



Age gaps between partners among immigrants and their descendants

Adaptation across time and generations?

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Abstract

Age gaps between partners – who are married, cohabitating or in childbearing unions – have undergone dramatic changes in high-income countries over the past century. Yet there has been little focus on this aspect of family behaviour for immigrants and their descendants. We argue that this is an important omission, not least because the mean age gaps across generations can be interpreted as a macro-level indicator of adaptation. Our study examines the age gaps of immigrants and their descendants in Sweden, a country with high gender equality and a stable mean age gap. Since the late 1960s, Swedish men have been around 2 years older, on average, than their female partners. Using longitudinal data for the whole population of Sweden, we examine changes in age gaps for cohorts born 1950-1986. We show that cohort trends in age gaps often follow very different patterns for male and female immigrant groups, with limited evidence of adaptation across cohorts. However, there is considerable evidence of adaptation toward the Swedish norm for the second generation, including when making a direct comparison between immigrants and their children, although more so for male immigrants, in part due to patterns of partnership with the Swedish-born.

Keywords: *Age difference, Partnership, Adaptation, Immigrants, Descendants of immigrants, Intermarriage*

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Introduction

The difference in age between partners is an important demographic trait, and both a cause and a consequence of changes in socio-demographic behaviour. Age gaps in childbearing relationships are not only determined by partner choice, but also by trends in union formation and dissolution (i.e. partnership markets) (Ní Bhrolcháin 1992), alongside decisions to have children, including who to have children with. It has been argued that man-older relationships are associated with less gender equality and more traditional family values (Atkinson and Glass 1985; Van De Putte et al. 2009), and that these relationships are associated with adverse well-being of the partners, specifically women (Barbieri and Hertrich 2005). In addition to the potential consequences of age gaps on the division of labour within unions, such as trade-offs between labour market and childrearing activities, age gaps also have repercussions beyond the childbearing stage since they impact both retirement (Kridahl and Kolk 2018) and longevity (Drefahl 2010). Thus, it can be argued that on an aggregated level, age gaps can be both a cause and a consequence of values and norms related to families and gender.

Since the 19th century, average differences in age between male and female partners have decreased steadily and are now just a couple of years in the majority of in Western industrialised countries (Esteve et al. 2009; Kolk 2015; van Poppel et al. 2001; Wilson and Smallwood 2008). With increased gender equality, a decrease of gendered division of labour, and fewer instrumental reasons for entering a marriage or long-term union, the reasons for choosing a given partner are now more similar for women and men (Shorter 1975). Alongside these social trends, many high-income countries – including Sweden (the country studied here) – have become home to an increasing number of immigrants from a diverse range of countries who may have different norms and preferences regarding the age of a prospective partner. If age gaps are indicative of changes in partner choice, and correlate with underlying partner preferences and norms, then research on the age gaps of immigrants and their descendants is an important means of understand behavioural adaptation (at least with respect to family formation behaviour). Moreover, as the size and share of the foreign-born population increases, the partnership behaviour of immigrants becomes an increasingly important component of partnership dynamics for the population as a whole. It is therefore surprising that there is a lack of research on the age gaps of immigrants (cf. Balistreri et al. 2017; Berrington 1994), in particular as compared with their descendants.

In this study, we analyse the age gaps of the entire population of Sweden who were born from 1950 onwards. We focus on Sweden because it is one of the few countries with both a long history of sustained levels of immigration and the availability of suitable data in order to analyse the age gaps of immigrants and their descendants for the whole population, including by sex, country of origin, birth cohort and parental country of birth. These data allow us to make a direct comparison between immigrants and their children. An additional advantage of Sweden as a case study is the fact that it has a long history of relatively high levels of gender equality and a stable mean period age gap. Since the late 1960s, Swedish-born men have been around 2 years older, on average, than their female partners (Kolk 2015).

Our central research question examines whether there is adaptation of age gaps across time and generations. More specifically, we analyse how age gaps within childbearing unions have changed for immigrants and their descendants by birth cohort (across time) and by comparing first generation immigrants with the second generation (across generations). In doing so, we compare with the trend in age gaps for native-born children of native-born parents, as well as examining variation by sex, whether partners are native-born or not, and (parental) country of birth. There is a considerable body of research on the adaptation (or assimilation) of other family behaviours, including fertility (e.g. Andersson 2004; Parrado and Morgan 2008) and different types of partnership formation and dissolution (e.g. Andersson et al. 2015; Nadja Milewski and Kulu 2014). Some of this research has uncovered considerable heterogeneity between groups (Adserà and Ferrer 2015). We aim to complement these studies by examining, in detail, the extent of adaptation to the Swedish age gaps norm (i.e. mean of the Swedish-born) for immigrants from different countries of birth, including in comparison with their descendants.

Background

Over the course of the 20th century, partner age differences decreased so that men in opposite-sex unions became closer in age to their female partners, on average, in many high-income countries (Esteve et al. 2009; Kolk 2015; Ní Bhrolcháin 1992; van Poppel et al. 2001). Before industrialization, large age gaps between spouses or partners were common in high-income countries, as male (but not female) resource acquisition was often highly desirable before entering marriage (Hajnal 1983). Given that male resources tend to increase with age, whereas valued female traits, such as childbearing potential, decrease with age, man-older unions were prevalent and age gaps often considerable. As the Malthusian features of marriage – where

resources constrain reproduction – have become less pertinent, the landscape of union formation has changed. In the 20th century, when unions have become less driven by instrumental reasons, relationships are more often entered on a basis of sentiments (Shorter 1975), and this is true for both men and women. As an example of this change, age heterogamy in the Netherlands has decreased linearly from an average of 4.5 years (man-older) in 1850, to 2.6 years (man-older) in the 1970s (van Poppel et al. 2001). Importantly, this change cannot solely be explained by lower ages at marriage during the same time (van Poppel et al. 2001).

Because age gaps are in part determined by opportunities to find partners of a given age, temporary shifts in age gaps may also be caused by population dynamics. Changes in sex ratios (e.g. partnership ‘squeezes’) may occur due to fluctuating cohort sizes, sex biases in migration, or wars (which kill more men than women), and this may cause changes in age gaps because one sex is more plentiful than the other (Ni Bhrolcháin 2001). However, a fluctuation in sex ratios is unlikely to explain long-term trends because its impact will disappear over time. A more likely explanation for long-term trends in age gaps, just like trends in other aspects of partnership behaviour, is changes in preferences, norms, and opportunities (Kalmijn 1998).

In high-income countries, with increased enrolment in higher education (especially among women), there has been a change in both individual life courses – such as delayed entry into parenthood – and the environments in which partners meet and form unions (Chudnovskaya 2017). Related to this, there has been a decline in marriage, a rise in cohabitation, and an increase in union dissolution (Lesthaeghe 2010). All of these trends may have driven changes in age gaps between partners. They also suggest that there are good reasons to focus on childbearing unions (as we do here), which have increasingly become a marker of union stability (Thomson et al. 2012). Childbearing unions are therefore a more stable and generalizable measure of average age gaps, especially for younger birth cohorts.

In addition, it is likely that changing age gaps reflect changes in gender dynamics. Using historical data, increasing age homogamy has been explained by both a weaker link between resources and marriage (Dribe and Stanfors 2017) and by a shift in cultural norms (Van De Putte et al. 2009), both of which relate to gender roles. Taking a cross-cultural perspective, patriarchal societies tend to have larger age differences, and more man-older relationships, as compared with societies where women’s position is more favourable (Casterline et al. 1986).

There is also evidence of a correlation between international measures of gender equality and lower age gaps (Carmichael 2011). For instance, the years of female education at age 15 is negatively associated with spousal age gap in a number of low income countries (Carmichael 2011). Thus, while it is clear that many factors contribute to observed age gaps in society, it could be argued that long-run trends in age gaps are an indirect measure of preferences and norms related to gender equality in families.

Family behaviour and adaptation among immigrants and their descendants

The family behaviour of immigrants often differs in important ways from those of the native-born population (Kulu and González-Ferrer 2014). Immigrants typically arrive with distinct traits that increase the diversity of demographic behaviour in their destination country. Over time, as they settle and integrate to life in their new destination, immigrants may adapt their family behaviour so that it more closely resembles the average behaviour of the destination population – i.e. the behavioural (or mainstream) norm (Alba and Nee 2005). Research has demonstrated that family behaviours are more likely to resemble those of the mainstream population if immigrants have experienced greater exposure to destination norms (e.g. by duration of residence), not only for partnership and partner choice (Dribe and Lundh 2008), but also for entry into parenthood (Andersson 2004), completed fertility (Wilson and Kuha 2018) and the uptake of family leave policies (e.g. Mussino et al. 2019).

Migration scholars have used a range of theories to explain differences in the family behaviour of native-born and foreign-born populations (Kulu and González-Ferrer 2014; Milewski 2010). Differences may be a result of exposure to norms and preferences during childhood (socialisation), underlying demographic or socioeconomic characteristics (compositional differences), artefacts of the migration event (e.g. delays in childbearing until after migration), or exposure to living in a new destination (which is frequently referred to as adaptation, or sometimes as assimilation, although the latter is arguably a more varied, contested and ambiguous term, (for example see Brubaker 2001; Zhou and Gonzales 2019). Research designs that can reliably distinguish between these explanations, or that try to explain their relative effects, are elusive (Tønnessen and Wilson 2019; Wilson and Sigle-Rushton 2014). This is largely because immigrants are selectively different from non-immigrants (e.g. Feliciano 2016; Ichou 2014; Wallace and Wilson 2019), including with respect to their family formation (Mussino and Ortensi 2018; Singley and Landale 1998). For immigrants who arrive as adults (i.e. after reaching childbearing age), it is therefore hard to explain changes in family behaviour

using factors after arrival, unless factors prior to arrival are also considered (i.e. unless selection is modelled in some way). For example, it is extremely difficult to say whether the family formation of immigrants who arrived as adults is due to uptake of destination country norms, anticipation of the migration event and/or selection, even when analysing fertility by duration of residence or by comparing immigrant childbearing before and after arrival (Hoem 2014; Hoem and Nedoluzhko 2016). In addition, as compared with other social outcomes (such as income), it is more difficult to analyse how family behaviours change over time because they involve rare events, which means that family circumstances are often time-constant over most of the life course.

