How we met: the demography of online and offline partnerships

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Abstract

Prior studies have documented how online dating has altered the way people meet romantic partners but few studies have provided recent estimates of the prevalence of online partnerships or examined whether partnerships formed online resemble those formed offline, and whether they have similar rates of marriage and dissolution. We use Generations and Gender Surveys conducted from 2020-2024 to examine online partnership formation in eleven European countries. Retrospective partnership histories, which ask respondents how they met their first co-residential partners, allow us to compare the increase in online partnership formation across countries and over time and examine the social pattern of those who meet their first partners through online dating. Using competing risks hazard models, we analyze the risk of first marriage and dissolution, controlling for a set of standard characteristics. We also examine whether the association between meeting online and partnership outcome changes over time, from the 1990s when online dating first became available to the 2020s. We find little evidence of an association between marriage risks and mode of meeting, and in half of studied countries, a higher risk of separation for those who met through online dating.

Introduction

The digital revolution has transformed the social world, fundamentally altering people's lives (DiMaggio et al 2001). The internet has also transformed how romantic partners and family members interact (Qian and Hu 2023, Tammisalo and Rotkirch 2022). With the explosion of online websites and dating apps over the past two decades (Bergstrom 2022), digital innovation has created new opportunities for individuals to meet and form relationships (Rosenfeld and Thomas 2012). In the United States, for example, meeting online has displaced more traditional ways of meeting a partner, with nearly 40% of all couples meeting

online by 2017 (Rosenfeld et al 2019). This rapid increase in online dating raises questions about whether partnerships formed online are selective of certain characteristics, and whether they have similar rates of marriage and dissolution (Danielsbacka et al 2022, Rosenfeld 2017). Online partnership trajectories may also differ across countries and shift over time.

One of the key debates in prior studies is whether online dating facilitates the formation of committed partnerships or instead leads to "Choice Overload," thereby eroding commitment and resulting in partnership churning (Sironi and Kashyap 2021, Rosenfeld 2012, Rosenfeld 2019). On the one hand, online dating sites may enable a better matching process, allowing individuals to filter out unsuitable matches and avoid unwanted advances. Online dating could be seen as a more efficient way of meeting a potential partner (Rosenfeld 2019), improving marriage prospects (Potarca 2021), and guarding against separation (Cacioppo et al 2013). On the other hand, some critics have argued that online dating promotes sexual promiscuity and weakens relationships (Turkle 2015), as individuals can exit unfulfilling relationships at any time and quickly find a new partner from the unlimited supply online (McKeever 2022). According to this perspective, partners who meet online may be less likely to marry and more likely to separate.

The process of searching for a partner online and finding a partner may also be selective of certain characteristics. When online dating first emerged in the 1990s, it was primarily used by individuals who struggled to find a mate in standard marriage markets, for example homosexuals (Rosenfeld and Thomas 2012). Online dating may also have been adopted by those who already had internet access and the skills to navigate dating websites (Potarca 2021, Sironi and Kashya 2022). Thus, online partnership formation may be selective of

certain characteristics, such as education and sexual orientation. However, selection into online partnerships and subsequent partnership trajectories may have changed over time. As online dating websites broadened their target audience and became more popular, the purpose of meeting a partner online may have shifted, thus changing the association between meeting online, selection, and partnership trajectories.

The development of online dating may also differ by context, producing different associations across countries. Just as changes in partnership formation are country-specific (Perelli-Harris et al., 2014), the prevalence and trajectory of partnerships formed online may differ across countries. Over the past few decades, cohabitation, divorce, and nonmarital childbearing have evolved in different ways, depending on cultural, legal, economic, and social factors (Perelli-Harris and Kuang 2023). The adoption of the internet and online dating has also varied across countries (Bergstrom 2022, Ch. 3, for US, Germany, and France). These demographic, social, and technological forces could differentially impact selection into online partnerships across countries and over time.

In this study, we use the 2020-2023 Generations and Gender Survey, which to our knowledge is the only cross-national dataset to collect information on how couples met their partners. We examine the development of online partnerships in Austria, Croatia, Czechia, Denmark, Estonia, Finland, Germany, the Netherlands, Norway, and the UK. Retrospective partnership histories, which ask respondents how they met previous and current co-residential partners, allow us to compare the increase in online partnership formation from the advent of online dating in the 1990s into the early 2020s. By focusing on first co-residential partnerships, we avoid short-term sexual relationship churning, with potentially many partners. We investigate whether first co-residential partnerships formed online are

selective of a range of individual characteristics, including sexual orientation, age, and education. Using competing risk hazard models, we analyze the risk of first marriage and dissolution, controlling for potential selection.

This study enhances our understanding of family formation in the following ways. First, while previous research has studied online partnership formation in specific countries, this the first study to compare the development of online partnering across multiple countries. Second, we investigate whether meeting a partner online is consistently selective of certain socio-economic characteristics, or whether online partnerships have become less selective over time as more people use the internet to find partners. Third, our retrospective partnership histories allow us to examine how partnerships develop over time and assess whether partnerships formed online are more likely to result in marriage or dissolve. Finally, with data collected since 2020, we capture partnerships formed in the last two decades, allowing us to examine how the nature of online partnerships have evolved as dating websites have transitioned from niche platforms to mainstream tools.

Theoretical Framework

The development of online dating

In the mid-1990s, the internet opened a world of opportunities for meeting potential partners. As early as 1995, websites such as match.com enabled individuals to find romantic partners without being limited to their proximate physical surroundings or immediate social networks. Initially, internet dating sites facilitated searches in “thin” markets (Rosenfeld and Thomas 2012), where specific groups could meet, for example homosexuals (e.g. Gaydar launched in 1999) and specific religious denominations (e.g. JDate for Jewish singles and Shaadi.com an Indian matrimonial service, both launched in 1997). The forerunners who

went online at this time had to have the skills and resources to access the internet and navigate online platforms, and they may have been at an advantage in finding a better mate. However, in the early days, online dating was also met with skepticism and even social stigma (Bergstrom 2022).

Over time, the spread and purpose of online dating shifted, no longer targeting specific markets, but becoming a general-purpose tool. Early online matchmaking services tended to promote their ability to broker a “good” marriage (Schwartz 2018). In 2000, for example, eHarmony launched an online dating service that used computer algorithms to match people on compatible traits and values, with the aim of facilitating long-term relationships, and ideally marriages (eHarmony 2025). However, other websites which launched in the early 2000s, such as Badoo and PlentyofFish, emphasized social-networking and dating rather than explicitly finding a marriage partner (Wikipedia 2025). In 2012, when introducing the concept of “swipe right,” the smartphone app Tinder revolutionized matching by unlocking immediate access to nearby dating partners in real time. Subsequent apps fine-tuned the matching process; for example, Hinge focused on relationships built around similar interests, while Bumble and Lemon Swan in Germany required female users to message their male interest. Hence over the past decade, online dating has become ubiquitous, accepted, and less reliant on technological proficiency. By 2017 in the United States, online dating had “displaced” other ways of meeting, including through friends or family (Rosenfeld et al 2019). Attitudes towards whether the internet is a suitable venue for meeting people have also become more tolerant and even normalized (Vogels and McClain 2023, Reid et al 2022).

Online dating facilitates better matches and potentially leads to marriage

Prior studies examining the rise of online dating have analyzed to what extent dating websites reinforce assortative mating, creating endogamous matches within social groups (Potarca 2017, Thomas 2020). According to some researchers, internet dating sites facilitate "successful" partner matching, resulting in a more "efficient" market (Rosenfeld and Thomas 2012). Because online dating widens the pool of potential mates beyond work, family, and friendship networks, dating websites can provide individuals with more opportunities for better matches (Rosenfeld and Thomas 2012). By specifying search categories, individuals can filter profiles based on their own preferences and steer clear of undesirable mates. They can peruse profiles at their leisure to find an attractive candidate for an initial interaction and then a meeting in real life. If that person is not deemed suitable, the cycle repeats itself until a suitable match is found. In addition, dating websites can potentially improve matches by employing algorithms that pair individuals according to a range of psychological traits, behaviors, and interests. Because of these advantages, Rosenfeld and Thomas (2012) predicted that "the internet era will increase partnership rates and reduce the unmatched proportion of the adult population" (Rosenfeld and Thomas 2012).

Whether a match is deemed "successful" is often measured by whether it results in better relationship quality (Cacioppo et al 2013) and progression to marriage (Rosenfeld 2017). Since marriage is often a conventional goal of the partnership process (at least in the United States, see e.g. Sassler and Miller 2011), many early dating sites promised clients that they would find a marital spouse. Even today, many current websites (e.g. Plenty of Fish, Bumble, eHarmony) feature success stories with photos of happy brides and grooms. Thus, according to many of the websites and apps, the measure of success is not only a long-term partnership, but also a wedding.

The evidence for higher relationship quality and progression to marriage is scant and restricted to the early years of internet adoption. In the US, Rosenfeld and Thomson (2012) found no differences in relationship quality or separation risks between those who met on and offline, but Rosenfeld (2017) found that meeting online predicts faster transitions to marriage. Also in the US, Cacioppo et al (2013) found that married couples who met online reported marginally higher relationship satisfaction and were slightly less likely to divorce. Few differences in relationship satisfaction were found in Switzerland (Potarca 2020) and Germany (Danielsbacka et al 2022). Keep in mind that the internet may also differentially facilitate partnership formation at different stages of the lifecourse (Sironi and Kashyap 2022). Although young adults may experiment with online dating, internet use for finding a committed partner may become relevant only when adults become older and ready to "settle down" (Sironi and Kashyap 2022). While we condition our analyses on partners who have made the initial step of moving in together, partnership progression to marriage may not be as relevant for the youngest adults.

Online dating weakens relationships and leads to more unstable partnerships

Another strand of research claims that the internet has weakened the institution of marriage and led to more relationship churning. People who date online may become overwhelmed with so many choices and no longer satisfied with any choice they make, as argued by "Choice Overload" theory (Rosenfeld 2017, Turkle 2015). The abundance of potential new romantic partners weakens commitment to a current partner, as individuals always wonder if they can find someone better (Turkle 2015, McKeever 2022). As described in The New Laws of Love (Bergstrom 2022), several discourses have claimed that flexible sexual norms, together with new technology, have made "the Tinder generation" incapable of commitment and instead embrace casual sex (Bergstrom 2022). The "hookup culture" has

trivialized sexual relations, especially on the internet, while digital dating is the "commodification" of intimate relationships that are no longer meaningful (Illouz in Bergstrom 2022).

Thus, online dating can feed into the shift towards individualization that has propelled the transformation of relationships in the modern era (Beck and Beck-Gernsheim ([1995] 2018)). As interpersonal relationships have become unbound by social mores and the need for reproduction, individuals have been granted the freedom to jettison an imperfect partner and seek better opportunities (Giddens 1992 [2013]). Focus group discussions in the UK revealed this fear of commitment, especially for men, with some respondents concerned that if they commit through marriage, they will miss out on future opportunities and "may not be able to upgrade" (Berrington et al (2015): 341). Because dating platforms ask clients to describe their "perfect partner," they set up unrealistic expectations that such a partner exists (McKeever 2022). Online apps, especially Tinder, allow such individuals to easily see the countless "better" opportunities, and act on them with the swipe of a finger.

