

Shifting Marriage Age Patterns in Taiwan and Sweden from the 19th to 21st centuries

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Social heterogamy is one of the key topics in research on marriage patterns. While homogamous unions where “like marries like” are common, many others are involved in heterogamous marriages where spouses differ in traits such as age, education, race/ethnicity, or income level. While heterogamy by education, race, and income are considered positive because they signal social mobility, spousal age difference is often the contrary. Large spousal age difference, particularly when the husband is much older than the wife, has been interpreted as related to gender inequality in power relations (Bozon 1991; Van de Putte et al. 2009). Women in such unions tend to be more dependent on their husband economically than those in similar-age unions. Despite the social meanings of age pairing between spouses, the age patterns of marriage are relatively less studied in sociological or demographic research (Skopek, Schmitz and Blossfeld 2011) when compared to assortative mating by education and race. In the current study, we examine in detail how age differences in marriages are related to the age of the involved spouses. It is possible that age dissimilar marriages will be more common when the spouses are younger or older, and that this has a strong gendered dimension. Strong links between age at marriage and age differences may be strongly related to gendered attitudes towards acceptable and preferred ages of spouses (Ní Bhrolcháin 1992; Ní Bhrolcháin and Sigle-Rushton 2005), and these norms may be changing when age at marriage and other aspects of gender relations evolve overtime.

In many societies, spousal age preferences are changing. Age hypergamous marriages where the husbands are older (often times much older) than the wives have been a common practice in traditional settings. In times when women are not as educated as men and when women rely on men for economic support, men’s older age is often equivalent to more socioeconomic resources as a provider. However, with economic development and educational expansion, a trend toward more age homogamy and hypogamy (where wives are older than husbands) has emerged in many Western and Asian countries over the past three to four decades.

These changes often result in a shrinking age gap between the spouses, including countries in Asia (Jones 2010). Take East Asia for example, according to macro-level government statistics, increasingly more unions are formed between women who marry younger men in the advanced Asian economies when compared to a few decades ago. For instance, the share of Japanese marriages involving older wives has doubled between the 1970s and 2010s (ref). By 2010, the prevalence of age hypogamous unions ranged from roughly one-tenth to a quarter of all marriages in these East Asian societies.

In contrast, Sweden has been characterized by largely stable age differences in the 20th century. A pattern where men are about 2 to 2½ years older than women has been steady, though there has been some minor decline in the prevalence of men-older relationships over time (Kolk 2015). Very large age gaps with both older women and older men were more common before the 1950s, but has increased somewhat since the 1990s. Little is known about age gaps in pre-industrial Sweden, though statistics on mean age of marriages indicates that the pattern was quite similar to the post-industrial pattern (though mean age at marriage was much higher for both men and women than in the 1960s and 1970s). In general, relatively small age gaps have been described as typical for a Northwestern European marriage pattern, but few studies have studied when this emerged, and the extent to which it is similar to contemporary partner pairing patterns in Northwestern Europe (though see Poppel et al. (2001) and Van de Putte et al. (2009) for the lowlands).

Previous research on age differences has largely focused on contemporary western populations. The broad demographic patterns of age differences have been demonstrated in a large number of different countries, and some studies have focused on how the differences have evolved over time (Esteve, Cortina and Cabré 2009a; Hancock, Stuchbury and Tomassini 2003; Kolk 2015b; Van Poppel et al. 2001), differences by union order (Ní Bhrolcháin 2005), and a gendered perspective on age differences (the overall extent to which women are younger), as compared to the relative age differences in unions (Kolk 2015b). A related literature has examined age differences in the context of so-called “marriage squeezes”, and if age preferences may impact the marriage markets when cohort sizes fluctuate across years (Akers 1967; Ní Bhrolcháin 2001a; Veevers 1988). However, the topics of how age differences change with age at marriage or union formation, and how this has changed over time and across social contexts, have largely been ignored in the literature (though see Ní Bhrolcháin 2004).

This paper aims to explore spousal age pairing patterns from an East-West comparative perspective across two centuries of immense social changes in Taiwan and Sweden. These two

countries are an interesting contrast for geo-cultural reasons. geo Taiwan historically is a typical example of an “Eastern” family system, similar to that in China and Japan (ref), whereas Sweden in the 19th century was a very typical example of what has been called the Northwest European (or Malthusian) marriage pattern. While historically distinct, the countries also exemplifies two distinct examples of rapid and developmental change where Sweden developed from a typical European agricultural society, through rapid industrial growth, to a society characterized by high gender equality and strong governmental support for a dual earner-carer family model. Taiwan, also saw very rapid industrial change over the period, but followed a different trajectory with less government involvement in family life, and while the kinship system has individualized greatly, some developments such as long premarital cohabitation and childbearing in cohabiting unions remains rare.

Taiwan and Sweden also represent two countries with very different gender and demographic regimes. Contemporary Taiwan has sustained a relatively patriarchal social milieu compared to Sweden, even though women’s socioeconomic attainment has improved tremendously over the past decades. Marriage rates have been declining in Taiwan since the 1980s, along with rapid fertility drop to ultra-low levels of about 1.2 children in recent years. Both patterns in Taiwan are in stark contrast with Sweden, where prevalence of cohabitation has sustained rates of union formation and period and cohort total fertility rates have remained close to replacement level. Such differences in family behaviors have been caused by relatively rigid and inflexible family values and gender relations during times of rapid social changes in Taiwan. Previous research has primarily focused on changes in average age gaps between spouses. We extend this focus to examine shifting marital ages and how the age gaps between spouses change by ages of the wife and the husband over a long time horizon in two distinct social settings. Our study is unique by the use of high quality contemporary and historical micro-level data that allow us to follow marital histories, including date of marriages and date of births, with a monthly precision.

Marriage Systems and Social Changes

Marriage Systems in Eastern and Western Cultures

Social and Demographic Changes in Taiwan and Sweden

Demographic behaviours are often closely tied to the changing social and economic milieu in a given society (Davis 1963; Goode 1963). In particular, economic transformations that bring about advancements in productivity are often accompanied by large-scale behavioural

changes at the individual level. In the case of Taiwan, the shift from an agrarian to an industrialized society and the ensuing changes in family behaviours are well-portrayed by Thornton and Lin (1994). Between 1950 and 1990, the government in Taiwan implemented industrial upgrading policies, which successfully transformed Taiwan into a prosperous industrialized society.

Educational expansion has taken place since the 1970s in response to the shortage of skilled labour during the process of industrialization. Increasingly more women advance to tertiary education after finishing secondary education. The proportion of female students among all college students has risen from 21% in 1960 to 36% in 1970 and further to 50% in 2010 (Ministry of Education 2012). The improvement in human capital among women has propelled a surge in labour force participation rates at prime-working ages—a tremendous increase from 56% to 84% at ages 25 to 29 and from 55% to 77% at ages 30 to 34 in between 1987 and 2010 (DGBAS 1987-2010). In turn, the earning capacity of women has largely improved. Prolonged education and female economic independence have been associated with delayed or even foregone marriages, as bachelorhood by age 50 has been increasing substantially for the cohorts born after the 1950s (Ministry of the Interior 1975-2016; Thornton and Lin 1994).

In addition to behavioural changes, studies on family attitudes also show changes toward non-traditional, liberal values in the past few decades. For examples, increasingly more people think that one can enjoy a satisfactory and successful life even without getting married, and that married people are not always happier than the unmarried (Cheng and Yang 2016). More people now think that newlywed couples should establish their own household, rather than living with the husband's parents, and that it is tolerable for a daughter-in-law to quarrel with her mother-in-law (Cheng and Yang 2016). Given these observed value changes, one would expect that the process of mate selection might change with time as well, such as age preferences. In fact, research on Western developed societies has reported shifting age preferences over the past century (Atkinson and Glass 1985; Esteve, Cortina and Cabré 2009b; Kolk 2015a; Kolk 2015b; Ní Bhrolcháin 2001b; Van Poppel et al. 2001).

The Swedish kinship pattern shares many familiarities with other northwest European populations, and originates in the Germanic groups living in northwestern Europe two thousand years ago (Kolk 2014; Murray 1983). Compared to other regions of the world, marriage was typically late for both men and women, and in pre-industrial Sweden both men and women typically worked outside their family of origin for an extended period of time before forming a

neolocal marriage. With industrialization and increasing economic resources, ages at marriage declined in the middle of the 20th century, but have steadily increased after the 1970s. In contemporary Sweden, marriage increasingly takes place quite late in the family formation process, often several years after the birth of joint children (Holland 2013). Pre-marital cohabitation is nearly universal. Mean age differences as indicated from mean age at marriage statistics are quite typical for western countries (Ortega 2014).

Theories on Age-matching Patterns

The predominance of age hypergamy observed in many societies across the globe has attracted scholarly interests. In general, the main explanations are based on evolutionary and economic reasons (Bergstrom and Bagnoli 1993; Buss 1989). That is, men seek out younger women to maximize reproductive success, and women look for older men who tend to be more economically established to play the provider role. Given that procreation and earning capacities are both related to age, though in different directions, a strong selection into men-older marriages is inevitable. However, critics have pointed out how these explanations are losing explanatory power in contemporary societies where women have become much better educated and economically independent, which largely increase their bargaining power and choices prior to forming marital unions.

Social exchange theory underlies the evolutionary-economic explanations for the prevalence of age hypergamy observed across human societies. In other words, men and women exchange desirable traits that are valued by the opposite sex when forming unions within a given socio-cultural context. In pre-industrial societies, women generally rely on men for economic support, and hence men's provider-role is preferred. The expansion of educational opportunities in industrialized societies alters the life chances of women and couple dynamics. As more women have become tertiary-educated and economically independent, their preferences for future spouses undoubtedly change with their rising social status. For instance, when a woman can provide for herself, she may value other non-economic characteristics in her future spouse, such as youth, appearance, or desirable personality traits. On the other hand, the high living costs commonly observed in modern societies could further reinforce the importance of men's economic standing, because women's expectations on an ideal living standard could also rise with their social statuses. In turn, the former could cause age hypogamy to rise, while the latter would cause age hypergamy to persist.

