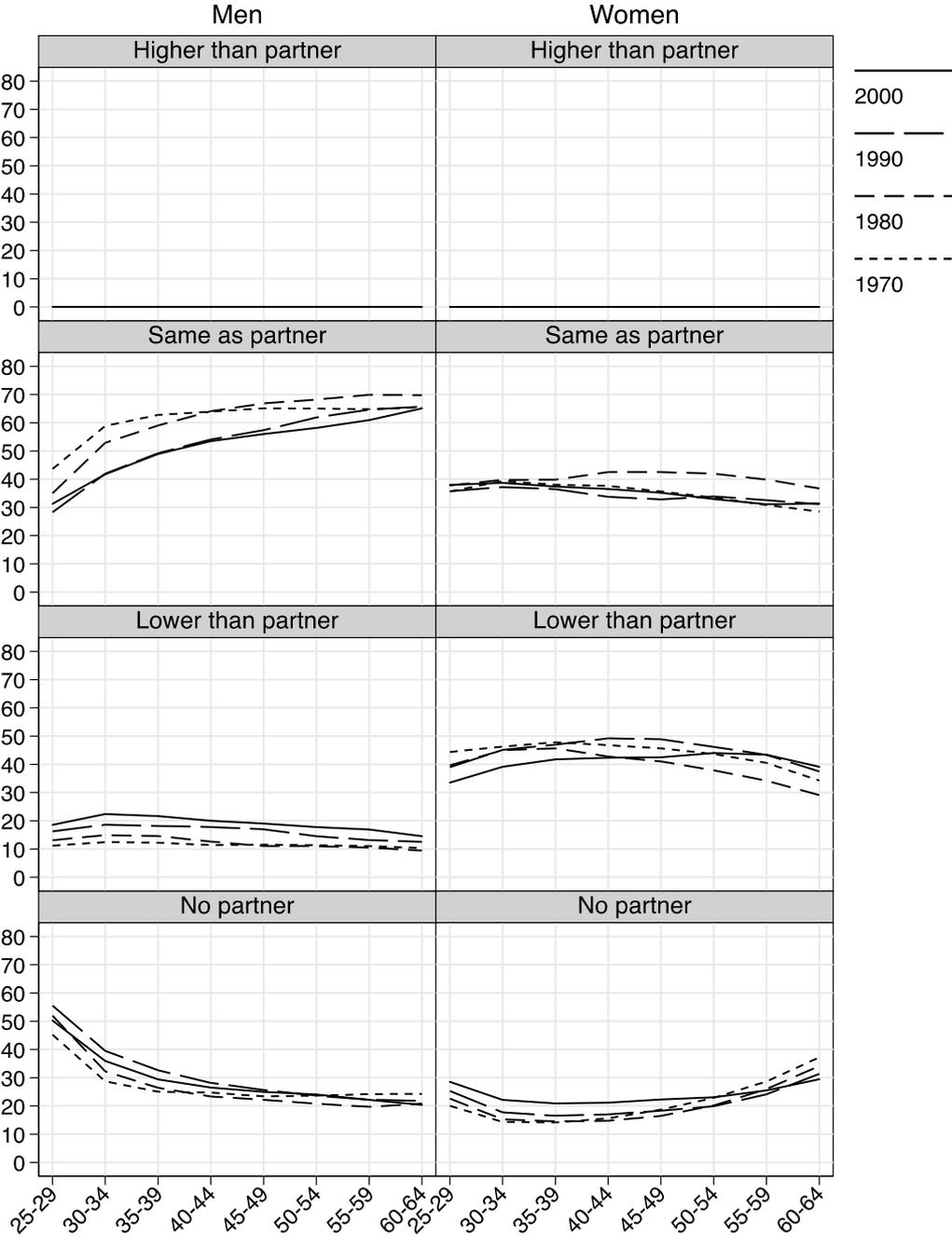
Figure 4: Educational homogamy and partnerlessness (living without a partner in the same household) for persons with intermediate educational attainment by gender, age and year



Finally, *Figure 5* displays the changes for persons with low education. Educational homogamy among men in this group has declined substantially in the course of educational expansion (in middle-aged groups from approximately 65 percent to approximately 55 percent), while the share of men in a relationship with a woman with a higher educational level increased accordingly. Partnerlessness increased much less among men with low education than among men with a high or medium education. With the exception of the

youngest age groups, however, partnerlessness is still most pronounced among men with a low educational level.