Those who date and find partners online may also be less conventional and more willing to try new experiences. Like the forerunners of the Second Demographic Transition (Lesthaeghe 2014), online daters may be more likely to buck established social norms and adopt new family formation behaviors. People who use non-traditional methods of finding a partner may also be more open to long-term cohabitation and/or dissolving dysfunctional or substandard relationships. The process of finding a mate online usually occurs outside of social networks, detached from other social activities, and alone (Bergstrom 2022, Turkle 2011). Once together, partners' lack of support from established social networks – friends

and family – may result in more precarious relationships. As a result, partners who meet online may be slower to commit through marriage and more likely to separate.

Finally, although some researchers (Rosenfeld and Thomas 2012), and indeed, dating companies (match.com), claim that online dating services can produce more complementary matches, few studies provide evidence for this assertion. Psychologists have criticized online dating sites' matching algorithm as unscientific (Finkel and Sprecher 2012), as the mathematical modeling maximises similarity and complementarity, but few studies have found evidence that these principles predict marital well-being (Finkel and Sprecher 2012). Therefore, online dating may be no better, or even worse, at producing "successful" long-term matches than those initiated in conventional offline venues.

Selection

Those who use online dating may be selective of certain characteristics (Potarca 2023). As mentioned above, initially online dating was advantageous for less common population groups, for example, gays and lesbians (Rosenfeld and Thomas 2012), and highly educated women in Germany (Potarca 2021) and the US (Cacioppo et al 2013). In the early days of online dating finding a partner online may also have been more selective of those who had difficulties finding a partner in their community. However, as online dating became more widespread, it may have become less selective and able to improve the sorting practices of the general population. As a result, partnership matching may have improved over time, even resulting in higher marriage rates (Rosenfeld and Thomas 2012). On the other hand, as online dating became more common, the purpose of online dating shifted away from finding a life-long marriage partner to instead finding less serious dates, or even sexual "hookups" (Bergstrom 2022). As a result, the association between finding a partner online and partnership outcomes (marriage or separation) could weaken and even reverse.

Change across countries and over time

In nearly every European country, marriage rates have declined, divorce rates increased, and cohabitation has become the normative pathway into a co-residential partnership (Perelli-Harris and Kuang 2024). However, the pace and rate of change differs across countries; for example, cohabitation rapidly increased and then plateaued in the Nordic countries in the 1980s but only started to increase in most of eastern Europe in the 2000s. The proportion of cohabiting couples continues to differ across countries, for example, only 12% of couples in Czechia live with their partners outside of marriage, but nearly a third of couples cohabit in Estonia (Perelli-Harris and Kuang 2024). The prevalence and age at first marriage also varies substantially, with some long-term cohabiting couples marrying after having children, later in life, or not at all (Holland 2017). Thus, progression to marriage may be less relevant in countries where cohabitation is widespread.

In the current paper our interest is not country differences in marriage and separation per se, but whether the outcome of first partnerships differs according to whether the couple met through online dating. In countries where online dating is less practiced, it could be used by specific population groups or more selective of certain characteristics. Data on internet penetration indicates that the percent of internet use varies from around 83% of the total population in Croatia to 99% in Norway (World Bank Group 2025); however, to our knowledge no dataset provides comparable estimates of how many people use online dating in our study countries. Thus, our data is the only source for understanding how online dating differs cross-nationally.

Data

We used the standardized partnership histories from nationally-representative Generations and Gender Surveys Round II, called the Harmonized Histories (www.ggp-i. https://www.ggp-i.org/data/harmonized-histories/). The GGS has been conducted in numerous countries, but here we study Austria, Croatia, Czechia, Denmark, Estonia, Finland, France, Germany, the Netherlands, Norway, and the UK, because surveys in these countries ask about how couples met. Conducted between 2020 and 2023, the surveys interviewed men and women aged 18-69 in Czechia; 18-49 in Denmark; 18-54 in Finland and Norway, and 18-59 in the remaining countries. The surveys were conducted in a range of modes, from completely online to online with telephone or paper follow up (https://www.ggp-i.org/ggs-round-ii/). We selected men and women who had ever been in a heterosexual or same-sex partnership (either cohabiting or married) and who answered questions about how they met their first partner, dropping missing cases. We do not examine higher order partnerships, because the selection processes into repartnering are different than those of entering a first partnership and would complicate the analyses. We restrict our sample to those who entered first partnerships in 1990 or later, when the internet became more widespread (see Table 1 for sample size for each country).

Variables

How partners met

We define online partnerships as those who reported meeting their first partner through online dating, based on the question "How did you and [partner] meet?" Respondents could select from a range of options (through work, in education, at church or equivalent, online dating, other online setting, vacation or business trip, at a bar/nightclub, through a social organization, health club/ gym/volunteer group, at a private party or social event, through

friends, through family, other). We focus on online dating only, because it more directly operationalises the theories above about efficient matching markets, assortative mating, and choice overload. We also found that associations with other online settings was more heterogenous; for example, in the UK meeting a partner in another online setting was associated with being born in South Asia, potentially due to remote marriage practices. Note that Norway, however, does not differentiate between meeting through online dating or another online setting.

Independent Variables

We include basic socio-demographic controls in all models (see Table 1). Age at partnership formation is included as a continuous variable, and year of partnership formation is included as three categories (1990-2005, 2005-2014, 2015-2022/23), which best capture sample sizes as online dating increases. Education is standardized across all countries using ISCED categories and then collapsed into High (5-8), Medium (3-4), and Low (0-2). Parental separation in childhood is captured through a question asking whether respondents lived with both biological parents at age 15. Those with missing data on education or whether their parents were together during their childhood were dropped from the analysis. These cases generally comprised less than 5% of the analytic sample.

Table 1 about here

Respondents were asked about the sex of their first partner, and we coded those with matching sex as living in a same-sex partnership. Religiosity was based on the question "Regardless of whether you belong to a particular religion, how religious would you say you are? Please express your religiosity on a scale of 0 to 10 where 0 means 'Not at all religious' and 10 means 'Very religious.'" Respondents were also given the option "Don't know" and

many respondents left the question unanswered, which we categorized as “Missing.” We therefore implemented religiosity as a categorical variable, with the categories “Not at all religious,” “1-5,” “6-10,” and “Don’t know/missing.” We were unable to specify ethnicity but included an indicator for whether the respondent was born in the country. Finally, in the partnership outcome model, we used a time-varying variable to indicate when the respondent had a child, as the presence of children may have an impact on relationship stability and affect partnership outcomes (Kuang et al. 2025).[1]

Analytic Methods

First, we present trendlines depicting the proportion of couples who met online, for those who moved in with their first partner between 1990 and the latest date available in each country. Second, to examine selection into meeting online versus meeting in other ways, we use logistic regression models with a binary outcome variable (met online vs offline). To test whether selection effects changed over time, we include for each country an interaction effect between each variable and year of partnership formation.

Third, we use monthly data from the Harmonized Histories to analyze transitions from the start of a first co-residential partnership to marriage, separation, or censoring at 10 years. We apply discrete time competing risks hazard models with three outcomes: marriage, separation, or continuing to cohabit (the reference category). When respondents reported the year but not the month, the month was randomly imputed. Respondents who did not report the year their partnership started or ended were excluded from the analysis. Table 1 uses life table methods to calculate the proportion of respondents who married their

[1] When the birth event variable is not included, results remained consistent across all countries. We also tested a variety of time varying fertility variables, such as age of youngest child, and number of children, results of which are available upon request.

partner within 10 years, who separated from their cohabiting partner, and who remained in their first cohabiting relationship at 10 years or the time of censoring. Direct marriages were categorized as transitioning to marriage in the first month or marriage occurring before cohabitation. To investigate change over time, we test an interaction between the year of partnership formation and online dating and conduct Wald tests to assess the interaction coefficients.

Results

1. The percent of partnerships which began online, 1990-2022/23

Unsurprisingly, the proportion of couples who met their co-residential partner through online dating has increased in all countries (Figure 1); however, the increase has not been as pronounced as expected. Until 2010, the proportion was less than 15% in all countries. The proportion then started to increase, but the rate of increase diverged across countries. By 2020-2022/23, only 12-20% of partners had met online in Czechia, Croatia, Germany, Austria, Denmark, and Estonia, while around a quarter had met online in France, the UK, Netherlands, and Norway. Finland had the highest proportion of first partners meeting online at 40%. Note that the trendline represents a lag between meeting a partner online and moving in together, as couples usually date for some time first.

Figure 1 about here

2. Selection into meeting through online dating

We first address whether we can detect any selection into partnerships which initially formed online. Table 2 presents odds ratios from logit models that examine whether partners met online or in another way. Consistently across countries, older people, those who formed their first partnerships more recently, and those with a same sex partner were

more likely to have met through online dating. For each year of age, the likelihood of meeting through online dating increased by 4-7% ($p<0.01$), with the exceptions of Austria and Croatia, where the effects of age were not significant. Forming a partnership before 2005 was associated with between 50-80% lower likelihood of meeting online, compared to those who met between 2005 and 2014 ($p<.01$, except for Finland where $p<.05$), whereas those who met after 2015 were generally more than twice as likely to have met online, except for in France, where the difference in likelihood of meeting online was not different between those who formed their partnerships in 2005-14 versus after 2015. Those with a same sex first partner were about 3-5 times more likely to have met through online dating, with the exception of Finland, where the difference between same-sex and heterosexual couples was not significant. In the UK, Germany, Croatia, and the Netherlands, those who reported higher religiosity had a 50-30% lower likelihood of meeting online, compared to those who reported being "Not at all religious." (significant at the $p<.01$-$.05$). Surprisingly, education was not significantly associated with meeting a partner online, with two exceptions: relative to those with a medium education[2], those with low education were nearly twice as likely to meet online in Czechia ($p<0.05$), but 44% less likely in the Netherlands ($p<0.05$). In Czechia, those with higher education were also more likely to meet online ($p<0.05$), relative to those with medium education, suggesting a U-shaped educational pattern for meeting online. For most countries, respondent sex was not significantly associated with how partners met, except in Germany and Denmark, where women were 28% and 35% more likely to meet a partner online, respectively ($p<0.05$). In

[2] When high education was used as the reference group, findings were consistent with one exception - the lowest educational group in Norway had a higher likelihood of meeting online (OR 1.43, $p<0.05$), relative to the highly educated.

Croatia, women were 30% less likely to meet their partner online ($p<0.05$). Finally, Austria and France were the only countries in which not living with both biological parents in childhood was positively associated with meeting online (OR 1.77, $p<0.01$ and OR 1.43 $p<0.05$, respectively).

In order to examine whether selection effects changed over time, we included an interaction term between key variables and year of partnership formation. With few exceptions[3], the interaction terms for being in a same sex partnership, education, religiosity, and age at partnership formation were not significant in any country, providing little evidence that selection changes over time; however, the small sample sizes do limit the conclusions that can be made.