Past Research

Age Differences in Marriage over Time

The rise of age homogamous marriages and the decline of age hypergamy have been documented in several European countries with long time-series data (Esteve, Cortina and Cabré 2009b; Kolk 2015a; Kolk 2015b; Van Poppel et al. 2001). For instance, a study on the Netherlands has shown by far the longest historical data on age pairing patterns of marriages from 1850 to 1993 (Van Poppel et al. 2001). The findings indicate that a gradual decline in spousal age gaps has been observed between 1850 and 1970 and increased a bit afterwards. Across nearly 150 years, age homogamy increased steadily, and hypergamy with large age differences showed a stable decline over time. Another study on Spain for the period between 1922 and 2006 also reveal resembling patterns of increasing age homogamy and decreasing hypergamy (Esteve, Cortina and Cabré 2009b). Similar shifts in age preferences were also reported for Sweden between 1932 and 2007 with marriage register data (Kolk 2015b). That is, age hypergamy has shown a moderate decline over time in both marital and childbearing unions. In the attempt to explain this changing trend, scholars have pointed out that educational expansion, changing socio-cultural preferences, and decreased impact of parental authority have led to behavioural changes toward shrinking age gaps among married couples over the past century in Europe (Kalmijn 1991).

Gendered Spousal Age Preferences

Past research noted age preferences in the mate-searching process as highly gendered (England and McClintock 2009; Skopek, Schmitz and Blossfeld 2011). That is, women and men show distinct age preferences for their partners over the entire life course. Scholars have explained such a pattern from perspective of a cultural “double standard of aging” and evolutionary reasons (England and McClintock 2009). Indeed, a study by Skopek, Schmitz and Blossfeld (2011) show that while men increasingly prefer younger women as they age, women’s mating age preferences become more heterogeneous over the life course. In addition, another recent U.S. study also indicated that the older men are when they marry, the more years they marry down (England and McClintock 2009). In particular, highly educated men marry down further in age than their less educated peers at higher ages at marriage, even though the difference is not large. Such a gendered age preference often created a marriage squeeze against older women, resulting in higher share of them remaining single in the U.S.

Data and Methods

There are two sets of different data sources for studying spousal age preferences from the 19th to 21st century in Taiwan and Sweden. We will study all marriages of men and women, including also unions where one or both spouses have previous marital histories. Remarriages are characterized by larger age differences in general, and the inclusion of higher order marriages is, in general, more impactful when we look at marriages at older ages where a larger share of marriages are remarriages.

The data used for this study come from historical Taiwanese register data (1905-1946), multiple waves of the Women's Marriage, Fertility, and Employment (WMFE) Survey, and marriage registration data (1998-2015) in Taiwan. The historical registers are administrative data collected by the Japanese colonial authorities in the first half of the 20th century. The household registration system records all demographic events, household information as well as migration histories of the inhabitants (Wolf and Huang 1980).

The WMFE is a repeated cross-sectional government survey that can be dated back to 1979 and has since collected 18 waves of data up to 2016. It contains large nationally representative female respondents aged 15 and above. The sample size of each round of the survey has been around 25,000 respondents. The source dataset harmonized across 18 waves contains 484,979 respondents, in which 263,466 women who married during the years between 1895 and 1999 had reported information about their current husbands. One data limitation is that we do not know whether their husbands at the time of survey are the ones they married at first marriage, which could cause mis-categorizing some remarried husbands as first husbands. Given that divorce rates were particularly low in the decades between 1940-1975 (check Barclay 1966), potential bias could be less severe in parts of our sample. We further restrict our analytical sample to women and their male partners who married at age 15 and above and exclude invalid cases with unreasonable reports on their ages at first marriage. The final dataset contains couple information for 262,747 couples who married during the years between 1895 and 1999.

Finally, the marriage registration data are acquired from the Department of Household Registration, Ministry of the Interior in Taiwan. These marriage records are available in digital format since 1998 for all marriages registered each year in Taiwan. The data offer information on husband's and wife's date of birth, date of marriage, education, marital history (first marriage or remarriage), and nationality (from 2001 onward). We analyzed 145,059 and 151,253 marriages formed in 2005 and 2015, respectively, to show the most recent age pairing patterns in Taiwan.

For Sweden, we use a combination of contemporary register data of the complete Swedish population (1968-2017) with parish data from Northern Sweden (1800-1955). Both sources contain registers of all marriages that took place within the administrative area and contains

information both on the order of marriage and the birth year and month of both spouses. The historical data are collected by the demographic database at Umeå University and is a selection of parish registers from adjacent parishes around the town of Skellefteå (Alm Stenflo 1994; Engberg, Westberg and Edvinsson 2016). The modern registers contain the complete population of Sweden. As the population size of the historical registers is much smaller we pool a large number of marriage cohorts when presenting results for historical periods. Between 1955 and 1968 we do not have digitized marriage records.

Throughout this study, spousal age difference is defined by subtracting wife's age at marriage from husband's age at marriage. Thus, a positive age difference indicates a men-older marriage (i.e., age hypergamy) and negative a wife-older one (i.e., age hypogamy). Absolute age difference refers to the absolute value of this age gap, regardless of who is older in a marriage.

This paper will start by offering descriptive graphs that show the mean age at marriage, percentage distribution of age at marriage for men and women, along with the percentage distribution of spousal age differences by marriage cohort. Next, we present mean spousal age differences by bride's and groom's age at marriage. In the analyses that follow, age differences were calculated by subtracting wife's age from husband's age, and hence a positive value reflect men-older marriages and negative wife-older marriages. At the end, we also calculate absolute age differences, in which we include female-older marriages with a positive instead of negative sign, assessing the change in marriages with an age difference that deviates from 0.

Results

Table 1 offers a overview of the data analyzed in this study for Taiwan and Sweden. The analytical timeframe span across more than a century for Taiwan and nearly two centuries for Sweden. Two data sources were used to investigate age pairing patterns for both countries. From the statistics of mean ages at marriage, Sweden appears to be a much later marrying population than Taiwan in all comparable time periods, ranging from a mean age gap of slightly more than 1 year (grooms in 1970) to as many as more than 7 years (brides at the turn of the 20th century). One notable phenomenon is the larger scope and faster speed of increase in mean age at marriage in Taiwan than in Sweden from historical to contemporary periods.

Figure 1 presents the percentage distribution of age at marriage from the perspectives of brides and grooms across all marriage cohorts in our analyses. The patterns for Taiwan and Sweden are very distinct, and both show great changes over time. For women in Taiwan, the

age patterns indicate that marriages formed in the late 19th and early 20th centuries were mostly clustered around the late teens and early twenties, with smaller variations in terms of age distribution. Very few marriages took place beyond age 30 in historical time. Modal ages at marriage gradually moved from the early to late twenties for the birth cohorts between 1960 and 1999 and increasingly became more dispersed in age distribution. Variations in age at marriage are particularly wide for those who married after the new millennium, when many marriages were formed at ages 40 and beyond. For men, the shifts in modal ages at marriage somewhat resemble those observed for women across marriage cohorts, but the expansion of age variances took a slower pace than women. In Sweden, the distribution of age at marriage is largely similar across marriage cohorts, but where the 1970s stick out with unusually early age at marriage, and that the latest measurement point in the 2000s has the latest age at marriage. The Swedish age at marriage distribution is consistently later than the Taiwanese pattern, though in the 2000s the differences are smaller. The distribution of ages at marriage for men are similar to that of women, though shifted a few years later. In the last cohort, there is evidence of a digit preference for marriages formed at round numbers (Ohlsson-Wijk 2014).

Next, the percentage distribution of spousal age differences by marriage cohort is shown in Figures 2a and 2b. In Taiwan (Figure 2a), modal spousal age differences have lingered around 2 to 4 years for a long time, roughly from the marriage cohorts of 1940 to 1989. For marriage cohorts of 1990 and later, the distributions of mean age differences have substantially moved toward 0 to 2 years, with a clear increase in wife-older marriages in recent years. The overall shift is characterized by a pattern of increasingly smaller age differences at marriage for these marriage cohorts. In Sweden (Figure 2b), there is a consistent pattern of a peak at the distribution for men being around 2 years older than their spouses which is quite consistent over time. In the historical periods, the overall distribution is more evenly distributed, while the narrowest distribution is found in the 1970s. The 2000s pattern is slightly more age homogamous than the 1970s pattern. Unlike the recent surge of age hypogamous unions in Taiwan, women-older marriages were most common in the historical periods.

To look at spousal age differences from an absolute age gap perspective, Figures 3a and 3b show that the overall distribution looks quite similar in both Taiwan and Sweden from the 19th to the 21st century. That is, modal age differences have been around one year between wives and husbands. In Taiwan, the age distributions of the most recent marriage cohorts resemble those in historical periods, while the 1970s and 1980s marriage cohorts seem to have slightly wider dispersion of age differences. For Sweden, the three historical marriage cohorts have

nearly identical but more dispersed patterns, whereas the three more contemporary ones appear quite similar and resemble the contemporary Taiwanese patterns.

The next graphs in Figures 4a and 4b showcase the mean spousal age gaps from late adolescence to old ages from the perspectives of the bride's and groom's age at marriage. The findings reveal that patterns of age difference are gendered and vary between the two countries. Overall, age differences vary strongly with age of the husband and wife in Taiwan, while in Sweden the directions of covariation with the age of either spouse are somewhat similar (negative slope for women and positive for men) but much smaller in scope. The U-shaped patterns of an age gap for women in Taiwan are particularly notable, indicating that women marrying at relatively younger and older ages tend to have much older spouses than those marrying at more normative ages in a given period. Such a pattern is not present in Sweden.