Figure 5: Educational homogamy and partnerlessness (living without a partner in the same household) for persons with low educational attainment by gender, age and year



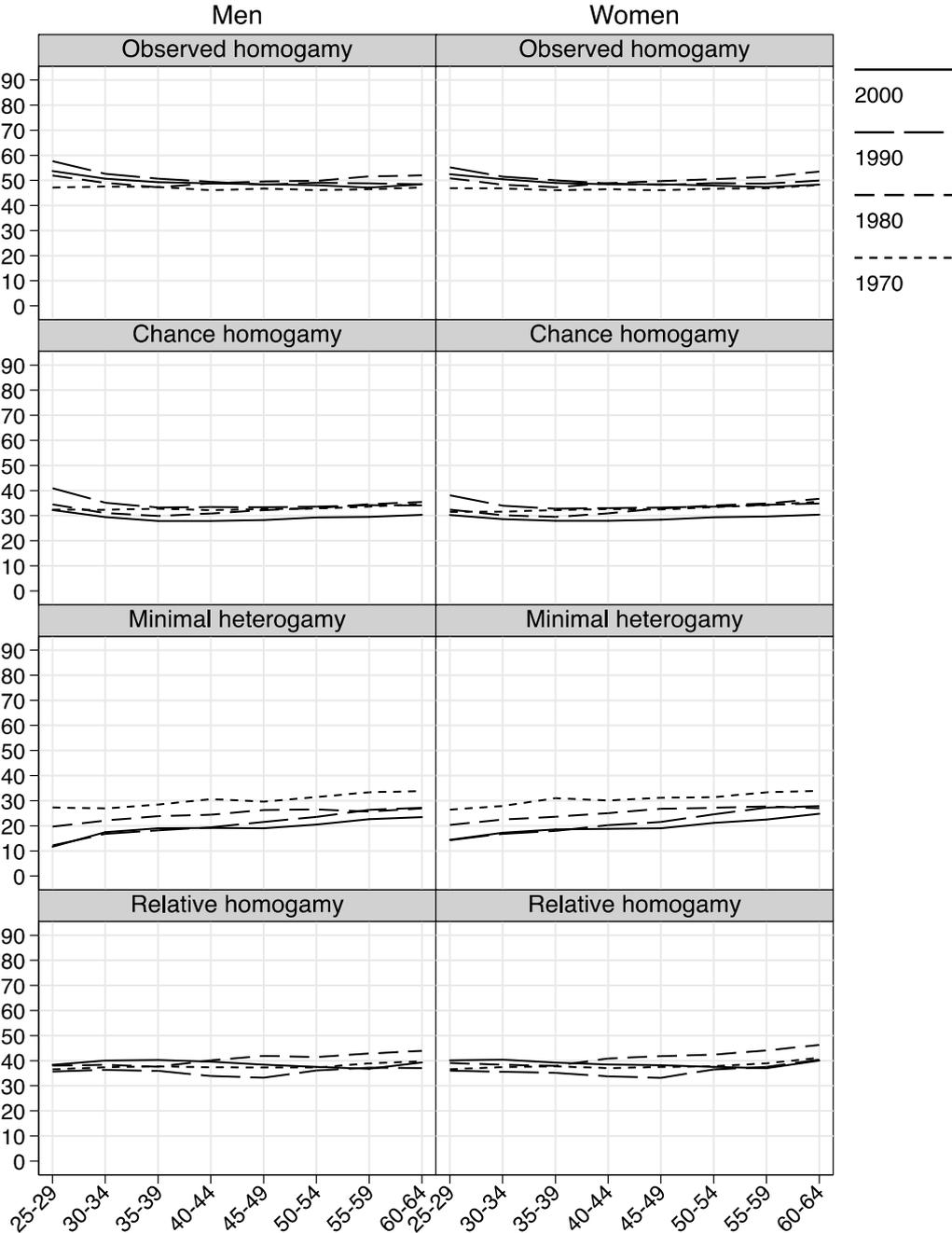
Interesting in this context is the comparison with women. While there is a negative relationship between educational level and partnerlessness among men, the situation for women is exactly the opposite. For both genders, however, the relationship has weakened over time so that overall one can speak of a certain equalization. For example a significant increase in partnerlessness can be observed for most age groups of women with a low educational level, who in 1970 were least affected by partnerlessness.