As one way to avoid these dilemmas, researchers have proposed that adaptation is better tested by examining the behaviour of the descendants of immigrants, especially as compared with that of their parents' generation (Parrado and Morgan 2008; Smith 2003). Here we follow this line of argument in order to carry out a more rigorous test of adaptation than would be possible by focussing on the age gaps of immigrants alone. We analyse first generation immigrants in order to establish whether (and how) their age gaps are different from the mainstream age gap norm (i.e. the mean of the Swedish-born). Then, instead of trying to analyse adaptation across the lives of individual immigrants, we examine how mean age gaps change over time and across generations. In particular, we compare first generation immigrants with their descendants, the second generation, including a direct comparison between immigrants and their children. Other authors have referred to this approach as a test of intergenerational assimilation (e.g. Parrado and Morgan 2008) or intergenerational adaptation (Dubuc 2012). However, at least in theory, convergence of mean age gaps may be determined by factors other than adaptation or assimilation (which is also a point that has been made by the aforementioned authors). Convergence may occur due to structural factors (such as the influence of institutional factors or labour market participation: (Andersson and Scott 2005)), or as a by-product of other changes in family behaviours. The role of norms in relation to family behaviour is a contested topic (Liefbroer and Billari 2010), something we return to in the discussion.

The intersection between gender and migration background

Gender plays a fundamental role in the lives of immigrants and their descendants (González-Ferrer et al. 2018; Pedraza 1991). Here, we follow others in arguing for the importance of taking an intersectional approach when analysing demographic behaviours (Sigle 2016), particularly

given that we focus on partnership, a process that is likely to differ for women and men. Our study examines the interaction between gender and migration background in order to understand how female and male immigrant age gaps differ and whether female and male descendants of immigrants show different degrees of adaptation. Among any group where there are preferences or norms regarding man-older unions, women and men may face rather different scenarios at the time of family formation. For women, opportunities to find a partner decrease with age, whereas young men may have to delay family formation and spend a longer time being single. Once in a man-older union, given that the man has had longer time to establish himself in the labour market, both partners may face incentives to adhere to a traditional male breadwinner relationship – even they did not enter the on those grounds (Rothstein 2012). While the incentives for a traditional family norm among man-older couples apply both for immigrants and natives, women with a migration background may be particularly vulnerable to economic factors (Qian, 2013).

In a population where partnership is only endogamous (with members of the same group) and monogamous (i.e. there are no concurrent partners), age gaps for males and females should be the same. However, when comparing average age gaps in different sub-groups of the population – as we do here by birth cohort, generation and country of birth – results are not (necessarily) symmetrical for women and men. Female age gaps are often higher (i.e. more likely to be man-older), especially when comparing men and women from the same age group or birth cohort. This is partly because men are more likely to re-partner, including entry into new childbearing unions (de Graaf and Kalmijn 2003; Ivanova et al. 2013; Ní Bhrolcháin 1992). Here we focus on the age gaps of women and men at the time of their first childbearing union, but we do not restrict our analyses to the first childbearing union of *both* partners. Consequently, some women will enter their first childbearing union with men who have children from a previous union.

Partnerships between immigrants and the native-born

The age gaps of immigrants are partly a product of the degree to which they partner with the native-born population (often called intermarriage). Here we refer to such unions as bi-national partnerships. A number of studies have examined the determinates of bi-national unions (or marriages) and found that they are more common for those who have spent longer residing in the destination country (Dribe & Lundh, 2008; Obućina, 2016; Qian & Lichter, 2018). In Sweden the proportion of bi-national partnerships among male descendants of immigrants

has doubled from 12% since the early 1990s, but there has been no corresponding increase for females (Haandrikman 2014). The prevalence of native-immigrant unions (in aggregate, among different groups) is sometimes regarded as a definitive marker of immigrant integration (Kalmijn 1998), in part due to an association with economic integration (Meng and Gregory 2005). Irrespective of their meaning, bi-national unions are known to have different age gaps. For example, large age gaps are more common for native-born Swedes if they have low education, low income, or if they partner with an immigrant (Gustafson and Fransson 2015). For both Swedish-born men and women, large age gaps are particularly common in partnerships where one partner is from Asia, Africa, Latin America or the Middle East (Elwert 2018). In this context it is relevant to note that 'marriage migration' – i.e. immigration that is linked to union formation – has increased since the 1990s, but is still at low levels overall, although this varies by country of origin (Niedomysl et al. 2010).

The Swedish context

Here we carry out a case study of Sweden, which is uniquely suited for studying the age gaps of immigrants and their descendants given that it has a combination of four characteristics. First, high levels of gender equality are a pervasive feature of Swedish society. Sweden is often considered a forerunner in family change with high levels of female labour force participation, paternity leave and gender equality (Bernhardt et al. 2007). This means that the age gap norm for the Swedish-born population is less likely to be determined by gender differences than in other destinations. It also means that male and female immigrants are likely to have the same opportunities, at least with respect to opportunities arising in Swedish institutions and the broader society. Second, it has a stable mean period age gap. Since the late 1960s, Swedish men have been around 2 years older, on average, than their female partners (Kolk 2015). This demonstrates that the Swedish norm is relatively unambiguous and that any evaluation of adaptation towards this norm is unaffected by changes in the norm itself. Third, Sweden has a large and diverse population of immigrants – and descendants of immigrants – due to a long history of sustained levels of immigration. Since the latter half of the 20th century, the foreign-born population in Sweden has grown considerably. At the same time, it has also become more diverse, in particular as the most dominant form of migration has changed from labour migration during the 1950s and 60s to refugee migration during the late 1970s, 80s and 90s.

Currently, about a fourth of the Swedish population are either foreign-born or have at least one foreign-born parent (Statistics Sweden 2019), which not only makes our study feasible, but also indicates the likely relevance of our study in helping to understand population change and family dynamics for a large section of the population. Fourth, we are able to make use of longitudinal register data for the whole population of Sweden, including all immigrants and their descendants. Taken together, these four characteristics are not found in any other national context, at least not for a country with more than 10 million residents. These factors allow us to study immigrants from many different countries of birth, who are born in different decades, and who migrated for different reasons, along with their descendants – the second generation – who were born and raised in Sweden. We already know that the second generation in Sweden often have similar levels of entry into parenthood (Scott and Stanfors 2011), similar (or lower) birth rates (Andersson et al. 2017), marriage rates (Andersson et al. 2015; Wiik and Holland 2018) and divorce rates (Andersson et al. 2015), as compared with native-born children of Swedish-born parents. Our study adds to this body of work and represents the first exploration of partner age gaps among immigrants and their descendants in Sweden, and, to the best of our knowledge in any other national context.

Research questions, data and methods

Our main aim is to study the adaptation of immigrants and their descendants toward the Swedish age gap norm. In order to achieve this aim, we pose the following research questions:

1. *How do the age gaps of immigrants vary by birth cohort and country of birth, and how do they compare to the age gap norm (average) in Sweden?*
2. *Is there evidence of adaptation (i.e. intergenerational convergence) across generations – if we compare the age gaps of the consecutive generations by (parental) country of birth?*
3. *Does any evidence of adaptation of age gaps and differ for women and men, and what can we conclude by examining the intersection between gender and migration background?*

The first question sets out to establish initial macro-level differences between immigrants and the mainstream Swedish norm. We do not seek to estimate age gaps in countries of origin, not least due to a lack of nationally representative data that are of sufficient detail and quality. However, we do not believe that this is necessary in order to answer the above research questions, not least because our evaluation of adaptation takes age gaps of the first generation

as the starting point (i.e. the initial difference that may or may not converge – see (Wilson and Sigle-Rushton 2014)).

Throughout this study we use register-based data that are collected and administered by Statistics Sweden. The data are accessed on a secure server and were made available after ethical approval. The subset of data used for our analysis is therefore based on a collection of linked registers that cover vital events – births, deaths, immigrations and emigrations – in Sweden from 1950-2016. Inclusion from 1950 is contingent on having lived in Sweden in 1960, (full coverage of vital events is available from 1968). These data allow us to analyse age gaps for childbearing unions at the time of first parenthood. Our study capture unions for male and female immigrants who were subsequently resident in Sweden, regardless of whether the child was born in Sweden or abroad. Our study population is the entire Swedish population who were born between 1950 and 1986 (with the additional restriction that they are resident in Sweden at some point between 1950 and 2016). We include all immigrants from these birth cohorts who arrived in Sweden 1950-2016, although we exclude those who emigrated before they had been resident for one year.

The register data allow us to examine 46 countries of birth (or detailed country groups) separately and to distinguish between immigrants who arrive as adults (the first generation, G1) and the children of two foreign-born parents (the second generation, G2). These are the two generations that we compare in aggregate. In analyses based on G1, we only include adult arrivals (those arriving aged 18 or more). This is because including child migrants (arriving aged 0-17) would confound the influence of origin country norms with socialisation in Sweden (i.e. exposure to Swedish society and norms during childhood). We do however make use of parent-child linkages to carry out an individual-level comparison of immigrants with their biological children. For this we focus on immigrants who arrived as children (the so called ‘one and a half’ generation, G1.5).