For women, very contrasting patterns were found in these two societies (see upper graphs in Figures 4a and 4b). In Taiwan, we observe an intriguing U-shaped pattern for contemporary women, in which high levels of age hypergamy is found both when the woman is relatively young and relatively old. The average spousal age differences are also much larger in Taiwan than in Sweden. In historical Sweden a reverse pattern with high level of age hypogamy for older women, and in contemporary Sweden there's little association between female age at marriage and age hypergamy for recent marriages (there is a constituent pattern of men being on average a few years older), while for older cohorts of marriages, older women typically marry men who are younger than themselves.

For men, we find that mean age hypergamy (where the man is older) increases with male age at marriage, particularly for men from ages 40 to 60 in hypergamous couples in both societies (see bottom graphs in Figures 4a and 4b). In Sweden, very young men typically marry women who are a few years older than themselves (which is true to a much smaller extent in Taiwan). However, the spousal age gaps by men's age at marriage increased much faster as men become older in contemporary Taiwan than in Sweden, which is likely due to the more patriarchal social relations observed in the former. In both countries we find that the tendency of men who marry much younger women at older ages was much stronger in the past, and that the latest marriage cohorts show less age differences by husband's age at marriage. The different gender regimes in the two countries likely contribute to the diverging patterns found for both men and women. The overall delay of marriage to later ages for both gender in past few decades also likely related to increasing rarity of very large age differences at ages 40 to 50 in both societies.

In Figure 5 we present absolute age differences. These are simply the age gap between spouses, regardless of who is older. While a marriage with a 2 year older wife, and different marriage with a 3 year older husband would give an overall gendered mean age difference of 0.5 years, their absolute mean age difference would be 2,5 years. This measure captures the extent to which men and women are not in age-similar marriages. Figures 5a and 5b suggest that levels of age differences tend to be shifted slightly upward for women when compared to similar graphs in Figures 4a and 4b, whereas those remain quite similar for men whether measured in relative or absolute terms. For Sweden, the lowest absolute age differences are found in the most recent cohorts, while for Taiwanese women it is instead the older cohorts that show the lowest absolute age differences.

Finally, Figures 6a and 6b present absolute age differences by the mean of husband's and wife's age at marriage to show changes over time. The patterns in Taiwan and Sweden reveal stark variations over marriage cohorts and across mean ages at marriage. Spousal age gaps show a much wider variation over more than a century in Taiwan than in Sweden, even though marriages formed in the teens and early twenties tend to show much smaller age gap than those formed later in the life course for both countries in all periods. In addition, marriages formed prior to 1990 in Taiwan have particularly large age gaps between husbands and wives, whereas patterns of age gap vary to a much smaller extent across marriage cohorts in Sweden. For the most recent marriage cohorts in the new millennium, patterns of age difference over the life course have converged in Taiwan and Sweden, revealing a range of age gap from 0 years for teen unions to less than 10 years in unions formed at age 50.

Conclusion and Discussion

This study set out to examine spousal age differences in Taiwan and Sweden from the 19th to the 21st century. The overall trend suggests Sweden has been a much later marrying population than Taiwan, and the distribution of age at marriage for men and women have become more dispersed in contemporary than historical periods for both countries. In addition, there is a tendency for age differences to decrease over time, especially in Taiwan. The share of the traditional men-older marriages have gradually decreased and unions involving similar-age spouses have become more prevalent in both countries. In particular, the current study explores the patterns of spousal age differences from the perspectives of wife's and husband's age at marriage. Such an approach has revealed substantial variations in age gap across the life course for both sexes. When compared between countries, the age patterns are particularly different for women: a U-shaped pattern across the life course for Taiwan, and a slightly negative slope for Sweden. For men, spousal age gaps increase monotonically with

age at marriage, with larger age gaps observed in Taiwan than in Sweden at most ages. Finally, while the Taiwanese and Swedish patterns of age differences vary in historical periods, the contemporary patterns suggest a convergence in these two countries, based on findings from the analyses of absolute age differences by spousal mean age at marriage. In both societies, unions formed at young ages have smaller age gaps than those at older ages, and this holds for all marriage cohorts.

The above findings suggest that socio-cultural and value changes observed during the modernization process have affected age differences in marriage. The societal changes caused by industrialization and market economies have raised the education levels of men and women and prolonged economically independent time from parents. Both processes influenced not only the mean ages people get married but also age preferences for partners, which are also related to shifting spousal age differences. These findings resonate with prior research that increasing mean age at first marriage often correlate with decreasing spousal age gaps in various populations (Carmichael 2011). On the one hand, economic restructuring during the modernization process has prompted educational expansion, which led to rising socioeconomic status among women. Economically independent women also have more incentives to look for love-based intimate relationships, which draw them closer to similar-age partners with whom they share more common cohort experiences and memories. Overall, in a more constrained socioeconomic environment (such as 19th century Sweden and early 20th century Taiwan), where marriage was strongly related to household production, marriage may more often have been done for pragmatic reasons. In such circumstances, pure personal age preferences for partners may have been less prevalent for both men and women, given the other aspects they had to take into account. On the other hand, modernization is often accompanied by a declining impact of parental authority and rising influences of peers, which could interrupt the inter-generational transmission of parental preferences for older men marriages and undoubtedly contributes to deviations from traditional age hypergamy. A large share of all marriages were arranged in the middle of the 20th century (ref), a custom that is now very uncommon. As Taiwan progressed from an agriculture-based society at the turn of the 20th century to a post-industrial society in the 21st century, patterns of spousal age differences increasingly resemble those observed in Sweden. At a later stage, it is also possible that greater individualization of societies and less strong societal norms, may once again reduce previous restrictive societal norms about suitable age differences. Age differences may therefore once again increase (cf. Kolk 2015b; Van de Kaa 2001).

These findings correspond with recent time-trend analyses conducted in a few other Western countries, such as Spain (Esteve, Cortina and Cabré 2009b), the Netherlands (Van Poppel et al. 2001), and Sweden (Kolk 2015b). In these European societies, a trend toward more similar-age and fewer men-older marriages has been observed over a period of eight decades or longer. Such a phenomenon has been interpreted as signs of greater gender equality. However, a recent study on China showed a declining trend of age hypergamy from

1960 to 1990 and then a reversal to more age hypergamy afterwards (Mu and Xie 2014). The authors have attributed such reversal to high living costs and housing prices that reinforce men's earning capacity in post-reform China.

This study also shows that first marriages involving older wives are also the ones where the wife is better educated than the husband (results not shown). In fact, a recent study (Cheng 2014) has indicated that tertiary-educated Taiwanese women manage to form unions and have higher marriage propensity than their less educated peers, despite facing a shortage of marriageable men with comparable education. This is very likely due to the fact that these well-educated and perhaps economically independent women “marry down” in terms of age and education. This phenomenon can be viewed as the traditional hypergamy in reverse: Older women are exchanging their resources (better education and income) for younger men's youth and (perhaps) more egalitarian gender ideology. Such behavioral shifts resonate with the arguments by Ní Bhrolcháin (2001b)—even in the face of marriage squeeze resulting from sex imbalance in the marriage market, marriage levels are not severely affected because individuals tend to adapt their preferences and behaviors to meet new structural challenges.

For Taiwan, the findings reveal educational expansion has also improved women's socioeconomic status. Extended years of schooling and higher labor force participation rates tend to increase the chances for a woman to meet her future partner in more diverse social settings, who is more likely to possess similar sociodemographic traits as she does. In a similar vein, a recent study that analyzed a nationally representative adult sample shows that while about a third (32.1%) of the respondents in older cohorts (those born before 1956) met their current spouse through friends/colleagues, the comparable figure for the younger cohorts (born in 1956 and after) has increased to 53.5% (Wu, Yeh and Tsay 2014). In other words, more than half of younger Taiwanese who came of age during an era of rapid industrialization are less likely to have known their current spouse through parents or relatives, which tends to decrease the likelihood of traditional age hypergamous marriages. This weakening of parental authority to impose preferences on offspring's mating process and the rise of romantic love likely lead to a decline in large spousal age differences among the younger generations.

One thing to be noted is that while long-term cohabitation and non-marital births remain relatively rare in contemporary Taiwan, they have become quite normative in Sweden. Hence, Swedish patterns of age gap in marriage have become less representative of age preferences at first union formation, as a non-trivial minority of couples have lifelong stable cohabiting unions with joint children. Swedish ages at marriage are also increasingly less reflective of very early stages of a union formation career, but marriage may instead be something a couple do after 10 or even 15 years together. This does not affect the age differences between spouses but does affect their age at marriage. Also in a Taiwanese context, later ages at marriage may not be associated with long periods of pre-marital cohabitation, but still often involved in a romantic union for a long period before their marriage, which is in sharp contrast to the mid 20th-century marriage formation.