### *Structural effects of the educational expansion*

We now turn to the question regarding the extent to which the observed changes in educational homogamy are due to purely structural effects of the educational expansion. Partnerless persons are omitted from the analysis, that is, only persons who were in a relationship at the time of the census are considered as potential partners (i.e. it is assumed that partnerless persons are not available for the partner market). This assumption is made for methodical reasons so as to be able to determine the relevant marginal distributions. Although it is possible that changes in education-specific mating behavior have effects on the pool of potential partners, it is unclear how such effects could be incorporated into the analysis. In essence, a sophisticated dynamic partner choice model would be required that distinguishes between partnerlessness due to lack of a potential partner with a desired educational level and partnerlessness due to other reasons. Developing such a model would exceed the scope of the current article and, in addition, we do not see how such a model could be implemented based on census data. As such, however, we do not expect the results from a more refined analysis to be fundamentally different from the results presented below because partnerlessness can have many reasons and only some of them will be related to the dynamics of education-specific mating.

*Figure 6* shows the development of gross (observed) homogamy, random homogamy, minimum heterogamy and net (relative) homogamy (see the definition of these quantities in section 3) for women and men of different ages over time. The results are almost identical for women and men due to the symmetry of affairs: Differences only come about because women and men form partnerships not only with people of approximately the same age.

Figure 6: Breakdown of the educational homogamy by gender, age and year



As we have already seen, the observed homogamy has not changed all that much overall. About half of all partnerships in all age groups are educationally homogamous (topmost subgraphs). From 1970 to 1980 or 1990 observed homogamy slightly increased, after that we again see a slight reduction. It can also be observed that the homogamy that would be expected under random matching declined somewhat due to a shift in the marginal distributions of the educational levels for women and men in the course of the educational expansion – in particular during the period between 1990 and 2000 (from about 35 percent to approximately 30 percent). That means that based on purely structural changes in the educational distributions somewhat fewer educationally homogamous couples could be expected in 2000 than in 1990. The minimum necessary heterogamy given the marginal distributions – that is, the share of couples with a heterogenous education that remains if one forms as many homogeneous couples as possible – has also declined over the entire period.

Since the educational distributions of men and women have become similar over time, it has become ever easier for as many people as possible to find a partner with the same educational level. Since these two structural effects partially offset each other (less homogeneous couples in case of random matching coupled with a higher potential for homogeneous couples), the net homogamy corrected for the structural effects shows a picture quite similar to that for the de facto observed gross homogamy: during the period between 1970 and 2000 there was overall no great change, or at best a marginal increase, in homogamy.

In order to provide a more differentiated picture, the *Figures 7, 8 and 9* again show results broken down by educational level. Overall one can see an increase in the share of homogamous partnerships among men with high or medium education (topmost subgraphs in the *Figures 7 and 8*) as well as among women with high education (topmost subgraph in *Figure 7*). For men with low education, educational homogamy has declined (topmost subgraph in *Figure 9*), while no clear trends are visible for women with a medium or low educational level (topmost subgraphs in *Figure 8 and 9*).

The observed changes seem to be due in large part to structural effects. In the three cases in which an increase in educational homogamy occurred (men and women with a high education, men with a medium education), randomly expected homogamy has increased and minimally necessary heterogamy has declined. That is, both structural effects were such that homogeneous partnerships became more likely. Accordingly, the trends in net homogamy corrected for the structural effects are substantially less pronounced than the trends in observed homogamy for these groups.<sup>10</sup>

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<sup>10</sup> That the values for net homogamy are nearly identical for men and women in spite of some large differences in observed gross homogamy is a logical consequence of the structural correction.

Figure 7: Breakdown of the educational homogamy for persons with a high education by gender, age and year