All G1 migrants are categorised by their own country of birth. Ancestry of the Swedish-born G2, however, is based on mother’s country of birth. In a few instances, where maternal country of birth was missing, but paternal country of birth was in the data, father’s country of birth was used to determine ancestry. In the results presented separately by background of the

partner (Figure 3), we distinguish between cases where partners are foreign-born or Swedish-born, both in our analyses of the G1 and G2.

Our outcome variable is the difference in age – i.e. the age gap – between individuals and their partners when individuals enter childbearing unions for the first time. As noted above, their partners may or may not have had children before. We limit our analysis to opposite-sex unions. In all cases, age gaps are given in years and are calculated by subtracting the man's age from the woman's age, (irrespective of whether we are estimating averages for women or men).

We focus on individuals born between 1950 and 1986 and chose the lower limit largely because the majority of immigrants born before 1950 were born in another Nordic country. There are also very few G2 born before 1950. The upper limit was chosen because we focus on childbearing unions at the time of first parenthood, i.e. individuals need to have had a first birth in order to be included in our study. We therefore chose to include only individuals who are aged 30 or more, which means we exclude individuals born after 1986 (less than 30 in 2016, the final year our data).

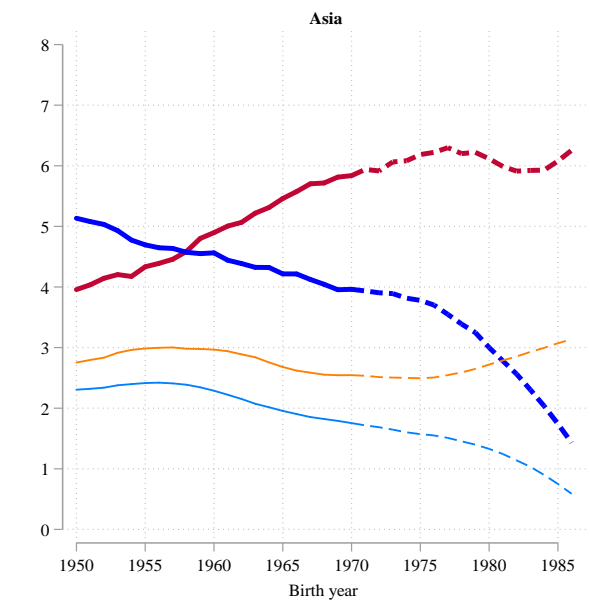
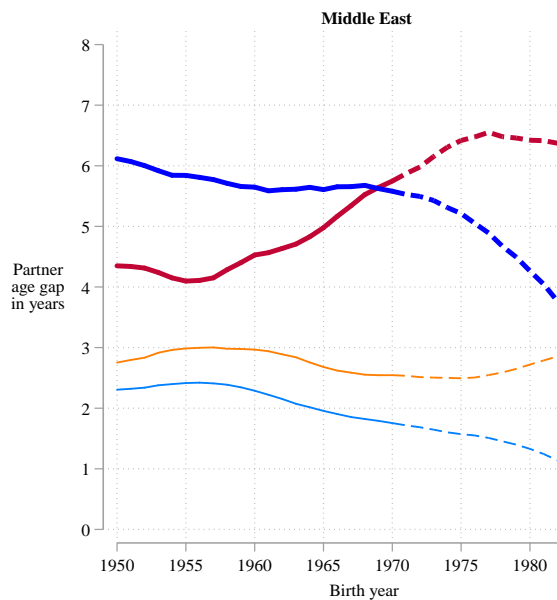
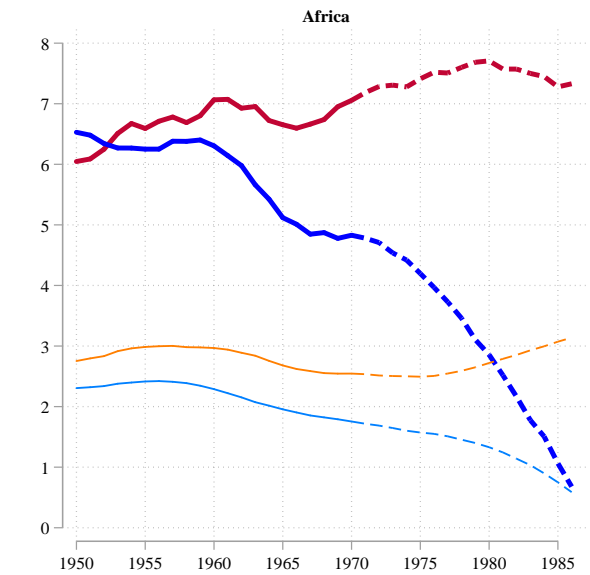
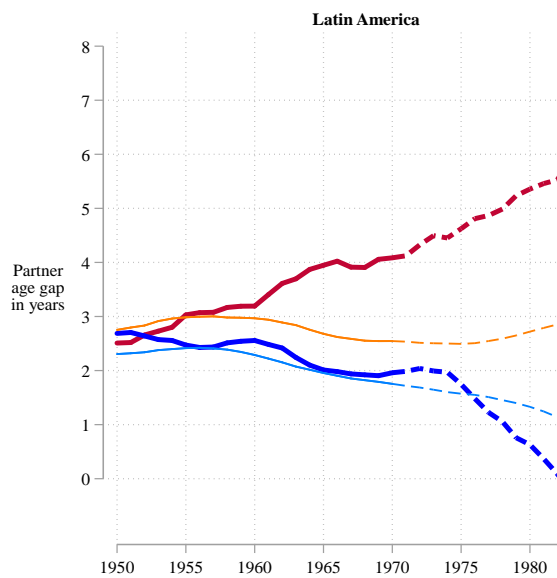
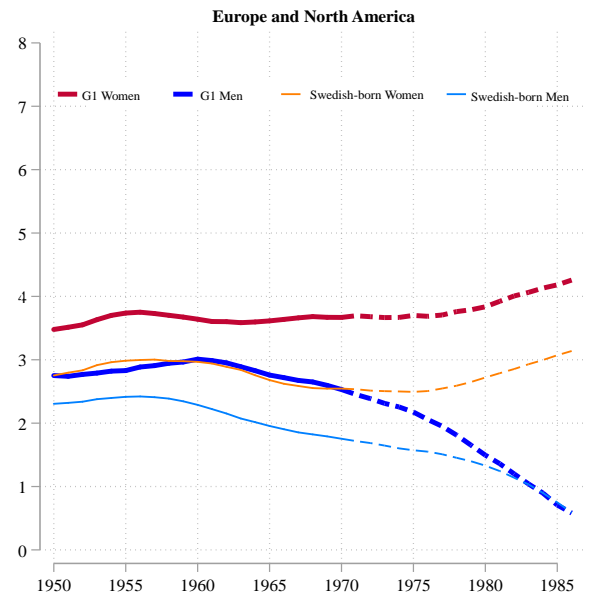
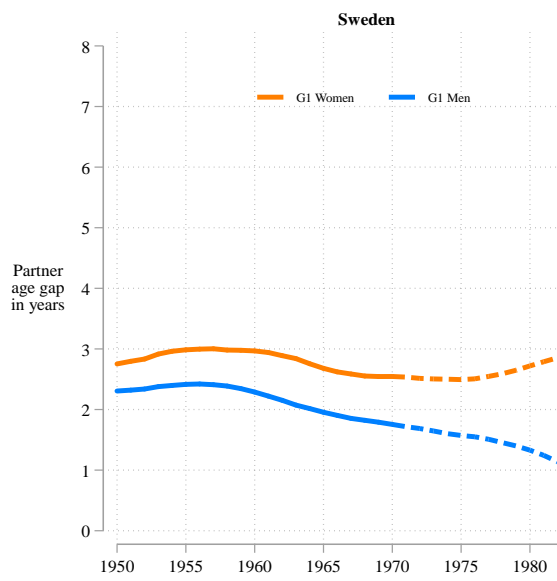
Further, we exclude anyone who does not have an identifiable partner and a small number of cases who were missing country of birth or age at arrival. It is possible for immigrant's union to have been formed before coming to Sweden, but we do not have information on when this union was formed. Similarly, we are unable to identify cohabitation outside of childbirth, for any Swedish residents, because Swedish register data does not allow identifying cohabitants until 2011. That said, we include all unions at the time of a parent's first birth, so it is merely a case of not differentiating between those that occur within marriage or cohabitation (or neither of these). In a few instances, some populations' sub-groups are small, so we also drop any estimate that is based on a sub-population of less than 10 individuals. Our final study population includes 349,317 male and 340,928 female G1 immigrants from 46 countries of birth (or detailed country groups), as well as 50,402 male and 53,066 female Swedish-born members of G2. There were 72,104 male and 79,906 G1.5 child migrants. Our ancestral Swedish-born (with two Swedish-born parents) reference population comprises 2,485,901 individuals. A complete list of countries is shown in the Appendix.

Given that our research questions concern changes in age gaps at the aggregate level, our method is based on mean age gaps, a task that is made straightforward by the availability of whole population data. To answer the first research question, we estimate trends in age gaps by birth cohort for six different country of birth regional groups: Sweden, Europe and North America, Latin America, Africa, Middle East, and Asia (Figure 1). This allows us to contrast the trends for G1 immigrants with those for the Swedish-born population. For the time trends, we construct 5 year moving averages, because some combinations of YOB, migrant generation and country of birth yield small numbers. To answer our second and third questions, which focus on adaptation, we first compare age gaps for G1 and G2, both cross-sectionally and across lagged generations (Figure 2 provides a visualisation of the results, while a numerical comparison is given in Appendix Table A1. The role of bi-national unions in explaining this comparison is investigated by disaggregating age gaps for G1 and G2 according to the country of birth (COB) of their partner (Figure 3). Finally, we carry out an comparison of age gaps for G1.5 and G2 women and men with the age gaps of their parents, which is analogous to making a within-family comparison (i.e. not dissimilar to using family fixed-effects). We focus on the G1.5 and G2 because data linking parents to their children is only available if the focal individual's parents have ever lived in Sweden (rare for adult arrivals). Lastly, we stratify all our analyses by sex, which enables us to examine the intersection between gender and migration background. All results are averages for different (parental) COB groups, as our primary objective is to analyse population-level behaviour for different groups. Modal age gaps from the 46 countries (or country groups) with quartile ranges are shown in the appendix (Figure A1 and A2).