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Table 1. Descriptive Statistics for surveys and register data in Taiwan and Sweden

Taiwan

Marriage cohort	1895-1929	1930-39	1940-49	1950-59	1960-69	1970-79	1980-89	1990-99	2005	2015
data source	Survey of Women's Marriage, Fertility, and Employment 1979-2016							Marriage registration		
sample size N	1,251	7,084	19,743	38,247	51,583	71,805	51,940	21,094	145,059	151,253
mean age at marriage (bride)	18.73	19.39	20.21	20.82	21.36	21.87	23.15	24.89	28.03	30.90
mean age at marriage (groom)	21.36	22.31	23.48	24.40	26.57	26.28	26.44	28.25	32.27	33.66
mean age at 1st marriage (bride)	18.73	19.38	20.21	20.82	21.36	21.87	23.14	24.89	26.97	29.44
mean age at 1st marriage (groom)	21.36	22.31	23.48	24.40	26.57	26.28	26.44	28.25	30.18	31.74

Sweden

Marriage cohort	1830-1869	1880-1909	1920-1939	1969-1971	1984-1986	2004-2006
data source	Parish registers from the Skellefteå region			Swedish national population registers		
sample size N	3,943	6,426	4,365	127,815	115,551	124,023
mean age at marriage (bride)	26.51	26.08	25.96	24.84	28.55	34.40
mean age at marriage (groom)	28.44	28.85	29.58	27.48	31.36	36.92
mean age at 1 st marriage (bride)	25.48	25.13	25.39	24.83	27.92	31.67
mean age at 1 st marriage (groom)	27.00	27.56	28.70	27.40	30.65	33.97

Figure 1a. Percentage distribution of ages at marriage by sex and marriage cohort in Taiwan

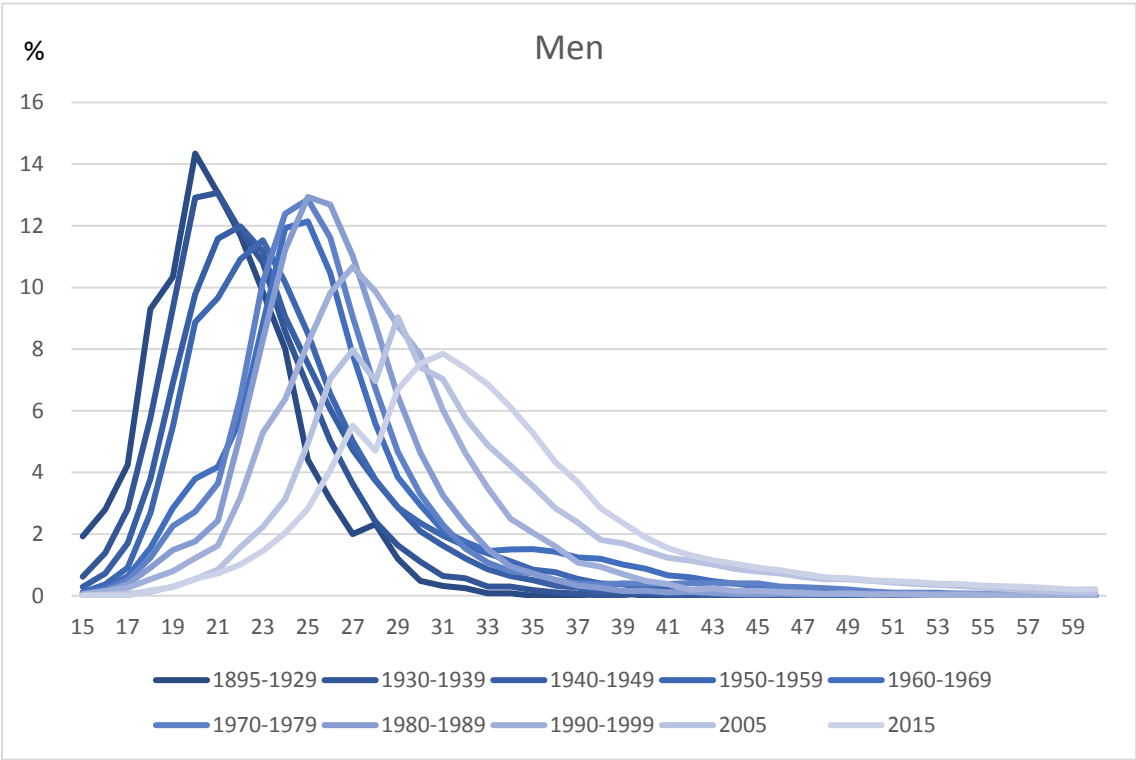
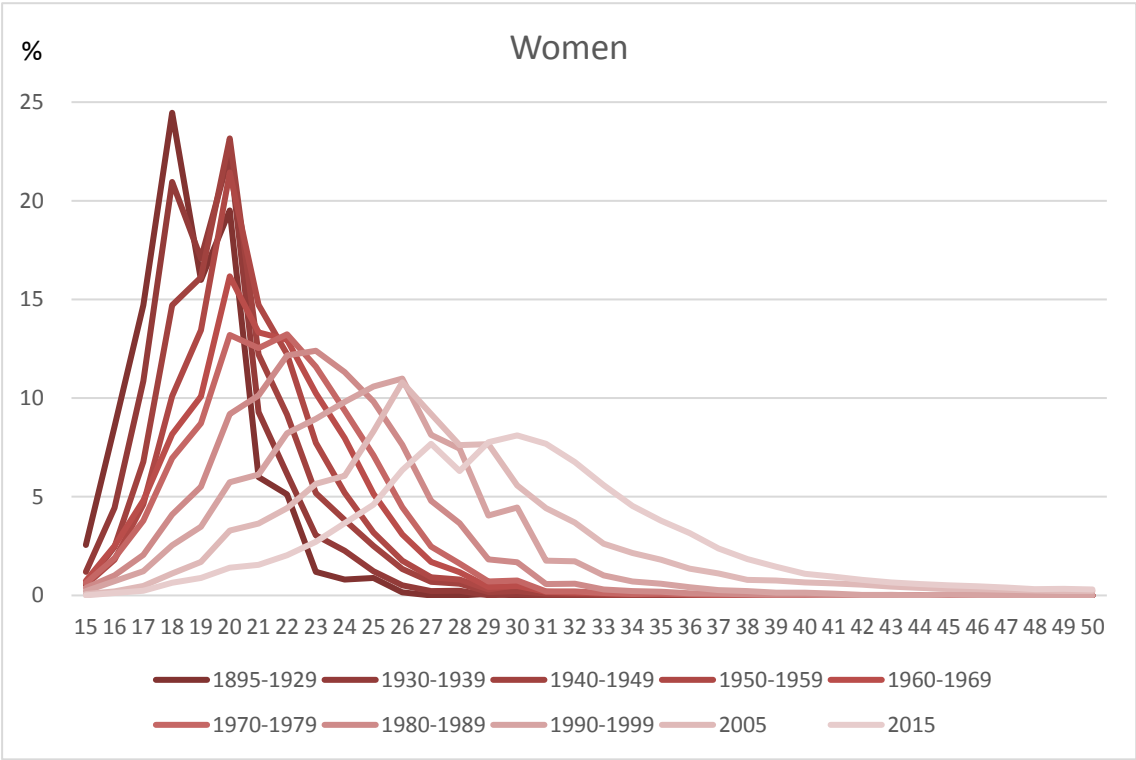


Figure 1b. Percentage distribution of ages at marriage by sex and marriage cohort in Sweden