3. Competing risks hazard models – marriage

First note that the proportion who have married their first cohabiting partner within 10 years differs across countries, ranging from 40% in Norway to over 80% in Croatia (Table 1). Tables 3a and 3b show competing risks hazard models that include all covariates of the risk of marriage[4] and separation, relative to remaining within cohabitation. The risk of marriage is not significantly different for those who met on a dating website and in other ways (met on and offline) (Table 3a), with the exception of Estonia, where those who met online have a 40% higher risk of marriage versus staying in cohabitation ($p<0.001$), and Croatia, where those who met online have a 30% lower risk of marriage ($p<0.001$), compared to those who did not meet online. Figure 2, panel a, illustrates the cumulative incidence of marriage over

[3] In France, highly educated respondents had a higher likelihood of meeting online in 2015-22/23 versus 2005-2014. In Finland, those with higher religiosity had a lower likelihood of meeting online in 2015-22/23 versus 2005-14.

[4] A lower proportion of those who marry directly met online, compared to those who did not marry directly.

months since partnership formation in each country. In most countries, the risk of marriage is very similar between those who met on and offline, across partnership duration; the lines overlap in UK and Denmark. In Austria, Croatia, and Estonia, the gap in the risk of marriage between those who met on and offline increases over the duration since partnership formation.

Figure 2 about here

The other coefficients in the model are in line with prior studies, for example, the risk of marriage increases with age of entrance into union in all countries, and generally decreases over time, although not all time periods are significant. Those who are more religious have significantly higher marriage risks in all countries, as do those who were born in another country, with the exception of Czechia (and the coefficient was not significant in Finland). Not living with both parents in childhood generally lowers marriage risks, although the coefficient is not significant in all countries. The risk of marriage for same sex couples is generally lower than for opposite sex couples,[5] but it is much lower in Czechia, France, Germany, and the UK ($p<.001$). Finally, the results for having a child (before marriage or separation) during the first partnership are inconsistent; in Denmark ($p<.001$) and Austria ($p<.01$) and Germany ($p<0.05$) the birth of a child prompts marriage, while in Estonia ($p<.01$) and the Netherlands ($p<.001$), those who had a child are less likely to marry. In many countries, couples are more likely to marry before having children (Blom et al 2022), or directly afterwards, which makes the interpretation of this coefficient challenging.

[5] We tested an interaction term between meeting online and being in a same sex partnership and generally found no evidence of interaction, in predicting the risk of marriage. The one exception to this was the Netherlands, where same sex couples who met online were less likely to marry.

Interaction terms between meeting online and year of partnership formation indicate that the association between online dating and marriage does not significantly change over time in most countries. Only Denmark, Estonia, and Germany passed the Wald test indicating that the interaction term improved model fit (see Figure 3, panel a). In Estonia, online and offline daters did not differ before 2005, but online daters in the latest period have a significantly higher risk of marriage. In Denmark (and the Netherlands, too, but it did not pass Wald test), those who met online had a lower risk of marriage before 2005, compared to those who did not meet online, but by the 2015-2020/23 period, those who met online have a similar risk of marriage as those who did not. Lastly, in Germany, before 2015 those who met online had a similar marriage risk as those who did not meet online; after 2015, those who met online had a lower marriage risk than those who did not. Thus, the association between meeting online and marriage is not consistent across countries.

4. Competing risks hazard models – separation

The results for separation show more consistency.[6] In about half of the countries, separation risks are significantly higher for couples who met online (Table 3b). Online daters in Estonia, Germany, and the Netherlands are 27% to 39% more likely to separate (vs. remain in cohabitation) compared to those who met in other ways ($p<0.05$). In Austria ($p<.01$) and Croatia ($p<0.05$), online daters are around 60% and 70% more likely to separate compared to those who met in other ways, respectively. In Czechia, Denmark, Finland, France, and the UK the association between meeting online and separation is positive, but the coefficients are not significant. These findings suggest that the online matching process does not result in

[6] An event history model was also fit with only one event of interest- separation. There were no changes to online dating effects, except that the coefficient for meeting online became significant in the UK ($p<0.05$). In six out of eleven countries, those who met online were still more likely to separate, so it does not matter if couples married and then separated.

partnerships which are more stable than marriage. Note, however, that in Estonia, both marriage and separation risks are higher for those who meet online, which may reflect a desire to either commit to a partnership through marriage or leave the partnership to find a new partner.

As with the marriage risks, associations with the risk of separation are generally as expected (Table 3b). Separation risks are higher for those who enter a union at a younger age. For most countries, separation risks are higher for those with a same sex partner, except for in the Netherlands where those in a same sex partnership were 76% less likely to separate ($p<0.05$.)[7] The risks increase in the years after forming the partnership and then fall. They are generally lower for people with higher levels of religiosity ("1-5" and 6-10"), versus those "not at all religious" (although not in Estonia, which has an opposite relationship between religiosity and separation). For people who have a child during their partnership (before marriage or separation), they are between 68% and 37% ($p<0.001$) less likely to separate, compared with those who do not (although not in the UK, where people who have a child are significantly more likely to separate, OR 1.51 ($p<0.001$)). As with marriage, separation risks by how partners met differ little across partnership duration, except for Austria where the gap between online daters and non-online daters increases over relationship duration (figure 2, panel b). In general, the difference in separation risks is low at each duration point, potentially due to the small sample size of couples who met online. In both Germany and Finland (figure 3, panel b), interaction terms between meeting online and year of partnership formation indicate that the association between online dating and separation changed for those who met online. In Finland, the risk of separation was lower for those

[7] We tested an interaction term between meeting online and being in a same sex partnership and found no evidence of interaction, for the risk of separation.

who met online (versus those who did not) before 2015 and higher for those who met online after 2015, indicating increase over time. While in Germany, the risk of separation decreased over time; those who met online had a higher risk of separation (than those who did not) before 2015, and a similar risk of separation after 2015.

Discussion

As internet use, social media, and smartphones have become ubiquitous, the overriding assumption has been that online dating has fundamentally changed how couples meet and form long-lasting partnerships (Rosenfeld 2019). However, our data from ten countries in Europe indicates that while the proportion of couples who met online has increased, by 2020-2022/23 this proportion was still less than a quarter of all couples, with the exception of Finland where 40% met online. Although we only analyze first co-residential partnerships - and there is usually a lag between when people meet and move in together - it is still surprising that the percent is not higher, given our studies took place in the post-Covid era. Thus, although digital technology may be impacting how families interact in other domains (Qian and Hu 2023), our findings suggest that online dating has not (yet) displaced alternative forms of meeting a partner throughout these European countries.

Online dating has also generated intense debate about whether the online matching process leads to committed couples more likely to marry, or instead weakens commitment, resulting in less stable partnerships (Rosenfeld 2019, Bergstrom 2022, Danielsbacka et al 2022). Our results show evidence that only in Estonia is meeting online associated with a higher risk of marriage. Instead, we find more consistent evidence that meeting online is associated with separation (in five out of eleven countries). Thus, these findings do not suggest that online

dating is more efficient at producing matches that result in long-term marriage, but rather that online dating may be contributing to partnership instability.

One of the main methodological and conceptual issues in studying online dating is whether individuals who find a partner online are selective of certain characteristics. In line with prior studies (Rosenfeld and Thomas 2012), we find that same-sex couples are much more likely to meet online in every country (with the exception of Finland, although this could be due to sample size). These results provide further evidence that individuals attracted to the same sex have fewer opportunities to find a partner in a standard partner market and are more likely to have success online. However, same-sex couples who met online are not more or less likely to marry, possibly because laws prevented same-sex couples from marrying. With respect to other selection factors, however, our models find few consistent associations, other than age and to a small extent religiosity. In Germany, women were more likely to meet their partner online than men, corresponding to Potarca's (2021) findings. However, the most obvious selection factor – education – was only associated with online partnering in Czechia (with a U-shaped educational pattern) and the Netherlands (with lower risks among the low educated). These findings suggest that selection based on standard background characteristics is not particularly strong. Nonetheless, we may be missing important characteristics associated with finding a partner offline, including employment status, income, attraction and personality; for example, less extraversion has been shown to be associated with online partnering in a German study (Danielsbacka 2019). Longitudinal studies which track couples over time may be better able to capture variables measured contemporaneously and hence control for selection.

We also hypothesized that the association between online dating and partnership outcomes would change over time, as online dating became less specialized and more commonly available. In the initial period, matchmaking services, such as match.com or eHarmony, used computer algorithms to find users their perfect match; however, as apps such as Tinder emerged, online dating became more oriented towards social networking and sexual encounters, rather than finding a marital spouse. In our data, the association between online dating and partnership outcomes changed over time in only four countries, and the direction of change was not consistent in any of them. Thus, while the meaning of online dating may have shifted in some countries, it does not seem like the meaning has changed universally across countries. Future research is needed to better understand uptake and attitudes towards online dating in individual countries.

It is also important to keep in mind that as cohabitation has increased throughout Europe, the meaning of marriage has changed (Perelli-Harris et al 2014), and fewer couples transition into marriage (Andersson et al 2017). In our data, between 12-32% of couples were still cohabiting after 10 years or at the time of censoring (see Table 1 for exact estimates). In countries such as the Netherlands and Norway, marriage risks may not significantly differ by how couples meet, because far fewer couples show commitment through marriage. Instead, cohabitors in Europe may demonstrate commitment in other ways, such as buying a house or having children (Berrington et al 2015). Therefore, other than looking at separation rates, we have no way of knowing whether *commitment* differs by how partners meet.

This study has the following limitations. First, we have little information about the context of online dating in each country, either captured within the survey or using external data.

Online platforms, dating apps, frequency of use, and attitudes to finding a partner online may differ according to context, which may shape the association between meeting online and partnership outcomes. Second, because the Generations and Gender Survey only asks about prior co-residential partnerships, we cannot examine dating or living apart together relationships. This information is collected for current partnerships, but studying current partnerships would not allow us to examine separation. Here we also do not examine repartnering, as it is beyond the scope of this study. Third, the analyses are subject to the data limitations of each survey, for example small sample size, mode of survey data collection, or, in the case of Norway, differences in question wording.

Despite these limitations, our study indicates that overall, co-residential partnerships formed online do not appear to benefit from better matching algorithms, wider partner markets, or more efficient search processes (Rosenfeld and Thomas 2012, Sironi and Kashyap 2022). Instead, those who find a partner through online dating are more likely to separate from their partner, or at least we find few differences between meeting someone online and partnership outcomes. We can only speculate why this may be the case. Because partners found online are not embedded in physical social networks, new partners may not relate to existing friends and family members, who in turn may not be as supportive of the couple. Those who partner online may be selective of certain traits not captured in our survey (Danielsbacka et al 2022) or more open to new experiences. Like the forerunners of the Second Demographic Transition (Lesthaeghe 2014), new technology adopters may be less likely to commit to a long-term partner. Indeed, online dating, with its multitude of options that maximize choice, may be exacerbating the movement towards individualization and simultaneously producing anxiety about “settling down” (Turkle 2015). Even after having

moved in together, couples who met online may still feel the urge to pursue a better option (McKeever, 2022).