Results

For Swedish-born women and men who have completed childbearing (or are close to completing), age gaps at first birth are slightly lower for more recent cohorts. Figure 1 shows this trend alongside the equivalent trends for G1 immigrants, grouped into five different regions based on country of birth.

Figure 1. Age gap (man older, in years) by birth cohort and region of birth.

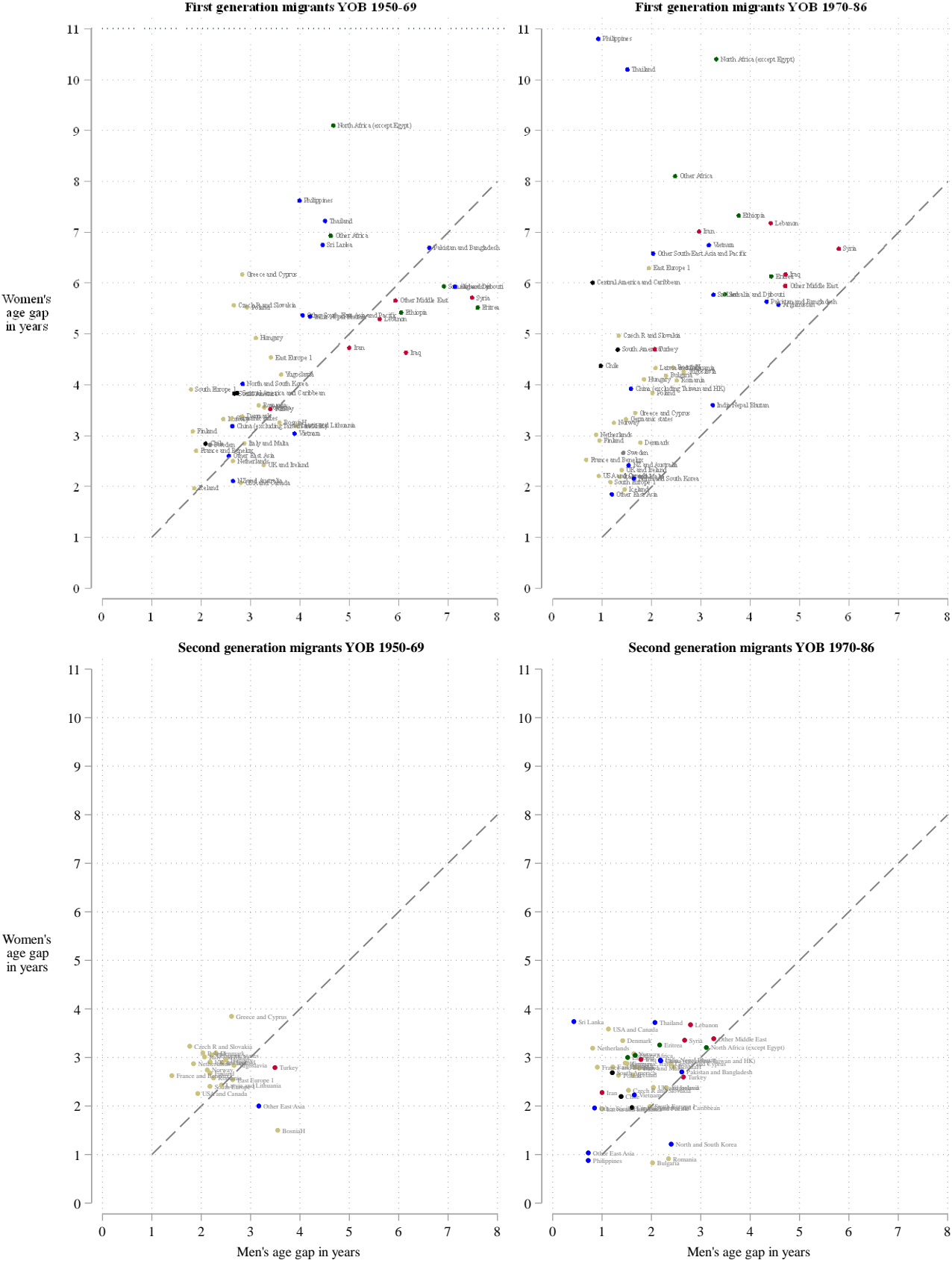


The trend lines are dotted after 1971 to indicate that women and men born after 1971 have not yet completed childbearing (i.e. they have not reached age 45 years in 2016). We only observe age gaps for those who have had a first birth. This is around 85-90% of the population for cohorts born before 1971, but a lower proportion for those born afterwards. As shown by the results for the Swedish-born cohorts who have not completed childbearing (1971-1986, age gaps diverge as birth cohort age decreases. Women from younger cohorts tend to have larger age gaps (i.e. relatively older male partners), whereas men from younger cohorts tend to have smaller age gaps (i.e. older female partners). As suggested by the dotted lines- irrespective of country of birth - this phenomenon becomes less evident as childbearing becomes closer to being complete. This is essentially because those who have postponed childbearing will now (by 2016) have had a first birth, and will therefore have an observed age gap that is less constrained by their own age.

Although age gaps for the Swedish-born cohorts who have completed fertility show a slightly decreasing trend, hovering around 2 years for men and around 2.5-3 years for women, this is not the case for many G1 immigrant groups. With the exception of Africans, mean age gaps for male immigrants do exhibit a similar trend to Swedish-born males. That said age gaps are systematically higher by around one year for Europeans and North Americans, around four years for men from the Middle East and around three years for men from Asia. The only male group with a clearly different trend is Africans, whose mean age gap fell from 6.5 years for those born in 1950 to 5 years for those born in 1970. This is no doubt due, at least in part, to changes in the distribution of migration from Africa.

Interestingly, the birth cohort trends in Figure 1 already show the importance of taking a gendered approach. Unlike G1 men from the same birth cohorts, G1 women who have completed childbearing exhibit age gaps at first birth that are increasingly larger than the Swedish norm for more recent cohorts. For example, the mean age gap for Asian women has risen from four years to six years comparing those born in 1950 and 1970.

Figure 2abcd. Age gap (man older, in years) by sex, birth cohort and generation.

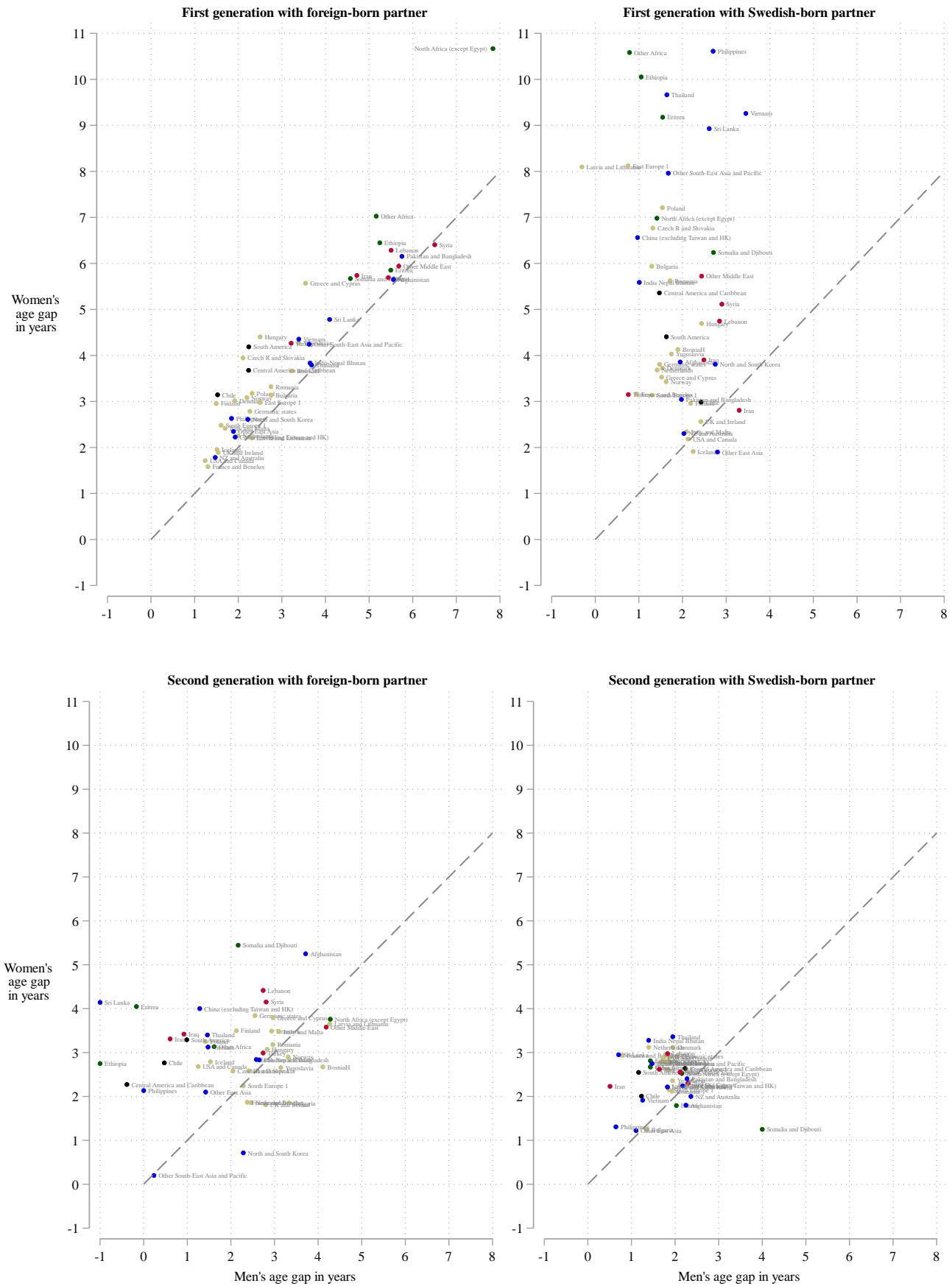


Footnote: Diagonal lines indicate where male and female migrants would have equal age gaps, so any data point above the line indicates that female migrants from a given origin have larger age gaps than their male counterparts.