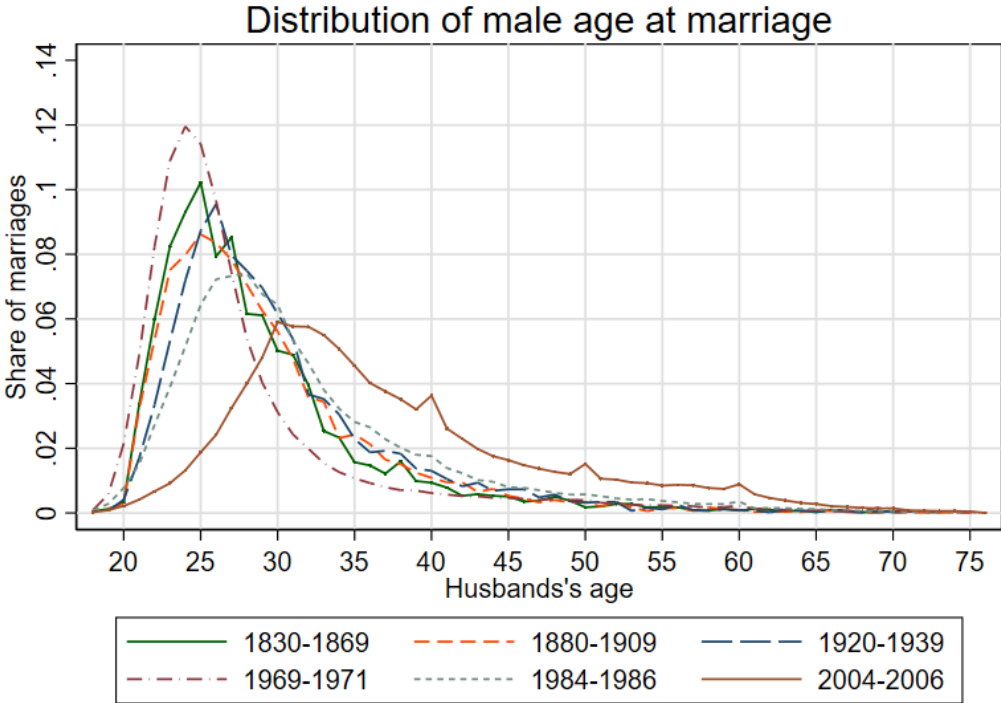
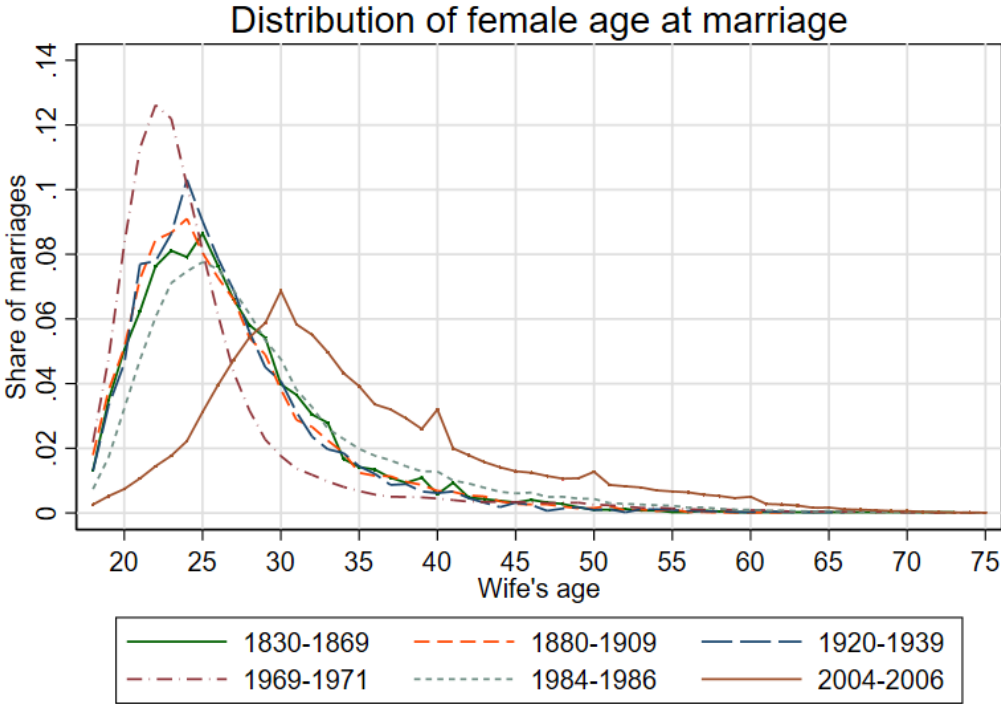
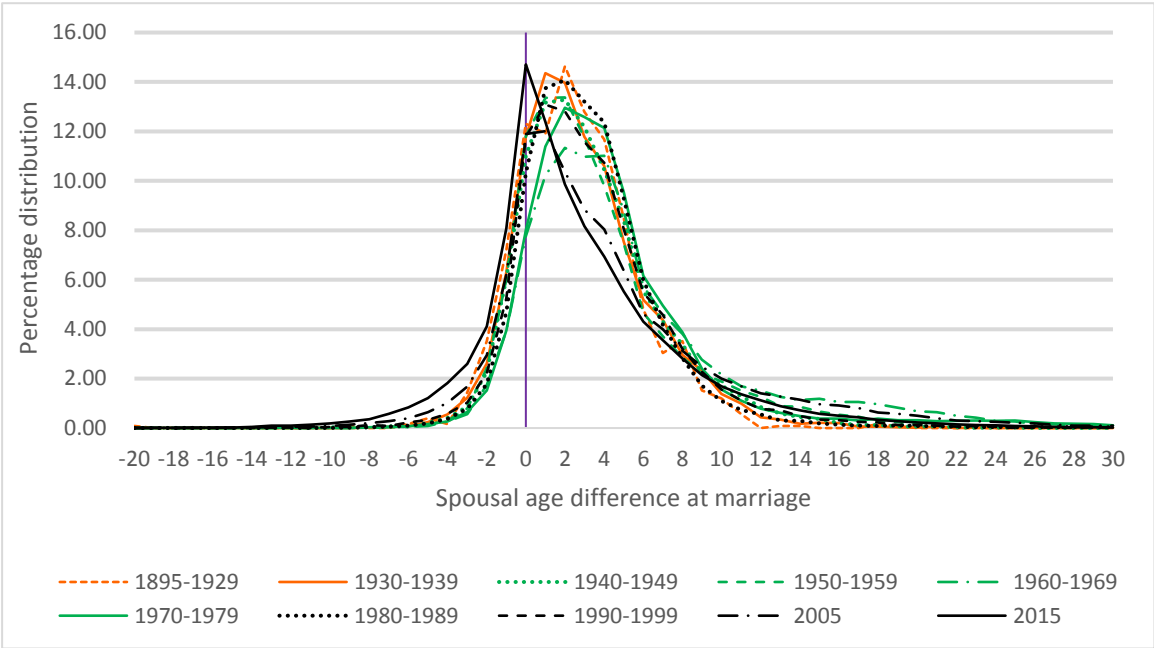


Figure 2a. Distribution of spousal age differences (husband-wife) by marriage cohort in Taiwan, 1940-2015



Data sources: Survey of Women’s Marriage, Fertility, and Employment (1940-1999) and marriage registration data (2000 and after) in Taiwan

Figure 2b. Distribution of spousal age differences (husband-wife) by marriage cohort in Sweden, 1830-2006

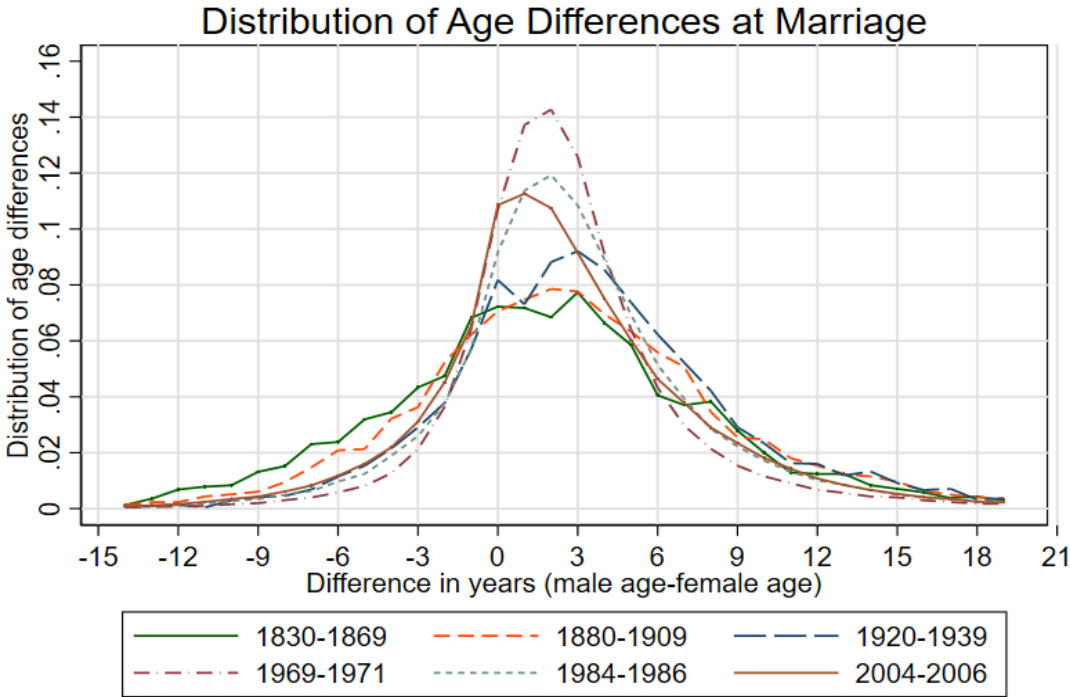


Figure 3a. Distribution of absolute spousal age differences by marriage cohort in Taiwan

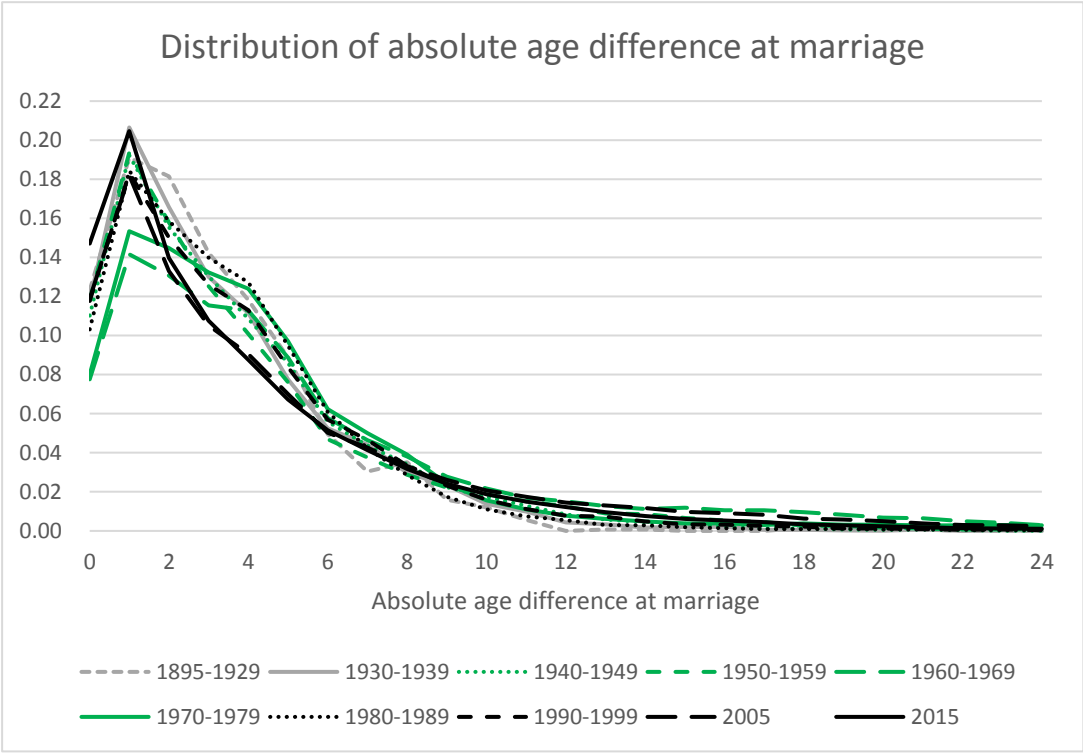


Figure 3b. Distribution of absolute spousal age differences by marriage cohort in Sweden