Also note that because we only observe couples who were committed enough to move in together, our results likely underestimate the overall impact of online dating on relationship behavior. Many dating relationships end before they progress to the co-residential stage, contributing to relationship churning and delaying entrance into cohabitation. Although we urge caution in interpreting our findings, as the associations were not especially strong or evident in all countries, they do raise questions about whether online dating in general may be exacerbating partnership instability or delaying the formation of committed partnerships. Future research needs to investigate the impact of online dating before couples move in together to establish whether online dating is fundamentally changing partnership behavior at an earlier stage in the relationship process.

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Table 1. Descriptive background characteristics of main sample (percentages)

Country **Survey year**	**Austria** **2022-23**	**Croatia** **2023**	**Czechia** **2020-22**	**Denmark** **2021**	**Estonia** **2021-22**	**Finland** **2021-22**	**France** **2024**	**Germany** **2021-22**	**Nthlands** **2022-23**	**Norway** **2020**	**UK** **2022-23**
Mean age of entry into first partnership	25.18	25.8	24.7	24	23.9	23.4	26.2	25.1	26.1	24.65	25.57
Year of partnership formation											
Before 2005	44.9	38	46.5	37.3	45.1	48.8	44.5	30.4	42.82	43.64	40
2005-14	30	34.7	30.7	35.5	33.4	30.5	30.3	40.3	30.08	35.62	30.52
2015-2022/23	25.1	27.3	22.8	27.2	21.5	20.7	25.2	29.3	27.1	20.74	29.49
Sex											
Female	50.6	53.6	50.3	53.3	52.5	52.5	51.8	52.9	51.16	50.81	52
Male	49.4	46.4	49.7	46.7	47.6	47.5	48.2	47.1	48.84	49.19	48
Education											
High	36.3	33.5	27.5	62.9	44.2	46.6	45.4	34.5	51.26	53.1	54.79
Medium	50	60.1	65.2	31.3	43.8	45.8	40.5	53.9	35.69	18.76	41.88
Low	13.7	6.4	7.3	5.8	12.0	7.6	14.1	11.6	13.06	28.15	3.33
Religiosity (on 0 to 10 scale)											
Not at all religious	21.6	10	33.7	25.5	30.1	27.0	33.3	30.4	41.21	35.37	42.41
1 to 5	42.1	27.5	41.4	37.9	42.6	41.5	34.0	43.3	31.48	43.84	34.38
6 to 10	28.1	51.8	16.9	9.5	14.5	26.1	18.0	25.1	18.25	12.69	18.26
Don't know/Missing	8.2	10.7	8	27.2	12.8	5.4	14.7	1.2	9.06	8.11	4.96
Migrant status											
Born outside country	22.8	11.6	3.5	17.1	5.5	5.6	13.4	11.9	9.31	13.77	17.33
Lived with both parents in childhood											
Yes	86.8	89	84.5	93.4	73.6	83.4	83.1	83.5	91.24	82.28	80.39
No	13.2	11	15.5	6.7	26.5	16.6	16.9	16.5	8.76	17.72	19.61

Same sex first partnership											
No	97.2	99.1	97.9	96.8	98.6	97.3	97.2	97.1	98.04	96.79	95.22
Yes	2.8	0.9	2.1	3.3	1.4	2.7	2.8	2.9	1.96	3.21	4.78
Percent direct marriage	12.1	34.0	16.2	5.5	10.1	6.2	14.7	8.5	11.72	7.16	14.13
Had child during 1st partnership before marriage or separation	36.1	16.6	29.6	41.8	44.5	24.4	50.3	22.1	29.3	41.1	18.0
First partnership outcome											
Married within 10 years	51.5	82.0	61.9	43.6	43.8	42.7	41.8	51.2	56.2	40.8	51.5
Separated within 10 years	26.4	5.3	23.8	29.3	27.9	31.2	26.0	25.3	16.0	28.8	28.8
Cohabiting	22.0	12.7	14.3	27.1	28.3	26.1	32.2	23.5	27.9	30.5	19.6
n	4,263	3,602	3,032	3,503	4,914	2,044	5,298	12,188	4,254	2,947	4,154

Table. 2 Logit model odds ratios (standard errors) of meeting through online dating vs. meeting any other way

VARIABLES	Austria	Croatia	Czechia	Denmark	Estonia	Finland	France	Germany	Nthlands	Norway	UK
Age at partnership formation (continuous)	1.02	1.01	1.04**	1.07***	1.05***	1.07***	1.03***	1.07***	1.06***	1.07***	1.06***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year of union formation (ref. 2005-14)											
Before 2005	0.26***	0.26***	0.52**	0.32***	0.30***	0.50*	0.18***	0.29***	0.34***	0.19***	0.36***
	(0.07)	(0.07)	(0.12)	(0.06)	(0.05)	(0.15)	(0.03)	(0.06)	(0.06)	(0.04)	(0.06)
2015-22/23	2.35***	2.90***	1.81**	2.27***	1.94***	3.22***	1.28	2.37***	2.15***	2.33***	3.23***
	(0.41)	(0.51)	(0.37)	(0.29)	(0.25)	(0.68)	(0.18)	(0.23)	(0.27)	(0.35)	(0.42)
Sex (ref. male)											
Female	0.77	0.70*	1.21	1.35*	1.07	1.38	1.01	1.28*	1.03	1.18	1.00
	(0.12)	(0.11)	(0.21)	(0.16)	(0.13)	(0.30)	(0.13)	(0.12)	(0.12)	(0.17)	(0.12)
Same sex union? (ref. no)											
Yes	3.23***	4.97**	4.98***	2.59***	3.04**	1.67	4.04***	2.85***	3.12***	5.27***	4.50***
	(1.05)	(2.73)	(1.93)	(0.64)	(1.14)	(0.74)	(0.78)	(0.58)	(0.96)	(1.58)	(0.95)

Education (ref. medium)											
High	0.74	0.93	1.47*	0.96	0.95	0.82	1.15	0.88	1.03	0.87	1.20
	(0.12)	(0.15)	(0.26)	(0.12)	(0.11)	(0.17)	(0.15)	(0.07)	(0.13)	(0.17)	(0.15)
Low	0.85	1.40	1.90*	0.68	0.92	0.50	1.18	0.89	0.56*	1.20	0.59
	(0.28)	(0.63)	(0.55)	(0.24)	(0.20)	(0.33)	(0.33)	(0.25)	(0.17)	(0.27)	(0.27)
Religiosity (ref. 0 "not at all religious")											
1 to 5	0.88	0.67	0.99	1.07	0.97	0.87	0.98	0.89	0.87	1.12	0.87
	(0.16)	(0.16)	(0.21)	(0.16)	(0.13)	(0.19)	(0.14)	(0.10)	(0.11)	(0.17)	(0.11)
6 to 10	0.68	0.49**	0.69	0.86	0.86	0.68	0.81	0.68**	0.66*	1.02	0.57**
	(0.16)	(0.11)	(0.19)	(0.22)	(0.17)	(0.19)	(0.17)	(0.09)	(0.11)	(0.23)	(0.11)
Don't know/missing	0.71	0.58	1.03	1.06	1.02	0.73	0.84	0.73	0.81	0.48*	1.18
	(0.23)	(0.19)	(0.34)	(0.17)	(0.18)	(0.27)	(0.18)	(0.33)	(0.18)	(0.15)	(0.29)
Migrant status (ref. non migrant)											
Migrant	1.07	1.04	1.19	0.91	0.97	0.37	0.70	0.77	0.82	0.87	0.97
	(0.21)	(0.26)	(0.42)	(0.16)	(0.28)	(0.20)	(0.16)	(0.15)	(0.16)	(0.18)	(0.16)
Lived with both parents in childhood? (ref. yes)											
No	1.77**	1.36	0.63	1.03	1.11	0.82	1.43*	1.09	1.21	0.88	1.02
	(0.35)	(0.35)	(0.17)	(0.27)	(0.14)	(0.24)	(0.23)	(0.15)	(0.22)	(0.17)	(0.14)
Constant	0.05***	0.07***	0.02***	0.01***	0.03***	0.02***	0.05***	0.01***	0.02***	0.02***	0.02***
	(0.02)	(0.03)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)

*** p<0.001, ** p<0.01, * p<0.05

Table 3a. Competing risks discrete time hazard model of marriage and separation: *Hazard risks of marriage versus remaining in cohabitation*

VARIABLES	Austria	Croatia	Czechia	Denmark	Estonia	Finland	France	Germany	Nthlands	Norway	UK
Met online dating? (ref. no)	0.86	0.70***	1.10	0.97	1.41***	0.96	0.97	0.99	0.89	1.11	1.04
	(0.12)	(0.07)	(0.14)	(0.10)	(0.13)	(0.17)	(0.11)	(0.08)	(0.08)	(0.14)	(0.10)
Age at partnership formation (continuous)	1.04***	1.02***	1.03***	1.06***	1.02***	1.04***	1.00	1.03***	1.02***	1.04***	1.03***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Year of union formation (ref. 2005-2014)											
Before 2005	1.63***	1.46***	2.15***	1.18**	1.65***	1.10	1.40***	1.10*	1.42***	1.68***	1.24***
	(0.10)	(0.07)	(0.15)	(0.07)	(0.08)	(0.11)	(0.08)	(0.04)	(0.07)	(0.12)	(0.07)
2015-2022/23	1.03	0.70***	0.91	0.86	0.81**	0.56***	1.05	0.88**	0.94	0.83	0.60***
	(0.09)	(0.04)	(0.10)	(0.08)	(0.06)	(0.09)	(0.09)	(0.04)	(0.07)	(0.11)	(0.05)
Sex (ref. male)											
Female	1.25***	1.19***	0.72***	0.98	0.91	0.93	0.93	1.06	1.06	1.00	0.94
	(0.07)	(0.05)	(0.05)	(0.05)	(0.04)	(0.10)	(0.05)	(0.04)	(0.05)	(0.07)	(0.05)
Same sex union? (ref. no)											
Yes	0.72	0.65	0.25***	0.89	0.64	1.17	0.49***	0.51***	0.72	0.56**	0.42***
	(0.16)	(0.17)	(0.08)	(0.15)	(0.18)	(0.29)	(0.08)	(0.07)	(0.12)	(0.13)	(0.06)
Time since partnership formation (ref. 0-11 months)											
12-23 months	0.60***	0.38***	0.45***	0.73**	0.64***	0.79	0.80**	0.81***	0.44***	0.65***	0.59***
	(0.05)	(0.02)	(0.04)	(0.08)	(0.04)	(0.13)	(0.07)	(0.05)	(0.03)	(0.07)	(0.05)
24-35 months	0.62***	0.38***	0.51***	1.04	0.48***	0.90	0.78**	1.06	0.73***	0.90	0.82*
	(0.05)	(0.03)	(0.05)	(0.10)	(0.04)	(0.14)	(0.07)	(0.06)	(0.05)	(0.10)	(0.06)
36-47 months	0.66***	0.26***	0.40***	1.18	0.47***	1.08	0.88	1.17**	0.74***	0.90	0.82*
	(0.06)	(0.02)	(0.05)	(0.12)	(0.04)	(0.17)	(0.08)	(0.07)	(0.05)	(0.11)	(0.07)
48-59 months	0.80*	0.21***	0.47***	1.31**	0.38***	0.96	0.80*	1.20**	0.78**	1.08	0.81*