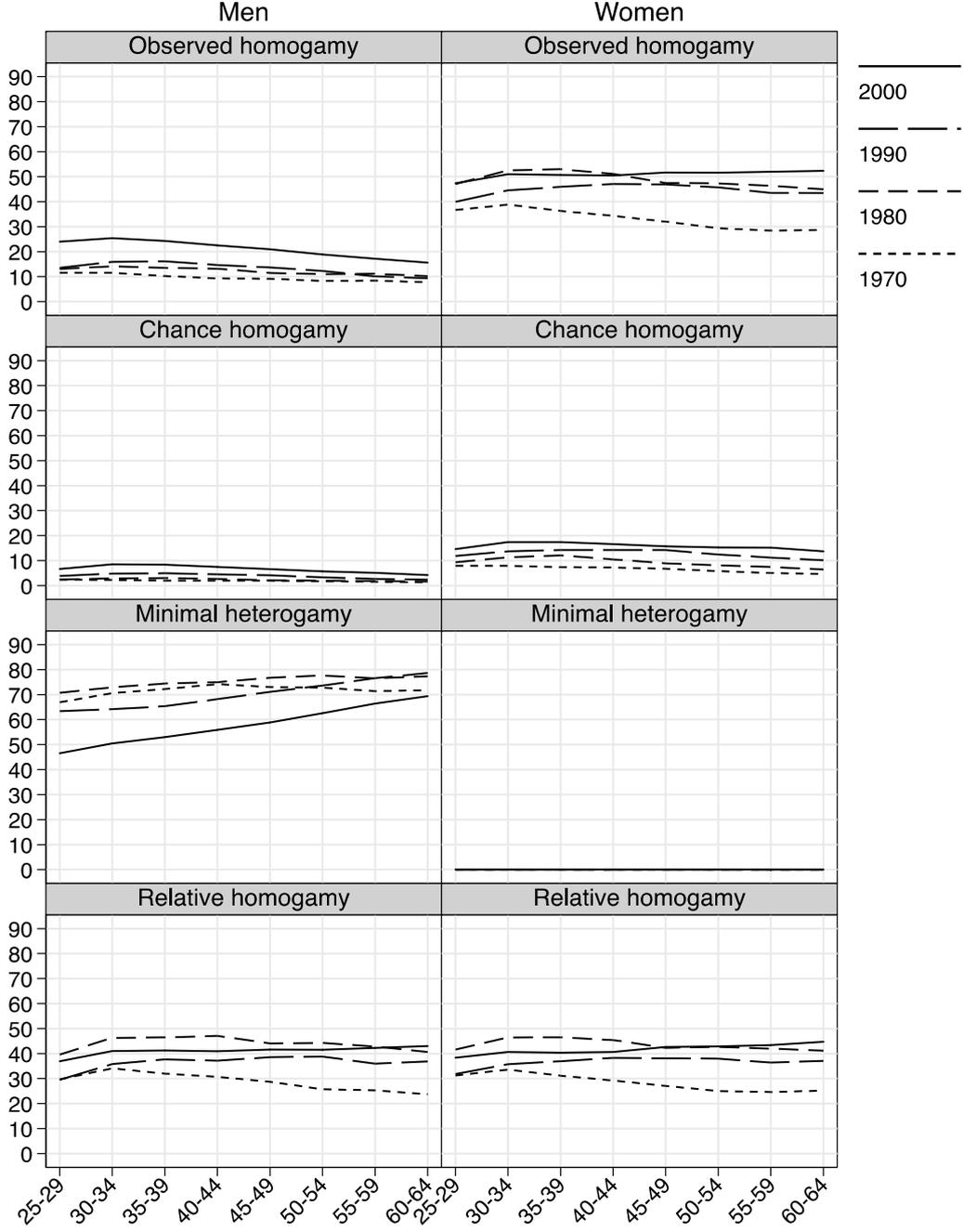


Figure 8: Breakdown of the educational homogamy for persons with a medium education by gender, age and year