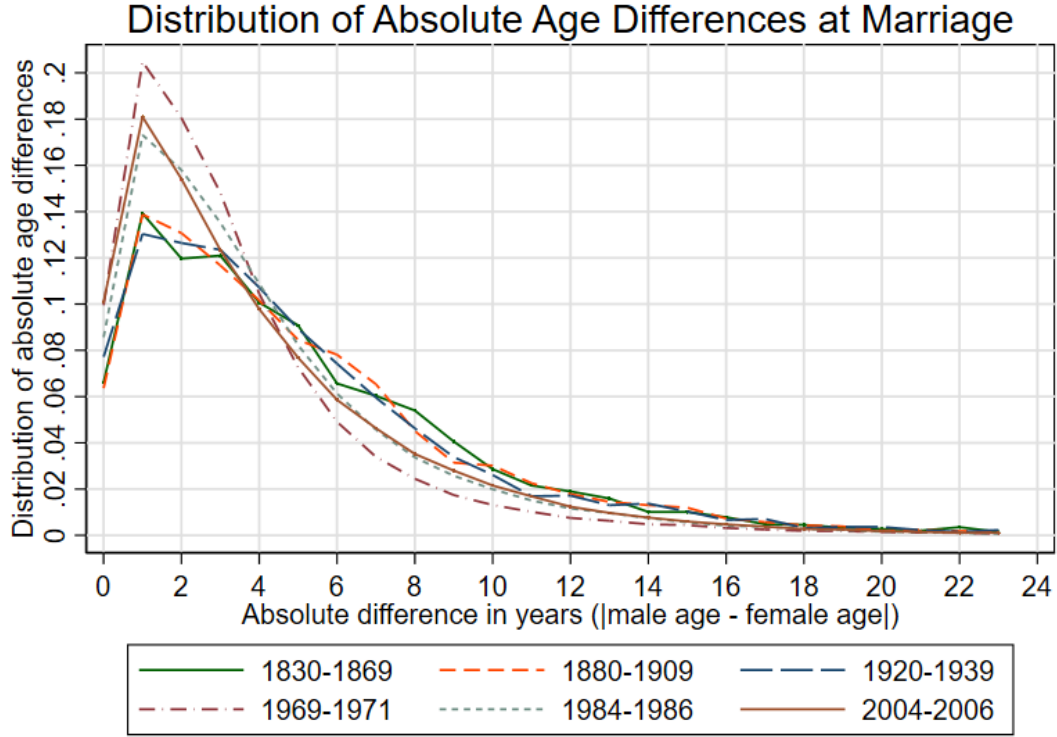
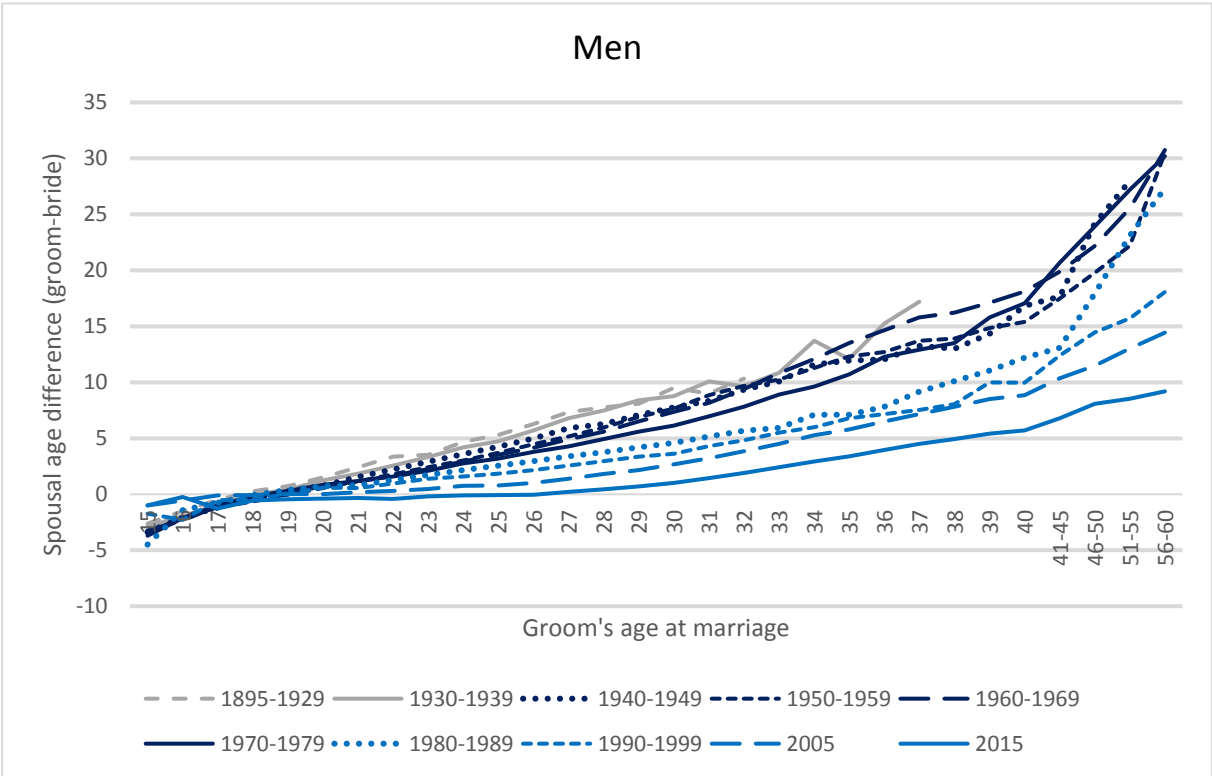
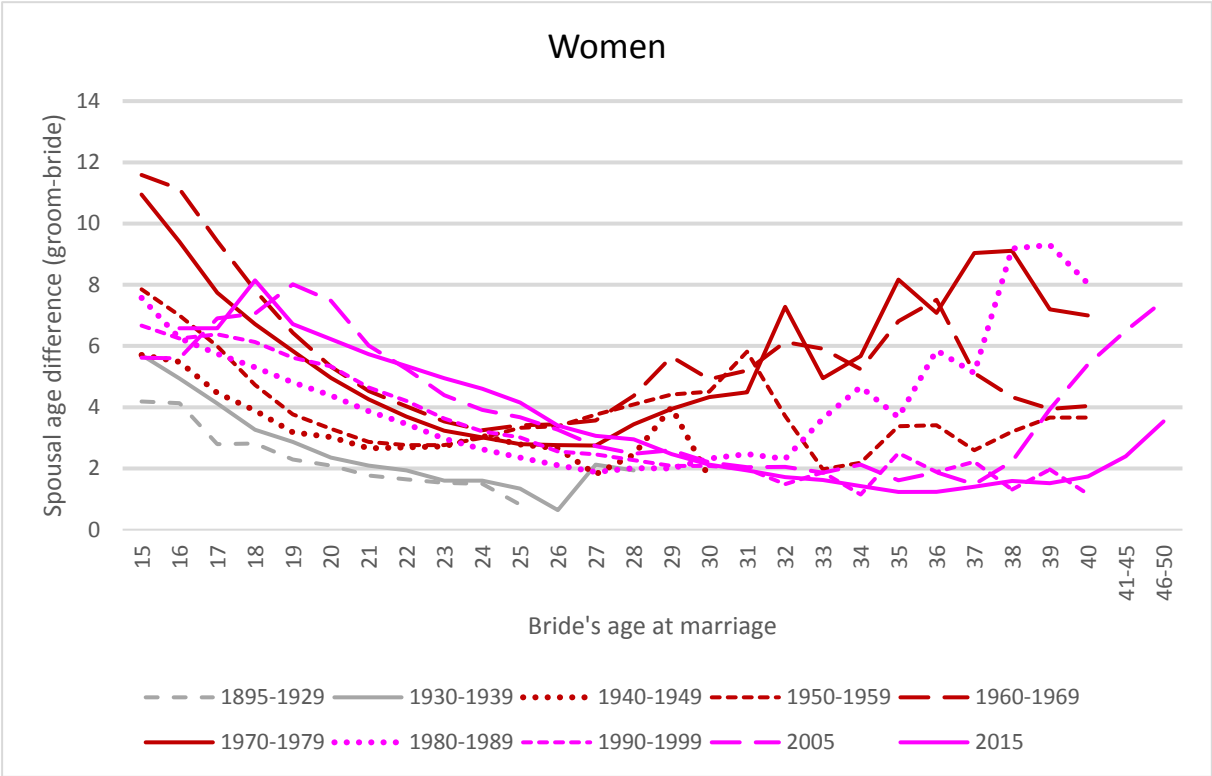


Figure 4a. Mean spousal age differences by sex and marriage cohort in Taiwan



Data sources: Survey of Women’s Marriage, Fertility, and Employment (1940-1999) and marriage registration data (2000 and after)