	(0.08)	(0.02)	(0.06)	(0.13)	(0.04)	(0.17)	(0.08)	(0.07)	(0.06)	(0.13)	(0.08)
60-71 months	0.73**	0.22***	0.40***	1.45***	0.45***	1.87***	0.77*	1.27***	0.70***	1.10	0.75**
	(0.08)	(0.03)	(0.06)	(0.16)	(0.05)	(0.31)	(0.08)	(0.09)	(0.06)	(0.14)	(0.08)
72-83 months	0.66***	0.16***	0.38***	1.39**	0.41***	1.36	0.72**	1.31***	0.60***	1.00	0.56***
	(0.08)	(0.03)	(0.06)	(0.16)	(0.05)	(0.28)	(0.09)	(0.10)	(0.06)	(0.15)	(0.07)
84-95 months	0.79	0.16***	0.25***	1.40**	0.32***	1.13	0.76	1.14	0.52***	0.91	0.55***
	(0.10)	(0.03)	(0.05)	(0.18)	(0.04)	(0.29)	(0.11)	(0.11)	(0.06)	(0.15)	(0.08)
96-107 months	0.66**	0.09***	0.32***	1.78***	0.22***	0.78	0.49***	1.11	0.64***	0.66*	0.35***
	(0.09)	(0.02)	(0.07)	(0.22)	(0.04)	(0.22)	(0.08)	(0.11)	(0.08)	(0.12)	(0.07)
108-120 months	0.61**	0.09***	0.23***	1.47**	0.35***	1.29	0.53***	1.02	0.41***	0.62*	0.50***
	(0.10)	(0.02)	(0.06)	(0.21)	(0.05)	(0.34)	(0.09)	(0.12)	(0.06)	(0.12)	(0.09)
Education (ref. medium)											
High	0.81***	0.77***	1.08	1.26***	1.18***	1.60***	1.13*	0.93**	0.84***	1.47***	1.19***
	(0.04)	(0.03)	(0.06)	(0.08)	(0.06)	(0.16)	(0.06)	(0.03)	(0.04)	(0.15)	(0.06)
Low	1.36**	0.98	0.77*	1.00	0.71***	1.71	0.98	1.31**	0.98	1.25	0.69
	(0.13)	(0.11)	(0.08)	(0.16)	(0.07)	(0.57)	(0.10)	(0.13)	(0.08)	(0.15)	(0.18)
Religiosity (ref. 0 "not at all religious")											
1 to 5	1.56***	1.70***	1.15	1.21**	1.28***	1.48**	1.31***	1.32***	1.23***	1.28**	1.28***
	(0.13)	(0.14)	(0.08)	(0.09)	(0.07)	(0.20)	(0.09)	(0.05)	(0.07)	(0.10)	(0.07)
6 to 10	2.12***	2.51***	1.62***	1.89***	1.83***	2.20***	2.04***	1.91***	3.26***	2.58***	2.06***
	(0.18)	(0.19)	(0.14)	(0.18)	(0.13)	(0.32)	(0.16)	(0.09)	(0.19)	(0.26)	(0.14)
Don't know/missing	1.92***	1.95***	1.06	1.36***	1.22*	1.86**	1.52***	1.25	1.35***	1.27	1.37*
	(0.22)	(0.19)	(0.13)	(0.10)	(0.10)	(0.42)	(0.13)	(0.17)	(0.11)	(0.17)	(0.18)
Migrant status (ref. non migrant)	2.02***	1.23***	0.82	1.40***	1.96***	1.25	1.88***	1.60***	1.18*	1.37***	1.31***
	(0.13)	(0.08)	(0.13)	(0.11)	(0.17)	(0.23)	(0.14)	(0.09)	(0.09)	(0.13)	(0.09)
Lived with both parents in childhood? (ref. yes)	0.80**	0.83**	0.82*	0.93	0.87**	0.83	0.83*	0.85**	0.86	0.91	0.71***
	(0.07)	(0.06)	(0.08)	(0.10)	(0.05)	(0.13)	(0.06)	(0.04)	(0.07)	(0.09)	(0.05)

Birth of child (ref. no birth)	1.23**	0.90	1.11	1.67***	0.82**	1.07	0.94	1.11*	0.53***	0.98	0.87
	(0.08)	(0.08)	(0.11)	(0.10)	(0.05)	(0.15)	(0.07)	(0.06)	(0.04)	(0.08)	(0.12)
Constant	0.00***	0.02***	0.01***	0.00***	0.01***	0.00***	0.01***	0.00***	0.01***	0.00***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Person months	209,349	88,360	113,855	231,123	260,720	100,885	344,240	495,018	225,862	159,576	172,794

*** p<0.001, ** p<0.01, * p<0.05

Table 3b. Competing risks hazard model of marriage and separation: *hazard risks of separation versus remaining in cohabitation*

VARIABLES	**Austria**	**Croatia**	**Czechia**	**Denmark**	**Estonia**	**Finland**	**France**	**Germany**	**Nthlands**	**Norway**	**UK**
Met online dating? (ref. no)	1.59**	1.69*	1.15	1.25	1.39**	1.05	1.11	1.27*	1.38*	0.84	1.18
	(0.23)	(0.40)	(0.21)	(0.15)	(0.17)	(0.19)	(0.15)	(0.13)	(0.20)	(0.13)	(0.14)
Age at partnership formation (continuous)	0.93***	0.98	0.95***	0.94***	0.91***	0.92***	0.93***	0.91***	0.96***	0.91***	0.94***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Year of union formation (ref. 2005-2014)											
Before 2005	0.99	1.43	0.76*	0.85*	0.87*	0.87	0.82*	1.04	1.04	1.20*	1.08
	(0.08)	(0.27)	(0.09)	(0.06)	(0.05)	(0.11)	(0.07)	(0.05)	(0.10)	(0.10)	(0.09)
2015-2022/23	1.30*	1.53*	1.55***	0.98	1.32**	1.18	1.39***	0.99	0.87	1.18	0.85
	(0.14)	(0.30)	(0.19)	(0.09)	(0.12)	(0.20)	(0.13)	(0.07)	(0.11)	(0.17)	(0.09)
Sex (ref. male)											
Female	1.11	0.86	1.17	1.17*	1.00	1.10	0.98	0.93	0.96	1.01	0.92
	(0.08)	(0.13)	(0.12)	(0.08)	(0.06)	(0.15)	(0.07)	(0.04)	(0.08)	(0.08)	(0.07)
Same sex union? (ref. no)											
Yes	1.17	2.55**	1.45	1.64**	1.97***	1.74*	1.98***	1.14	0.24*	2.51***	1.09
	(0.23)	(0.89)	(0.45)	(0.26)	(0.39)	(0.41)	(0.28)	(0.14)	(0.14)	(0.42)	(0.16)

Time since partnership formation (ref. 0-11 months)											
12-23 months	2.00***	2.27**	1.88***	1.33**	1.88***	1.67**	1.49**	1.51***	1.69***	2.14***	2.15***
	(0.27)	(0.65)	(0.29)	(0.13)	(0.19)	(0.30)	(0.18)	(0.11)	(0.25)	(0.29)	(0.25)
24-35 months	2.26***	3.37***	2.31***	1.40***	2.28***	1.70**	1.57***	1.63***	2.30***	2.20***	2.23***
	(0.31)	(0.94)	(0.35)	(0.14)	(0.24)	(0.31)	(0.20)	(0.12)	(0.34)	(0.30)	(0.28)
36-47 months	2.61***	5.57***	1.94***	1.31*	2.30***	1.61*	1.44**	1.54***	1.88***	2.22***	1.79***
	(0.37)	(1.72)	(0.34)	(0.15)	(0.25)	(0.30)	(0.19)	(0.13)	(0.31)	(0.33)	(0.25)
48-59 months	2.31***	4.71***	1.85**	1.05	2.02***	1.93**	1.20	1.45***	1.55*	1.95***	2.06***
	(0.35)	(1.51)	(0.38)	(0.13)	(0.25)	(0.43)	(0.17)	(0.13)	(0.28)	(0.32)	(0.30)
60-71 months	1.90***	3.85***	2.61***	1.03	1.59**	0.99	1.72**	1.13	1.78**	1.96***	1.55**
	(0.32)	(1.34)	(0.51)	(0.15)	(0.22)	(0.24)	(0.28)	(0.13)	(0.33)	(0.37)	(0.25)
72-83 months	1.57*	3.54**	1.32	0.85	2.28***	1.13	1.00	1.19	1.81**	1.49*	1.29
	(0.31)	(1.50)	(0.43)	(0.15)	(0.32)	(0.38)	(0.18)	(0.15)	(0.38)	(0.30)	(0.24)
84-95 months	2.44***	5.30***	1.06	0.81	1.53*	1.70	1.65**	1.01	1.15	1.14	1.50*
	(0.47)	(2.23)	(0.34)	(0.17)	(0.27)	(0.59)	(0.30)	(0.14)	(0.34)	(0.28)	(0.30)
96-107 months	1.76**	5.38***	0.70	0.70	1.46*	1.60	1.55*	0.99	1.60	1.70*	1.14
	(0.38)	(2.25)	(0.26)	(0.18)	(0.27)	(0.59)	(0.30)	(0.16)	(0.42)	(0.46)	(0.27)
108-120 months	1.26	2.03	1.38	0.76	1.87***	1.37	1.24	0.55**	1.83*	1.09	1.42
	(0.36)	(1.49)	(0.50)	(0.22)	(0.35)	(0.64)	(0.25)	(0.12)	(0.47)	(0.33)	(0.35)
Education (ref. medium)											
High	1.16*	1.34*	0.97	0.95	1.00	0.94	1.13	1.00	1.09	0.94	1.00
	(0.09)	(0.20)	(0.09)	(0.07)	(0.06)	(0.10)	(0.09)	(0.04)	(0.10)	(0.10)	(0.07)
Low	0.85	1.06	0.93	1.01	0.80	1.89*	1.12	1.20	0.91	0.92	1.51
	(0.16)	(0.75)	(0.14)	(0.17)	(0.10)	(0.50)	(0.18)	(0.17)	(0.16)	(0.11)	(0.42)
Religiosity (ref. 0 "not at all religious")											
1 to 5	0.75**	0.96	0.93	0.88	1.00	0.75*	0.82*	0.95	0.87	0.78**	1.09
	(0.07)	(0.19)	(0.10)	(0.07)	(0.07)	(0.10)	(0.07)	(0.05)	(0.08)	(0.07)	(0.09)
6 to 10	0.73**	0.75	1.15	0.79	1.33**	0.76	1.03	0.85**	1.12	0.84	0.94
	(0.08)	(0.15)	(0.16)	(0.11)	(0.13)	(0.12)	(0.12)	(0.05)	(0.15)	(0.13)	(0.11)
Don't know/missing	0.63*	0.42*	0.77	0.75**	0.72**	1.00	0.60***	0.96	0.92	0.72*	0.78