Figure 2 elaborates upon these trends by comparing men and women from the same country of origin, both for G1 and G2, separated into two birth cohort groups. Focussing on completed cohorts (1950-69), it is clear that the intersection between gender and migration background is important. For example (as shown in Figure 2a), some G1 groups – like Iraq, Ethiopia and Syria – have larger age gaps for men than women, whereas the opposite is true for other groups – such as North Africa, Philippines and Thailand. Crucially, the distribution of mean age gaps is much narrower for both G2 women and G2 men, as compared with G1, which we interpret as evidence in support of intergenerational adaptation. That said, we note that many parental countries of birth are absent from the G2 analysis for completed cohorts (1950-69) because immigrants from those countries did not give birth to material numbers of (G2) children in Sweden prior to 1970.

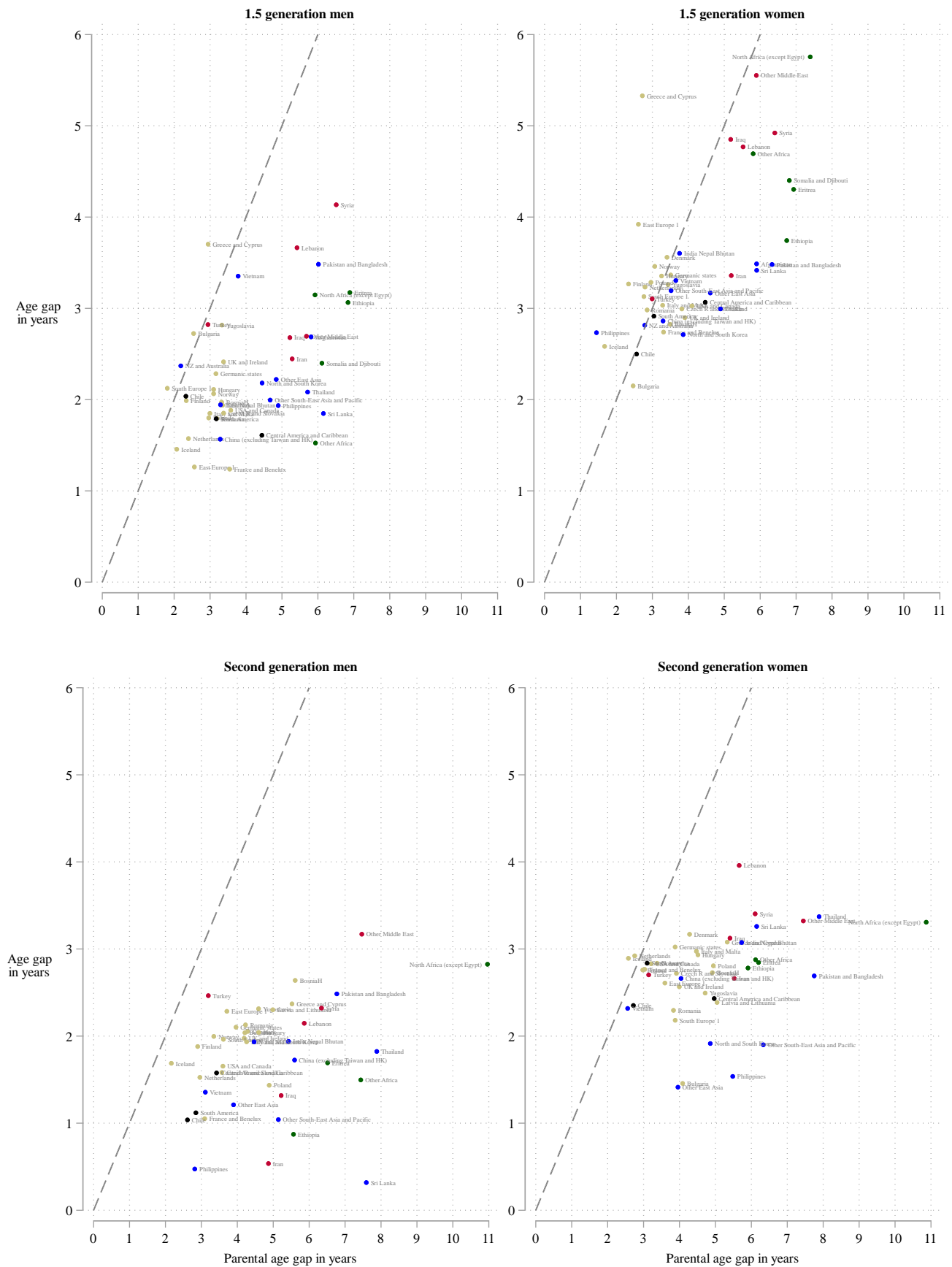
Among more recent birth cohorts (1970-1986), both the G1 and G2 panels illustrate the same drift in age gaps for incomplete cohorts that are seen in Figure 1. It is therefore reasonable to assume that, all else equal, the age gaps for these cohorts will become lower for women in future periods (beyond 2016) and higher for men. This suggests that the two G1 plots will become more similar once more recent birth cohorts (1970-1986) complete their childbearing (by the year 2031). It also suggests that the results for G2 women will – if anything – move in the direction of smaller age gaps. Assuming this is the case, then a comparison of generations across lagged birth cohorts (G1 1950-69 versus G2 1970-86) can also be interpreted as evidence in support of adaptation. This is important given that lagged comparisons have been argued to be a more accurate assessment of adaptation because they more closely approximate comparisons between parents and their children (Parrado and Morgan 2008; Smith 2003).

Figure 3abcd. Age gap by generation and partner's country of birth.



A primary reason for differences between male and female age gaps – in particular for immigrants from the same country of birth – is differences in patterns of union formation with the Swedish-born population. As expected, there is a strong positive linear correlation between the mean age gaps of women and men from the same country of birth if we only analyse first childbearing unions between those who are both foreign-born and from the same country of birth (Figure 3a). This can be contrasted with those immigrants who enter their first childbearing union with someone who is Swedish-born (Figure 3b). The gender differences for these bi-national unions are considerable. Among G1 men with Swedish-born partners, age gaps between 1 and 3 are very common, whereas G1 women exhibit a much broader range, with mean age gaps between 2 and 10 years. The largest mean age gaps include women from Philippines, Thailand, Vietnam, Sri Lanka, Ethiopia and Eritrea. The G2 do not mirror this pattern. On the contrary, they show no strong gender differences when partnering with other members of the Swedish-born population (Figure 3d), while partnerships between the G2 and G1 are slightly more diverse in terms of age gaps (Figure 3c), including some averages below zero (i.e. woman-older unions for G2 men whose parents are from Sri Lanka, Ethiopia, Eritrea, and Central America and the Caribbean). However, unlike G1, there is no G2 group that has a mean age gap greater than 6, irrespective of their partner's country of birth.

Figure 4abcd. Intergenerational transmission of age gap (man older in years) for parents and their children by migrant generation (G1.5 and G2).



Arguably, the most robust assessment of adaptation is a comparison between parents and their children. Among other things, this enables us to disregard compositional differences between groups (i.e. many potential confounders) as an explanation for our results. Figure 4 shows that mean age gaps are almost always smaller for the children of immigrants – G1.5 and G2 – as compared with their (G1) parents. Notable exceptions to this general pattern include G1.5 men and women from Greece and Cyrus, as well as G1.5 women from Finland, Iceland, Philippines and some countries in Eastern Europe. Moreover, it appears that adaptation may be faster for men than it is for women. For both women and men, the mean age gap for G1 parents is highly correlated with the mean age gap of their children, but this association is stronger for G1.5 women ($\rho=0.63$) than G1.5 men ($\rho=0.48$). In other words, the intergenerational transmission of age gaps is stronger for G1.5 women. We note that this gender difference is not mirrored by the results for the G2 ($\rho=0.36$ for men and $\rho=0.35$ for women). However, this may be because the G2 appear to be adapting faster toward the Swedish norm, as might be expected given their longer exposure to Swedish society.

Discussion

We have provided the first comprehensive analysis of partner age differences for immigrants and their descendants in any country. Our data cover the entire Swedish population, including a diverse range of (parental) origin countries, as well as longitudinal information on all first childbearing unions, not only for individual immigrants, but also for their children. These data allow us to investigate the adaptation of partner age gaps. Our approach is unique because we are able to consider adaptation in several dimensions – across time and across generations – while taking into account compositional changes in the population.

Overall, our results provide considerable evidence of adaptation within the space of one generation. Most children of immigrants have mean age gaps on par with the Swedish-born children of Swedish-born parents. This includes those whose parents were born in countries with a very different cultural context from Sweden. We also show that gender, country of origin and partner's COB background are interlinked, such that they all play a complex role in determining age gaps. Although gender differences are negligible for the second generation, our results for child migrants point towards stronger adaptation (i.e. weaker correlation with parental behaviour) for sons of immigrants than their daughters. As we discuss further below, this may be linked with gendered differences in marriage migration, bi-national partnerships, and birth cohort trends.