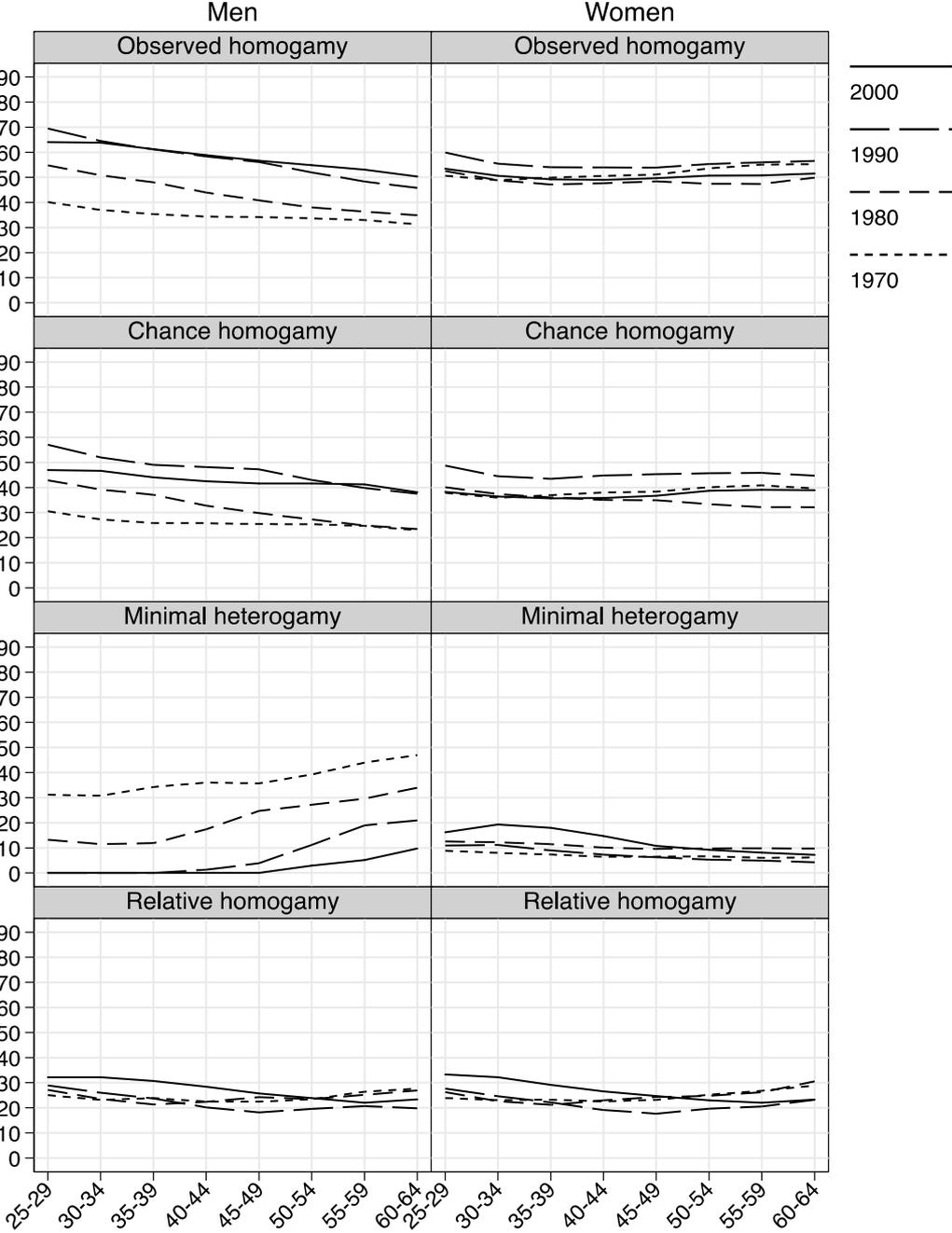
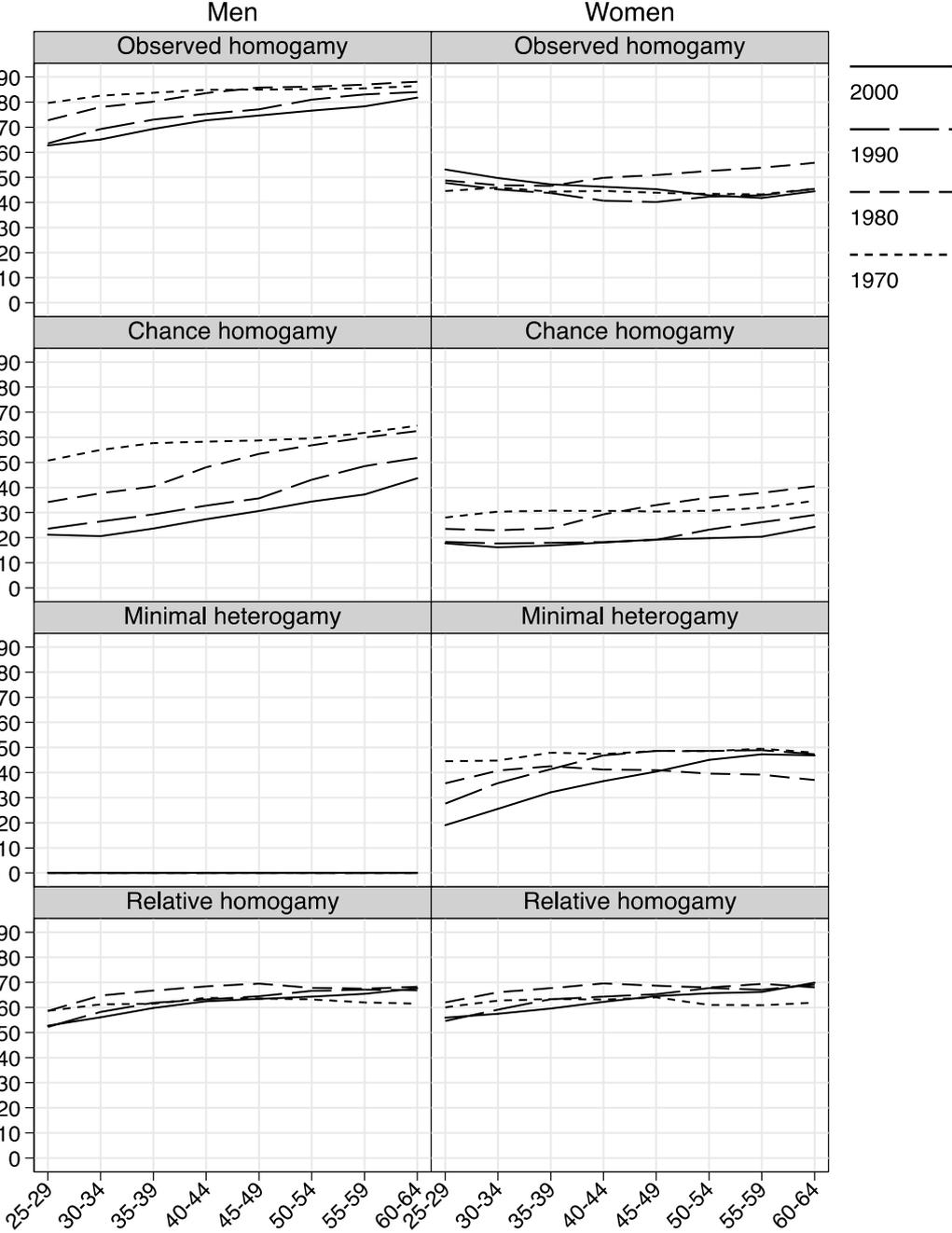