	(0.12)	(0.17)	(0.16)	(0.07)	(0.08)	(0.28)	(0.08)	(0.22)	(0.15)	(0.12)	(0.14)
Migrant status (ref. non migrant)	1.11	1.38	0.89	1.02	1.06	1.34	1.25	0.96	1.11	0.94	1.46***
	(0.12)	(0.34)	(0.23)	(0.12)	(0.16)	(0.42)	(0.18)	(0.09)	(0.17)	(0.14)	(0.15)
Lived with both parents in childhood? (ref. yes)	1.18	1.02	1.02	0.93	1.12	1.32*	1.20*	1.13*	1.38*	1.19	1.29**
	(0.12)	(0.25)	(0.13)	(0.12)	(0.07)	(0.19)	(0.10)	(0.07)	(0.18)	(0.12)	(0.11)
Birth of child (ref. no birth)	0.57***	0.32***	0.40***	0.55***	0.51***	0.47***	0.53***	0.63***	0.47***	0.53***	1.51**
	(0.08)	(0.11)	(0.07)	(0.07)	(0.04)	(0.10)	(0.05)	(0.07)	(0.08)	(0.06)	(0.20)
Constant	0.02***	0.00***	0.01***	0.02***	0.03***	0.04***	0.02***	0.05***	0.01***	0.04***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
Person months	209,349	88,360	113,855	231,123	260,720	100,885	344,240	495,018	225,862	159,576	172,794

*** p<0.001, ** p<0.01, * p<0.05

Figure 1. Proportion of first partnerships formed from online dating by country and year of partnership formation

(Note: countries in the legend are listed in order of country proportion for final year i.e. Finland with highest proportion of first partnerships formed through online dating)

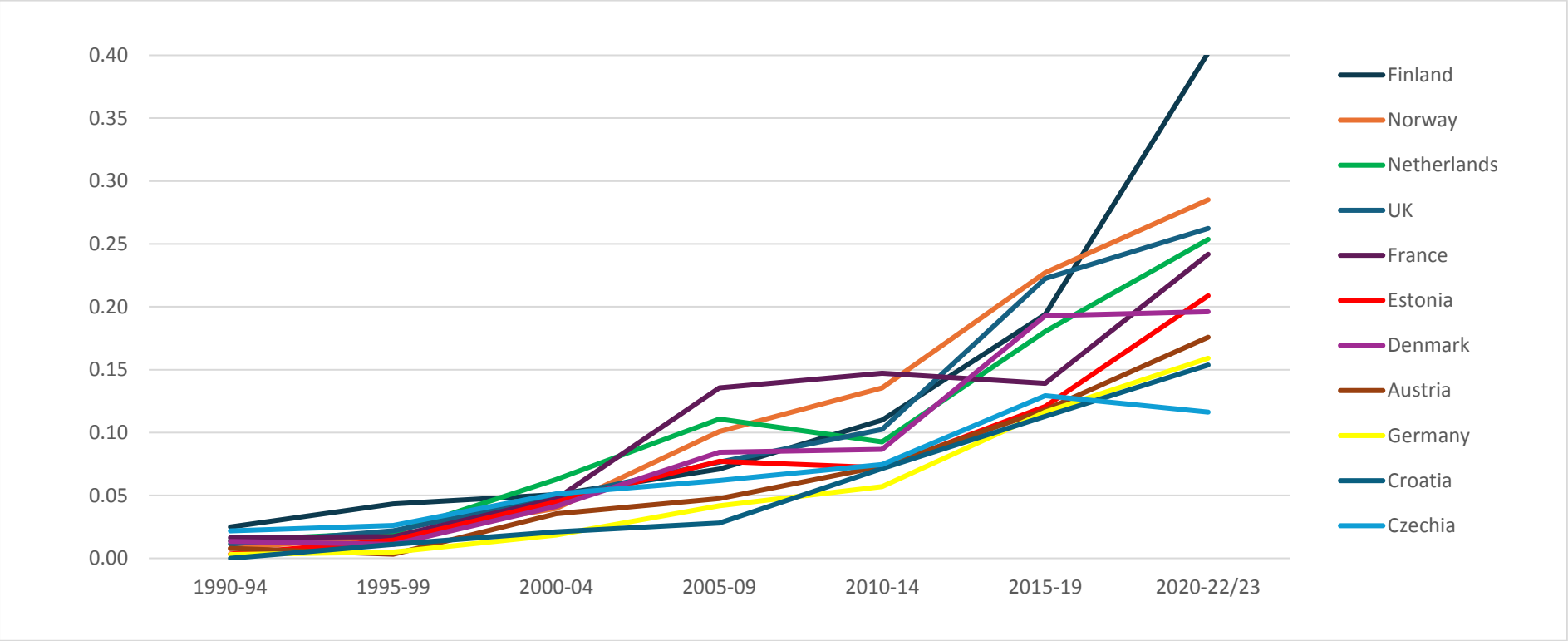
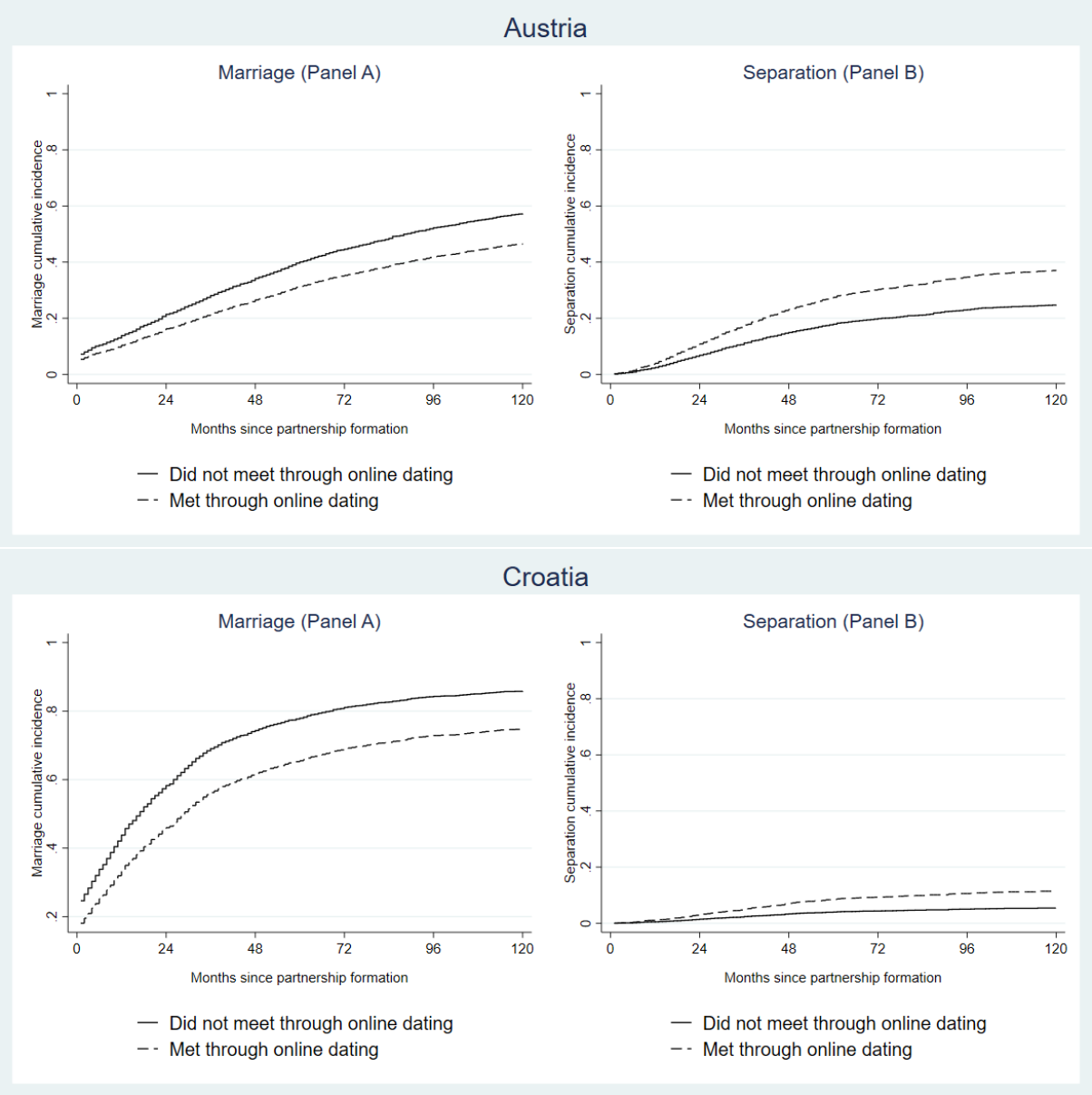
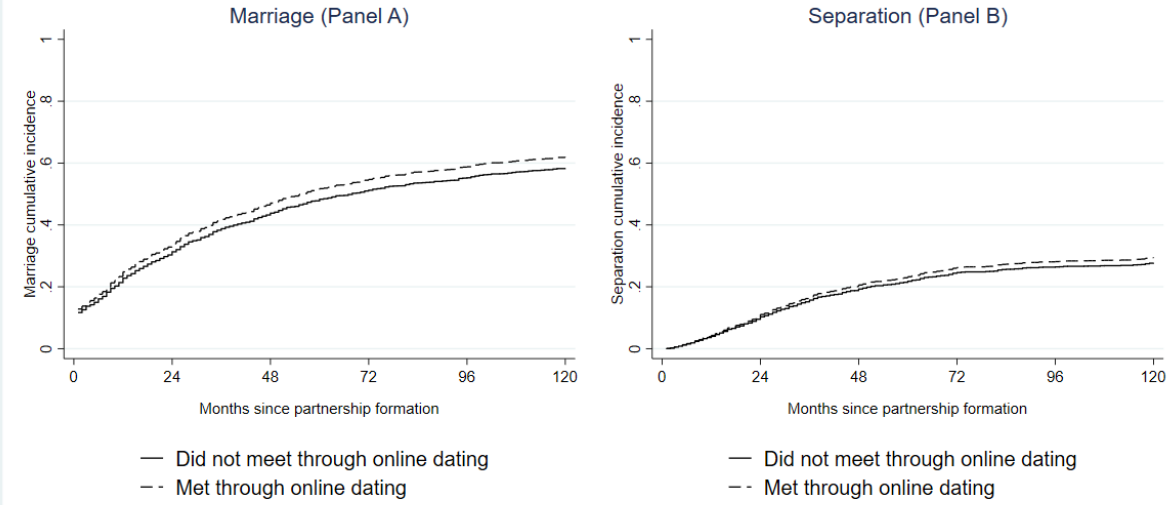