The first generation: Divergence in age gaps between women and men

One of the most evident differences between female and male immigrants is their age gap trends by birth cohort. For immigrant women who have completed childbearing more recently – i.e. those born in more recent cohorts – their mean age gap is much higher than the Swedish mean age gap (Figure 1). In other words, G1 women exhibit evidence of divergence across time, whereas the same is not true for G1 men. There are two main explanations for this gender difference, both of which are likely to have some effect on these cohort trends. The first is compositional differences between G1 birth cohorts. We have already noted that immigration to Sweden was characterised by labour migration after the Second World War, but changed in character from the 1970s onwards, largely due to an increase in refugee arrivals (Statistics Sweden 2004). Although we analyse birth year, and not arrival year, our results reflect such broader changes in the composition of the Swedish population. That said, our finding that birth cohort trends diverge for G1 women and G1 men is drawn from analysis by origin region, and is consistent for Latin America, Asia, Africa and the Middle East.

The second prominent explanation for gender differences in age gap trends is sex-differences in partnership behaviour, including differences by partner's COB background (what is often referred to as intermarriage). Simultaneous with a geographic expansion in partnership 'markets', which has been evident across the globe (Niedomysl et al. 2010), immigrants have become more numerous in Swedish society, relationships between individuals from different country backgrounds have become more prevalent and more diverse (Haandrikman 2014). There are evident gender differences in these bi-national partnerships, which can be seen in our analysis of G1 age gaps by partner's country of birth (Figure 3a and b). In particular, when limiting our analysis to immigrants with Swedish-born partners, the differences in mean age gaps between women and men from the same country of birth are often considerable. For example, G1 women from Philippines, Thailand, Vietnam, Sri Lanka, Ethiopia and Eritrea all have mean age gaps of 8-11 years (i.e. their male Swedish-born partner is on average 8-11 years older than themselves). This can be compared with men from (all) the same origins who never have a mean age gap of more than 4 years.

Intergenerational adaptation

One of our other most distinct findings is the difference in age gaps between G1 and G2. Overall, we find strong evidence of intergenerational adaptation, not only when comparing generations at the macro-level by (parental) country of origin, but also when making a direct comparison between G1 and their children. There is some heterogeneity among the G2 by sex and parental country of birth, but in general they have adapted to the Swedish norm, which has been stable at around 2-3 years older men. We also find some evidence that adaptation may be faster for men than it is for women, although this is only evident when comparing G1 parents with their children who were born abroad (G1.5), and not for the second generation (G2).

With respect to gender differences – in particular the stronger adaptation for G1.5 men – it may be that partnership opportunities and constraints differ for foreign-born men and women. This pattern might arise if foreign-born daughters are be subject to higher parental expectations to adhere to origin norms than their brothers (Hampshire et al. 2012). Foreign-born women may also have very different opportunities to interact with Swedish society and its institutions (e.g. schools, communities and workplaces). Social interaction is a potentially important mechanism here, not only because it provides access to potential partners, but also because it is a potential determinant of exposure to partnership norms (including with respect to the ideal timing of entry into parenthood, which is strongly associated with age gaps as shown in Appendix Figure A3.). It may also be the case that G1.5 men are better able to ignore the partnership norms of their parents, or that the individual preferences regarding partners' age is different for G1.5 women than they are for G1.5 men. We note that there is no gender difference in the association between G1 parents and their children (G2). There is a high level of adaptation for both G2 women and men, which suggests that spending the entire childhood in Sweden is linked with gender similarities in terms of outcomes of age gaps. That said, there is considerable heterogeneity by parental country of origin, as shown in Figure 4.

At the macro-level, adaptation to the Swedish age gap mean may suggest the uptake of local norms pertaining to partnership and family formation. There are several ways that this might occur. First, adaptation might arise because of cultural adaptation, i.e. that individuals' preferences for a partner of a given age start to resemble the preferences native-born Swedes with Swedish-born parents generally hold. In addition, if parental attitudes start to resemble

those of Swedish-born parents, or if immigrant parents have less influence over their children's partner choice over time, age gaps may show signs of adaptation. Second, it may be that any adaptation to Swedish mean age gap, are unrelated to age gap and partnership norms, but driven by the uptake of *other* preferences or norms that are linked with partnership. The most closely related norms to partnership are those related to childbearing (Forste and Tienda 1996), and higher age gaps are more likely when female entry into parenthood is young (see Appendix Figure A3.). It follows that a reduction in age gaps may occur if women adopt norms relating to childbearing postponement. Moreover, postponement may itself be driven by the uptake of other norms relating to the sequence of life course events. For example, mean age gaps will fall if women are more likely to enter tertiary education and delay childbearing. Similarly, if both men and women are expecting to contribute equally to paid and unpaid work – which may be the case as immigrants and their descendants adopt Swedish gender norms – then one of the structural determinants of man-older relationships will be less pertinent.

Third, adaptation of age gaps may be unrelated to uptake of cultural norms and driven by economic or structural factors. For example, adaptation may be expedited because the descendants of immigrants face similar opportunities and constraints in local partnership markets as the mainstream Swedish population. Moreover, changes in the structural factors that determine age gaps – such as enrolment in higher education, economic opportunities, and other life course events – may be driven (in whole or part) by explanations unrelated to partnership norms. Thus, even if preferences or norms for large age gaps persist, it is possible that they cannot be realised or are at odds with other behaviours. Given the consistency of our findings of adaptation across origin groups, this may be unlikely, but it could occur if the pool of potential partners is small (e.g. because of other partner preferences).

These potential explanations for adaptation are not mutually exclusive, and structural determinants are likely to be correlated with cultural determinants, even if they are not causally interrelated. This is one reason why it has been so difficult for prior research on intermarriages and partnerships across origin countries to disentangle the role of preferences, norms, and opportunities (and constraints) (Kalmijn and Tubergen 2010). Our research suffers the same limitation, but nevertheless advances current knowledge by showing how gender intersects with migration background to generate heterogeneous partnership behaviour among different groups in the population.

We have also highlighted the importance of bi-national partnerships, especially in explaining macro-level patterns of behaviour. Previous research has shown that male descendants of migrants are more likely than their female counterparts to marry or have a childbearing relationships with someone who is Swedish-born (Çelikaksoy 2016; Haandrikman 2014). We show that both G2 men and women have smaller age gaps, on average, if they have a Swedish-born partner, but we also show that this is not the case for G1. Age gaps of G1 men and women are very different, on average, if they have a Swedish-born partner. Among immigrants in Sweden, men with higher education are more likely than women to partner with someone outside of their own ethnic group (Behtoui, 2010; Çelikaksoy, 2016). Similar findings exist for immigrants in for example Spain (González-Ferrer et al. 2018), implying that either preferences, norms or opportunities are different for highly educated male and female immigrants.

Our results show that in addition to gender it is also to consider partner's background when analysing the age gaps of immigrants and their descendants. Partner's COB appears to play an important role, especially for the G1. It is important to note that the partnership history of G1 immigrants varies on arrival. Some of the G1 arrive with a partner, some arrive without a partner, and some arrive in tandem with a partnership event. It is for this reason that our comparisons between G1 adult immigrants and their G1.5 or G2 descendants should not be taken as a measure of difference in age gaps between origin and destination countries. Immigrants from different origins are subject to different selection mechanisms, which means that G1 age gaps may be very different from those in origin countries.

We note that it is not possible to draw strong conclusions about individual behaviour from macro-level patterns and trends (i.e. we should be careful to avoid the ecological fallacy). Somewhat similarly, observed behaviours should not be taken as a direct reflection of changing partner preferences. Any union is likely to be subject to trade-offs between desired partner characteristics. It could be argued that any changes in choice (e.g. age gaps) may reflect novel partnership preferences or norms, but a more direct indication of what traits individuals prefer in a partner, can only be assessed using different types of information, such as surveys or qualitative data. One example is data from online dating services which indicates partner preferences. These types of sources tend to find that individual prefer partners of the same race (Potârcă and Mills 2015) and that men prefer younger women and that women prefer male partners slightly older than themselves (e.g. (Bhrolcháin and Sigle-Rushton 2002; Hitsch

et al. 2010). However, data on the partnership preferences of immigrants and their descendants that would tap into the underlying mechanisms for results shown here, appears to largely be absent from this literature.

Our analysis focuses on differences in the *mean* age gaps. We believe that the focus on the means is warranted given our aim to examine the overall behaviour of different population sub-groups. However, aside from mean age gaps, future research may develop additional insights by also examining the distribution of age gaps. This may be useful for understanding the extent to which individuals from different groups adhere to a given behaviour. Although mean age gaps in Sweden have remained broadly stable over the last few decades, the distribution of age gaps has widened, in part because women-older unions have become more common (Kolk 2015). Similar trends have been observed in the Netherlands, Spain, the UK and the US (Esteve et al. 2009; Zhenchao Qian 1998; van Poppel et al. 2001; Wilson and Smallwood 2008), and are likely to not only reflect changes in norms but also increases in family complexity (McLanahan 2004).

In summary, we have shown clear evidence of adaptation for descendants of immigrants in Sweden. We have also identified considerable variation in mean age gaps for different groups of immigrants and their descendants. Although age gaps have been studied before, they have rarely been examined for immigrants specifically, let alone for the children of immigrants. Our study indicates the value of doing so, and paves the way for future research. In particular, we have focussed on age gaps as a behavioural outcome, but they may also be a composite marker of distinct circumstances, which in turn may determine various differences in social outcomes. For example, couples who have a smaller age gap also have higher earnings (Carollo et al., 2019; Dribe & Nystedt, 2017). Future research should test whether this is also the case for immigrants and their descendants, which is especially interesting if selection into age homogamous unions differs by migration background.