Figure 4b. Mean spousal age differences by sex and marriage cohort in Sweden

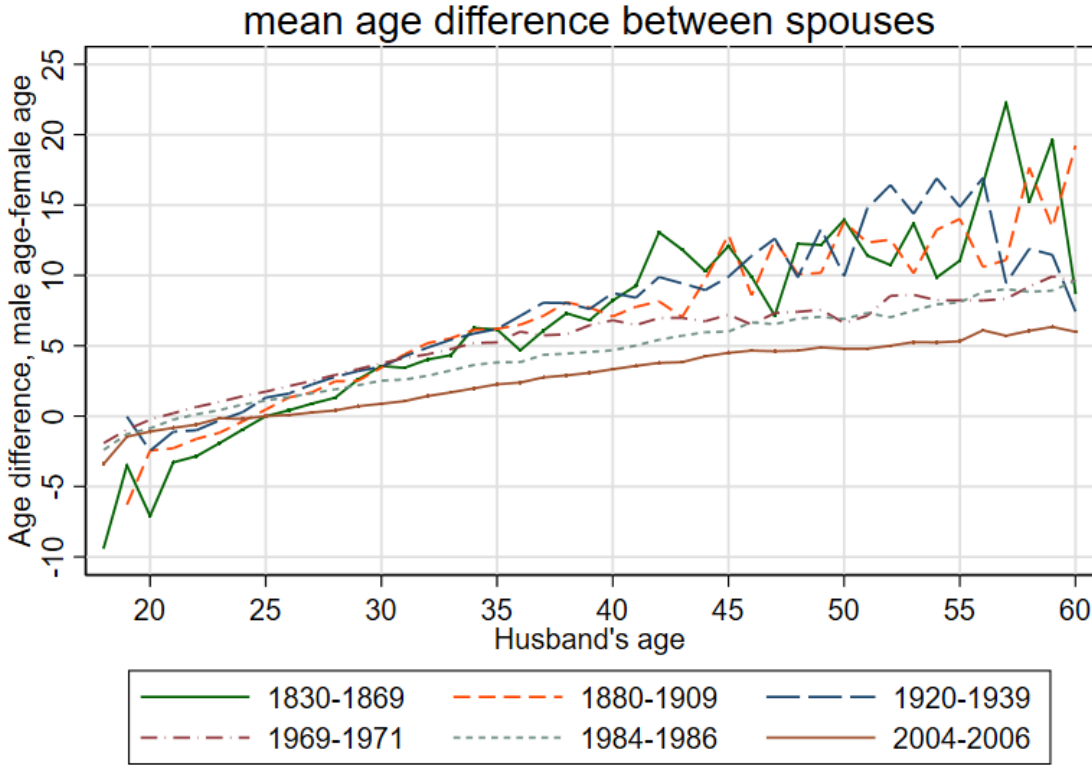
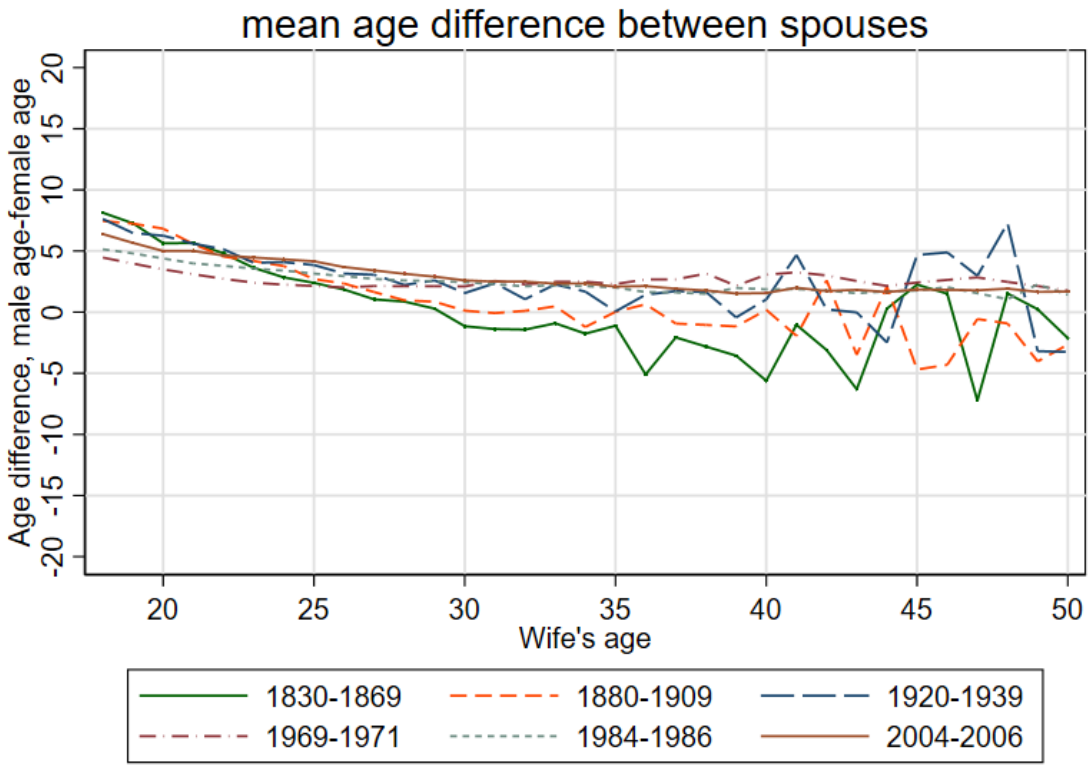


Figure 5a. Mean spousal absolute age differences by sex and marriage cohort in Taiwan

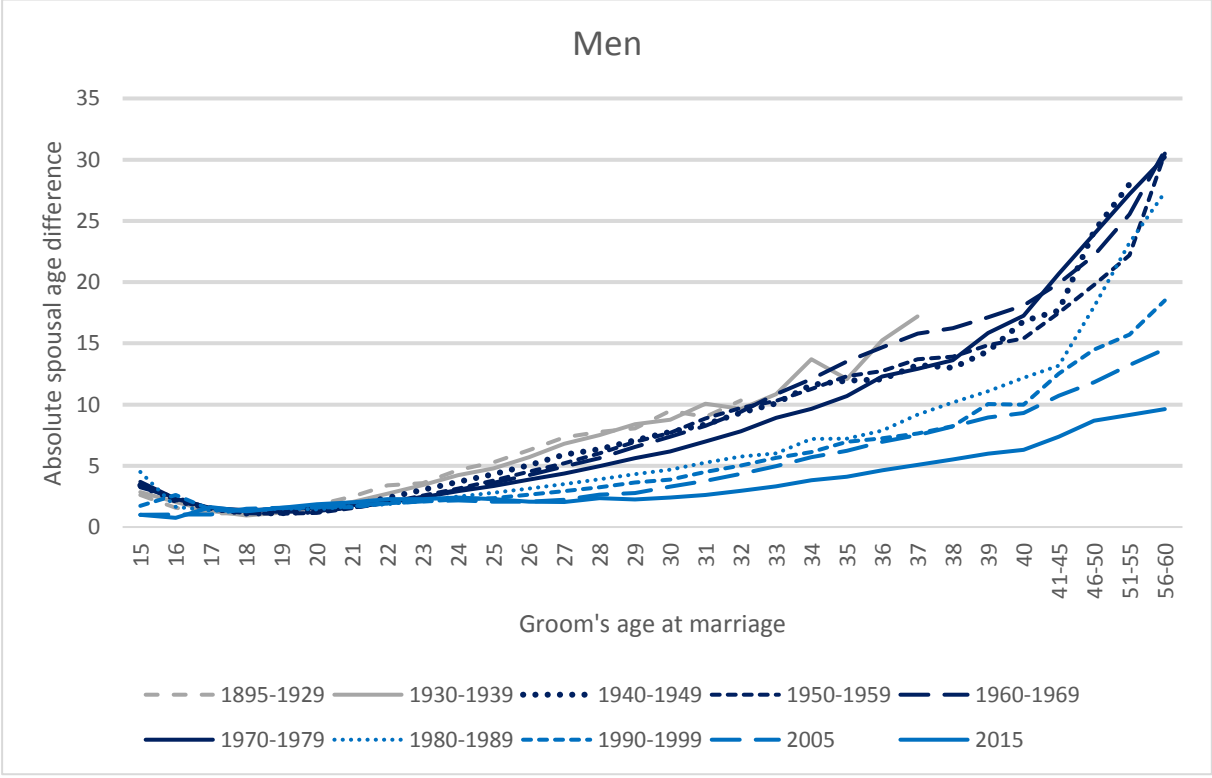
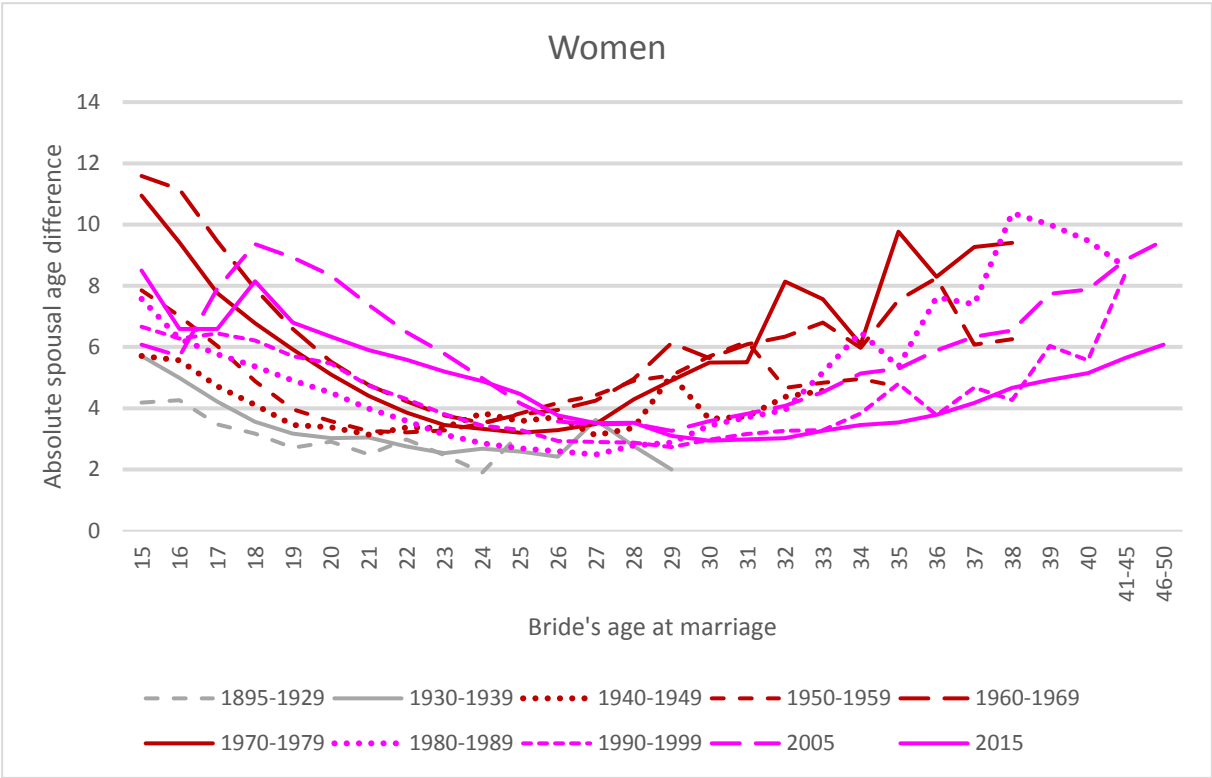