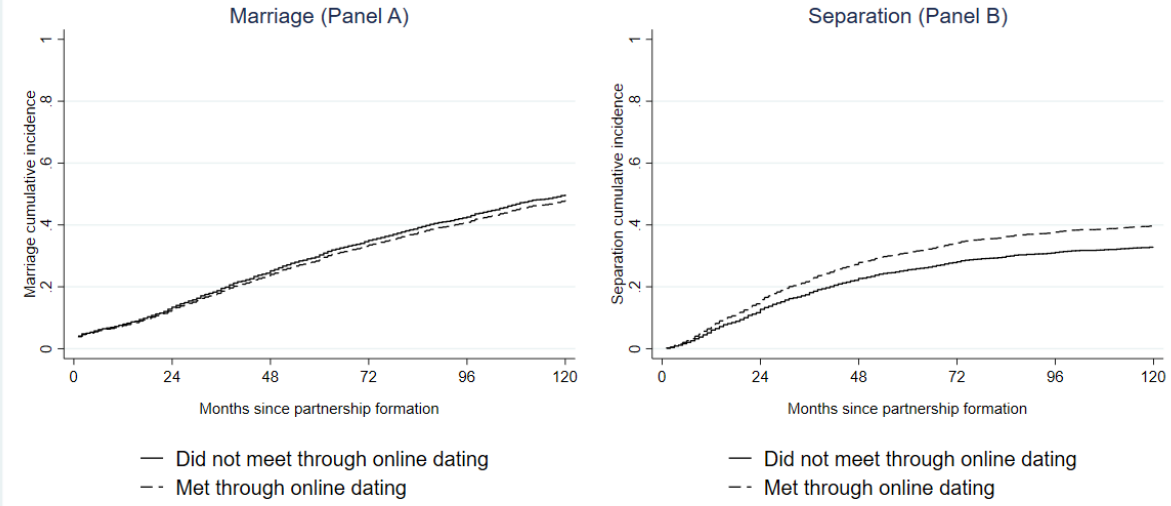
Figure 2. Cumulative incidence of marriage (panel a) and separation (panel b), by partnership duration ** all controls included