Figure 9: Breakdown of the educational homogamy for persons with little education by gender, age and year



For highly educated women and men a substantial increase of the tendency towards homogamy can only be observed between 1970 and 1980 after taking account of structural effects. After that, the situation has remained fairly stable. Among men with medium education, there was a certain increase in the tendency towards homogamy in the younger age groups (mostly between 1990 and 2000), where for the older age groups relative homogamy somewhat declined (mostly between 1980 and 1990). Similarly, the decline of observed homogamy among men with low education was accompanied by a decline in randomly expected homogamy, so that also here only minor changes in net homogamy remain across the whole period.

In sum, we can say that the observed changes in educational homogamy are due in large part to changes in the opportunity structures that are associated with a shift in the educational distributions in the course of educational expansion. No clear indication of a change in partner choice behavior that is independent of structural effects can be found in the data. Nonetheless, it is sociologically interesting to see that structurally adjusted partner choice behavior seems to differ between the educational groups. Net homogamy, which measures how much the observed homogamy exceeds what one would expect under random matching of partners, is highest for people with low education (about 60 percent). People with medium education reach the lowest values (20 to 30 percent). People with high education lie in between (around 40 percent). For persons with low education the inclination to take their cue from their own group when choosing a partner thus seems highest, while it seems to be lowest among persons with medium education.

## 5. Summary and discussion

This article described the effects of the educational expansion on marriage markets and education-related partnership patterns for Switzerland in the second half of the twentieth century. The assumption was that due to the peculiarities of the comparatively moderate course of the educational expansion (Buchmann et al. 2007; Blossfeld & Shavit 1993), the slow changes in social structures and social inequality (Jann & Combet 2012), and the continuing traditional division of labor in private households (Levy 2013) – even in the face of an increasing labor force participation of women (Imdorf & Hupka-Brunner 2015) – Switzerland is a special case when it comes to the consequences of the educational expansion for demographic and family-demographic processes. It was therefore of special interest to examine, by means of census data for the total population, whether the progressive increase in qualifications across the birth cohorts resulted in a gradual social opening of the marriage and partnership markets and thus lead to a greater educational heterogamy of the couples or, conversely, whether traditional marriage patterns (with men having a higher educational level than their partners) persisted, possibly coupled with an increase in homogamy among highly educated women and men and a greater disadvantage for persons with low education on the partnership market.