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Appendix Table A1. Mean age gap in years (man-older) by country of birth (or ancestry), migrant generation (G1 or G2, i.e. second generation), sex and birth cohort. - denotes n less than 10 (excluded). Abs. change is the absolute change in mean years between G1 and G2, a negative value implies a decrease in mean age gap (man-older) in years.

Appendix Figure A1. Male median age gap and distributions (with 25th and 75th percentiles) by country of birth.

Appendix Figure A2. Female median age gap and distributions (with 25th and 75th percentiles) by country of birth.

Appendix Figure A3. Age at first birth and age gaps (man-older, in years) among 1st generation migrants, by birth region, and the native-born.

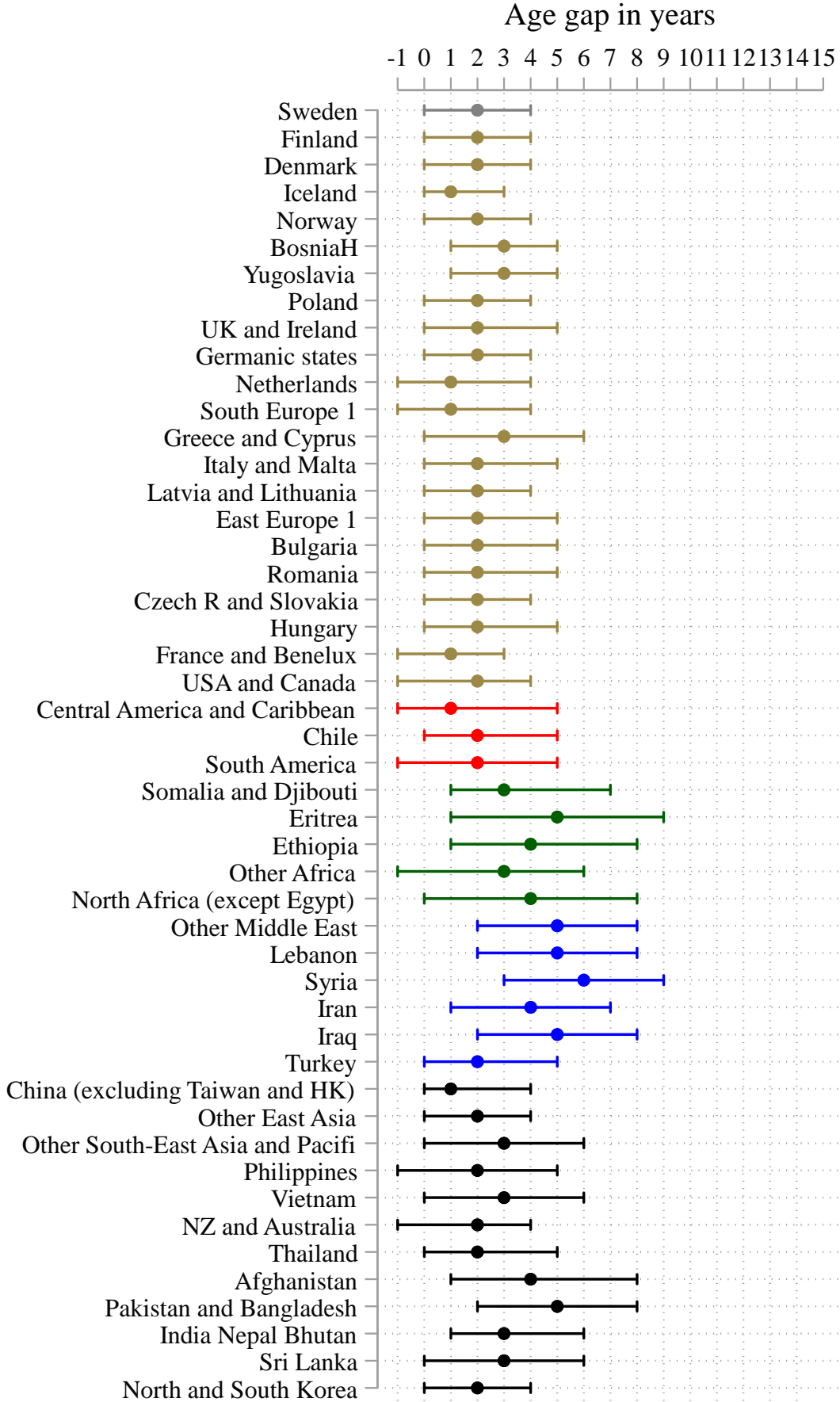
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Mean age gap in years (man-older) by country of birth (or ancestry), migrant generation (G1 or G2, i.e. first or second generation), sex and birth cohort.

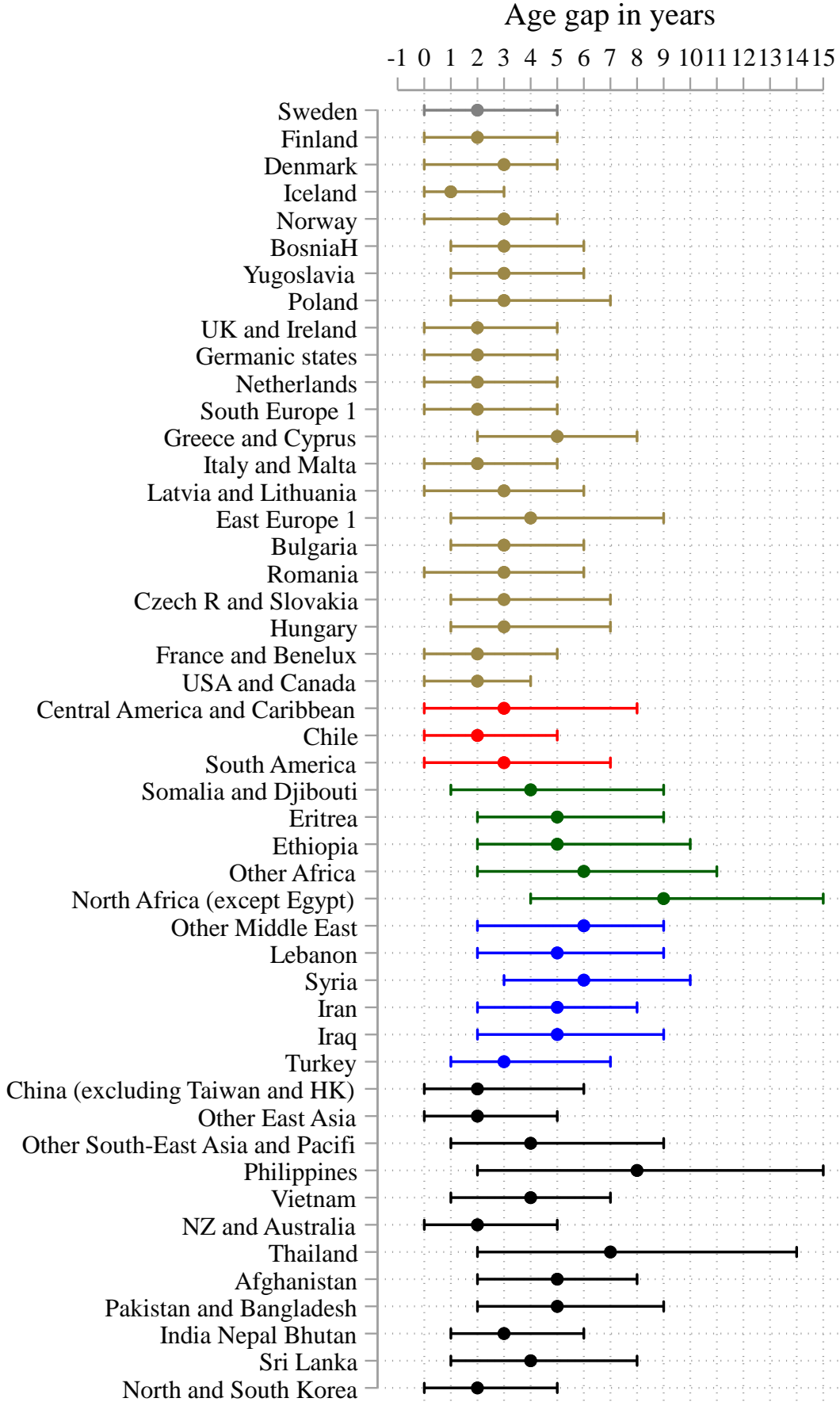
Region	Country of birth/ancestry	G1 men	G2 men	Abs. change men	G1 wom.	G2 wom.	Abs. change wom.	G1 wom/men	G2 wom/men
Europe & North America	Finland	1.8	2.2	0.3	3.1	2.7	-0.4	1.7	1.2
	Denmark	2.8	2.3	-0.5	3.4	3.1	-0.3	1.2	1.3
	Iceland	1.9	2.4	0.6	2.0	2.9	0.9	1.1	1.2
	Norway	2.4	2.1	-0.3	3.3	2.7	-0.6	1.4	1.3
	Bosnia Herzegovina	3.6	3.6	0.0	3.3	1.5	-1.8	0.9	0.4
	Yugoslavia	3.6	2.7	-1.0	4.2	2.8	-1.4	1.2	1.0
	Poland	2.9	2.0	-0.9	5.5	3.1	-2.4	1.9	1.6
	UK and Ireland	3.3	2.2	-1.1	2.4	2.9	0.5	0.7	1.3
	Germanic states	2.6	2.2	-0.4	3.3	3.0	-0.3	1.3	1.4
	Netherlands	2.6	1.8	-0.8	2.5	2.9	0.4	1.0	1.6
	South Europe 1	1.8	2.2	0.4	3.9	2.4	-1.5	2.2	1.1
	Greece and Cyprus	2.8	2.6	-0.2	6.2	3.8	-2.4	2.2	1.5
	Italy and Malta	2.9	2.1	-0.8	2.8	3.0	0.2	1.0	1.4
	Latvia and Lithuania	3.9	2.4	-1.5	3.2	2.4	-0.8	0.8	1.0
	East Europe 1	3.4	2.6	-0.8	4.5	2.5	-2.0	1.3	1.0
	Bulgaria	3.3	2.1	-1.1	3.6	-	-	1.1	-
	Romania	3.2	2.3	-0.9	3.6	2.6	-1.0	1.1	1.1
	Czech R and Slovakia	2.7	1.8	-0.9	5.6	3.2	-2.4	2.1	1.8
	Hungary	3.1	2.5	-0.6	4.9	3.0	-1.9	1.6	1.2
	France and Benelux	1.9	1.4	-0.5	2.7	2.6	-0.1	1.4	1.9
USA and Canada	2.8	1.9	-0.9	2.1	2.3	0.2	0.8	1.2	
Latin America	Central Am. & Caribbean	2.7	3.6	0.9	3.8	-	-	1.4	-
	Chile	2.1	-0.5	-2.6	2.8	-	-	1.3	-
	South America	2.7	3.0	0.3	3.8	-	-	1.4	-
Africa	Somalia and Djibouti	6.9	-	-	5.9	-	-	0.9	-
	Eritrea	7.6	-	-	5.5	-	-	0.7	-
	Ethiopia	6.0	0.0	-6.0	5.4	-	-	0.9	-
	Other Africa	4.6	4.6	0.0	6.9	-	-	1.5	-
	North Africa (exc. Egypt)	4.7	3.9	-0.8	9.1	-	-	1.9	-
Middle East	Other Middle East	5.9	5.7	-0.3	5.7	-	-	1.0	-
	Lebanon	5.6	4.8	-0.9	5.3	-	-	0.9	-
	Syria	7.5	4.2	-3.3	5.7	-	-	0.8	-
	Iran	5.0	9.0	4.0	4.7	-	-	0.9	-
	Iraq	6.1	-	-	4.6	-	-	0.8	-
	Turkey	3.4	3.5	0.1	3.5	2.8	-0.7	1.0	0.8
Asia	China (ex.Taiwan & HK)	2.6	1.2	-1.4	3.2	-	-	1.2	-
	Other East Asia	2.6	3.2	0.6	2.6	2.0	-0.6	1.0	0.6
	Other SE Asia & Pacific	4.1	2.4	-1.6	5.4	-	-	1.3	-
	Philippines	4.0	-1.0	-5.0	7.6	-	-	1.9	-
	Vietnam	3.9	-	-	3.0	-	-	0.8	-
	NZ and Australia	2.6	2.3	-0.4	2.1	-	-	0.8	-
	Thailand	4.5	-	-	7.2	-	-	1.6	-
	Afghanistan	7.1	5.3	-1.8	5.9	-	-	0.8	-
	Pakistan and Bangladesh	6.6	8.0	1.4	6.7	-	-	1.0	-
	India Nepal Bhutan	4.2	2.0	-2.2	5.3	-	-	1.3	-
	Sri Lanka	4.5	-	-	6.7	-	-	1.5	-
North and South Korea	2.8	0.8	-2.0	4.0	-	-	1.4	-	