Figure 5b. Mean absolute spousal age differences by sex and marriage cohort in Sweden

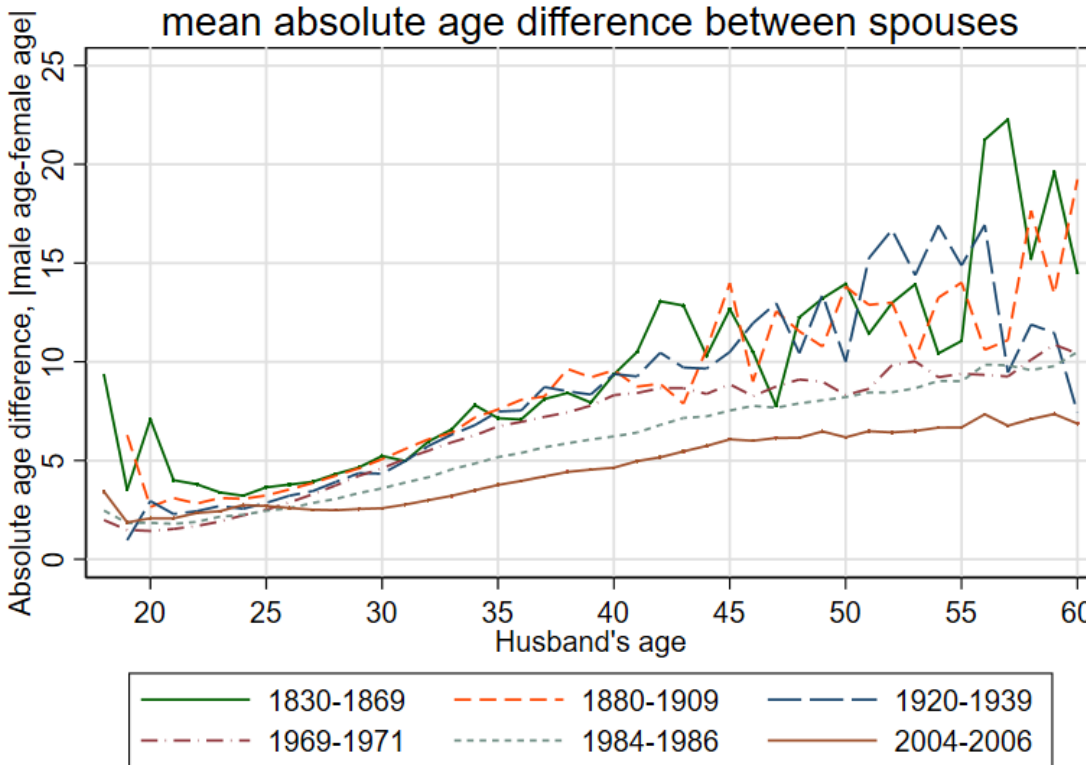
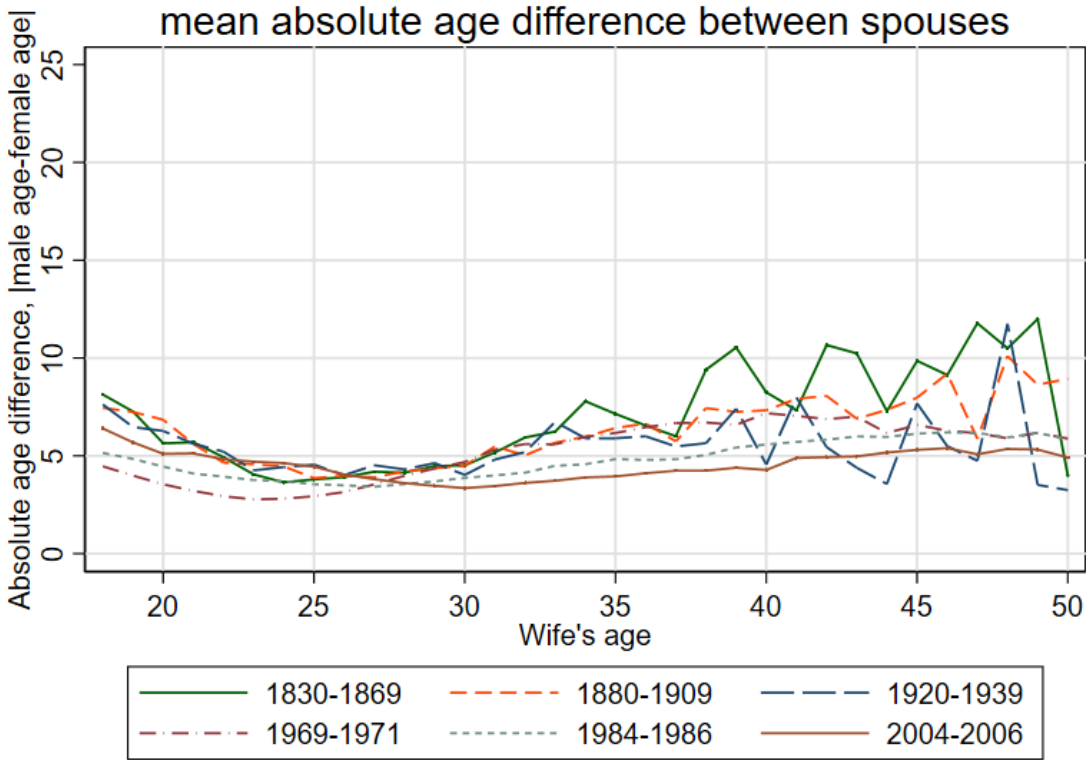


Figure 6a. Mean absolute spousal age differences by average age of spouses and by sex and marriage cohort in Taiwan

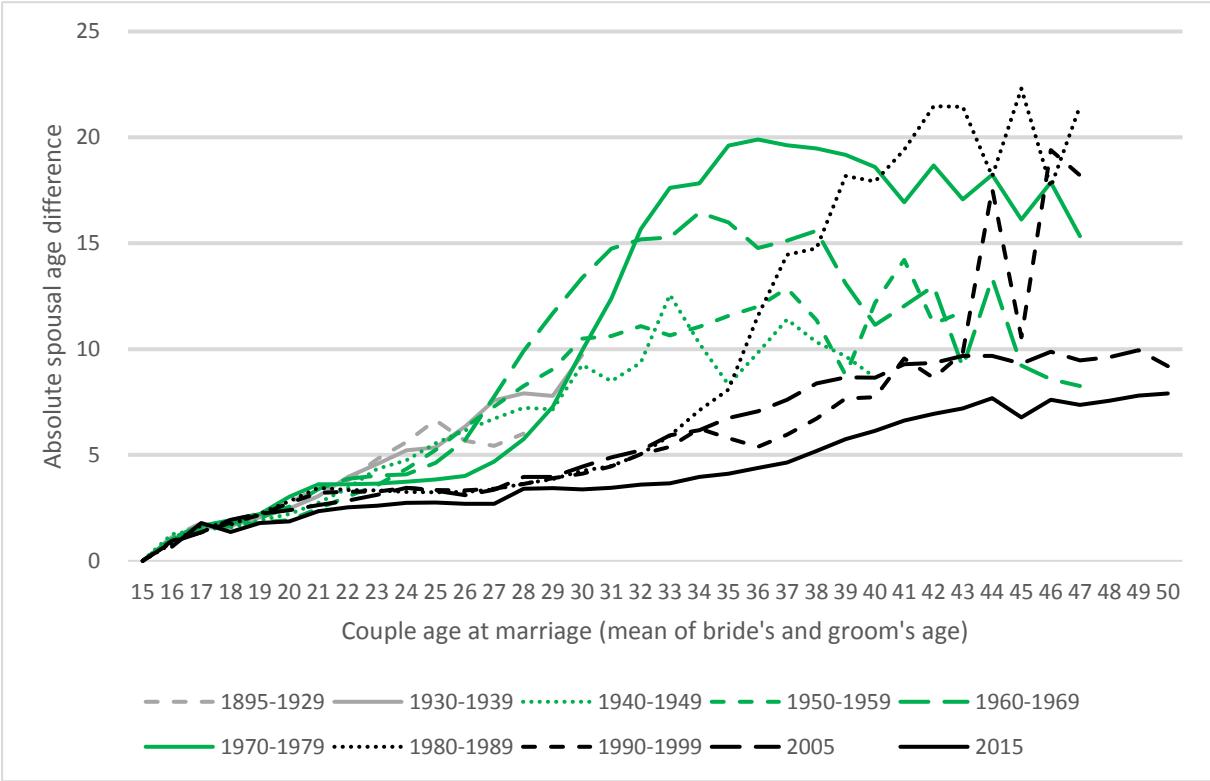


Figure 6b. Mean absolute spousal age differences by average age of spouses and by sex and marriage cohort in Sweden