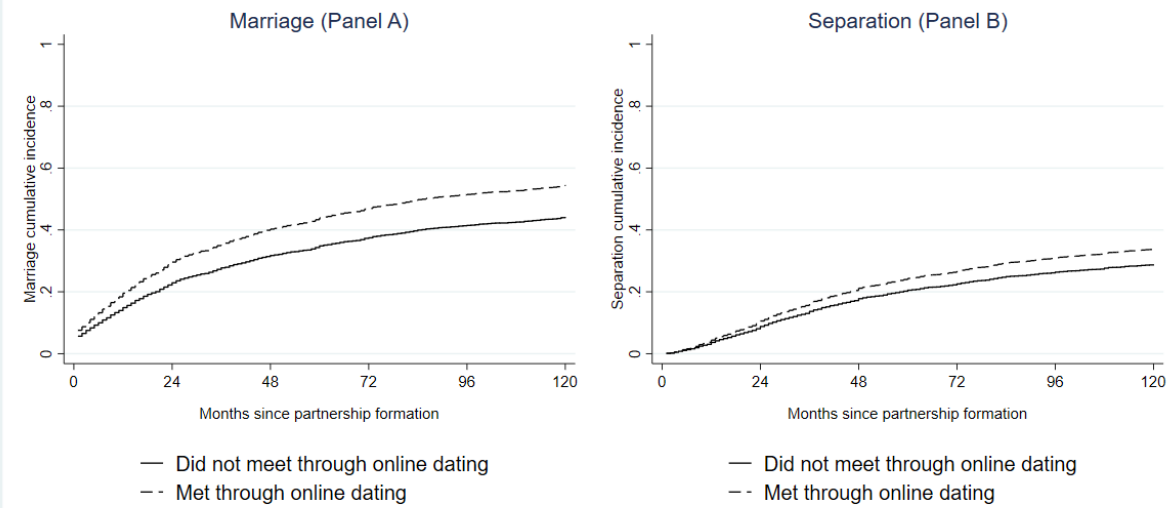
Czechia



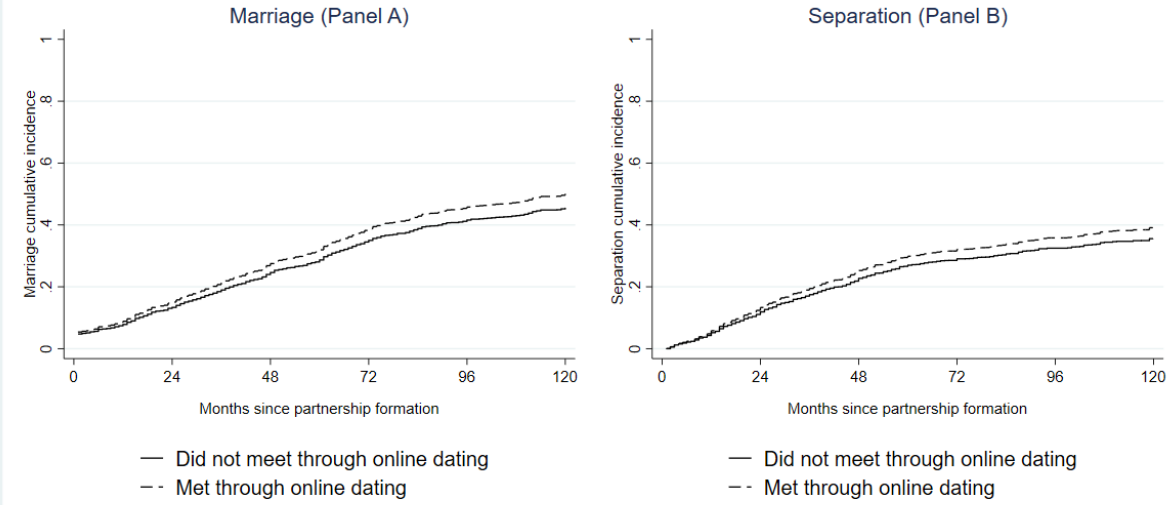
Denmark



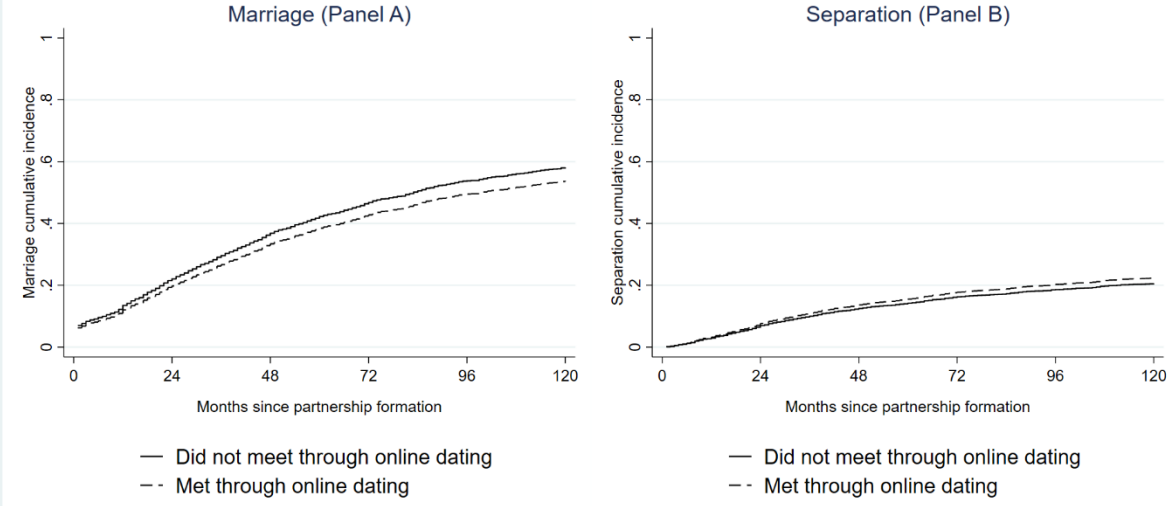
Estonia



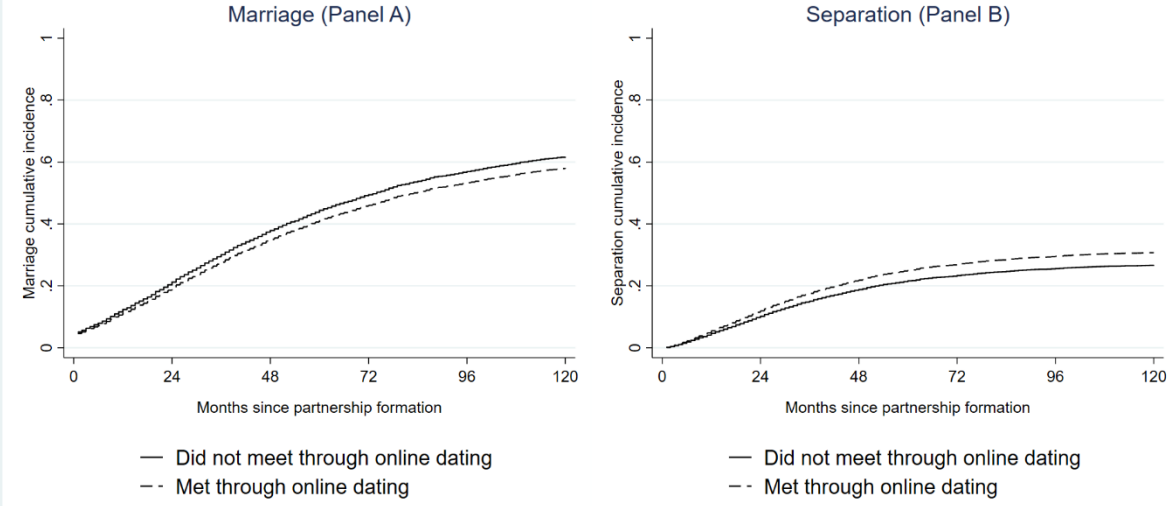
Finland



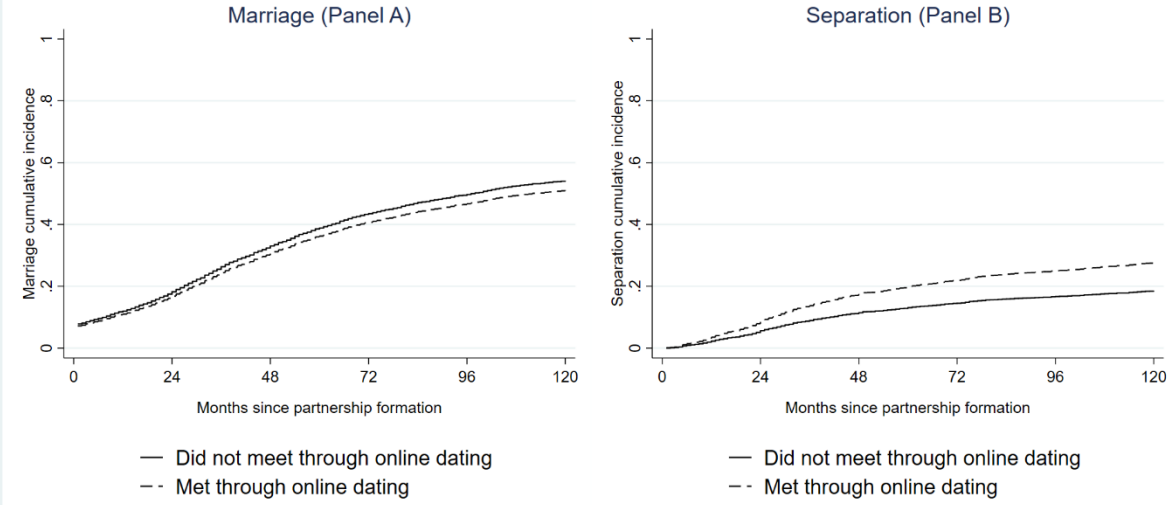
France



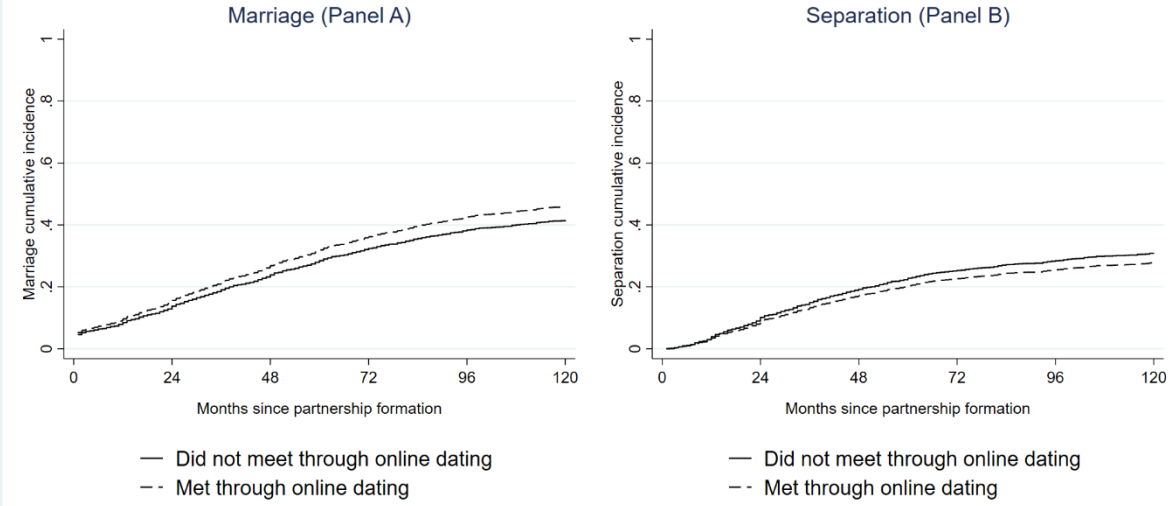
Germany



Netherlands



Norway



UK

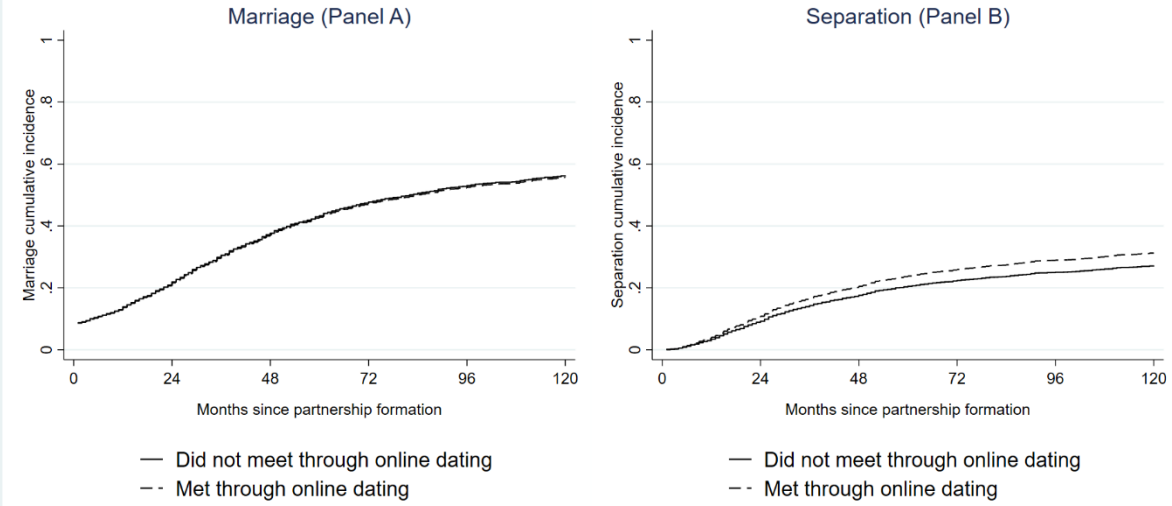
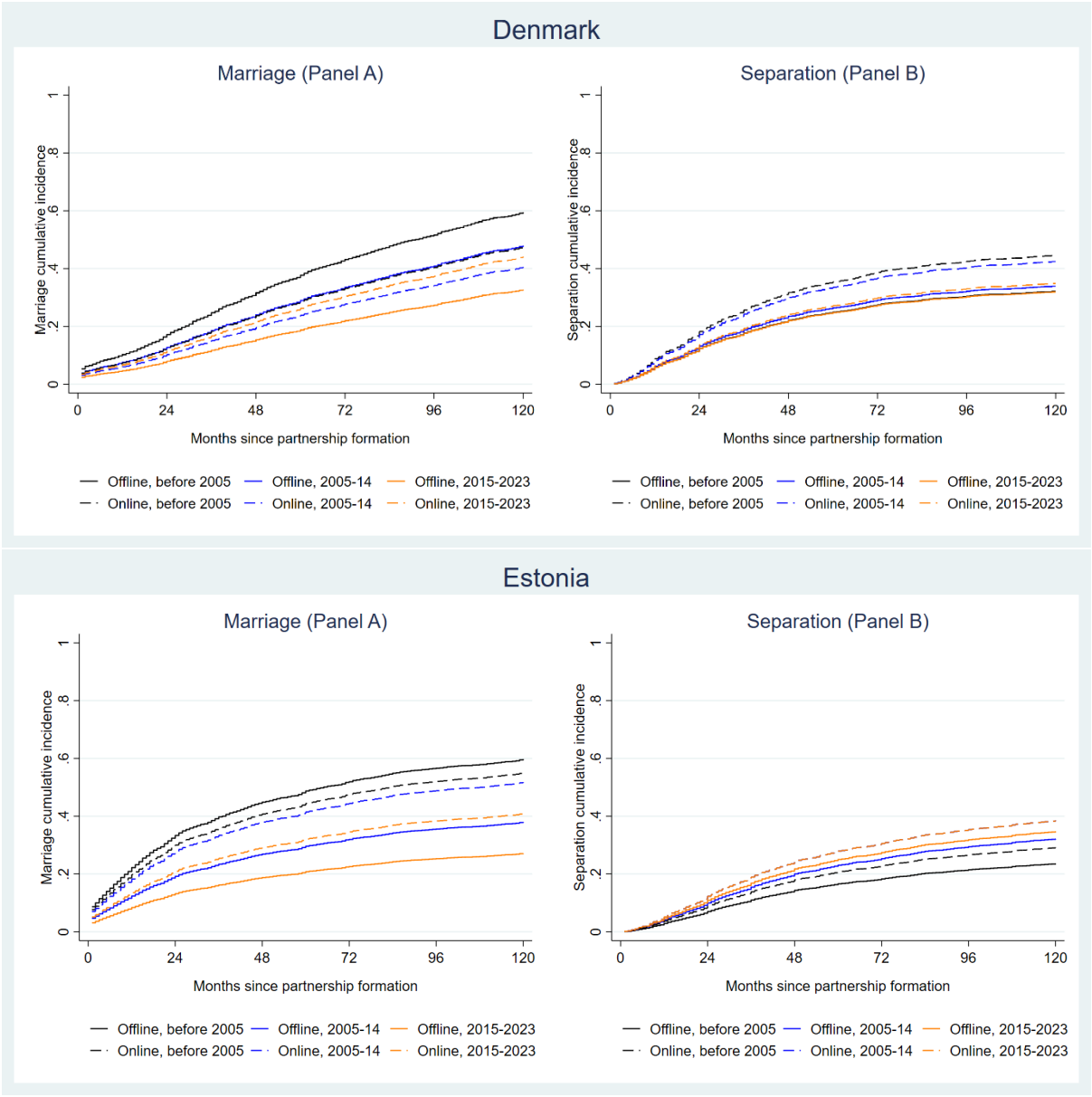
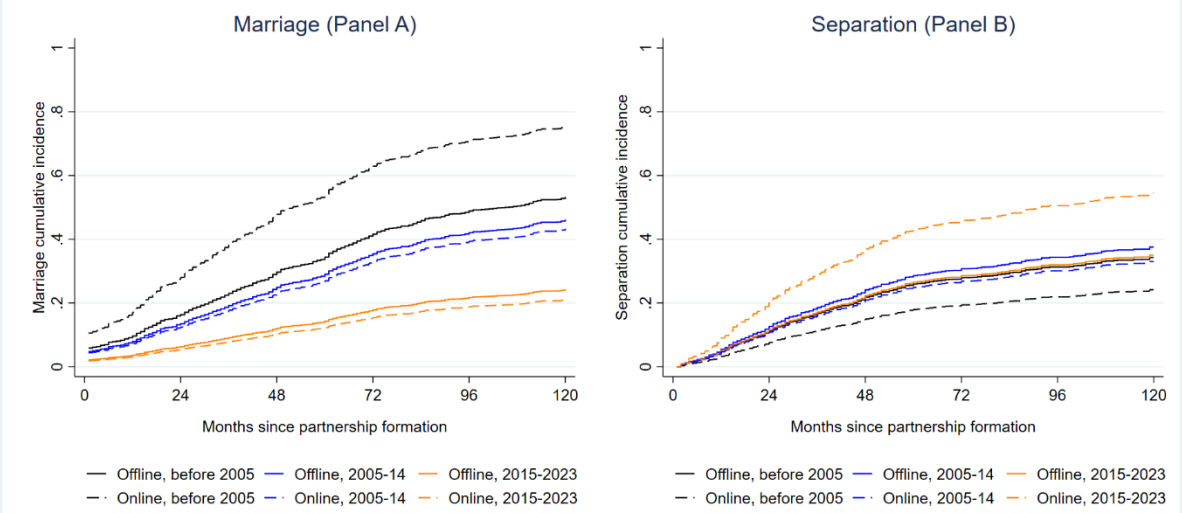


Figure 3. Cumulative incidence of marriage and separation from competing risk model, by partnership duration ** all controls included, with interaction between period and meeting online, countries that pass Wald test only



Finland



Germany