Note: - denotes *n* less than 10 (excluded); 'wom.' refers to women; 'Abs. change' is the absolute change in mean years between G1 and G2 where a negative value implies a decrease in mean age gap (man-older) in years.

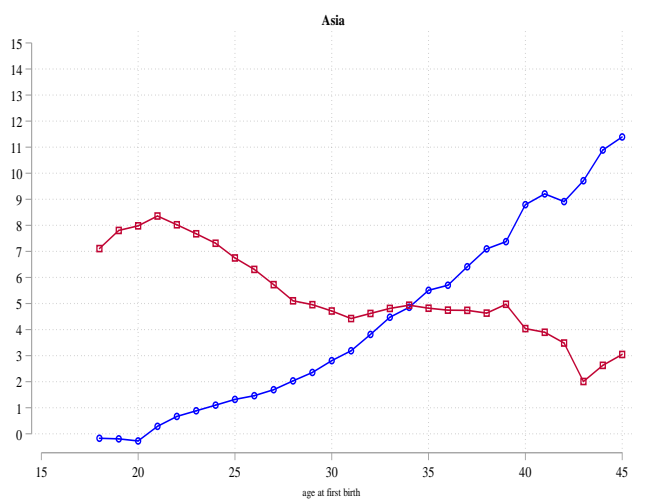
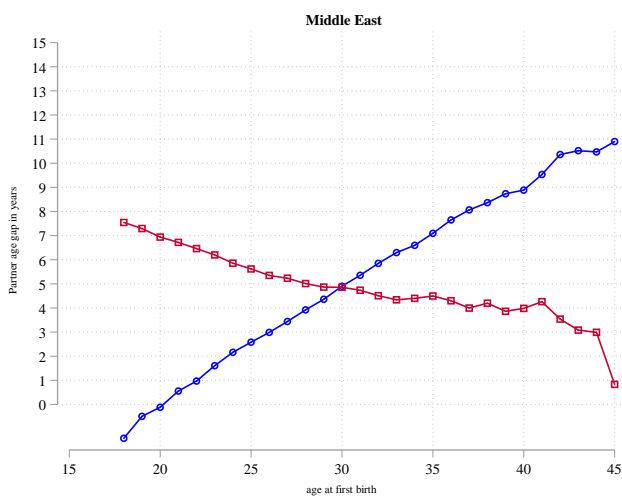
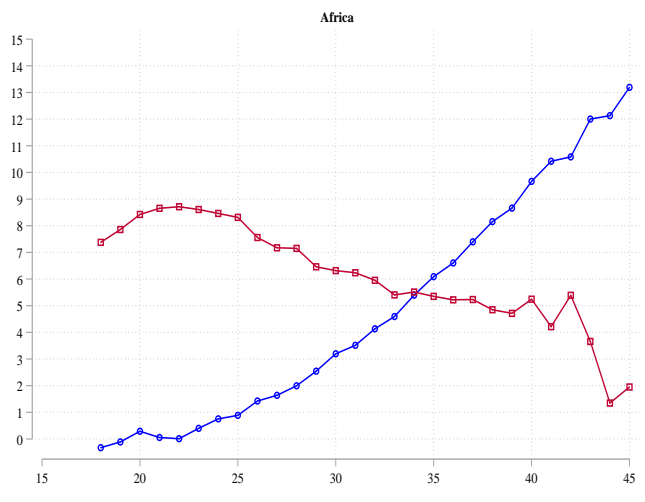
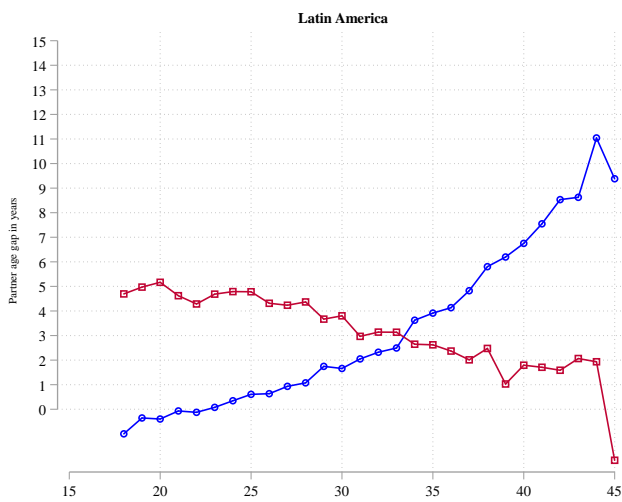
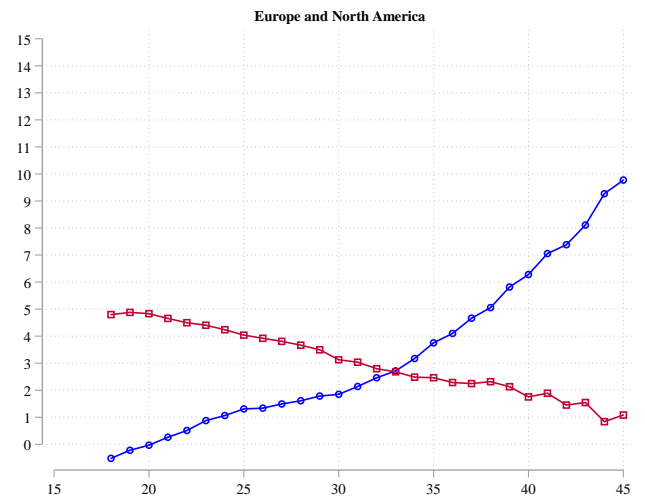
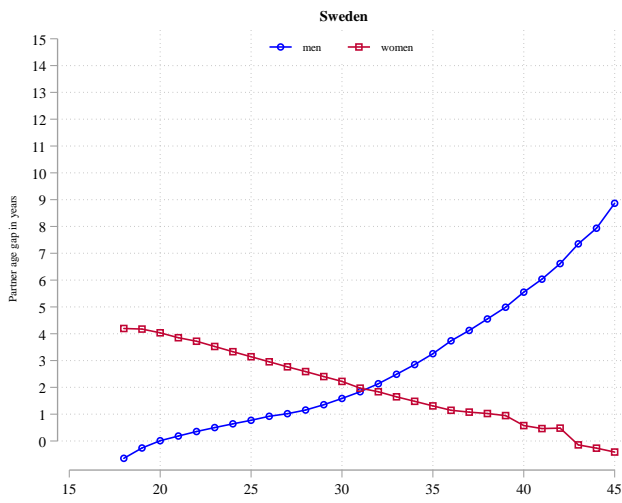
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