The census data allowed a step-by-step reconstruction of the theoretically assumed processes for the connection between educational expansion and partnership patterns for selected age groups. On the one hand, the empirical findings do not yield any clear trends for a social closure or opening of the partnership and marriage markets in Switzerland. In international comparison Switzerland is a special case in this respect. On the other hand, interesting differential developments were uncovered. For example, partnerlessness (defined as not living with a partner in the same household) among women and men in prime marriage age has increased. This is particularly true for men with medium or high educational levels, whereas for women the effect can mostly be observed for lower educational levels, but not among the highly educated. Despite these trends that lead to some convergence in the sex-specific educational gradients in partnerlessness, partnerlessness is still most prevalent among less educated men and more educated women. One potential reason is that men with a low educational level, and therefore a low average income, are particularly unattractive on the partnership and marriage markets, while highly educated women are less inclined to form steady relationships because their high economic and social independence is at odds with traditional family roles. But note that, contrary to expectation, both the negative relation between partnerlessness and education for men and the positive relation between partnerlessness and education for women have weakened over time. Furthermore, there are differential trends in homogamy depending on gender and on the educational level: homogamy has increased substantially for highly educated women and men as well as for

men with medium education, while a noticeable decline in homogamy can be observed for men with low education. Moreover, as expected due to the educational catch-up of women, hypergamy in men has declined in favor of hypogamy and homogamy. There are thus indications that in this regard women have profited more from the educational expansion than men. In these developments Switzerland does follow the development patterns in modern societies, albeit by far not as clearly as is the case, for instance, in Germany.

If the structural effects of the educational expansion are taken into account, there was no noticeable change, or at best a marginally increased inclination toward homogamy across all educational levels during the period from 1970 to 2000. The observed changes in educational homogamy therefore seem to be mostly due to changes in the opportunity structures associated with a shift of the educational distributions over the course of the educational expansion. However, the structurally adjusted partner choice behavior differs between the educational groups. Net homogamy is highest for persons with little education and lowest for persons with a medium education, while the highly educated persons are positioned between these two educational groups. Thus the social closure is highest for the groups that did not participate in the educational expansion, while the marriage market for the middle and higher educational groups is socially more open. In this sense one can talk of a polarized partner market with a stronger closure at the lower end of the educational scale and a relative openness in the middle educational layers. The degree of polarization, however, slightly decreased over time as there were moderate positive trends in net homogamy among highly educated (primarily between 1970 and 1980) and among persons with medium education (primarily between 1990 and 2000), whereas net homogamy remained rather stable for persons with low education.

One must assume that the norms of homogamy are probably still widespread and enshrined just as strongly in the Swiss social structure as the gender-typical division of labor in private households. Further analyses from the life history perspective with event-oriented prospective panel data for successive age groups are necessary in order to evaluate these issues empirically in more detail (see Blossfeld 2009; Blossfeld & Timm 2003, 1997). For example, based on census data it is not possible to differentiate between a first marriage and remarriage. Additional analyses with up-to-date longitudinal data for Switzerland are necessary in order to answer the question as to whether the sustained educational expansion promotes educational homogamy also in cases when people remarry.

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## Appendix

Table A1: Number of observations (population aged 25–64 years), by educational level and partnership status

	1970		1980		1990		2000	
	N	%	N	%	N	%	N	%
Total	3,025,803	100.0	3,201,572	100.0	3,681,257	100.0	3,951,740	100.0
<i>By education</i>								
Low educational level	1,311,073	43.3	1,208,926	37.8	1,026,176	27.9	899,079	22.8
Medium educational level	1,337,846	44.2	1,494,846	46.7	2,023,358	55.0	1,969,286	49.8
High educational level	242,264	8.0	368,445	11.5	586,487	15.9	857,688	21.7
Unknown educational level	134,620	4.4	129,355	4.0	45,236	1.2	225,687	5.7
<i>By partnership status</i>								
Living without a partner	688,340	22.7	753,929	23.5	954,749	25.9	1,117,053	28.3
Living with a partner								
Homogamy determinable	2,213,089	73.1	2,341,445	73.1	2,684,449	72.9	2,651,606	67.1
Homogamy undetermined	124,374	4.1	106,198	3.3	42,059	1.1	183,081	4.6

Figure A1: Cumulative distribution of partnership status (living with or without a partner in the same household) by gender, age, and year

